IJMRA

International Journal of Multidisciplinary Research and Analysis

VOLUME 07. YEAR 2024 ISSUE 05 MAY

International Journal of Multidisciplinary Research and Analysis is a leading analysis journal for publication of new idea s in multidisciplinary area

EXPLORE YOUR REASEARCH TO THE WORLD....

www.https://ijmra.in/   Email: editor@ijmra.in

Editorial Team Member

Dr.Umesh Sehgal(Ph.D. (Computer Science))
Assistant Professor and Department Head (GNA University, Phagwara),Bundelkhand University, Jhansi
India

Dr. Grebenisan Gavril (PhD. Eng)
Assoc. Prof. University of Oradea, 1 Universitatii str., 410089, Oradea, **Romania**

Professor Ibrahim Ormanovich Darvishov (Doctor of Philosophy in Philology, (PhD))
Acting Associate Professor of Uzbek Language and Literature, Namangan State University
Namangan Region, Mingbulak District

Professor Abdulvohid Khabibullevich Abdullazizov
Acting Head of the Department of Russian Language and Literature, Namangan State University
Namangan Region, Uychi District

Dr. Bogdan Constantin Ungurean (PhD Biology)
Lector, Faculty of Physical Education and Sport of "Al. I. Cuza" University
Str. Toma Cozma Nr. 3, Iasi 700554**, Romania**

Dr Kadir Shukurlaev (DCs)
Head of the Department of Physiology and Pathological Physiology, Urgench branch of the Tashkent Medical Academy
Republic Of Karakalpakstan, Amudarya District

Dr Bakhromjon A. Otakulov (Doctor of Philosophy in Technical Sciences)
Senior Lecturer of the department "Manufacture of building materials, products and structures" Fergana Polytechnic Institute
Fergana Region, **Fergana District**

Dr. Abdirashid M. Babadjanov (Candidate of Economic Sciences)
Associate Professor of the Department "Accounting and audit" of the Tashkent Institute of irrigation and agricultural engineers.
Tashkent City, Sergeli District

Professor Karimkhodjaev Nazirjon,
Associate Professor of the Andijan Machine-Building Institute. Department of "Avtomotive"
Uzbekistan

Dr. P.Ganesh Kumar (Doctorate(PhD))
Professor in Networking, K.L.N College of Engineering, Anna University
Anna University, Chennai, **Tamil Nadu, India, 2009**

Dr Durdana E. Lutfullayeva (Doctor of Philological Sciences)
Leading Researcher of the Department of Modern Uzbek Language of the Institute of Uzbek Language, Literature and Folklore of the Academy of Sciences
Tashkent City, Shayhontohur District

Dr. Rano Kh. Davlatova(Doctor of Philological Sciences)
Head of the Department of Preschool Education, Navoi State Pedagogical Institute
Navoi City, Lomonosova Street

Dr. Gulmira K. Obidova(Ph.D. in Pedagogical Sciences)
Assistant of the Department of Languages and Sports, Fergana Branch,Tashkent University of Information Technologies
Fergana Region, Fergana City

Dr. Md. Amir Hossain (PhD)
Assistant Professor, Department of English IBAIS University (International Business Administration and Information System)
Bangladesh

Dr. Parizod Sh. Turopova(Doctor of Philosophy in Philology)
Senior Lecturer of the department of teaching methods of Uzbek literature of Jizzakh State Pedagogical Institute
Jizzakh City, Uratepalik Mahalla

Dr. Nodira I. Soatova (Philological Sciences)
Associate Professor of the Department of Methods of Teaching Uzbek Literature at Jizzakh State Pedagogical Institute
Sh.Rashidov District, Uzbekistan

Tahir, Nura Musa (B. Eng. (BUK), M Eng. (UTM, Malaysia).)
Department of Mechatronics and System Engineering, Faculty of Engineering and Engineering Technology, Abubakar TafawaBalewa University, Bauchi,
P.M.B 0248, Bauchi, Bauchi State, Nigeria

Dr. Saida I. Sadiqova(PhD)
Associate Professor of the Department of Internal Medicine No. 2 of the Tashkent Medical Academy
Namangan City, Namangan Region

Dr. Manoj Kumar Rastogi (Ph.D. (Statistics))
Assistant Professor Department of Statistics Patna University,
Department Of Statistics, Patna University, Patna-05, **Bihar**

Dr. Mourad Hebali (Ph.D. in Electrical Engineering)
Professor Assistant in University Mustapha STAMBOULI Mascara
Mascara 29000, **Algeria.**

Dr. Shaimardan K. Hudjanov (Candidate of Medical Sciences)
Associate Professor of ENT Diseases, Tashkent Medical Academy
Tashkent Region, Zangiota District

Dr. Devarani Devi Ningombam (Ph. D.Computer Engineering)
Post-doctoral fellow,Department of Information strategy, Electronics and Telecommunications Research Institute (ETRI)
Electronics And Telecommunications Research Institute (ETRI) Dormitory, Gajeong-Dong,Yuseong-Gu, Daejeon 34129, South **Korea**

Dr. Shakhnoza Mukhamedjanovna Jalolova (Doctor of Philosophy in Philology)
Acting Associate Professor of English Philology, National University of Uzbekistan named after Mirzo Ulugbek
Tashkent City, Chilanzar District, Kyzyl Sharq District, **Uzbekistan**

Dr. Suheela Shabir (Doctorate (PhD) in Marketing)
Asst. Prof. in College of Business and Administration in PRINCESS NOURA BINT ABDUL RAHMAN UNIVERSITY, Riyadh
Saudi Arabia

Dr. Abdilatip Abdirakhimovich Sarimsokov (Historical Sciences)
Acting Head of the Department of Archeology, Namangan State University
Namangan City, Porloq MCM, 3rd Micro-District, 3rd House, 8th Apartment

Dr. Dharmendra Singh (PhD, CFP, CFA, Associate-life, UGC-NET)
Assistant Professor, Modern College of Business and Science (MCBS), Sultanate of Oman
Oman

Dr. Ayman Shehata Mohammed Ahmed Osman Mohammed El-Shazly (Ph.D. (Pure Mathematics- Mathematical Analysis - Complex Analysis))
Lecturer, Department of Mathematics, Faculty of Science, Assiut University, Assiut 71516**,**
Egypt

Dr. Jamila Sharipovna Jumabayeva (Doctor of Philological Sciences)
Head of the Department of English Philology, Faculty of Foreign Philology, National University of Uzbekistan named after Mirzo **Ulugbek Tashkent**

Dr. Lola S. Ortikova (Doctor of Philosophy in Agricultural Sciences)
Lecturer of the Department of Biology Teaching Methods, Jizzakh State Pedagogical Institute
Jizzakh City, Almazar Mahalla,

Farisa T S(M.Tech (CSE))
Digital signal processing, Data Mining, Natural Language Processing **INDIA**

Dr. G.RakeshP.hd(Computer Science & Application)
Dean of Science JAIRAMS COLLEGE OF ARTS & SCIENCE, KARUR.**INDIA**

Dr. Shamsiddin A. Allayarov(Ph.D.)(Candidate of Economic Sciences)
Head of the Department of Management and Marketing, Tashkent Financial Institute
Tashkent City, Mirzo Ulugbek District

Dr. Rashmi Rai(Ph. D,(Quality of Work-Life and Job Performance))
Assistant Professor , Management Department , Christ University, **Bangalore,INDIA**

Dr. Ravshan Khudayberganov(PhD on historical sciences)
Senior scientific researcher, Al-Beruni Institute of Oriental Studies, Academy of Sciences of the Republic of Uzbekistan, Tashkent,
Tashkent, Uzbekistan

Dr. Mohammed Nader Shalaby(Ph.D. Degree of Pathobiology and Physiology)
Associate Prof. of Biological Sciences and Sports Health Department, Faculty of Physical Education, Suez Canal University
Egypt, Ismailia

Dr.Mona Mostafa Abdo Sakoury(P.hd)
Associate Professor, Faculty of Applied Studies and Community, Service, Imam Abdulrahman Bin Al- Faisal University.
Saudi Arabia

Dr. Rita Greengold(Ph. D, Histroy)
College of William & MaryLyon G. Tyler Department of History.

Dr. Nargiza Sharopalievna Mullaboeva(Doctor of Philosophy in Psychology (PhD))
Senior Lecturer of Namangan Institute of Engineering and Technology, **Uzbekistan**

Dr. Shuchi Gupta(PhD (Commerce))
Associate Professor,University of Hail, KSA
Haryana, India

Dr. P.Malyadri(Ph.D. (Bank Finance for Rural Development))
Principal for 11 Years in Government Degree Colleges,Srisailam,Patancheru, Tandur,Chevella,Serilingampally,Kukatpally
Hyderabad, INDIA

Dr. Makhmud Akhmedovich Shakhodjaev
Associate Professor of Fergana Polytechnic Institute, Faculty of Energy, "EEE"
Fergana Region, Margilan City, M.Khofiz Street

Dr. Xaynazarov Baxromjon (Phd In History)
Faculty of History,National University of Uzbekistan
Tashkent, Uzbekistan

Dr. Dildora Bakhadirjanovna Agzamova
Associate Professor of "Translation Theory and Comparative Linguistics" of the National University of Uzbekistan named after
Mirzo Ulugbek

Dr. Izzatilla Makhmutalievich Khaydarov
Associate Professor of "History and Ethnology of the Peoples of Central Asia" Tashkent State University of Oriental Studies

Dr. Khurshida Erkinovna Yunusova(Doctor of Historical Sciences)
Professor of the Department of History of Uzbekistan, National University of Uzbekistan named after Mirzo Ulugbek
Tashkent City, Chilanzar District , Uzbekistan

Dr. Ravshan Berdimurodovich Siddikov(Doctor of Historical Sciences)
Associate Professor of History of Uzbekistan, National University of Uzbekistan named after Mirzo Ulugbek
Tashkent City, Almazar District, Uzbekistan

Dr. Ijod Narziqul ugli Akhmedov(Doctor of Philosophy (PhD) in Philosophy)
Head of the Department of Distance Education in Social Sciences and Humanities Jizzakh State Pedagogical Institute

Dr.Moise Adrian Cristian (Doctorate(PhD))
Associate Professor, Spiru Haret University of Bucharest, **Romania**

Dr. Umidjon Yandashalievich Kuziev
Acting Head of Department of Uzbek Language and Literature, Namangan State University
Namangan Region, Chust District

Akpojaro Ogheneochuko Owens (Msc, PGD,HND, ND)
Assistant Lecturer, School of Basic ScienceProgramme(Mathematics Unit), **Nigeria**

Dr. Prof. Shoeb Ahmad (Ph.D.)
PROFESSOR, Al Zahra College for Women, (Muscat) Oman
(Muscat) Oman

Rajibkumar Sanyal (M.Sc., PGDM, Ph.D., D.Sc. (Honoris Causa))
Associate Professor & Senior Researcher of Economics
Amity University, Kolkata Action Area II, Major Arterial Road, New Town

Dr. Askar R. Babaev
Acting Associate Professor
Tashkent City, Mirabad District,

Dr. Thirupathi Dongala(Ph.D, M.Sc. B.Sc. IT)
Working as Analytical Scientist-I with AUREX LABORATORIES LLC, 10 Lake drive, East Windsor, NJ, 08520 USA

Dr. Samuel Jacob Bunu (Doctor of Pharmacy)
Department of Pharmaceutical and Medicinal Chemistry, Faculty of Pharmacy, Niger Delta University, Wilberforce Island, Bayelsa State, **Nigeria.**

Chibuisi C. Okorieimoh Doctoral Researcher)
Assistant lecturer School of Multidisciplinary Technologies, Technological University Dublin

Dr. G.V.P. Samaranayake
Lecturer (Probationary), Department of Ayurveda Basic Principles, GampahaWickramarachchi Ayurveda Institute, University of Kelaniya, **Sri Lanka**

Khalid Zemam Amer
Responsible for the Division of Marketing of Scientific Products / Department of Scientific Affairs / Presidency of Mustansiriyah University

Dr.Wafaa Mohamed Mohamed Moustafa(M.Sc., B.Sc., Ph.D, chemical engineering)
Head of the Central Laboratory of Environmental Isotope Hydrology, **Egypt**

Dr. Chandramohan Andavar(Doctorate in Biochemistry. M.Sc., M.Tech)
Associate Professor and Head in the Department of Biochemistry Annai Violet College of Arts and Science Menambedu, Ambattur, Chennai, **India.**

Dr. Oyepata Simeon Joseph (Ph. D in Pharmacology and Toxicology)
Senior Lecturer, Department of Pharmacology, Faculty of Pharmaceutical Sciences, Bingham University, Karu, Nasarawa State, **Nigeria**

Dr. Janna A. Nazarova(Doctor of Medical Sciences)
Doctor of Medical Sciences
Tashkent City, Chilanzar District

Dr. Amadou Danlami(Ph. D in Commonwealth Literature and culture)
University of Dschang, Faculty of Arts, Letters and Social Sciences, Department of Applied Foreign Languages

Dr.Ramesh Prasad Adhikary(Ph.D)
Assistant Professor (English) Tribhuvan University, M.M. Campus, Nepalgunj

Dr Kholida K. Matjanova(Postgraduate, student of the Institute of Bioecology of the Karakalpak branch of the Uzbek Academy of Sciences)
Associate Professor

Republic Of Karakalpakstan, Amudarya District

Dr.Ali Adel Dawood(Ph.D,)
Lecturer, College of Medicine, Mosul, Iraq Course Unit Director, College of Medicine, Uni. of Mosul
IRAQ

Dr Raushana K. Kurbaniyazova(Doctor of Philosophy in Philosophy)
Senior Lecturer of the Department of Social Sciences, Urgench Branch of the 1st Tashkent State Medical Institute
Republic Of Karakalpakstan, Amudarya District

Dr. Kamila K. Juraeva (Ph.D.)
Associate Professor of Power Supply, Tashkent State Transport University
Tashkent

Dr. Wan Ainun Binti Mior Othman(Ph.D)
Associate Professor Institute of Mathematical Sciences, Faculty of Science, University of Malaya, 50603 Kuala Lumpur**, Malaysia**.

Dr. Dharmendra S. Mistry (Ph.D.)
Prin. M. C. Shah Commerce College (Navgujarat Campus),(Affiliated toGujarat University)
Ahmedabad, INDIA

Dr. Murodulla A. Juraev(Doctor of Philosophy in Philology)
Senior Lecturer of the Department of Methods of Teaching Uzbek Literature of Jizzakh State Pedagogical Institute
Jizzakh City, Ittifaq Mahalla

Dr. Surayyo I. Eshonkulova(Philological Sciences)
Associate Professor of Teaching Methods of Uzbek Literature, Jizzakh State Pedagogical Institute
Jizzakh Region, Jizzakh City

Dr. Namrata Raviraj Vaishamapayan(MD, PGDHA, BHMS)
Assistant Professor(Practice of Medicine),MNR Homoeopathic Medical College, Sangareddy, Telangana

Prof. Dr. Majid Mohammed Mahmood(Ph.D,)
A University professor of Immunology Mustansiriyah University – College of Science, **Baghdad**

Dr. Yelimbet K. Sultanov(Technical Sciences)
Associate Professor of "Agricultural Mechanization and Investment Activity" Nukus branch of Tashkent State Agrarian University.

Dr. Durdona A. Akhatova(Pedagogical Sciences)
Associate Professor of General Pedagogy and Psychology, Navoi State Pedagogical Institute

Professor Zulkhumor N. Tojieva
Professor of Economic and Social Geography
Tashkent City, Yashnaabad District, Baku 1-Berk Street

Dr. Ulughbek M. Ergashev(PhD in Medical Sciences)
Senior Lecturer of the Department of Otorhinolaryngology and Dentistry, Tashkent Medical Academy
Tashkent City, Yashnabad District

Dr. Jamolbek A. Djuraev(Doctor of Philosophy in Medical Sciences)
Senior Lecturer, Department of Otolaryngology and Dentistry, Tashkent Medical Academy
Tashkent City, Almazar District

Dr. Lola S. Ortikova Senior Lecturer of the Department of Otolaryngology and Dentistry, Tashkent Medical Academy
Tashkent City, Mirabad District, Sadyk Azimov Street

Dr Ziyoda G. Mukhamedova(Doctor of Sciences in Technics)
Doctoral student of the Department of Freight Transport Systems, Tashkent State University of Transport (DSc)
Tashkent City, Yunusabad District

Dr. Shahzada Mudasir Rashid(PhD)
Assistant Professor (Scientist) Division of Veterinary Biochemistry, Faculty of Veterinary Sciences, SKUAST-K, Shuhama, Alustang, Srinagar.

Professor Rustam Djumayev
Professor of the Department of "Oriental Policy and International Relations" of the Tashkent State University of Oriental Studies
Uzbekistan

Dr. Karno Kumar Mondal(Ph.D)
Teaching Assistantship Undergraduate Lab Department of Physics Khulna University of Engineering & Technology, Khulna-9203

Dr. Begzodbek Kh. Abdullaev(Doctor of Philosophy in Philology)
Associate professor , Andijan State Universitys
Andijan Region, Altynkul District

Dr Farida T. Rabbimova(Doctor of Pedagogical Sciences)
Senior Lecturer of the Department of General Biology and Methods of Teaching ,Jizzakh State Pedagogical Institute

Dr. Rakhimjon Kh. Muradov(Doctor of Philosophy in Technical Sciences)
Senior Lecturer, Namangan Institute of Civil Engineering
Namangan Region, Mingbulak District

Dr.Vishal Dubey (Ph.D)
Director, Department of Pharmaceutical Sciences, Naraina Vidya Peeth Group of Institutions, **INDIA**

Dr. Venkataraman Mugundan(PhD in Mathematics)
Math Lecturer in 'INSTITUTE OF APPLIED TECHNOLOGY',(GOVERNMENT OF ABU DHABI), Fujairah, United Arab Emirates, **U.A.E.**

Dr Muzraf T. Rabbimov(Ph.D)
Associate Professor at the Department of Primary Education at Jizzakh State Pedagogical Institute

Dr Otabek Sh. Ochildiev(Doctor of Philosophy in Technical Sciences)
Head of the Laboratory "Software Management and Mechatronics"of the Research Institute of Agricultural Mechanization
Tashkent Region, Yangiyul District,

Dr Umidbek B. Yusupov(Doctor of Philosophy in Technical Sciences)
Acting Associate Professor of "Vehicle Engineering" Tashkent State Transport University
Tashkent City, Sergeli District,

Dr Abdirasuli A. Ibragimov(Doctor of Philosophy in Technical Sciences)
Scientific Secretary of the Research Institute of Agricultural Mechanization and Electrification
Tashkent Region, Yangiyul District,

Dr. Shakhlo B. Samanova (Doctor of Philosophy)
Associate Professor of "Theory of building a democratic society in Uzbekistan." Urgench State University.
Khorezm Region, Urgench District

Dr. Abderraouf Mtiraoui (Ph.D in Economics)
Assistant Professor in Economics at the Higher Institute of Finance and Taxation (HIFT)-Sousse- **Tunisia**

Dr. Muhammad Faizal bin Samat (Doctor of Philosophy (Marketing Communication))
Senior Lecturer at Malaysian Academy of SME & Entrepreneurship Development, Universiti Teknologi MARA, Shah Alam
Malaysia

Dr. Wulan Rahmadhani (Doctor in Public Health)
Lecturer, Department of Midwifery, Sekolah Tinggi Ilmu Kesehatan Muhammadiyah Gombong, **Indonesia**

Dr. Adeboye, N. Olawale (Doctor of Philosophy (PhD))
Department of Mathematics & Statistics, Federal Polytechnic Ilaro, Nigeria

Ewa, Moses Apie (Ph.D)
Lecturer Department of Educational Foundations & Childhood Education, Faculty of Education, Cross River University of Technology (CRUTECH), Calabar, **Nigeria**

Shaimaa Mohamed Hassanin (Ph.D in English Literature)
Lecturer of English language and American literature at Horus University
Damietta, Egypt

Dr. Dildora S. Davronova (Doctor of Philosophy in Pedagogical Sciences)
Associate Professor of "Pedagogy and Psychology" at the Uzbek State University of World Languages
Chilonzor Region Tashkent, Uzbekistan

Dr. Karima J. Tulenova(Doctor of Philosophy)
Acting Head of the Department of Social Sciences, Tashkent State Pedagogical University named after Nizami
Tashkent City, Yakkasaray District

Yannick Boum (Ph.D in English Language)
A researcher from the University of Yaounde **Cameroon, Central Africa**

Dr. Rashmi S (Doctor of Philosophy in Botany)
Assistant Professor, Post Graduate Department of Botany, JSS College of Arts, Commerce and Science (Autonomous) Ooty Road, Mysore, Karnataka, **India**

Dr Abdimurot U. Kuziev(Candidate of Technical Sciences)
Head of the Department of Transport Systems and Structures of Termez State University
Surkhandarya Region, Termez City

Dr. Normakhmat P. Panjiev (Doctor of Philological Sciences)
Head of the Department of Russian Linguistics, Termez State University
Surkhandarya Region, Termez City

Rawda Bashir Abdulla (Ph.D.)
Assistant Professor in Teaching English language and Applied Linguistics, Department of English Language Skills Jouf University
Kingdom of **Saudi Arabia**

Dr. Nemat Kh. Kushvaktov(Ph.D Pedagogical Sciences)
Head of the Department of General Pedagogy of Jizzakh State Pedagogical Institute.
Jizzakh City, Navruz Mahalla

Dr Khurshid A. Sattarov (Ph.D.)
Head of the Department of Electronics and Radio Engineering, Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, **Tashkent City, Mirabad District**

Dr. Manoj Kumara.N.V (Ph.D in Finance)
Associate Professor in Department of Management Sciences, Maharaja Institute of Technology- Mysore.
Karnataka, India

Jupeth Toriano Pentang (Doctor of Philosophy Major in Educational Management)
Mathematics Educator, Researcher and Extensionist, College of Education, Western Philippines University Puerto Princesa City,
Philippines

Housseine Bachiri (Ph.D)
Assistant Professor at the Faculty of Sciences and Technologies, Tangier
Tangier (Morocco)

Dr. Sarvarbek Kh. Jumaboev(Doctor of Philosophy in Technical Sciences)
Acting Associate Professor of Power Supply, Tashkent State Transport University
Uchtepa District

Dr. Gulmira J. Tulenova
Professor,Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Tashkent, Uzbekistan
Uzbekistan

Seham Ismail (Doctor Philosophy in Agricultural Sciences)
Head of Department of Insect Population Toxicology, Central Agricultural Pesticides Laboratory, Agriculture Research Center,
Dokki, Giza, Egypt
 Egypt

Dr. Veena N (Ph.D. in Educational Psychology)
Associate Professor, Christ Academy Institute for Advanced Studies (CAIAS), Bangalore
Bangalore

Dr. Djuraev Jamolbek Abdukakharovich (Ph.D.)
Senior Lecturer Department of Otolaryngology and Dentistry TMA
Tashkent

Dr. V.KIRUTHIGA (Ph.D)
Assistant Professor, Department of Management Studies, Faculty of Engineering and Technology, Jawaharlal Nehru Salai, 100 Feet
Road, Vadapalani, Chennai-600026
Chennai

Dr. Govind Shinde (Ph.D.)
Professor, Babasaheb Gawde Institute of Management Studies. (Approved Associate Professor Finance Faculty University of
Mumbai)
Mumbai

Prof. Dr. Nagham Mahmood Aljamali (Ph.D.)
Professor in organic chemistry, Department of Chemistry, Synthetic Organic Field, IRAQ
Iraq

Dr. Tiziana Ciarambino (Ph.D. in Geriatrics Phisiopathology)
Teacher at the University of Campania
Campania

Dr. Kalandarov Palvan Iskandarovich (Doctor of Technical Sciences)
Professor at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers in Tashkent
Tashkent, Uzbekistan

Dr. MC Manjunatha (Phd.)
Assistant Professor, Department of Civil Engineering, Maharaja Institute of Technology, Thandavapura, Mysuru -571 302
Mysuru

Dr. Sourabodhi Bhattacharyya (Ph.D)
Assistant Professor of Sanskrit (Stage II) Galsi Mahavidyalaya, B.U, Galsi,Purba Bardhaman , W.B-713406
India

Dr. Naftaly Gisore Mose (Ph.D in Economics)
Lecturer (Economics) University of Eldoret
Kenya

Dr. ARTI (Ph.D. in Law)
Assistant Professor, Desh Bhagat University, Punjab
INDIA

Dr. MOTHUKURI ANJAIAH (Ph.D. In Library Science)
Assistant Professor (Dept. of Library and Information Science)
INDIA

Dr. Youssif Zaghwani Omar (PhD in English Education)
General Director of the Institute of Human Resources Development at the Libyan Academy
Libya

Dr. Ndubuisi-Okolo (Ph. D)
Lecturer, Nnamdi Azikiwe University
Nigeria

Dr. Mourad Romdhani (Ph.D. in English Literature)
Assistant Professor, the Faculty of Letters and Humanities, University of Sousse, Tunisia
Tunisia

Dr. Utemuratova Gulshirin Najimatdinovna(PHD in Biological Science)
Karakalpak Scientific Research Institute of Natural Sciences Laboratory of Animal Science, Doctor of Philosophy PHD, Biological Science, Uzbekistan
 Uzbekistan

Dr. Tureyev Abat Arisovich, PhD(Doctor of Philosophy (Tourism))
lecturer of technology of storage and processing of agricultural crops, philosopher of Biological Sciences ,Karakalpakstan Institute of Agriculture and Agrotechnology,
Uzbekistan

Dr. Rico Paulo G. Tolentino (PhD in Development Education)
School Principal, Department of Education, Schools Division of Bulacan, Philippines
Philippines

Dr. Nik Alif Amri Bin NikHashim (Doctor of Philosophy (Tourism))
Senior Lecturer (DS51), Faculty of Hospitality, Tourism & Wellness, University **Malaysia Kelantan**
Australia

Shuang Li (Ph.D. in Sociology)
Sociology Lecturer, Department of Sociology and Social Work University of Wisconsin-Stevens Point
Wisconsin

Dr. V.KAVITHA (Ph.D. in English Literature)
Assistant Professor of English, Nehru Arts and Science College (Autonomous), Coimbatore
Coimbatore

Dr. Samieva Gulnoza Utkurovna
Doctor of medical sciences (DSC), Samarkand State medical institute, Uzbekistan
Uzbekistan

ANOKE, Amechi Fabian (Ph.D)
Lecturer, Department of Business Administration, Faculty of Management Sciences; Nnamdi Azikiwe University, Awka, Anambra State **Nigeria**

Dr..L.Bhuvana (Ph.D)
Assistant Professor of Chemistry, Shrimati Indira Gandhi College, Tiruchirappalli
Tamil Nadu, India

Dr. Norjigit T. Nishonov(Candidate of Agricultural Sciences)
Senior Lecturer, Department of Agrochemistry, Soil Science, Plant Protection and Quarantine, Samarkand Veterinary Medical Institute Samarkand Region

Dr. Esirgap I. Turapov(Ph.D)
Associate professor of the Department of "Machine Engineering Technology" at the Almalyk Branch
Jizzakh Region, Galla-Aral District

Dr Alisher J. Shokirov(Doctor of Agricultural Sciences)
Dean of the Faculty of Storage and Processing of Agricultural Products, Tashkent State Agrarian University
Tashkent Region, Yunusobod District

Dr. Patkhillo Siddikov(Doctor of Technical Sciences)
Professor of "Technology of textile fabrics" of the Tashkent Institute of Textile and Light Industry
Tashkent City, Chilanzar District

Suyarova Nargiza Yuldoshevna (Doctor of Philosophy (PhD))
Senior teacher, Philological Sciences, Karshy State University, Uzbekistan

Table of Contents IJMRA Volume 07 Issue 05 May 2024

13.	Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam	Nhung Doan Thi Hong , Hang Trinh Thi Thu	1924-1934
14.	Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice	Ahmad Ainun Najib , Putri Ayu Sutrisno	1935-1940
15.	Upholding Informed Consent: Experiences of Note – Taking without Audio Recording of in-Depth Individual Interviews in a Qualitative Study on the Implementation of the Pregnancy ReEntry Policy in Zambia	Namakau Kakanda-Sinkala	1941-1944
16.	Teachers' Utilization of Digital Tools and Confidence in Technology	Rekmel Mayantao , Rosalinda C. Tantiado	1945-1952
17.	Empowering Patients: The Role of Education in Pain Alleviation during IUD Insertion	Eden Estevez , Shivaughn M. Hem-Lee-Forsyth , N'Diera Viechweg , Sharon John , Stephanie P. Menor	1953-1956
18.	Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach	Tuhin G M Al Mamun , EHSANULLAH	1957-1963
19.	Ownership of Humans	Dr. Nguyen Anh Quoc	1964-1970
20.	Sustainable Cultivation of Millets	Sandhyarani S. Sonkamble , Aakanksha C. Kumbhar, Kumudini R. Pawar , Dr. Suraj V Nalawade	1971-1977
21.	Book Review: Sommer, Doris. The Work of Art in the World: Civic Agency and Public Humanities (Durham, NC: Duke University Press, 2014)	Mohamed Idyassine	1978-1980
22.	Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City	Merdi Hajiji , Lisdawati Wahjudin	1981-1993
23.	Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents	Marison Felicidad R. Dy , Erick Vernon Y. Dy	1994-2001
24.	The Impact of School Environment on Student Health Behaviors: Insights from Qualitative Interviews	Banh Thang Long , Vu Thanh Hung	2002-2007
25.	Unveiling Gender Discrimination in the Workplace: A Qualitative Analysis of Vietnamese Women's Narratives	Dinh Thi Nguyet	2008-2013
26.	Cultural Influences on Students' Information Technology Skills Development	Nguyen Thị Quynh Trang , Phan Thị Thu	2014-2019
27.	Impact of Psychological Factors on Physical Education Learning Outcomes	Windi Surya Pratama , Wilda Welis , Ishak Aziz , Syahrastani	2020-2025
28.	AI Based Chatbot: A Case Study Afghanistan Healthcare Services Mental Health Disorder	Esmatullah Sabet , Sayed Shafiullah Sadat , Hasib Ahmad Khaliqi	2026-2029
29.	The Role of School Sports in Shaping Student Identity and Social Relationships	Le Phuoc Quang	2030-2035
30.	Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports	Le Hai Ha	2036-2044

31.	Analytics Integration in Performance Management: A Bibliometric Analysis	Lekshmi Chithra R , Dr Prakash Pillai R	2045-2055
32.	Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics	Ahmad Zamzami Nur , Sri Harti Widyastuti	2056-2060
33.	Evaluation of Achievement Development Management of Bhayangkara Precision Football Club	Muhammad Adam Fatihurrahman , Duwi Kurnianto Pambudi , Enggista Hendriko Delano	2061-2067
34.	The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee	Mifta Arifin , Mismiwati , Deky Anwar	2068-2076
35.	Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia	Abd Azis , Sagaf S. Pettalongi , Saude Saude , Nurdin Nurdin	2077-2083
36.	Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal	Shristi Karmacharya1 , Rupa Devi Thapa2	2084-2091
37.	Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network	Joshua Odion , Andikan Kenneth Ekpa	2092-2101
38.	Bridging the Gap between Criminology and Information Technology	Quimberly Rose P. Estrada , Dr. Kristine Soberano , Zillah R. Segue	2102-2106
39.	Exploring EU Culture Policy towards Eastern Partnership Countries	Sophio Chantadze	2107-2116
40.	Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State	Dorothy J. Okoro , Usen Essien Inyang , Godswill Efiom Etim , Uduak. I. Umoh	2117-2122
41.	Game Model to Improve the Motor Abilities of Primary School Students	Tuswan , Hari Yuliarto , Sri Mawarti , Anastasia Erlina L. , Sb.Pranatahadi , Hadwi Prihantanta , Margono	2123-2131
42.	Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta	Pris Azassih , Sumaryanti	2132-2140
43.	Implementation of Preventive Maintenance Management on Multiline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary	Dede Roni , Atika Dwi Arsanti , Elaeys Mulia Bulqis , Revryand Alfaridzi , Tri Ngudi Wiyatno	2141-2149
44.	Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center	Minangoao P. Imam , Jalal P. Samsodin	2150-2155
45.	Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method	Hassan Elsan Mansaray , Victor Tamba Simbay Kabba , Hebert Borboh Kandeh, Abdulai Sillah	2156-2170
46.	Online Autism Literacy to Improve Acceptance of Mothers of Children with Autism Spectrum Disorders	Kumala Windya Rochmani	2171-2177

63.	A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions	M. Sandoval-Hernandez,, N. Carrillo-Ramon , S. E. Torreblanca-Bouchan ,A. de J. Mota-Hernandez , G. J. MoralesAlarcon , A. R. Escobar-Flores , J. Farias-Uscanga , J. E Perez-Jacome-Friscione ,U. A. Filobello-Nino , H. VazquezLeal , S. Y. Campos-Dominguez , S. Ocaña-Pimentel	2350-2357
64.	The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China	Zhongguo Huang, MPH,* , Tao Liu, PhD,* Yan Shi, PhD* , Yanfei Guo, PhD , Guanhao He PhD, JianXiong Hu, PhD, Xiaomei Dong, PhD , Jianpeng Xiao, PhD, Ziqiang Lin, PhD , Fan Wu, PhD* , Wenjun Ma, PhD.*	2358-2368
65.	Effect of Plyometrics Hexagonal Drill and Zig-Zag Drill with Muscle Strength towards Leg Muscle Power and Vo2max of the Volleyball Extracurricular Members of SMA Negeri 5 Kota Magelang	Riris Aji Prasetiyo , Ahmad Nasrulloh	2369-2372
66.	The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)	Khalliyma Dara Efda , Rachmah Laksmi Ambardini	2373-2382
67.	Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta	Desi Andini , Pamuji Sukoco , Nevitaningrum , Wahyu Dwi Yulianto	2383-2389
68.	Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam	Thu Nhung Nguyen	2390-2398
69.	Professional Liabilities of Legal Officer in Providing Legal Opinion to the Corporate Directors	K. Ikka Shintya Daivi, Johannes Ibrahim Kosasih , I Made Arjaya	2399-2405
70.	Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia	Teddy Giolanda Pratama , Hari Yuliarto , Soebagyo , Ngatman , Achad Imam Ma'ruf	2406-2411

Analysis of Wrist Fitness on the Backhand Lob Badminton Better For Badminton Athletes in Takalar District

Muhammad Rhandy Amin[1], Widiyanto[2], Melati[3]

[1,2]Department of Sport Science, Faculty of Sport and Health Science, Yogyakarta State University, Yogyakarta.

[3]Department of Physical Education, Health and Recreation, Makassar State University Indonesia.

ABSTRACT: This study aims to determine the level of wrist flexibility on badminton backhand lob for badminton athletes in Takalar District. This research type is quantitative research. The variables in this study are wrist flexibility and backhand lob strokes. The population in this study is all badminton athletes in Takalar District, the sample technique that used in this study is simple random sampling. Data collection techniques used are wrist flexibility test and backhand lob test. The method used in this research is descriptive correlation, namely by knowing the relationship between wrist flexibility and the ability to hit backhand lobs for badminton athletes in Takalar district. Based on the research, the result shows that wrist flexibility on badminton backhand lob strokes for badminton athletes in Takalar district as many as 20 respondents has a significant relationship between wrist flexibility. With the elasticity of the muscles and the breadth of the joints, it will be easier for a person to master movement skills in various sports and faster, because the possibility of movement will be more flexible and difficult movements can be done, such as doing lob movements in badminton.

KEYWORDS: Wrist Flexibility, Backhand Lob, Badminton

I. INTRODUCTION

Badminton is a sporting activity that involves using a racket and shuttlecock to hit it over the net. Badminton is a sport that is popular with various groups of people, from urban to rural areas.

Badminton is a type of sport that is popular among the residents of South Sulawesi. This sport is widely known and can be enjoyed by people of all ages and backgrounds, both men and women. Both in cities and in remote villages. The popularity of this sport is so widespread that almost everywhere you can find a badminton court, even though it is in a very simple form. Moreover, badminton is a sport that has provided brilliant achievements for Indonesia, making it a source of pride for this country.

Badminton is a sport that is quite popular among the people of South Sulawesi. This game is famous and can be enjoyed by people of all ages, both men and women, from various walks of life, this sport is popular not only in big cities, but also in remote villages. The popularity of this sport is so widespread that almost everywhere you can find a badminton court, even though it is in a very simple form. In particular, badminton has become a proud sport for Indonesia, bringing a good name to this country.

The development of the sport of badminton is increasingly rapid because it has a unique appeal and attracts attention Namely, one of his attractions lies in his interesting movements, such as making a backhand shot which involves swinging the racket from the front of the chest outward to hit the ball. When making a backhand shot, the palm of the hand faces the opposite direction from the ball. With the progress of this sport, opportunities will open up for badminton fans to improve their achievements.

The lob shot is a technique in badminton which aims to send the shuttlecock into the air as high as possible and towards the back of the court. The lob shot involves a relaxed body position, with the body positioned behind the shuttlecock, the position of one foot in front is used by placing the body weight on the back. The shuttlecock is hit in the front of the head with a swing of the racket towards the front of the head, while fully straightening the arm. After the racket hits the shuttlecock, continue the hitting motion so that the racket is next to your body Drs. Herman Subardjah, (2000: 46-47).

The rapid growth in the sport of badminton is due to its unique appeal, pulling movements in badminton, such as the

backhand, involve hitting the ball with a swing of the racket from the front of the chest outward. When making a backhand shot, the palm of the hand faces the opposite direction from the ball. As this sport develops, it will provide opportunities for badminton fans to develop their achievements.

Mastery of basic techniques really determines the quality of badminton. Athletes or players who have good mastery of basic techniques will be able to perform games with high skill. In badminton, there are several basic techniques that must be mastered, one of the fundamental aspects of the game of badminton which has an important role for players to master is the backhand technique.

Badminton is an individual sport that can be played in a one-on-one or two-on-two format, using a racket and shuttlecock. The badminton court is rectangular in shape and divided by a net to separate the players' own and opponent's areas (Drs. Herman Subardjah, 2000:3).

Badminton is a sport that is included in the game category, Badminton is individual with two game formats, namely singles and doubles, which are played by various ages from children to adults with various skill levels, from basic to the most complex level. (Mangun, F. A., Budiningsih, M., & Sugianto, A. 2017).

The lob shot in badminton is a shot that aims to send the shuttlecock into the air as high as possible, towards the back of the court line (Drs. Herman Subardjah, 2000: 46- 47). After the serve, the lob or long shot becomes a very significant skill in the game of badminton. This ability must be maintained to send attacks to the back of the field. Usually, new players have difficulty hitting lob shots to the back of the court. (Puji Hastuti 2009: 21).

Overhead punch technique, also known as overhead punch. Mastering this punch is important to be able to stop your opponent's movements. A shot that may be difficult to execute at certain age points, the level of difficulty mainly occurs when the shuttlecock comes into contact with the racket, in making the shot It requires using the wrist with strength and speed to direct the shuttlecock to the back of the opponent's court. Mastering the backhand overhead lob skill can increase the precision and range of the backhand overhead clear. (Umam, 2008).

To perform a backhand overhead lob in the left back area, the player needs to step his right foot back first. First, rotate your right foot to initiate the step in the backhand overhead lob, then take a long step towards the back left corner of the court with your left foot. The next step is to take a long step with the right foot, Take a few steps with your right foot to get yourself in the right position for a backhand overhead lob.

Flexibility is the ability of the wrist/joint to be able to move in all directions with a wide and large range of motion that suits the function of the joints that are moving (Syafruddin, 2012:111). Flexibility is a person's ability to perform movements with a wide range of joint motion (Vai, A., Ramadi, R., & Johanes, B. 2018).

Flexibility is one element of the physical condition component which is also included in the basic component category of physical condition, flexibility is considered a component of basic physical conditions because it is independent and separate from other components, Flexibility is not affected by other physical components. Flexibility is the capacity of the wrist or joint to make optimal movements in all directions, flexibility is also an aspect of physical condition. Flexibility plays an important role in changing the direction of movement when executing a short serve (Ihsanul Qalbi, Abdurrahman, Bustamam. 2017).

Badminton players who have good wrist flexibility can direct force effectively when executing a backhand lob. This is because with good wrist flexibility, badminton players can execute various movements more smoothly. So, to produce an effective backhand lob, wrist flexibility must be optimal.

II. METHOD

reserch variable, In this study, there are two variables involved, namely the independent variable and the dependent variable. In this study, these two variables will be identified as wrist flexibility in executing a backhand lob. Research design is a framework used as a guide in carrying out research. This research is a type of descriptive research which aims to evaluate how big the contribution of the backhand lob in badminton.

$$ X \xrightarrow{\quad r \quad} Y $$
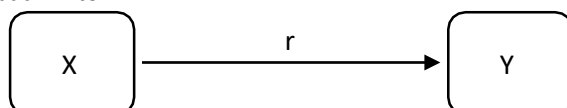
Information :

X   : wrist flexibility

Y   : Backhand Lob

r   : Relationship between X and Y

Data analysis, Descriptive data analysis aims to provide a general description of wrist flexibility, including values such as average, standard deviation, variation, minimum value and maximum value.

Analysis of Wrist Fitness on the Backhand Lob Badminton Better For Badminton Athletes in Takalar District

The correlation test in this study aims to evaluate whether there is a relationship between wrist flexibility and backhand lob shots in badminton athletes in Takalar Regency, with a standard value referring to the P value > α (0.05).

III.   RESULT AND DISCUSSION RESULT

To test this hypothesis, a correlation test was carried out between wrist flexibility data and backhand lob hitting skills in badminton Correlation analysis of Takalar Regency badminton athletes will use the Pearson product moment correlation method. The findings from the correlation analysis will be explained as follows:

Table 1. Summary of the results of the correlation analysis of wrist flexibility on badminton backhand lob skills in badminton athletes in Takalar district.

Variable			Information
KPT(X) – KBL (Y)			Signifikan

Based on the data in Table 3, it can be seen that the calculated Pearson correlation value is 0.656 ($P < 0.05$), This shows that there is a significant relationship between wrist flexibility and backhand lob skills in badminton in Takalar Regency badminton athletes. Data analysis obtained calculated correlation value (r) = 0.656 ($P < 0.05$), then H0 was rejected and H1 was accepted. This indicates that there is a significant relationship between wrist flexibility and backhand lob skill in badminton in athletes from Takalar Regency.

Discussion

The results of the analysis of the relationship between an independent variable and the dependent variable in hypothesis testing need to be studied further by providing an interpretation of the relationship between the analysis results achieved and the theories underlying this research.

This explanation is important to assess the suitability between the proposed theories and the research results that have been obtained: First hypothesis test results: There is a significant relationship between wrist flexibility and badminton backhand lob skills in Takalar Regency badminton athletes.

Based on statistical results, there is a significant relationship between wrist flexibility and backhand lob skills in badminton in athletes from Takalar Regency. Thus, the results of this research basically support and strengthen theories and findings from previous research.

With elastic muscles and a wide range of motion in joints, a person will be able to master movement skills in various sports more efficiently, this is because it is possible that his movements will be more flexible, allowing him to perform difficult movements, such as a lob in badminton. In order to achieve maximum performance in a sport, especially badminton, To achieve maximum performance in certain sports, especially badminton, it is important to maintain wrist flexibility. With good flexibility, a person can smash with the correct and strong technique.

Therefore, it is very important to increase the flexibility of athletes because this has an impact on stretching tendons and ligaments, as well as improving the quality of movement optimally. As previously explained, flexibility can be increased through muscle stretching exercises and exercises to increase joint range of motion. Because flexibility is influenced by how much range of motion a person's joints have.

If an athlete has good flexibility in terms of quality and quantity, This will provide psychological benefits to athletes, such as increased self-confidence, courage to move, and so on. Because flexibility has many benefits in reducing the risk of injury, athletes will have a lower risk of injury by increasing their flexibility. However, in flexibility training, it is important to use the right methods and appropriate exercise dosage. However, apart from flexibility, there are other physical components that also play a role in the backhand lob another factor that influences a backhand lob is arm muscle strength, which determines how strong a shot a player can make.

IV. CONCLUSIONS

Based on the results of data analysis and the description of the discussion that has been presented, it can be concluded as follows: There is a significant relationship between wrist flexibility and badminton backhand lob skills in Takalar Regency badminton athletes.

REFERENCES

1) Arikunto, Suharsimi. 2002. Prosedur Penelitian: Suatu Pendekatan Praktek. Rineka Cipta. Jakarta.

2) Aryanti, Silvi, Ahmad Richard Victorian, And Soleh Solahuddin. 2021. "Video Pembelajaran Pada Materi Teknik Dasar Footwork Bulutangkis." Jurnal Patriot 3(3): 329–39.

3) Drs. Herman Subarjah. 2000. Bulutangkis. Jakarta. Dirjen Dikti PPLPTK Depdikbu RI.

4) Gokulkrishnan, G. (2018). Effect of circuit training and interval training on vital capacity and VO2 maxin women badminton players. International Journal of Physiology, Nutrition and Physical Education, 3(2), 1204–1206

5) Gunawan, Riyan, Herman Subarjah, And Encep Sudirjo. 2019. "Perbandingan Antara Metode Latihan Shadow Dan Permainan Sentuh Warna Terhadap Keterampilan Footwork Bulutangkis." Sportive 2(1): 141–50.

6) Harsono. (2008). Coaching dan Aspek-aspek Psikologis dalam Coaching. Jakarta: Dirjen Dikti P2 LPTK.

7) Huang, K.-S., Shaw-Shiun, C., & Tsai, C.-L. (2002). Kinematic Analysis of three different Badminton Backhand Overhead Strokes. ISBS 201, 200–202.

8) Ihsanul Qalbi, Abdurrahman, Bustamam. (2017) Jurnal Ilmiah Mahasiswa Pendidikan Jasmani, Kesehatan dan Rekreasi Fakultas Keguruan dan Ilmu Pendidikan Unsyiah Volume 3, Nomor 1: 47 – 60

9) James Poole. Belajar Bulutangkis. Bandung : Penerbit Pioner Jaya, 2006.

10) Lundvall, S. (2015). Physical literacy in the field of physical education - A challenge and a possibility. Journal of Sport and Health Science.

11) Mangun, F. A., Budiningsih, M., & Sugianto, A. (2017). Model Latihan Smash Pada Cabang Olahraga Bulutangkis Untuk Atlet Ganda. Gladi Jurnal Ilmu Keolahragaan, 8(2), 78–89

12) Ninit Alfianika, M.Pd. (2018) Buku Ajar Metode Penelitian Pengajaran Bahasa Indonesia.

13) Nur Ichsan Halim, 2011. Tes pengukuran dan penyusunan alat evaluasi dalam bidang olahraga. Bahan kuliah FIK UNM Makassar

14) Prasetyo, Y. (2013). Kesadaran Masyarakat Berolahraga untuk Peningkatan Kesehatandan Pembangunan Nasional. Medikora,11(1),219228

15) Puji Hastuti. 2009. Buku Panduan Cabang Olahraga Bulutangkis Special Olimpics.Jakarta: Spesial Olimpics Indonesia.'

16) Umi, Narimawati. (2010) Metodologi Penelitian : Dasar Penyusun Penelitian

17) Safitri, Dian, And Dika Ramadani. 2021. "Prestasi Atlet Bulutangkis Putri Indonesia Di." Edukasimu 1(2):1–8.

18) Sugden, D., & Wright, H. (2014). Physical education. In Enabling Access: Effective Teaching and Learning for Pupils with Learning Difficulties. https://doi.org/10.4324/9781315067780-12

19) Sugiyono. 2014. Metode Penelitian Pendidikan Pendekatan Kuantitatif, KualitatifDan R&D. Bandung: Alfabeta.

20) Syarill Alhusin. 2007. Gemar Bermain Bulutangkis. Direktorat Jendral Pendidikan Dasar dan Menengah.

21) Syafruddin. 2012. Ilmu Kepelatihan Olahraga. Padang. UNP Pres Padang.

22) Vai, A., Ramadi, R., & Johanes, B. (2018). Hubungan Antara Power Otot Lengan Dan Bahu, Power Otot Tungkai Dan Kelentukan Pergelangan Tangan Dengan Hasil Smash JOPE (Journal Of Sport Education), 1(1), 1–8.

23) Umam, C. (2008). Pengaruh latihan pukulan backhand lob evorhead dan kekuatan lengan terhadap jauhnya pukulan backhand lob overhead bulutangkis bagi pemain putra usia 12-15 tahun di Persatuan Bulutangkis Empat Putra Ketapang Kabupaten Sampang. 2(1), 2. Retrieved from library.um.ac.id/freecontents/printjournal.php/37766.html.

24) Yuksel, M. F., Cengiz, A., Zorba, E., & Gokdemir, K. (2015). Effects of Badminton Training On Physical Parameters of Players. Anthropologist, 21(3), 542–547.
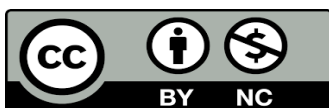
Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

MAKOSSO-VHEIYE Georges[1], MOULONGO Jean Georges André[2], PACKATCHISSAMBOU Bernard[3], LITOTO Lucien[4], MOUANDA KONDE Dorel[2], MASSAMBA Alphonse[2]

[1]Unit of Nutritional Science and Metabolism, Laboratory of Sports Biosciences, Higher Institute of Physical Education and Sports, Marien Ngouabi University, Brazzaville, Congo

[2]Exercise Physiology and Biomechanics Laboratory, Higher Institute of Physical Education and Sports, Marien Ngouabi University, Brazzaville, Congo

[3]Unit of Toxicology and Human Nutrition, Higher Institute of Physical Education and Sports, Marien Ngouabi University, Brazzaville, Congo

[4]Laboratory of Sport Sociology, Higher Institute of Physical Education and Sports, Marien Ngouabi University, Brazzaville, Congo

ABSTRACT: The COVID-19 pandemic has a negative impact on people's living conditions, particularly in sub-Saharan Africa in vulnerable and low-income families. The aim of this work is to analyze the socio-demographic profile of people who engaged in food sales activities during the COVID-19 lockdown in Brazzaville, as well as their coping and survival strategies. The study, which used a mixed (qualitative and quantitative) approach, included 716 people (241 men and 475 women) aged 18 to 72 years residing in four communes in the southern zone of Brazzaville,

Republic of Congo. The main study inclusion criterion was the practice of selling food during COVID-19 lockdown. However, we did not include people whose profession had been selling these products prior to the health crisis. The qualitative data collected during the interviews concerned information on vendors, sales locations, coping strategies used to find the products sold, and sales prices. As for the qualitative data assessed using a food questionnaire, they were summarized in terms of the quality and quantity of food consumed, which made it possible to assess daily energy intake and therefore the level of food security. The results showed that the sellers, with an average age of 42.7, had a relatively low level of education and lived in a medium-sized family (8). Of these, 21.8% were food insecure. Foodstuffs sold were dominated by miscellaneous products (48.2%), street foods (26.7%), ready-made meals (22.3%), cassava flour (17.4%) and fruit and vegetables (7.5%). Salted fish, smoked fish and frozen (imported) meat products were also sold. As far as prepared dishes were concerned, grilled meats of various kinds were the most popular. Sales outlets included state markets, neighborhood markets, storefronts and street markets for auctions. The use of rickshaws and wheelbarrows by a few money-seeking youngsters enabled the products purchased to be transported from the places of purchase to the various markets or sales sites. In short, given the absence of an effective distribution and marketing policy in the food system in times of crisis in the Congo, our results call into question the resilience of vulnerable populations in the face of the country's sociosanitary crises.

KEYWORDS: COVID-19, adaptation strategies, food sales, food security, Brazzaville

INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has become a major global pandemic following its outbreak in Wuhan (China) in December 2019. A pandemic declared a public health emergency of international concern by the World Health Organization (WHO) on January 30, 2020, the virus has reached every continent with high virulence in Europe and America, affecting almost every country on the planet. In Africa, the pandemic has not had the same impact, with the exception of South Africa, Morocco and Egypt. The Republic of Congo-Brazzaville has not remained on the sidelines: from March 14, 2020, when the Congolese government confirmed its first case of the COVID-19 coronavirus, to February 21, 2022, 3905 cases of COVID-19 have been diagnosed and confirmed, with a total of 378 deaths (case-fatality rate of 1.6%) (Ministry of Health and Population,

2022). Faced with this health emergency with an asymmetric impact on the socio-economic situation, several essential protective measures were taken to combat the pandemic, including the declaration of a nationwide state of health emergency, coupled with the announcement of a general 20-day lockdown, followed by the publication of Decree N°2020-99 of April 1, 2020 listing essential goods and services and authorized essential travel. The populations of the country's two main cities, Brazzaville (political capital) and Pointe-Noire (economic capital and seaport on the Atlantic Ocean), the epicenters of the epidemic, were particularly concerned, as the first cases of COVID-19 were diagnosed there. The first lockdown of Brazzaville's population, by government decision, included: the opening of state markets (district or neighborhood) three days out of seven (Monday, Wednesday and Friday); a week-long ban on vehicles, motorized vehicles and bicycles; a ban on leaving the district of residence; the wearing of masks (medical or home-made); and the introduction of a curfew (from 8pm to 5am). The implementation of these measures, combined with the closure of interdepartmental and international borders, has had a major impact on the national economy and, above all, on the food and nutritional security of the population. Indeed, the restrictions on citizens' mobility during the lockdown phase, combined with the closure of many food stores, supermarkets, mini-markets, cafés and restaurants, exacerbated the impoverishment of low-income households, particularly those living from day to day on small trades, street trading and hawking. As with the impact of armed conflict on the lives of displaced or refugee populations in sub-Saharan Africa, the analysis of the impact of lockdown on food consumption and survival strategies of populations in the epidemiological cycle draws on the nutritional crisis and poverty. It is in this context that, during the period of lockdown, an emergence of the informal food sector was noted among confined populations in the various districts of Brazzaville, using marginal markets to replace the usual household distribution, supply and consumption circuits. Urban, peri-urban and even rural agricultural production supplying Brazzaville has been severely disrupted. Indeed, before the publication of the decree specifying essential goods, actors and services, urban and periurban market gardeners were already calling for a relaxation of lockdown measures, so that they could continue their activities to feed the population (Lossele and Atipo, 2020). With regard to imported food products (beef, pork, poultry, frozen sea fish, salted fish, wheat, sugar, rice, pasta, oil, salt, tomatoes and onions), the COVID-19 crisis revealed the fragility and heavy dependence of the Congolese food system (Bitsoumanou Nkounkou and Martin, 2021). Following the flooding of markets and panic buying observed a few days after the announcement of the lockdown measures, food consumption collapsed and underwent profound changes. An analysis of the food situation and living conditions therefore appeared to be an essential element in the epidemiological crisis situation. In view of these observations, the absence of strategies for monitoring and/or supporting the population's food supply by the Congolese authorities, and the limitations of a few fragmentary studies and reports on the impact of the COVID-19 pandemic on the Congolese food system (Bitsoumanou Nkounkou and Martin, 2021; Ngoma, 2020), we felt it necessary to understand the food survival strategies implemented by the inhabitants of Brazzaville during the COVID-19 lockdown period, in order to enable political and socio-health decision-makers to intervene with precision in times of crisis.

To this end, our study was structured around the following questions: Who are the nonsalespeople by profession who engage in commercial activities in the food sector during the COVID-19 lockdown in the southern part of Brazzaville? What is the nature of these activities? This study therefore aims to: (i) identify the profile of people involved in food sales/production activities during the COVID-19 lockdown in Brazzaville, (ii) assess their level of food security; (iii) characterize these activities in the context of food survival strategies, and (4i) specify the reasons for selling food products during this period.

MATERIALS AND METHODS

Scope of the study

The study was carried out from March 10 to August 10, 2020 (COVID-19 lockdown period) in four of Brazzaville's ten communes: Madibou, Makélékélé, Bacongo and Mfilou (Figure 1). The choice of the study area, located in the southern part of Brazzaville, is explained by the precarious living conditions of the population and/or the low income of the majority of families (CNSEE, 2018).

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

Study area
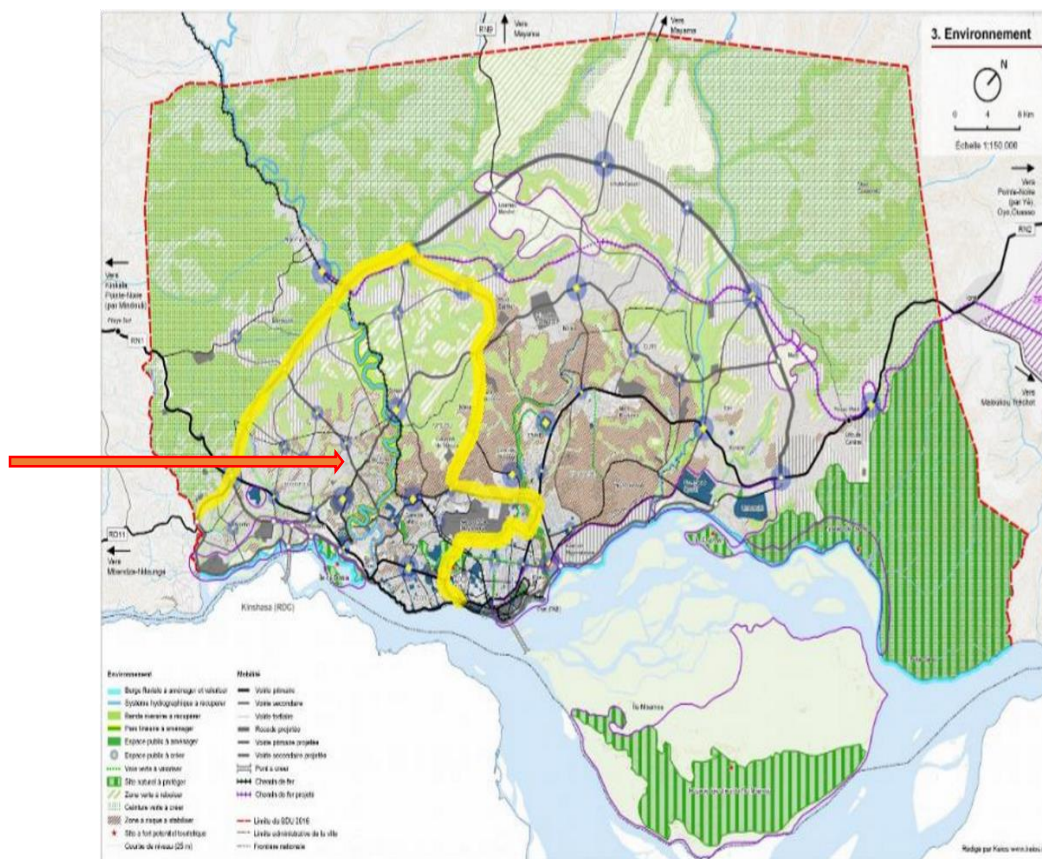
Figure 1: Location of the study area in the city of Brazzaville. (MCUVCV, 2016)

What's more, the recurrent armed conflicts of 1997-1999 in these four communes have further eroded families' standard of living, making it difficult for them to guarantee food security and even balance their daily food intake (Makosso Vheiye et al., 2008). We know that in a context of advanced impoverishment, disadvantaged people develop multiple survival strategies. They make changes in the way they manage their domestic economy (Nganga et al., 2013).

Sample

A total of 6,000 families, from the Kongo ethnic group which is in the majority in these communes, made up the study population at the time of the survey (RGPH, 2014). These were subject to 2 random draws with 2 fractions of 1/3. Each commune is divided into neighborhoods, which are subdivided into blocks. For fins of representation, the selection of neighborhoods and blocks within the study area was based on a 1/3 draw for each entity. This procedure resulted in the selection of 108 blocks. From the families making up this population, the minimum 1/10 drawing method, a fraction accepted during national survey operations (Hambleton et al., 1995), enabled us to select 716 families, divided into 228 families in Makélékélé, 184 families in Bacongo, 163 families in Mfilou and 141 families in Madibou. The process also took into account the geographical location of the living areas (number of streets, superficie). As a result, one street in three was selected within the block monitored, and one plot in five within the same street (once on the left, once on the right). The effective population selected was that of people engaged in an informal activity associated with the sale of foodstuffs within the family during the period of lockdown. It was derived from the source population. Furthermore, if several individuals in the same family were engaged in such activities, only one of them was selected by random draw. In all cases, in two-parent families, the woman was selected; in single-parent families, it was either the mother or the father. The inclusion criteria for the study were: selling food products during the COVID-19 lockdown; being resident in Brazzaville for at least one year. The main exclusion criterion was to be a professional food seller. Voluntary consent to participate in the study was a prerequisite. A total of 716 individuals of both sexes met the inclusion criteria and thus constituted the study sample.

The study was approved by the Comité National d'Ethique pour la Recherche en Sciences de la Santé (CNERSSA), an organ of the Délégation Générale de la Recherche Scientifique et Technique du Congo.

Methodological approach

This was a qualitative and quantitative study. The use of the qualitative approach, which was inspired by Lambert and Lambert (2012), aimed to answer the questions "Who", "What", "How" and "Where", on the practice of selling food products in Brazzaville

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

during the COVID19 lockdown. The qualitative survey, which took place during the three opening days of the state markets (Monday, Wednesday and Friday) in the four selected communes, from 8 a.m. to 4 p.m., used individual interviews as a research tool. The semi-structured interview was conducted with people involved in food sales during the period of lockdown. It enabled us to gather information on the socio-demographic status of the vendors, the nature and characteristics of the food sales activities they were engaged in, and the reasons given for carrying out these activities.

The quantitative approach involved the administration of a questionnaire. The aim was to identify the vendor, but above all to determine the foods consumed that day, the most common modes of consumption and the quantities ingested (evaluated in glasses, spoons, cups, kitchen utensils, half-liter). This made it possible to quantify daily energy intake using the FAO's improved food table for use in Africa (FAO, 1970), and thus to assess the overall food security status of vendors during the COVID-19 lockdown period. A person was considered food-secure when his or her daily food consumption was greater than or equal to 2400Kcal (Devereux, 2006).

The questionnaire, which was drawn up in accordance with the rules for the construction of quantitative food questionnaires (Cubeau and Pequinot, 1976), was judged to be highly satisfactory, since 96% of respondents felt they had answered the questions asked truthfully. The majority of vendors were fixed to a sales outlet to carry out their activities, which favored their location and therefore facilitated the interviews. In the case of auction vendors, the surveys took place at the place where the interviewer purchased the food product. To facilitate data collection, appointments were made with sellers on a day of their choosing or during a period convenient to them. Those who were unable to complete the questionnaire were assisted by a member of the research team, which included the first author of this article and the other coauthors, all PhD holders (two in nutrition, one in development sociology, one in biostatistics, one in food toxicology and one in applied informatics).

Experimental procedure

The interview was coupled with in situ questionnaire completion. Selected subjects were invited to spend half an hour with the interviewer filling in the questionnaire in a semi-directive manner. If the subject's level of education did not allow for dialogue in French (the official language), national languages (Kituba and Lingala) and departmental languages (Lari, the local language widely spoken by these populations) were used for the interview.

However, Lari or Kituba, which is widely spoken in the study area, was used predominantly. The survey was carried out in two phases of 27 days each, between March 15 and August 7, 2020. The first phase, from March 15 to April 30, 2020, enabled the identification of sellers, as well as the modalities and reasons for carrying out sales activities. The second phase, from May 5 to August 5, 2020, was devoted to a quantitative study of the sellers' nutritional profile. In addition, subjects were made aware of the purpose and objectives of the survey, its scientific importance; anonymity and confidentiality were also guaranteed. During the surveys, the recommendations concerning physical distancing and the compulsory wearing of protective masks were respected.

Statistical analysis

Data entry and production of raw tables were carried out using Epi-Info version 6.1.0 and Stata®, version 10.0, followed by Excel for graphical illustrations. To process the data collected, the first step was to count the number of responses received. Secondly, we crossreferenced certain parameters that seemed relevant. Qualitative variables are expressed as figures and percentages, quantitative variables as mean (x) ± standard deviation (SD), sometimes accompanied by extreme values. The 2 means were compared using Student's t-test. The Chi-square statistical test (χ^2) was used to determine independence between the practice of income-generating activities associated with food and the various categorical variables. Odds ratios (ORs) between the levels of the various variables and the practice of said activities were calculated, along with their confidence intervals (CIs) using the logit method.

A multivariate logistic regression model was used to estimate the odds ratios adjusted for possible confounding effects between the variables studied. Egret software was used for logistic regression. The threshold for statistical significance was set at $p < 0.05$.

RESULTS

Socio-demographic profile of sales staff

Among the 716 vendors, there were 241 men (M) (33.6%) and 475 women (F) (66.4%). Table 1 reports the distribution of study participants according to family age, height, marital status and educational level.

**Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo**

Table 1: Distribution of participants by age and household size

	Effective	Percentage
Age		
Under 30	91	12.7
30 to 39 years old	184	25.7
40 to 49 years old	268	37.4
50 to 59 years old	106	14.8
60 and over	67	9.4
Family size		
Less than 4 people	56	7.8
4 to 7 people	323	45.1
8 to 11 people	242	33.8
12 to 15 people	81	11.3
16 people and more	14	2.0
Civil status		
Single	57	8
Divorced	221	31
Married.	193	26.9
Separated.	214	29.9
Widowed.	29	4.2
Education level		
Primary	343	47.9
Secondary, 1st cycle	175	24.4
Secondary, 2nd cycle	86	12
University	14	1.9
Vocational school	66	9.2
Non-formal education	32	4.6

The average age of the respondents was 42.7 years, the youngest being 18 and the oldest 72. Sellers aged between 40 and 59 made up more than half the sample (52.2%); those who were not married were the most numerous (73.1%; p<0.02). The level of education was relatively low, not exceeding junior high school (85.1%; p<0.001). Average family size was around 8 members, with extremes of 2 and 18 members.

Food consumption and calorie intake
Food supplies were purchased at markets, most often and preferably in the morning, on working days during lockdown. For 63.3% of those surveyed, these were the major markets in each commune (Figure 1), for 10.1% of those surveyed, butcher's shops close to their homes, and for 7.2 % of those surveyed, auctioneers (Figure 2.)

Figure 1: Secondary market

Figure 2: Food sales at auctions

In addition to these places, there were neighborhood markets open in the afternoon, before dusk (5.4% of respondents), as well as front-of-house shops (4%) (Figures 3 and 4).

Figure 3: Hut front shops

With regard to meals, 29.0% of respondents ate just one meal a day, 55.5% two meals a day, and 15.5% three meals a day. In the latter case, the composition of the evening meal was not very varied for 72.4% of them. The data also revealed that 535 respondents (74.7%) did not eat a snack, and 654 (91.3%) did not eat lunch. The main foods consumed according to local recipes during lunch and dinner were: freshwater fish in broth; smoked fish mixed with salted fish, vegetables and dried shrimps cooked in water; smoked fish cooked in a broth made from peanut paste and Gnetum africanum (wild harvested leaves); braised pork skin ("poso" in Lingala, one of the national languages). During breakfast, 97.6% of subjects consumed bread, powdered milk (77.6%) compared to condensed milk (51.3%), meat saved the previous evening (52.9%), chickpea pulses (Vigna unguilata or "Cao" in Congolese parlance) for 56.5% of subjects, raw fruit (carrots, cabbage, cucumber, tomato, avocado) or cooked fruit (green papaya with vinaigrette) for 27.5% of respondents. With regard to caloric intake, 21.8% of respondents (N=228), including 10.3% of women, were food insecure, with average individual energy intakes at the limit of norms: 2475±394 Kcal/d. Although there was no difference between the four communes in terms of daily energy intake: 2507±405 Kcal/d in Makélékélé versus 2531±398 Kcal/d in Bacongo versus 2492±410 Kcal/d in Mfilou versus 2370±361 Kcal/d in Madibou, the level of food security was lowest in Madibou (67.2%). The influence of family size on food security was highlighted: if the family size was greater than 8, food insecurity was characteristic of the member surveyed (p<0.05).

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

Household survival strategies

Table 2 reports on food sales activities in markets, storefronts and streets.

Table 2: Sales activities in markets, storefronts and streets

	Total (N)	Males n (%)	Females n (%)
Sale of ready-to-eat meals	163	28 (17.2)	132 (82.8)***
Small produce stall	342	147 (43.0)	195 (57.0)*
Street food	191	74 (38.7)	117 (61.3)*
Sale of cassava flour	125	7 (5.6)	118 (94.4)***
Sale of fruit and vegetables	54	3 (5.5)	51 (94.5)***

*, significant intersex difference at p<0.05; ***, significant intersex difference at p<0.001

Women predominated in all food sales activities carried out by our respondents during the COVID-19 lockdown.

Selling food in the street, in front of the hut or by auction was the primary survival strategy of the respondents. It was the main source of income for 347 respondents (48.5%), including 251 women. Foods sold included bread, peanuts, doughnuts and croquettes, and grilled meats (sea fish, top-quality beef and pork, chicken and turkey wings, chicken legs). However, local foods were also prominent (Figure 4), notably fried bananas and sweet potatoes (26.8%), followed by squash (19.5%).

Figure 4: Display of local fruit and vegetables

The sale of baked cassava bread was carried out exclusively by women (n=86/475; 18%). The other lucrative agri-food activities practiced during lockdown, shown in figure 5, concerned 172 respondents (36.7%), and four types were identified. Firstly, 43 respondents (9.1%), including 21 women, were engaged in market gardening. Secondly, there were those involved in agro-resource processing, with 56 cases, including 44 women. The fruits used for making/processing fruit juices were sorrel (Hibiscus sabdarifa), a juice known in the local language as bissap; ginger for a fruit juice known in the local language as tangawiss; and passion fruit or barbadine. The use of colorants has also made it possible to sell colored drinks.

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo
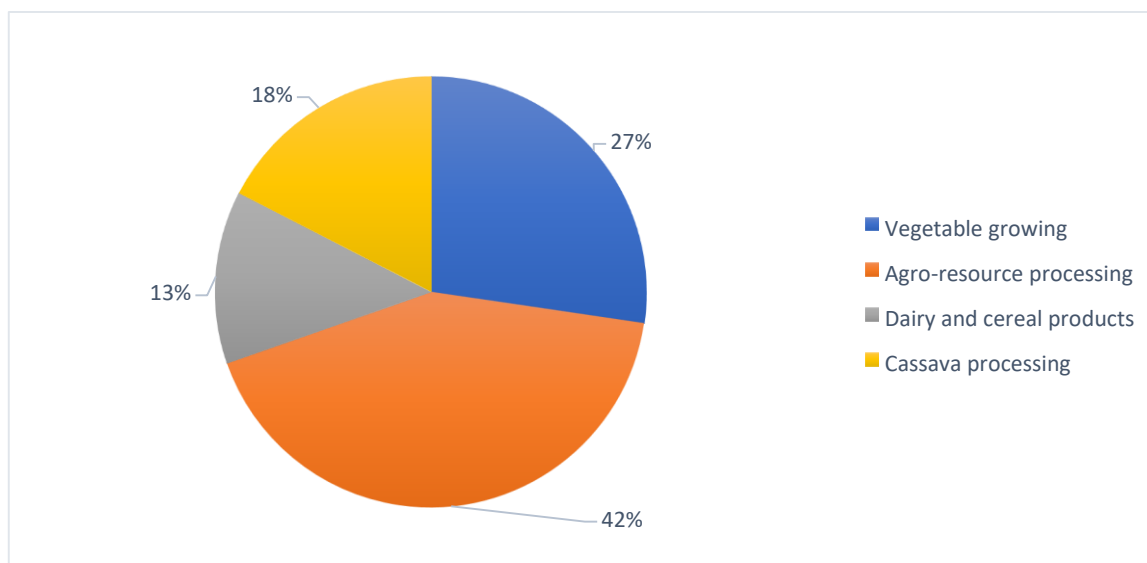
Figure 5: Frequency of other commercial activities associated with street food and auctions

Thirdly, the low price of dairy products (powdered milk) and cereals (maize) led 31 respondents (4.3%), all women, to make yoghurt (sold in 50 ml bags) and popcorn respectively. Finally, 42 women were involved in transforming rolled cassava dough into chikwangue (cassava bread). The remaining 111 respondents also engaged in other types of commercial activity, both in secondary markets and in front of huts. The first category was represented by the sale of food products on small wooden stalls or on the ground, carried out by 82 respondents (8.7%) (Figure 6).

Figure 6: Selling food on small wooden stalls

Products often found were canned goods (sardines, beef, pork), pasta, dried beans, cereals (rice, soya), peanut oil, palm oil, confectionery, packets of cookies and chocolate. Finally, the marketing of meals prepared at home and made available to customers occupied the last position (29 quotations; 4%). This activity concerned more women (n=22) than men (n=7). Among these 22 women, 17 (2.4%) mentioned the sale of cooked bushmeat dishes, notably civet (*Civettictis civetta*), dogfish (*russettus angolensis*), python (*Python sebae*) and Atherurus (*Atherurus africanus*). This activity took place in houses set up as "clandestine" restaurants, during the period when hunting was closed nationwide.

The adjusted logistic regression model indicated that the significant effect of age held when controlled for gender and type of activity practiced, except for those under 40. Also, the association between gender and lucrative food survival strategies remained significant. Similarly, the existence of a fixed family income had a significant effect. However, this effect was within normal limits when the subject involved was a woman (OR=1.18; CI: 1.00 - 2.19).

Multi-variate analyses are presented in Table 3.

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

Table 3: Adjusted odds ratios (OR*) for food-related income-generating activities

Variables	OR*	IC (95%)	p
Gender			
Male	2.31	1.35 – 3.48	0.006
Female	1.32	0.81 – 2.16	<0.05
Age			
<under 40	0.90	0.40 – 2.21	NS
40-60 years	8.25	4.43 – 15.20	<0.001
>60 years	24.92	5.17 – 121.96	<0.001
Existence of a fixed income within a family	5.73	3.74 – 8.82	<0.001

Finally, the main reasons for choosing to sell food as a survival strategy during COVID-19 lockdown are given in Table 4. Nearly a third of the vendors surveyed (35%) explained that they sold food for reasons linked to difficulties encountered in daily life (rent payments, family maintenance, tontine contributions), while 129 respondents (18%) did so to contribute to the family income. The restrictive context of measures associated with the fight against the COVID-19 pandemic was mentioned by only 13.5% of respondents.

Table 4: Main reasons for choosing food sales activities

	Effective	Percentage (%)
Encouraged by another	57	8.0
Own initiative	31	4.3
Hardship and survival	251	35.0
Contribution to family income	129	18.0
Other source of income	101	14.1
COVID-19 context	97	13.5
Few or no alternatives	50	7.1
Total	**716**	**100**

DISCUSSION

The aim of this study was to characterize the food selling activities adopted by the populations of the southern arrondissements of Brazzaville as a means of survival during the COVID-19 lockdown.

Socio-demographic profile of respondents

Our data revealed more women (n=475; 66.4%) than men (n=241; 33.6%) among the respondents, with an M/F ratio equal to 0.5 (p<0.05). This observation is in line with other studies carried out in sub-Saharan Africa. For example, Resnick (2020) in Nigeria reports more women than men in the food sales sector, an observation also made by Oloko and Ekpo (2021) in the same country during the COVID-19 pandemic. This over-representation of women can be explained by the role of women in Congolese society, as elsewhere in Black Africa, in supplying the family or household in times of crisis (Osman, 2009), particularly during the COVID-19 lockdown, as shown by Matanga and Mukurazhizha (2023) in Zimbabwe.

The "stay at home" instructions during the lockdown had a negative a negative effect on economic conditions and altered people's mental health (Hamadani et al., 2020), which later led to exacerbated the risk of food insecurity and domestic violence in households. The latter point is underlined by one of Matanga and Mukurazhizha's surveys (2020): "My husband is always at home because of the restrictions, he doesn't provide food for the family at all, but he expects to take all the meals. If I don't manage to provide him with food, he beats me" (p.6).

Under these conditions, women are more involved in playing an important role in ensuring the family's food security, a fact reported by several studies (Pongponrat and Ishii, 2018; Ruszczyk et al., 2020; Thibault and Van Wijngarden-Cremers, 2020; Tierney, 2019; Towo, 2020). This is in line with the words of a respondent in the study by Matanga and Mukurazhizha (2020): "We

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

hear about different ways of making money, like making palm oil.... (...)..., because we don't go to our weekly meetings, we don't know how to provide for our families, we can't earn a living by staying at home" (p.5).

To this end, women food vendors in major African cities were key players in the food system during the COVID-19 lockdown, as Adegbenle (2021) also reports from Nigeria. This trade therefore constituted an income-generating activity. Two other reasons that may explain the greater number of women vendors are the deterioration of public services and the decline in individual and family incomes. Faced with these problems, women find themselves trapped in food insecurity, and to escape the grip of poverty, they struggle in the rapidly expanding informal food-selling sector. In many Black African countries, but also in South America and Southeast Asia, with the exception of those where social norms prevent women from working outside the home, such as countries with a strong Islamic religious tradition (Cocheux, 2022; Valensi, 2004), women are in the majority among these vendors (Muzvidziwa, 2000).

In terms of age, the number of salespeople aged 18 to 49 increased from 91 (12.7%) to 268 (37.4%), followed by a decrease: n=106 (14.8%) in the 50-59 age bracket and n=67 (9.4%) in the 60-72 age bracket. The increase in numbers up to the age of 49 is clearly linked to the search for satisfaction of basic needs among young working adults during this period, during which independence, autonomy and the assumption of responsibility are of the utmost importance (Caussat, 1995; Luyckx et al., 2008; Ryan and Deci, 2018).

Our data, which constitute indicators of young adults' participation in the informal food-selling sector, particularly street food in Congo, concur with those obtained by Oloko and Ekpo (2021) in Nigeria, with proportions nonetheless higher for the 18-30 age group (40.7%). In the smallscale street food trade, the proportion reported in the literature averages 31.7% in black Africa in this age bracket (Economic Commission for Africa, 2020). However, this rate is likely to be higher nowadays following the economic crisis affecting all countries on the continent, aggravated by the COVID-19 pandemic, as highlighted by the report of the ninth Council of the African Regional Forum on Sustainable Development (UN, 2023), as well as the study by Houngbedji and Zunoso (2021).

In our study, the average family size is around 8 people, which is in line with what might be expected. Indeed, this figure is based on the African concept of the family, which is not limited to the nuclear family (Gruenais, 1981). Although 80% of the respondents are single, separated or divorced, they often house members of their immediate and extended family, so they need income to cope with the constraints of COVID-19 lockdown.

Our results revealed minimal food security among the respondents, with average energy intakes (2475 ± 394kcal) at the lower limit of normal. However, this level is slightly higher than the national average, estimated at 2393Kcal (MSP, 2022). This indicates the precariousness of living conditions, reflected in the absence of a national policy on food security as highlighted by several studies (Guina et al., 2021; Agejoh and Njieassan, 2022; Rudin-Rush et al., 2022) but above all by the reports of the thirty-second session of the FAO Regional Conference in 2022 held in Malabo (Equatorial Guinea) and the African Union (AU, 2020). This shows that a fifth of Brazzaville households are food insecure, a proportion similar to our own (21.8%). It can therefore be said that the COVID-19 lockdown has accentuated the pre-existing problem of food insecurity, a fact already noted by Makosso-Vheiye et al. (2008) in one of the communes studied (Bacongo) following the socio-political and armed conflicts of 1998-2002 experienced by the inhabitants of the said commune. All the above therefore follows a logic of actions described by Rwafa-Ponela et al. (2022), as illustrated in figure 7.
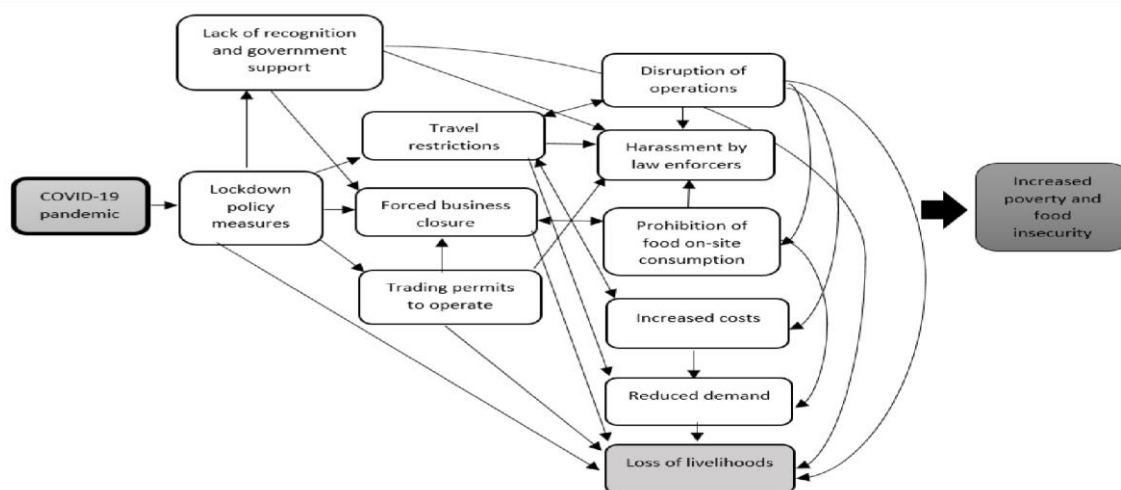
Figure 7: Effects of Covid-19 on the urban informal system that has threatened food security in Congo. Adaptée de Rwafa-Ponela et al. (2022).

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

Thus, the 21.8% of interviewees in a situation of temporary food insecurity is the result of a combination of factors such as: the socio-political and armed conflicts of 1988-2002; the rise in food prices, fuel prices and, more generally, imported food prices, linked to the war in Ukraine or associated with poor road conditions; structural factors. These factors make people more vulnerable to the restrictive social and health measures associated with the fight against the COVID-19 pandemic, especially as they destabilize local livelihoods. Moreover, the influence of household size on food insecurity found in this work has already been reported by other authors in times of crisis (Kississou et al., 2013; N'Da, 2014), notably in the Democratic Republic of Congo (Kalonda et al., 2022; Mushagalusa, 2020) and Mali (Adjognon et al., 2021).

Respondents' adaptation and resilience strategies

With regard to the adaptability and food sales strategies adopted by vendors, our results show once again, as elsewhere in Black Africa, that the food market is an important driver of agricultural and agri-food development (Cour, 2004). In many countries, this market reaches or exceeds export markets in value. COVID-19 lockdown has therefore been the source of incomegenerating jobs to keep demand solvent.

Activities linked to the sale of market garden produce (tomatoes, cabbage, peppers, chives, spinach, carrots, chillies, celery, etc.) occupy the last position in this work. The vegetables (especially leafy greens) and fruit sold came from the market gardens of the four Brazzaville communes included in the study, located along the right bank of the Congo River and the watercourses that irrigate the city, but also from plantations in the Pool department, an agropastoral department, not forgetting the home gardens scattered throughout the neighborhoods. These include cassava leaves, highly prized by the population, chickpeas, taro leaves and shower potato leaves (*Ipomoea batatas*, or matembele in the local language). It should be remembered that the period of lockdown coincided with the second rainy season in Brazzaville and the surrounding area, which did not favor the production of leafy vegetables, tomatoes, cabbage, eggplants, green beans, lettuce, etc., by market gardeners, resulting in high purchase prices and thus justifying the low number of sellers of these products.

Supplies were made early in the morning (6am-7am) at the terminus of transport buses from market garden sites and villages in the Pool department. In addition to these foods, palm oil and its derivatives were produced in Congo.

Imported foodstuffs came mainly from Europe, Kinshasa (Democratic Republic of Congo), Cameroon and Côte d'Ivoire. These included pasta, cans of tomato, various canned foods (pork pâté, beef pâté, green beans, white beans, etc.), various cans of sardines, seasoning products for prepared foods (peppers, black pepper, celery, parsley, etc.), sachet milk powder, rice, beans, chickpeas, onions and garlic, and various cookies. All these products were sold individually, with prices ranging from 25 CFA francs to 5,000 CFA francs. In most cases, foodstuffs were sold on wooden stalls, although the use of sacks on the ground, on which foodstuffs were placed, was also common. Sales areas in state-owned markets were rented temporarily from the market committee, a body set up by the commune. The daily rental fee for the sales site was set at 100 CFA francs for a surface area of 1m × 0.5m during the period of lockdown. No tax was charged for sales taking place in the neighborhood markets set up for the occasion, in front of the huts (plots) or at the auction.

As for the ready-made dishes sold, they were often composed as follows: salted fish / *gnetum africanum* (mfumbu in the local Lari language) / peanut paste, smoked fish / *gnetum africanum* / peanut paste, smoked fish broth (and/or salted fish) with eggplant, braised turkey wings, braised chicken thighs, braised pork chops, braised turkey wings, braised gizzard skewers, braised kidney skewers. The quantity of the dish offered is in line with the amount of money available to the buyer: half a dish at 500 CFA francs with two pieces of cassava or foufou (cooked cassava flour), a dish at 1000 CFA francs, a tablespoon of vegetable at 200 CFA francs, half a chicken leg at 500 CFA francs, a gizzard skewer at 500 CFA francs, a beef kidney skewer at 200 CFA francs. The predominance of women among salespeople in the ready-cooked meals sector can be explained by the low level of qualification and/or education of the women surveyed. Indeed, this independent activity does not require much investment in human, material or financial resources. For all of them, selling food is seen as an extension of the female role of providing care to others (Almeida et al., 2020; Hudson-Weems, 1993).

We also noted the availability of bushmeat among the dishes prepared and sold by our saleswomen. This testifies to the continuation of hunting activities in the departments neighbouring Brazzaville during this period when hunting was closed, endangering natural species as hunting resources are fragile and exhaustible.

However, in the midst of the COVID-19 pandemic crisis, the sale of ready-made meals, especially meats, as well as yoghurts and other milk derivatives, and even leafy vegetables, is likely to be contaminated by animal or human faeces. Indeed, even though these foods provide the proteins and micronutrients needed to guarantee the body's immune defense, and are less expensive than those from formal markets, in the midst of the pandemic crisis the consumption of these foods could constitute a risk to human health, due to poor handling before cooking and exposure to the open air (Doungué et al., 2023).

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

Study limitations and strengths

The results of this study should be treated with caution. The first is the lack of similar studies in black Africa to serve as a benchmark. In addition, the structures specializing in socioeconomic and demographic surveys in the Congo do not have databases for the population under consideration. In addition, the inclusion of economic variables (food purchase costs, family income, etc.) should enable a better discussion of the results obtained, as noted in other studies (Rogan and Skinner, 2017; WIEGO, 2020). These limitations do not, however, affect the power of our observations. Indeed, in an opinion survey, the quality of the information to be gathered depends on the respondent's credit and interest in the problem. Our data were therefore collected from a sample of people who had carried out an informal activity associated with the sale of foodstuffs. This survey was based on a random sampling process, based on voluntary participation. This approach is undoubtedly a source of bias in terms of selection, but in return it offers greater guarantees in terms of the accuracy of the data collected and the reliability of the responses, with the motivation of the people surveyed being of paramount importance. In any case, our study is the first of its kind in Central Africa to address this issue, and to include a representative sample.

CONCLUSION

Although the predominance of the female gender in this work may have introduced confounding factors, our study is the first to focus on food sales activities by non-professionals in this sector during the COVID-19 lockdown, a section of the Brazzaville population that experienced the lockdown in a situation marked by vulnerability. The results obtained show that, as elsewhere, families, in order to cope with the substantial drop in subsistence in their daily lives and to improve their ability to combat the aggressive phenomena associated with the pandemic, have carried out productive activities selling foodstuffs. These activities, which are usually minor commercial ventures, enabled them to cope with the lockdown under bearable conditions. Taking on the role of income-generator enabled our vendors to increase their selfreliance and improve their family's living conditions, especially for women. In the light of these results, it is clear that policies need to be implemented to support the disadvantaged fringe of the population during health crises such as that caused by the COVID-19 pandemic, in order to minimize food insecurity.

Conflicts of interest

The authors declare that they have no conflicts of interest in relation to this article.

REFERENCES

1) Adebgenle, A.S. (2021). Fashioning new ways of survival: small businesses' response to the economic impact of COVID-19 lockdown in Ibadan, Southwest Nigeria. [Research report] IFRA-Nigeria working papers series 81, IFRA-Nigeria, 81, pp.1-32. hal-03416175

2) Adjognon, G.S., Bloem, J.R., & Sanoh, A. (2021). The coronavirus pandemic and food security: evidence from Mali. Food Policy, 101, 102050.

3) African Union. (2020). Impact of the Coronavirus (COVID-19) on the African Economy (pp.1-35). Addis-Abeba: African Union.

4) Almeida, M., Shrestha, A., Stojanac, D., & Miller, L.J. (2020). The impact of the COVID-19 pandemic on women's mental health. Archives of women's mental health, 23,741-748. https://doi.org/10.1007/s00737-020-01092-2

5) Bitsoumanou Nkounkou, J., & Marin, G. (2021). L'impact de la crise du COVID-19 sur les systèmes alimentaires locaux du Congo et la réponse des institutions. FAO: Rome

6) Caussat, L. (1995). Les Chemins vers l'indépendance financière. Economie et Statistique, 283-284, 127-136. https://doi.org/10.3406/estat.1995.5967

7) Centre National de la Statistique et des Etudes Economiques. (2018). La République du Congo en quelques chiffres 2018. Brazzaville : Ministère de l'Economie et des Finances.

8) Cocheux, M. (2020). La condition féminine dans le monde arabe et musulman : évolutions et perspectives face aux enjeux de sociétés et politiques. Paris : Institut d'Etudes de Géopolitique Appliquée.

9) Cour, J.-M. (2004). Peuplement, urbanisation et transformation de l'agriculture : un cadre d'analyse démo-économique et spatial. Cahiers Agricultures, 13(1), 158-165.

10) Cubeau J., & Pequinot G. (1976). Enquête méthodologique testant la validité d'un interrogatoire portant sur l'alimentation passée d'un groupe de sujets de sexe masculin. Revue d'Epidémiologie et Santé Publique, 24, 61- 67.

11) Devereux, S. (2006). Distinguish between chronic and transitory food insecurity in emergency needs assessments (p.54). Rome: World Food Programme.

12) Doungué, A., Tchagui, S., & Ndoki, D. (2023). Risques sanitaires encourus par les usagers consommateurs des produits commercialisés le long des routes nationales au Cameroun : le cas de l'axe Yaoundé-Bafoussam. Revue Espace, Territoires, Sociétés et Santé, 6(11), 105-122.

13) Economic Commission for Africa. (2020). COVID-19 and export restriction: the limits of Internation Law and Lessons for AfcFTA. New-York: United Nations. Disponible sur le site https://www.un.org/africarenewal/news/coronavirus/COVID-19-and-exportrestrictions-limits-international-trade-law-and-lessons-afcfta.

14) FAO. (1970). Table de composition des aliments à l'usage de l'Afrique. Rome : FOA.

15) FAO. (2022). COVID-19 impacts on agrifood systems in Africa: policy session of FAO Regional Conference for Africa, Malabo, Equatorial Guinea, 11-14 April 2022. https://www.fao.org/publications/card/en/c/CB5911EN

16) Gouvernement de la République du Congo. Déclaration n°3 du Gouvernement de la République du Congo du 18 mars 2020 sur le coronavirus COVID-19 [en ligne]. https://sante.gouv.cg/declaration-du-premier-ministre-du-18-mars-2020

17) Gouvernement de la République du Congo. Décret n°2020-93 du 30 mars 2020 portant déclaration de l'état d'urgence sanitaire en République du Congo [en ligne]. https://www.sgg.cg/textes-officiels/congo-Decret-2020-93-declaration-etat-urgencesanitaire-Republique-Congo.pdf.

18) Gruenais, M.-E. (1981). Famille et démographie de la famille en Afrique. Paris : ORSTOM

19) Guina, J., Ferrâo, J., Bell, V., & Fernandes, V. (2021). The impact of COVID-19 in SubSaharan Africa food security and human development. European Journal of Agriculture and Food Sciences, 3 (2), 34-40. https://doi.org/10.24018/ejfood.2021.3.2.267

20) Hamadani., J.D., Hasan, M.I., Baldi, A.J., Hossain, S.J., Shiraji, S., Bhuiyan, M.S.A., Mehrin, S.F., Fisher, J., Togail., F., Tupu, S.M.M.U., Grantham-Mc Gregor, S., Biggs, B.-A., Braat, S., & Pasricha, S.-R. (2020). Immediate of stay-a-home orders to control COVID-19 transmission on socioeconomic conditions, food insecurity, mental health, and intimate partner violence in Bangladesh woman and their families: An interrupted time series. The Lancet Global Health, 8(11), e1380-e1383. https://doi.org/10.1016/S2214-109x(20)30366-1

21) Hambleton, R.K., Swaminathan, H., Algina, J., & Coulson, D. (1995). Criterionreferenced testing and measurement. Review of technical issues and developments. Report of Annual Meeting of the American Statistical Research Association. Washington (DC): American Statistical Research Association.

22) Houngbedji, K., & Zanuso, C. (2021). Les jeunes et les enjeux des marches du travail en Afrique. Economie Africaine, 270-271, 75-93.

23) Hudson-Weems, C. (1993). Africana womanism: reclaiming ourselves. Michigan: Bedford Publishers.

24) Kalonda Kanyama, I., Mujinga Kapemba, A., Mukadi Mukadi, J., & Lukunga Muyaya, A. (2022). Analyse de la sécurité alimentaire dans les zones post-conflits : Evidences empiriques dans le contexte du phénomène Kamuina-Nsapu dans la périphérie de la ville de Kananga. Revue Repères et Perspectives Economiques [en ligne], vol 5. N° spécial, mis en ligne le 08 février 2022.

25) Kississou, E., Onambélé, G.A., Madjioudal, A., Mesngar, D., Rimtebaye Riangar, Dreni-Mi, M.D., & Alhabo, M.A.A. (2013). Evaluation de la sécurité alimentaire des ménages ruraux dans les zones sahélienne et soudanaise du Tchad. Rome. PAM.

26) Lambert, V.A., & Lambert, C.E. (2012). Qualitative descriptive research: an acceptable design. Pacific Rin International Journal of Nursing Research, 16 (4), 55-256.

27) Lossele, G., & Atipo, M. (2020). La population envahit les marches de Brazzaville. Journal « Les Dépêches de Brazzaville », 9 Avril, n°3712, p.3.

28) Luyckx, k., Schwartz, S.J., Goossens, L., & Pollock, S. (2008). Employment, sense of coherence and identity formation: Contextual and psychological processes on the pathway to sense of a adulthood. Journal of Adolescence Research, 23,566-591.

29) Makosso Vheiye, G., Massamba, J., Massamba, A., Massamba, J. P., & Silou, T. (2008). Situation alimentaire des ménages de la commune de Bacongo en avril-juin 2007. Médecine et Nutrition, 44(2), 77-89. https://doi.org/10.1051 /mnut/ 2008442077

30) Matanga, S.Y., & Mukuruzhizha, M.R. (2023). The impact of the COVID-19 restrictions on women's responsibility for domestic found provision: the case of Maronder a Urban in Zimbabwe. Hts Theologiese Studies/Theological Studies, 79(3), a 8053. https://doi.org/10.4102/hts.v79i3.8053

31) Ministère de la construction, de l'urbanisme, de la ville et du cadre de vie. (2016). Schéma directeur d'urbanisme de la ville de Brazzaville. Keios Srl. Roma, Italia. 86p.

32) Ministère de la santé et de la population. (2018). Rapport sur la sécurité alimentaire et la nutrition en République du Congo. Brazzaville : Ministère de la santé et de la population.

33) Mulumeoderhwa, M.F., Mugisho, M.G, Rushigira, C., Biganiro, M.P. Vwima, N. S., & Mushagalusa, N.G. (2020). Stratégies d'adaptation et sécurité alimentaire des ménages dans les Hauts Plateaux de Minembwe au Sud-Kivu. Agronomie africaine, 32(2), 207220.

34) Muzvidziwa, V. (2000). Food vending: adaptation under difficult circumstances. Journal of social Development in Africa, 15(2), 69-92.

35) N'Da, L. (2014). Sécurité alimentaire et stratégies de résilience des ménages en Côted'Ivoire : Cas de la région Ouest. In : Châtaignier, J.M. (ed.), fragilités et résilience : les nouvelles frontières de la mondialisation. Paris : Karthala.

36) National Health Commission of the People's Republic of China. (2020). Update on the novel coronavirus pneumonia outbreak. http://nhc.gov.cn/xcs/yqtb/ 202002/18546da875d74445bb537ab014e7a1c6.shtml

37) Nganga, I., Massamba, D., Mbemba, F., Makosso Vheiye, G., M'bete, A. R., & Silou, Th. (2013). L'hygiène dans l'approvisionnement et la distribution de la viande de brousse à Brazzaville – Congo. Journal of Applied Biosciences, 61, 4448 - 4459

38) Ngoma, R. (2020). Les pousse-pousse prennent le relais des taxis. Journal « Les Dépêches de Brazzaville », 9 avril, n°3712, p.3.

39) Oloko, M., & Ekpo, R. (2021). Effects of the COVID-19 lockdown on the livelihood and food security of street food vendors and consumers in Nigeria. Journal of African Studies and Development, 13(4), 106-114. https://doi.org/10.5897/JASD2021.0641

40) Osman, I.F. (2009). The role of women in providing and improving household food security in Sudan: implications for reducing hunger and malnutrition. Journal of International Women's Studies, 10(4), 144-167, https://vc.bridgew.edu/jiws/vol10/iss4/10

41) PNUD. (2002). Développement humain en situation de post-conflit. Rapport national sur le développement humain. République du Congo. Brazzaville, 127 p.

42) Pongponrat, K., & Ishii, K. (2018). Social vulnerability of marginalized people in times of disaster: case of Thai women in Japan tsunami 2011. International Journal of Disaster Risk Reduction, 27, 133-141. http://doi.org/10.1016/j.ijdrr.2017.09.047.

43) Qing, Y., Bili, W., Jianhua, M., Junfen, F., Shiylang, S., Qiang, S., et al. (2020). Epidemiological analysis of COVID-19 and practical experience from China. J Med Virol, 10. https://doi.org/10.1002/jmv.25813

44) Resnick, D. (2020). COVID-19 lockdowns threaten africa's vital informal urban food trade. Washington, DC: International Food Policy Research Institute.

45) Rogan, M., & Skinner, C. (2017). The nature of the South African Informal sector as reflected in the Quarterly Labour-Force Survey, 2008-2014. Cape Town, South Africa: University of Cape Town.

46) Rudin-Rush, L., Michler, J.D., Josepsan, A., & Bloem, J.R. (2022). Food insecurity during the first year of the COVID-19 pandemic in four African countries. Food Policy, 111, 1-11. https://doi.org/10.1016./j.foodpol.2022.102306

47) Ruszczyk, H.A., Rahman, M.F., Bracken, L.J, & Sudha, S. (2020). Contextualizing the

48) COVID-19 pandemic's impact of food security in two small cities in Bangladesh. Environment & Urbanization, 33(1), 239-254. https://doi.org/10.1177/0956247820965156

49) Rwafa-Ponela, T., Goldstein, S., Kruger, P., Erzse, A., Abdool Karim, S., & Hoffman, K. (2022). Urban informal food traders: a rapid qualitative study of COVID-19 lockdown measures in South Africa sustainability, 14, 2294. https://doi.org/10.3390/su14042294

50) Ryan, R.M., & Deci, E.L. (2018). Self-determination theory basic psychological needs in motivation, development and wellness. New-York/ London: The Guilford Press.

51) Secrétariat Général du Gouvernement de la République du Congo. 34e réunion de la Coordination Nationale de gestion de la pandémie du coronavirus COVID-19 [en ligne]. https://www.sgg.cg/fr/actualités.

52) Suzanti, E., Kusjïarti, S., Mas'udah, S., Brudirahyu, T., & Sudaro. (2020). Survival strategies of Indonesian women from mow-income families during the COVID-19 pandemic. Journal of International Women's Studies, 24(8). https://vc.bridgew.edu/jiws/vol24/iss8/12

53) Tabe-Ojong, M.P.Jr., Nshakira-Rukundo, E., & Gebrekidan, B.H. (2023). COVID-19 and food insecurity in Africa: A review of the emerging empirical evidence. European Review of Agriculture Economics, 50(3), 853-878.

54) Thibault, F., & Van Wijngaarden-Cremers, P.J.M. (2020). Women's mental health in the time of COVID-19 pandemic. Frontuers in Global Women's Health, 1, 588372.

55) Tierney, K. (2019). Disaster. A sociological approach. New-York: Polity Press. Towo, A. (2020). COVID-19 Zim lockdown: Gendered impacts, implications and effects on women and girls as primary care givers, Kubatana. Disponible sur le site

Food Sales Activities Associated to Family Survival Strategies During Covid-19 Lockdown in Brazzaville, Congo

https://kubata.net.2020/04/10/covid-19-zim-lockdown-gendered-impacts-implicationsand-effects-on-women-and-girls-as-primary-care-guvers/ United Nations. (2023). Economic and social council. Ninth session of the Africa Regional Forum on sustainable Development. New-York: UN.E/HLPF/2023/3/Add.1 57) Valensi, L. (2004). La condition des femmes dans les pays arabes. Revue Projet, 282, 23-31.

56) WIEGO. (2020). Pandemic Adds to informal vendors' challenges. Manchester, UK: Women in Infromal Employment, Globalizing and Organizing (WIEGO).

Effectiveness of Food Processing Instructional Videos (Food Pro I-Vid) In Enhancing the Performance of Grade 9 TLE Learners

Sarah Lee V. Sablayan

Jacobo Z. Gonzales Memorial National High School Brgy. San Antonio, City of Biñan, Laguna- District of Biñan

ABSTRACT: This research determined the effectiveness of developed instructional videos in enhancing the performance of the learners. This study utilized quasi-experimental research design and match pairing method. The participants were grouped into control and experimental groups where each group has 30 students. Pre-test results revealed that the two groups of respondents had the same mean scores while on the posttest mean scores, the experimental group had a higher mean score than the comparison group. For the formative test mean scores of the two groups of respondents, it showed that there was a significant difference between the formative mean scores of the experimental and comparison groups. It revealed that there was a significant difference between the posttest mean scores of the experimental and comparison groups. The test of difference between the pretest and posttest means scores of both the experimental and comparison groups showed that there was a highly significant difference between the results of pretests and posttests on both experimental and comparison groups. The results showed a significant difference between the performance of the two groups of respondents. Hence this Food Pro I-Vid is an effective tool to enhance the teaching and learning among the students in TLE.

KEYWORDS: Pretest, Posttest, formative test, Instructional Video, TLE

INTRODUCTION

The United Nations report (2020) delved into the impact of the education catastrophe brought by the COVID-19 pandemic. It has wreaked havoc on education systems, affecting almost 1.6 billion students all over the globe. Some 94% to 99% of the global student population were impeded due to school closures and other learning centers. Closures of educational institutions obstruct the delivery of important services to children and communities, such as access to nutritious food, limit many parents' capacity to work, and increase the danger of violence against women and children (Ghallab, 2020).

More so, in the new normal of education, various learning modalities were given emphasis depending on the majority of the students' needs and the school's capacities to implement. While online learning is for those who have access to the internet and for those who have computers to use, modular learning modality is mostly offered to students who have no means to sustain education at a distance, leaving them with little interaction to no interaction at all with their teachers. Students merely rely on printed instructions from their modules.

Today, reading is a necessity to attain learning through the various modules and learning tasks that teachers give. For students, reading has become a springboard to grasp all the ideas, concepts and real-life lessons enclosed on every page of the module. This key factor hampers learning especially for those who cannot fully comprehend what is in the written text alone. In addition, the Technology and Livelihood Education subject requires interaction to process learning from theory into practice. With this scenario, it proves more than ever what we have been advocating since then – those educational materials and platforms are critical to improving the teaching-learning process, and modern educational technology's function is a cornerstone for many possibilities (Busayong, 2021).

Alongside the perseverance of DepEd to deliver quality and relevant education, budget allocation is recalibrated together with the initiative of local government units using the Special Education Fund (SEF). Tablets were purchased and were given to each student for better learning resources, experiences, and expansion of new learning modalities. This endeavor not only decrease paper production and lower printing cost, but also paves the way to instructional videos (Okumuş, Dağdeler, Konca & Demiröz, 2020).

Effectiveness of Food Processing Instructional Videos (Food Pro I-Vid) In Enhancing the Performance of Grade 9 TLE Learners

To point it out, Kukulska-Hulme (2013) defines instructional films as "the use of technology in language acquisition where portability enables a user-rich experience." This includes not only the text and pictures as the main aid for teaching and learning, but also consists of covers, MP3/MP4 recordings, and activities. This idea is underpinned by 'ubiquitous learning' (Cardenas-Robledo & Peña-Ayala, 2018) which can be enhanced through the help of augmented reality in both offline and online learning. For learners, social learning is a way of thinking through interactions between individuals and others in various situations, using immersive technology and a context-oriented emphasis (Bachore, 2015 as cited in Ghallab, 2020).

Apart from this, the fundamental qualities of learning using instructional films are accessibility, immediacy, interactivity, and schooling settings (Ogata & Yano, 2005). Ghallab (2020) believes that students and teachers can benefit greatly from learning through instructional videos. Cellphones, like computers, have slowly improved their ability to be used in teaching over the last few decades. Teachers have a critical role in the introduction and implementation of new technologies, such as the use of smartphones in TLE/TVL classes.

Relative to that, Mayer (2009, as cited in Walsh, 2017) points out the emergence of 'multimedia principle'. It suggests that words with visuals help people learn more profoundly than just plain text alone. Adding words to visuals, on the other hand, is not an effective approach to achieve multimedia learning. Furthermore, humans can only process a certain amount of information in a channel at a given time, and they make sense of incoming data by actively creating mental representations from sensory receptors to a repository of all learned information, or simply from short-term memory to long-term memory.

Consequently, these instructional videos as a learning resource paved the way for the researcher to improve teaching and learning Technology and Livelihood Education for Grade 9 high school students. The researcher who has been teaching for a couple of years witnessed the struggles and challenges of educators and students in teaching and learning skills, especially for modular learning modality. This impediment has stimulated timely and relevant innovations to tie the loose ends and bridge the gaps in learning.

In consonance, this research sought to improve the teaching-learning process especially in teaching Technology and Livelihood Education subjects among the high school students in Jacobo Z. Gonzales Memorial National High School. The developed instructional videos aim to promote better engagement with students, and offer varied educational resources such as the inclusion of videos, audio recordings and speech simulations accessible even for offline learning. Also, this research strived to empower students as active knowledge constructors in line with the demands of the 21st century.

This study may provide a relevant contribution to the teacher in Technology and Livelihood Education in enhancing the performance of TLE- Food Processing students. Real-life demonstrates that, even if students want to learn, a lack of instructional materials makes it difficult to learn and understand the lesson effectively, especially in distance learning. Indeed, instructional materials play an important part in improving student performance and deciding how successfully teachers teach and deliver lessons in their classrooms. The researcher came up with the idea to make a Food Pro I-Vid, an instructional video in Food Processing TLE 9 to enhance the performance of the Grade 9 students at Jacobo Z. Gonzales Memorial National High School.

OBJECTIVES OF THE STUDY

This research determined the effectiveness of Food Pro I-Vid (Instructional Videos) in enhancing the performance in TLE of Grade 9 students in Jacobo Z. Gonzales Memorial National High School.

Specifically, it answered the following questions:

1. What is the mean score performance of the experimental and comparison group on their pretest, posttest, and formative test?
2. Is there a significant difference between the formative test mean score of the experimental and comparison group??
3. Is there a significant difference between the posttest mean score of the experimental and comparison group?
4. Is there a significant difference between the pretest and post-test mean scores of the experimental and comparison group?

MATERIALS AND METHODS

This study used the quasi-experimental research design. In this design at least one independent variable was manipulated and treated, the other relevant variables were controlled, and the effect on one or more dependent variables was carefully observed. A focus observation should be done to gather reliable and valid results. Bautista (1998) added that experimental research design is best to show causal relationships between variables underplay.

To quantify the validity and acceptability of the developed instructional videos in teaching Technology and Livelihood Education for junior high school streamline for Hybrid learning, quantitative research design was used.

Effectiveness of Food Processing Instructional Videos (Food Pro I-Vid) In Enhancing the Performance of Grade 9 TLE Learners

In this study, the numerical data came from the pretest and posttest scores as they used the instructional videos in teaching Technology and Livelihood Education for junior high school streamline for Hybrid learning

A Match-only pretest-posttest control group design was employed in this research. This study had different groups, one with a pretest and a posttest, while the other two sets of observations (one representing the pretest and the other group experiments) were not assigned to the groups at random.

The participants of the study were Grade 9 TLE- Food Processing students in Jacobo Z. Gonzales Memorial National High School, Division of Binan City. The selection of the participants was based on the result of the pretest to be conducted with the group of 60 participants which belong to one section. The participants were grouped into control and experimental groups.

For validation of the developed instructional videos in teaching Technology and Livelihood Education for high school streamline for blended learning, the help of the experts were highly needed. The population for this study was composed of the Head and Master teachers of TLE, including the teachers of TLE in the High School department and 6 Information and Computer Technology (ICT) Teachers in Jacobo Z. Gonzales Memorial National High School.

In administering the pretest and posttest, Grade 9 learners from Jacobo Z. Gonzales Memorial National High School served as respondents. The researcher used the purposive sampling approach, which Crossman (2018) defines as a non-probability sample chosen based on demographic characteristics and the study's goal. This was useful since it allowed researchers to rapidly identify the target sample.

For the development and validation of the instructional videos for teaching Technology and Livelihood Education, the researcher asked help from ICT experts then, a standardized survey questionnaire for the expert's evaluation was used using the ISO 9126 Based Quality Model for E – Learning Systems Evaluation.

RESULTS AND DISCUSSION

Based on the data analyzed, the following findings are:

For the experimental group, the pretest mean score was 24.00 (SD=6.91) and the posttest mean score was 34.20 (SD=8.34). On the other hand, for the comparison group, the pretest mean score was 24.00 (SD=6.91) and the posttest mean score was 29.67 (SD=7.38). During the pretest, the two groups of respondents had the same mean scores while on the posttest mean scores, the experimental group had a higher mean score than the comparison group.

For formative test mean scores on performance of the two groups of respondents, the experimental group obtained 14.00 (SD=3.72), while the comparison group got a mean score of 11.40 (SD=4.47).

The experimental group had a mean score of 14.00 (SD=3.72) and the comparison group had a mean score of 11.40 (SD=4.47). It had a mean difference of 2.600 and Cohen's d of 0.632. It also showed that there was significant difference in the formative mean scores of the experimental and comparison groups (t(58) = 2.448).

In terms of posttest, the experimental group had a mean score of 34.20 (SD=8.34), while the comparison group had a mean score of 29.67 (SD=7.38) with mean difference of 2.033 and Cohen's d of 0.575. It revealed that there was a significant difference in the posttest mean scores of the experimental and comparison groups with t(58) = 2.229.

The results of the test of difference between the pretest and posttest mean scores of both the experimental and comparison groups. It showed that there was a highly significant difference in the results of pretests and posttests on both experimental and comparison groups with mean differences of 10.200 and 5.667, respectively. The computed t-value in the experimental group of 13.553 and in the comparison group of 3.248 were both interpreted as highly significant at 0.01 level of significance.

CONCLUSION

Based on the findings of the study, the conclusions were drawn:

There is no significant difference between the formative test mean scores of the experimental and comparison group was rejected since there is a significant difference between the formative test mean scores of the two groups of respondents.

There is no significant difference between the posttest mean score of the experimental and comparison group was also rejected since the mean scores of the experimental group in post-tests has a significant difference between the mean scores of the comparison group.

There is no significant difference between the pretest and posttest mean score of the experimental and comparison group was rejected since the pre-test and post-test mean scores of both groups are significantly different.

The outcome similarly shown that the utilization of Food Processing Instructional Video (Food Pro I-vid) is an effective instructional tool that can be utilized to teach TLE-Food Processing and can help in enhancing the performance of the learners

Effectiveness of Food Processing Instructional Videos (Food Pro I-Vid) In Enhancing the Performance of Grade 9 TLE Learners

RECOMMENDATIONS

The following recommendations are deemed appropriate based on the summary and findings of this study:

[1] Teachers may seek out opportunities to learn new teaching methods and approaches as part of their instructional talents.

[2] To help students attain higher levels of achievement, improve the teaching materials.

[3] School heads are encouraged to capacitate the faculty members through seminars, training, and internet resources that will help them address and improve their concerns about delivering the courses.

[4] The utilization of the localized instructional videos is encouraged in all grade levels and in all learning areas since it is effective in teaching and learning process.

[5] Organizing instructor seminars to encourage them to plan classes on the cognitive and emotional dimensions.

[6] A future researcher could conduct similar studies on other topics, focusing on teacher skills.

REFERANCES

1) Amin, F., and Salih, N. (2017). New Model to Achieve Software Quality Assurance in E-Learning Application. *IJCSI International Journal of Computer Science* Issues, Volume 14, Issue 3, May 2017 ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784. www.IJCSI.org https://doi.org/10.20943/01201703.6569.

2) Al- Aamri, K. (2011). The Use of Mobile Phones in Learning TLE/TVL Language by Sultan Qaboos University Students: Practices, Attitudes and Challenges. Canadian Journal on Scientific & Industrial Research Vol. 2, No. 3.(P-P 143-152).

3) Alexiou, A., Schippers, M.C. 2018. "Digital game elements, user experience and learning: A conceptual framework". *Education and Information Technologies,* vol. 23, pp. 2545–2567. https://doi.org/10.1007/s10639-018-9730-6.

4) Arnold, S. (2019, Jan 28). Change the game: using Minecraft to teach students with autism. *Edsurge*. https://www.edsurge. com/news/2019-01-28-change-the- game-using-minecraft-toteach-students-with-autism.

5) Azar, A. S., & Nasiri, H. (2014). Learners' attitudes toward the effectiveness of Mobile Assisted Language Learning (MALL) in L2 listening comprehension. *Procedia-Social Behavioral Sciences, 98*, 1836-1843. https//doi.org/10.1016/j.sbspro.2014.03.613

6) Bachore, M. (2015). Language Learning through Mobile Technologies: An Opportunity for Language Learners and Teachers. *Journal of Education and Practice.* Hawassa University,Hawassa, Ethiopia.Vol.6, No.31.P-P.50-5.

7) Bower M., Howe, C., McCredie, N., Robinson, A. and Grover, D. (2014) *Educational Media International*. Vol. 51, No. 1, 1–15. http://dx.doi.org/10.1080/09523987 2014. 889 400.

8) Cahill, G. (n.d). *Why game-based learning?* The Learning Counsel. Retrieved from https ://thelearningcounsel.com/article/why-game-based-learning.

9) Cardenas-Robledo, L.A., and Peña-Ayala, A. (2018). Ubiquitous learning: a systematic review. Telematics and Informatics. Retrieved from https://www.journals.elsevier.com/telematics-and-informatics.

10) Crespo, B., Rey, G., Míguez, C., Míguez-Tabarés, J., and De Lara, J. (2016). Development of a New Android Application to Remotely Control a Micro-Cogeneration System as E-Learning Tool. *Computer Applications in Engineering Education*. Jul2016, Vol. 24 Issue 4, p497-507. ISSN:1061-3773 DOI:10.1002/cae.21726

11) Djouab, R. & Bari, M. (2016). *An ISO 9126 Based Quality Model for E –Learning Systems*. Canada: International Journal of Information and Education Technology.

12) Ghallab, S. (2020). Using Mobile technology in the classroom for teaching speaking skill in Yemeni universities. *Language in India* www.languageinindia.com ISSN 1930-2940 20

13) Grimshaw, J., Cardoso, W., & Collins, L. (2017). Teacher perspectives on the integration of mobile-assisted language learning. In K. Borthwick, L. Bradley & S. Thouësny (Eds), CALL in a Climate of Change: Adapting to Turbulent Global Conditions – Short Papers from EUROCALL, 135–139. Retrieved from https://doi.org/10.14705/rpnet.2017.euro call2017.702.

14) Hayak, M. and Avidov-Ungar, O. (2020). The Integration of Digital Game-Based Learning into the Instruction: Teachers' Perceptions at Different Career Stages. Association for Educational Communications & Technology.

15) Katamadze, N. (2017). Incorporating IT into teaching speaking. The 9th Multidisciplinary Academic Conference. Batumi Shota Rustaveli State University. P. 142

16) Kukulska-Hulme, Agnes (2016). Mobile Assistance in Language Learning: A critical appraisal. In: Palalas, Agnieszka and Ally, Mohamed eds. The International Handbook of Mobile-Assisted Language Learning. Beijing: China Central Radio & TV University Press Co., Ltd., pp. 138–160.

17) Kukulska-Hulme, A. (2013). Mobile-assisted language learning. In C. Chapelle (Ed.), The encyclopedia of applied linguistics (pp. 3701-3709). New York: Wiley.

18) Lucanus, A. (2017). Technology and Livelihood Education Skills are important to students. Stanford University Blog. https://collegepuzzle.stanford.edu/ oral-communication-skills-are-important-for-students/.

19) Magulod Jr, G. C. (2019). Learning Styles, Study Habits and Academic Performance of Filipino University Students in Applied Science Courses: Implications for Instruction. *Journal of Technology and Science Education*, *9*(2), 184-198.

20) Mayer, R. (2014). Theory of Multimedia Learning. http://www.learning-theories.com /cognitive-theory-of-multimedia-learning-mayer.html.

21) Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University Press. https://doiorg /10.1017/CBO9780511811678.

22) Mohammed, S. (2019, May 8). Is technology good or bad for learning? *Brown Center Chalboard Series*. https://www.brookings .edu/blog/brown-center-chalkboard/ 2019/05/08/is-technology-good-or-bad-for-learning/.

23) Nariyati, N. P. L., Sudirman, and Pratiwi, N. P. A. (2020). EFL pre-service teachers' perception toward the use of mobile assisted language learning in teaching TLE/TVL. *International Journal of language Education*, Vol. 4 No.1, pp. 38-47. Ganesha University of Education, Indonesia.

24) Ogata, H., & Yano, Y. (2005). Knowledge awareness for computer-assisted language learning using handhelds. *International Journal of Learning Technology*, 5(1), P-P 435-449. Okoloeze, N. (2015). *Availability and Utilization of Instructional Materials In Business.*

25) Okumuş Dağdeler, K.; Konca, M. Y., & Demiröz, H. (2020). The effect of mobile-assisted language learning (MALL) on EFL learners 'collocation learning. *Journal of Language and Linguistic Studies, 16*(1), 489-509.

26) Poláková, P., and Klímová, B. (2019). Mobile technology and generation Z in the TLE/TVL language classroom—A preliminary study. *Journal of Educational Sciences*. 9, 203; Doi:10.3390/educsci9030203. www.mdpi.com/journal /education.

27) Quigley, E. (2019). ADDIE: 5 Steps to Effective Training. Learn Upon Blog. Available at https://www.learnupon.com/blog/addie-5-steps/.

28) Rahimi, M., & Miri, S. S. (2014). The impact of mobile dictionary use on language learning. *Procedia–Social and Behavioral Sciences, 98,* 1469–1474. https//doi.org/ 10.1016/j.sbspro.2014.03.567

29) Ramle, R., Rosli, D., Nathan, S., and Berahim, M. (2020). Question-led approach in designing Dijkstra algorithm game-based learning: A pilot study. *International Journal of Evaluation and Research in Education (IJERE)*. Vol. 9, No. 4, December 2020, pp. 926~933 ISSN: 2252-8822, DOI: 10.11591/ijere.v9i4.20651.

30) Rodelas, P. (2018). E-learning mobile application for TLE/TVL 8: Streamlining strategy for effectual pedagogy. Laguna College of Business and Arts.

31) Read, T., & Barcena, E. (2020). Toward a Framework for Language MOOCs and Mobile Assisted Language Learning. *Propósitos y Representaciones, 8*(1), e470. doi: http://dx.doi.org/10.20511/pyr2020.v8n1.470.

32) Sharples, M. (2007). A theory of learning for the mobile age. In Bachore, M.(2015). Language Learning through Mobile Technologies: An Opportunity for Language Learners and Teachers. Journal of Education and Practice. Hawassa University, Hawassa, Ethiopia.Vol.6, No.31.P-P.50-5.

33) Spencer, J. (2018). Seven reasons to pilot a game-based learning unit. https://spencerauthor.com/game-based-learning/.

34) Vincent, J. (2006). Emotional attachment and mobile phones. Knowledge, Technology & Policy, 19(1), 39-44.

35) Walker, E., Desjardins, J., Przestrzelski, B. (2020). Re-Designing The Senior Design Classroom Experience With Game-Based Learning. Advances in Engineering Education. Clemson University and University of San Diego.

36) Walsh, K. (2017). Mayer's 12 Principles of Multimedia learning are a powerful design resource. https://www.emergingedtech.com/2017/06/mayers-12-principles-of-   multimedia-learning-are-a-powerful-design-resource/

37) Yeh, H.-C., & Tseng, S.-S. (2019). Using the ADDIE Model to Nurture the Development of Teachers' CALL Professional Knowledge. Educational Technology & Society, 22 (3), 88–100.

38) Yudhiantara, R. A., & Saehu, A. (2017). Mobile-Assisted Language Learning (MALL) in Indonesian Islamic Higher Education. IJELTAL (Indonesian Journal of TLE/TVL Language Teaching and Applied Linguistics), 2(1). https://doi.org/10.21093/ijeltal.v2i1.52.

Quo Vadis Role of the Indonesian Election Supervisory Body In Monitoring the Neutrality of Civil Servants

Fifiana Wisnaeni[1], Sekar Anggun Gading Pinilih[2], Elisabeth Sihaloho[3]

[1,2] Lecturer of Faculty of Law Universitas Diponegoro, Indonesia
[3] Student of Master of Law Program, Universitas Diponegoro, Indonesia

ABSTRACT: Indonesian election as a form of democratic party, must be able to create a climate to pays attention for every principle of implementation of general elections. Such as, the principles of direct, general, freedom, confidential, honest, and fair without exception to state's civil service. Although there has been the election supervisory body, but in reality cases of state's civil servant non-neutrality are increasing in every period of election implementation. So, this article will examine and analyze how the form of supervision carried out by Indonesian Election Supervisory Body in case for maintaining the principles of general elections, especially to supervise civil servants. The research uses a normative judicial method with literature studies on law and regulations and other scientific writings that belong to the research topic. At the end, there are recommendation for the improvement of Indonesian Election Supervisory Body on order to increase the effectiveness of supervision over civil servants.

KEYWORDS: The Indonesian Election Supervisory Body, General Election, Neutrality, Civil Servant

I. INTRODUCTION

Indonesia as a democratic rule of law country, positions people's sovereignty as the basic of the state and has the highest existence in the constitution. Put democracy in its essence, namely as a form of effort to realize a decision that must be taken by all members and each has the same rights in the decision-making process. Therefore, in a democratic county, it cannot be separated from the presence of general elections (Triningsih & Aditya, 2021)

As the party of the people's voice, general elections are the main mechanism found in the stages of the state administration and government formation. General elections are seen as the most tangible form of sovereignty in the hands of the people in the administration of the state. Through general elections that provide opportunities for the public to freely choose their leaders based on the choices provide by political parties (Setiya Muhammad Junaidi, 2020).

In organizing general elections as a form of cheating a fully guided government from, by and for the people, it is hoped that in its implementation it can realize the structuring of the system and the quality of the implementation of general elections that reflect the basic principles such as direct, general, freedom, secret, honest and fair (Hardiyanto, 2016). The long process of implementing general elections has always been a concern of many parties, both election participants, election implementers to all levels of society, including the role of the state civil apparatus well known as the Civil Servant, which of course must be maintained neutrality (Muradi, 2018).

Article 9 Paragraph 2 of Law No. 20 of 2023 concerning The State Civil Apparatus stated that every employee of the state civil apparatus must be free from the influence and intervention of all groups and political parties. Furthermore, article 24 paragraph 2 said that, the Civil Servant employees are obliged to maintain neutrality and violations of are all the subject to disciplinary violations.

The concept of neutrality is a vital principle in realizing the professionalism of the the Civil Servant so that it can remain fair, objective, unbiased and free from influence and intervention from any party. This is because the Civil Servant is not only related to political actions but has a major impact on the delivery of public services and the effectiveness of the running of the government.

However, in the practice of the implementing general elections in 2019, as data from the results of Indonesian Election Supervisory Body said that was approximately 1.906 cases of violation of the code of ethics related to the neutrality of the Civil Servant, Indonesian National Army, and the Indonesian National Police. The non-neutrality of these parties undermines the spirit

Quo Vadis Role of the Indonesian Election Supervisory Body In Monitoring the Neutrality of Civil Servants

and legitimacy of the election results which leads and impacts practical politics. These violations are possible because there are no rules regarding limits or concrete form in maintaining neutrality.

Indonesian Election Supervisory Body has the authority to supervise and discipline recommendations to the authorized the Civil Servant agency or in this case that Indonesian Civil Apparatus Commission which will later follow up any recommendations given by the Indonesian Election Supervisory Body for violations of the neutrality of the State Civil Apparatus (Rizki Indra Yanti Hasan, 2022).

The Election Supervisory Body has strengthened its position and authority. This was proven after the Constitutional Court decision no. 48/PUU-XVII/2019 concerning Review of the Regional Head Election Law against the 1945 Constitution of the Republic of Indonesia. This Constitutional Court decision provides a new interpretation regarding the district/city level of general election supervisory committee which was previously ad hoc in nature and has become a permanent institution and relates to filling positions according to legality based on the Election Law. Legal certainty for the General Election Supervisory Body is very important because the General Election Supervisory Body carries out law enforcement and supervisory functions (Latifah, Fifiana Wisnaeni, Sekar Anggun Gading Pinilih, 2023).

II.   RESEARCH METHOD

The approach method used in this research is normative juridical. An approach that positions the law as a system of norms. The system of norms in question is about the principles, norms, and rules of law (Fajar Mukti, 2010). The statutory approach is carried out by examining all law and regulations that are properly related to the legal issues raised (Susanti, 2014), with an assessment of legal principles and legal norms. The specification in this research is descriptive-analytical, because of this research describes the applicable legislation relating to legal science theories and a certain situation or object factually and accurately, which then analyzes the data obtained from the research.

This research used secondary data, that obtained from research on regulations or writings related to research material, namely primary legal materials such as the 1945 constitution, Indonesian Election Supervisory Body regulations, and the Civil Servant regulations, that accompanied by secondary legal materials including literature studies, official documents, books and esearch results.

III.   RESULTS AND DISCUSSION

1.   Forms of Supervision by the Indonesian Election Supervisory Body on neutrality of the Civil Servant in the 2024 General Elections

The Indonesian Election Supervisory Body is a general election organizing body that it tasked with overseeing the entire stages of general elections throughout the territory of the Republic of Indonesia. Some of the obligations possessed by Indonesian Election Supervisory Body, include the preparation of standards for supervisory procedures, conducting prevention and prosecution, supervising the preparation of general elections, supervising the implementation of the general election stages, preventing the practice of money politics, and supervising the neutrality of the Civil Servant and providing recommendations for relevant agencies.

Law No. 20 of 2023 concerning the The Civil Servant regulates about civil servants and Government's employees with work agreements. Based on Article 9 Paragraph 2 mandates that every the Civil Servant must be free from the influence and intervention of all groups and political parties. The Civil Servant is prohibited from approaching or building relationships with political parties, declaring their participation in campaigns and supporting candidates participating in general elections.

In simple terms, the supervision carried out by Indonesian Election Supervisory Body based on Law Number 7 of 2017 is divided into 3 stages including:

a.   Pre-election phase (Preventive Supervision)

b.   phase during elections (Direct Supervision)

c.   Post-election phase (Monitoring of violations and ethical rules)

In preventive supervision efforts, Indonesian Election Supervisory Body took action to socialize and remind to all the Civil Servant supervisors to maintain neutrality through social media and policies to work ethics (Musfualdy, 2012). In direct supervision carried out by Indonesian Election Supervisory Body, it is carried out by recording alleged violations of abuse of authority, use of budgets, and use of government or regional government facilities and through supervision of violations of voter mobilization.

Article 3 paragraph 1 of the Indonesian Election Supervisory Body regulation No. 6 of 2018 concerning Supervision of the Civil Servant, Indonesian National Army, and the Indonesian National Police Members, explain that:

Quo Vadis Role of the Indonesian Election Supervisory Body In Monitoring the Neutrality of Civil Servants

a. Indonesian Election Supervisory Body supervises decisions and/or actions that favor or harm one of the election participants during the campaign period, and

b. Optimizing supervision of activities that lead to partiality toward election participants before, during and after the campaign period.

Indonesian Election Supervisory Body can monitor the neutrality of the Civil Servant with efforts:

a. Identify potential abuse of authority, use of budget and use of facilities;

b. Identify the potential involvement of the Civil Servant employees, Indonesian National Army and Indonesian National Police members;

c. Coordination with Indonesian National Army, Indonesian National Police Members, and the civil servants commission.

d. Cooperation with election monitors and mass media and the public to monitor.

In addition, Indonesian Election Supervisory Body has also collaborated by making a cooperation agreement with the Civil Servant Commission, the Ministry of Home Affairs, the National Personnel Agency, and the Ministry of Administrative Reform and Bureaucratic Reform, which states that energy and unity in efforts to oversee the Civil Servant neutrality.

Indonesian Election Supervisory Body is also responsible for making a study of alleged violations of the Civil Servant neutrality, until later Indonesian Election Supervisory Body provides recommendations which will be forwarded to the the Civil Servant Commission in following up on these recommendations and imposing sanctions / penalties on employees of the agencies concerned.

When examined, the legal regulations governing the nature and context of supervision by Indonesian Election Supervisory Body to the Civil Servant are considered quite good when viewed from the point of view of normative regulations. However, based on the practice of implementing general elections in 2019, as data on results by Indonesian Election Supervisory Body said there were approximately 1.096 case of violations of the code of ethics related to the neutrality of the the Civil Servant, Indonesian National Army and Indonesian National Police.

The amount of data on cases of non-neutrality of the Civil Servant in accordance with the previous explanation is influenced by several factors that hinder supervisory actions carried out by the Indonesian Election Supervisory Body, including:

a. The supervision system and synergy of cooperation with the Civil Servant Commission are not yet optimal;

b. The attitude and character of the Civil Servant who are still subject to officials above them affiliated with political parties or support candidates for general elections;

c. A sense of "reluctance" among co-workers and the community in reporting non-neutral the Civil Servant; and

d. The recommendations of Indonesian Election Supervisory Body and the Civil Servant Commission still not optimal because they are ignored by the relevant Government's employees with agreement. (Rizki Indra Yanti Hasan, 2022)

This all show that the supervision of the neutrality of the Civil Servant is far from being maximized and needs improvement. Through this scientific article, increasing the status of legal force on recommendations given by Indonesian Election Supervisory Body to the Civil Servant Commission, because the nature of the recommendation is that it can be implemented or not, because it does not have binding and forced power. The next breakthrough step that can be taken is to supervise the execution of decisions or recommendations by the Civil Servant Commission in order to ensure responsibility for the neutrality of the Civil Servant.

2. Implications of Non-neutrality of the Civil Servant for Fulfilling the Principles of Organizing General Elections

According to Law No. 5 of 2014, the Civil Servant employees are part of the human resources that drive the government as well as determining the success of government administration through dedication, dedication to service to the community in achieving general welfare for all people as mandated in the constitution.

In the implementation of general elections, the involvement of the Civil Servant is usually marked by a form of involvement in practical politics. Conditions when the Civil Servant openly and/or secretly becomes the success team of candidates participating in the general election (presidential and vice-presidential candidates, legislative candidates and regional head candidates)

This will degrade the concept of neutrality as a vital principle in realizing the professionalism of the Civil Servant so that it can remain fair, objective, unbiased and free from influence and intervention from any party. This all because the Civil Servant is not only related to political actions but has a major impact on the delivery of public services and the effectiveness of the running of the government (Akny, 2014).

The existence of the Civil Servant is faced with conflicting conditions and situations, on the one hand the Civil Servant is required to maintain neutrality in order to create a bureaucratic climate for good government management, but on the opposite side, every the Civil Servant has political rights as a basic right inherent in them, namely the right to associate, accumulate and express opinions (Pradono, 2019). These two things spur debate in the life of the the Civil Servant so that becomes easy to be influenced by political interests.

Quo Vadis Role of the Indonesian Election Supervisory Body In Monitoring the Neutrality of Civil Servants

As for the right to vote, basically it is also not included in the basic rights that cannot be limited or is not an absolute right, as stated in the International Convenant on Civil and Political Rights (ICCPR) which was ratified in Law No. 12 of 2005 said that every the Civil Servant although the right to vote in elections is a form of a fulfillment of human rights, but the right is not a right that can be limited, in the other words, the use or non-use of the right to vote by each individual does not have legal consequences, only politically and sociologically they have lost their contribution and interference in determining the direction of important policies and decisions in order to achieve the goals of the state (Jamaluddin, 2021).

General elections as a form of democratic party must be carried out by paying attention to the principles contained there. Article 22E of the Indonesian Constitution in 1945 has mandated for general elections must be held in a direct, general, freedom, secret, honest and fair manner. Fulfillment of the six principles must not only be obeyed by the parties organizing general elections such as General Election Commission and Election Supervisory Body, but also to all general election participants, especially for political parties, and presidential-vice presidential candidates, regional head candidates, and for legislative candidates. In addition, the public and the Civil Servant must pay attention and maintain these principles so as not to degrade the constellation of general elections.

One of the principles that is violated if the Civil Servant not neutral is the principle of confidentiality/honest. The Civil Servant who are unable to maintain their neutrality will indirectly ask their family and friends surrounding them to vote according to the Civil Servant's choice. If considering the position of the Civil Servant to making them follow suit. It is not uncommon for some the Civil Servant policies that can demonize if the community chooses the opposite party. This is what will harm and damage the ideals and the spirit of democracy in Indonesia General Elections.

The implications if the Civil Servant are not able to maintain their neutrality are, the interest of the civil are distorted, services are not optimal, the placement of the Civil Servant positions tends to see political involvement, allowing bureaucratic positions to be filled by incompetent the Civil Servant (Thoha, 2007).

IV.   CONCLUSION

General elections as a form of people's sovereignty in the context of a democratic state, must be able to create a climate that takes into account every principle of the implementation of general elections such as the principle of direct, general, freedom, secret, honest, and fair without exception to the Civil Servant who have vital position in the bureaucracy of government management. Therefore, Indonesian Election Supervisory Body has a significant role and responsibility in conducting preventive supervision and direct supervision to against the Civil Servant that unable to maintain their neutrality. Thus, improving the legal strength of the Indonesian Election Supervisory Body and the Civil Servant Commission recommendation need to be improved and providing optimal supervision of the execution.

REFERENCES

1) Akny. (2014). Realizing Good Governance Through Bureaucratic Reform in the Field of the Civil Servant to Improve Welfare. Journal Public Administration Network Vol.6 Num.1, 12.
2) Fajar Mukti, A. Y. (2010). Dualism of Normative & Emperical Legal Research. Yogyakarta: Student Library.
3) Hardiyanto. (2016). General Election of Regional Heads for the 2015/2020 Period (Study of LEgal Politics of Single Candidates. Journal Varia Justicia Vol.12, Num.1, 206.
4) Jamaluddin. (2021). THE CIVIL SERVANT in the Perspective of Election Law : a Study between Neutrality and Voting Rights. Journal Matriks Social Science Vol.93. Num.1, 48.
5) Muradi. (2018). the Urgency of the Roleof Police Professionalism in the Practice of Local Democracy. Journal Police Science Vol.12, Num.1, 9.
6) Musfualdy. (2012). Mechanism of Election Supervision in Indonesia. Journal Social Culture Vol. 9, Num.1, 45.
7) Pradono. (2019). THE CIVIL SERVANT in 2019 Election, Can be Neutral? Journal Policy Analyst Vol.0, Num.1, 52.
8) Rizki Indra Yanti Hasan, M. I. (2022). the Role of Indonesian Election Supervisory Body in Supervising the Civil Servant Neutrality in the 2019-2024 Legislative Election in North Buton Regency. Journal Selami IPS Vol.15, Num.1, 48.
9) Setiya Muhammad Junaidi, K. S. (2020). The Authority of The Indonesian National Police in Handling Cases of State Civil Apparatus Involvement in General Elecetion. Journal of USM Law Review Vol.03, Num. 2, 464.
10) Susanti, D. O. (2014). Legal Research. Jakarta: Sinar Grafika.
11) Latifah, Fifiana Wisnaeni, Sekar Anggun Gading Pinilih, E.S. (2023) 'Supervision of the Implementation of the 2020 Simultaneous Regional Head Elections by the Semarang City General Election Supervisory Body', INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS, 06(11), p. 5185. Available at: https://doi.org/10.47191/ijmra/v6-i11-25.

12) Thoha, M. (2007). Bureaucracy and Politics in Indonesia. Jakarta: Rajawali Press.

13) Triningsih, A., & Aditya, Z. F. (2021). Constitutional Law : History, Theory and Dynamics of State Administration in Indonesia. Depok: Raga Grafindo Persada.

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

Syarifuddin Dahlan
Faculty of Teacher Training and Education, University of Lampung, Indonesia

ABSTRACT: The role of the vocational personality to determine an individual's full success in his or her career is so long recognized. It has significant effect to job satisfaction of people's careers. Becase of that, helping the student to understand his or her vocational personality pattern is an important part of the career counseling and guidance service in the schools. This study has investigated Vocational Personality Profile Based on Where Students Live and School Popularity using Holland's categories: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). The results of the study were indicating that in general students' vocational personality patterns are: Artistic type (25%)—Social (23.4%)—Enterprising (14%)—Investigative (13.5%)—Conventional (12.4%)— Realistic (11.7%). In detail, students' personality profiles vary according to their residential grouping and the popularity of their school. Further discussion of the research findings are presented in this article.

KEYWORD: Vocational Personality, student residence, school popularity, Holland model classification Lampung Society

I. INTRODUCTION

One of the psychological variables that is important within a person and that determines his success, both in studies and career, is personality (Holland, 1997). The role of this factor in determining the quality of human activity has been studied and is often found in guidance and counseling literature (Kazi, & Akhlaq, 2017; Brown, & Andreas Hirschi, 2013). It can even be emphasized that The choice of a vocation is an expression of Holland's personality (1985). This suggests that these self-variables need to be understood adequately before someone makes a career choice, both in choosing a study plan and the field of work that they want to pursue as a career in life. Therefore, guidance and counseling teachers (counselors) always make this factor an important variable in making decisions about a person's career choice. In other words, the match between career choice and personality type or pattern (Wilkins, & Tracey, 2014), and the match between the choice of study major and personality type or pattern are determining factors for a person's success in life, both at work (Tracey, Allen, & Robbins, 2012), as well as in learning (Wille, Tracey, Feys, & De Fruyt, 2014).

There are two aspects of the self which are expressions of a person's vocational personality, namely interest in positions and talents (Ajayi, Moosa, & Aloka, 2023); Holland, 1997; 1985). If a person's talents and skills at work are related to his work skills, then job interest has a significant influence on a person's job satisfaction (Perdue, Reardon, & Peterson, 2007; Sullivan & Hansen, 2004). Likewise, in the success of a person's studies, these two aspects are also determining (van Vianen, 2018). A person's talent and interest in learning can make it easier for the person concerned to study subject matter, gain the necessary knowledge and learning skills (Rounds, & Su, 2014); Krapp, 2007).

In reality, these two aspects of vocational personality are not always found to be compatible and compatible. There are people who have talent for a certain activity or job, but are not interested in that activity or job. On the other hand, there are also people who are interested, and even very interested in a particular activity or job, but are unable (less talented) to do it well.

Counselors, especially career counselors, recognize that information on person-environment fit, vocational personality and work environment (Holland, 1997), various predictors of success in a job (Sack, 2015), and examination of person-environment and learning achievement (Milsom, & Coughlin, 2017) is an important consideration in making career choice decisions. Therefore, understanding the various consideration factors (compatibility of vocational personality with field of work) is the first step in career planning. Although there is no guarantee that if someone understands well they will act intelligently (be able to make the right career decisions), this can be seen as a valuable start in determining the

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

appropriateness of a particular action or choice. However, choosing something that is clearly known is better than choosing something about which there is no clear information.

The implementation of such career guidance efforts has long been emphasized in schools, especially in high schools, but the results have not been optimal. Students still seem uncertain and seem hesitant when asked about their career choice plans (Goliath, 2012; DiFabio, Palazzeschi, Peretz, & Gati, 2013). They generally do not fully understand themselves; they don't really understand their potential, both their strengths and weaknesses; they also don't understand the main sub-types or vocational personality patterns. As a result, they still experience difficulties in making career choices (Akpochafo, 2020); Hidayat, Kustandi, & Alfan, 2019); Vaiopoulou, Papavassiliou-Alexiou, & Stamovlasis, 2019).

This study is part of an effort to improve the quality of career interventions for secondary school students. In general, this research aims to answer the question: What is the vocational personality profile of high school students in the Holland classification categories: Realistic, Investigative, Artistic, Social, Entreprising and Conventional, based on the grouping of students' residence and school population? Specifically, this research aims to find out profile of students' vocational personality types based on where students live (Urban and Suburban) and popularity of the student's school (Popular-Not popular).

It is hoped that the findings of this research can be input for school guidance and counseling teachers (counselors) as considerations in career counseling services. The role of personality in making career decisions is needed (DiFabio, Palazzeschi, Levin, & Gati, 2015); Wu, Zhang, Zhou, & Chen, 2020).) and the suitability of vocational personality type to the work environment are always the main considerations in making career decisions (Su, Murdock, Rounds, 2015; Wilkins, & Tracey, 2014; Holland, 1997). Because understanding personality types with their distinctive characteristics which are students' tendencies will be important information for consideration by school counselors in carrying out student career interventions, both in making decisions about choosing a study program and choosing the field of work that will become a life career. future students.

A. Vocational Personality Type Categories

Holland (1985) proposed six categories of vocational personality types, namely: Realistic, Investigative, Artistic, Social, Entrepreneurial (Entrepreneur), and Conventional. Each type consists of a number of personal traits that form a number of special potentials to achieve certain successes and aspirations. In summary, the characteristics of each personality type are as follows:

Realistic. Prefers activities that require the manipulation of objects, tools, machines and animals directly, regularly and systematically, and avoids therapeutic and educational activities. These behaviors, in turn, lead to the acquisition of technical, electrical, agricultural, mechanical and manual competencies, and lead to a deficiency in educational and social competencies. Apart from the characteristics above, people belonging to this type tend to show maleness, physical strength, unsociality and aggressiveness. They have good motor skills and coordination, but lack verbal and human relations skills. They prefer concrete rather than abstract problems; considers himself as someone who is aggressive and manly, and has conventional economic and political values.

Investigative. Prefer activities that require creative, systematic, symbolic and observational examination of physical, biological and cultural phenomena in order to understand and control the phenomena in question; Likes to avoid competitive, social and persuasive activities. Such behavioral tendencies, in turn, lead to the acquisition of mathematical and scientific competition, and lead to a deficiency in persuasive competence. Apart from the characteristics above, people who are classified as investigative types tend to show traits that are more task-oriented, theoretical, rational and free. They prefer to use thinking skills in solving a problem rather than immediately acting emotionally; They also like activities or work tasks that are vague in nature; has scientific values and characteristics.

Artistic. Prefers ambiguous activities involving the manipulation of physical objects to create art forms or products. On the other hand, people of this type are reluctant to activities that are direct, systematic and rigidly organized. The behavioral tendencies of such individuals, in turn, lead them to the acquisition of artistic competencies—language, art, music, drama, writing—and less capable in business (enterprise) or creative systems. Apart from the characteristics above, people in the Artistic type group tend to be unsocial, open-minded, difficult to adapt, expressive, and disorganized. This type often suffers from high emotional demands; prefer to use Artistic competence in dealing with solving problems in other settings.

Social. Very fond of activities that require manipulation of other people in order to inform, develop, maintain, or explain. On the other hand, they are reluctant to activities that are systematic, neat and direct and involve tools, objects

(materials) or machines. Such behavioral tendencies in turn lead them to acquire human relations competencies such as educational and personal relations competencies, as well as lacking technical and manual competencies.

Enterprising. Very fond of activities that require manipulation of other people in order to achieve organizational goals or obtain economic benefits. Those who are similar to this type are reluctant to activities that are systematic, symbolic and observational. Such behavioral tendencies, in turn, lead to an acquisition of persuasive, interpersonal, and leadership competencies, as well as a lack of scientific competence. In addition to the characteristics above,
people who are classified as the Entrepreneurial type also tend to show the nature of being adaptable, optimistic, likes to talk, passionate, energetic, ambitious, dominates the atmosphere, attaches importance to their appearance or appearance. They accept themselves as people who have leadership abilities, are confident, aggressive, popular, and sociable or friendly.

Conventional. Most enjoy activities that require systematic, orderly and direct manipulation of data such as storing records, archiving materials, producing materials, organizing business machines and data processing machines to achieve economic goals and objectives. organization, and are reluctant to activities that are ambiguous, free, exploratory, or that are not systematized. Such behavioral tendencies, in turn, lead them to a lack of competition in the business system, and a lack of artistic competition. Apart from the characteristics above, people who are classified as the Conventional type tend to display conformist, rigid, careful, thrifty, neat, principle-abiding characteristics. They place a high value on things based on status and wealth.

B. Personality Type Measurement

According to Holland (1997, 1985), a person's personality can be assessed or determined by comparing the similarity of the traits they have with the traits that characterize each personality type. A person's similarity to each of the six personality types will produce a pattern of similarities and differences. Assessment in this way allows for depiction of personal complexity so that it is not classified as a person who has only one personality type. This method of assessment will refute the opinion that there are only six types of people in the world. With a certain scheme, this method of assessment produces a model with 720 possible similarities of a person with each personality orientation model.

The combination of the six interest types will form sub-types and vocational personality patterns. Sub-types are names for major vocational personality patterns. Vocational personality patterns are a profile of a person's similarity to these vocational personality types. Meanwhile, vocational personality itself is a reflection of a person's (student's) score profile on The Self-Directed Search (Behrens, & Nauta, 2014; Holland, 1994; 1985). In this study, a person's similarity profile with vocational personality types has been measured using the Self-Directed Career Exploration Inventory (IEKAD; Dahlan, 2010). This inventory is a modification of Self-directed Search (Holland, 1994) into the Indonesian version. The measurement scores for each sub-type are converted into a letter code to produce a three-letter summary code that reflects the most preferred style. The order of the three summary letters is arranged hierarchically. The first letter always reflects the strongest preference for a type. In other words, a higher score on a type indicates a person's level of similarity to the type in question is higher than to other types. The highest score reflects the personality type of the individual concerned.

II. METHODOLOGY

This study is descriptive research that uses a quantitative approach to measure the similarity of students' personalities with the typical characteristics of Holland's six personality types: Realistic, Investigative, Artistic, Social, Entrepreneurial (Entrepreneur), and Conventional.

The population of this study is high school students who are in class XII in 96 classes (study groups). The sample consisted of 564 secondary school students. They came from six public high schools and four private high schools who were drawn randomly using a purposive sampling technique. This means that subjects are selected and determined according to the need to achieve research objectives, such as representing the characteristics of the students who will be examined in this study.

Personality type has been assessed based on self-direction using the Self-Directed Career Exploration Inventory (IEKAD; Dahlan, 2010). This inventory was developed from the career tool "Self-Directed Search" (Holland, 1994). The inventory contains four statement sections as an assessment of Activity Preference, Position Preference, and Self-Estimation, as well as academic achievement which is classified into six personality type categories (Realistic, Investigative, Artistic, Social, Entrepreneurial (Entrepreneur), and Conventional).

The data obtained in this research was analyzed descriptively-quantitatively using statistical techniques. Descriptive analysis is used to provide vocational personality profile data for each and every group of students. All data calculations for data analysis purposes in this study will be carried out computerized using SPSS facilities.

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

III. RESULTS AND DISCUSSION

A. General vocational personality type profile of Middle School Students

From the results of research data analysis, the percentage distribution figures for secondary school students in the six vocational personality types were obtained as seen in Figure 1 below.

In Figure 1 it can be seen that in general the vocational personality of secondary school students is spread across six personality types with varying percentage distribution. It turns out that the first largest percentage distribution is in the Artistic Personality Type (25%) and the smallest is the Realistic Personality Type (11.7%). The second largest percentage distribution is in the Social Personality Type (23.4%) and the third is the Enterprising Personality Type (14%). Then followed by the Investigative Personality Type (13.5%) and Conventional (12.4%). Based on the results of this calculation, the vocational personality profile of secondary school students can generally be described as follows: Main personality type: Artistic. Vocational personality patterns: Artistic—Social—Enterprising with Summary Code: ASE. Meanwhile, the complete picture of their vocational personality is based on six personality types: Artistic—Social—Enterprising—Investigative—Conventional—Realistic.

In detail, the vocational personality profile of secondary school students varies according to their grouping of democratic characteristics (place of residence and school popularity). The distribution of the percentage of students for each type of six personality types is presented in the description of each student group's vocational personality profile.
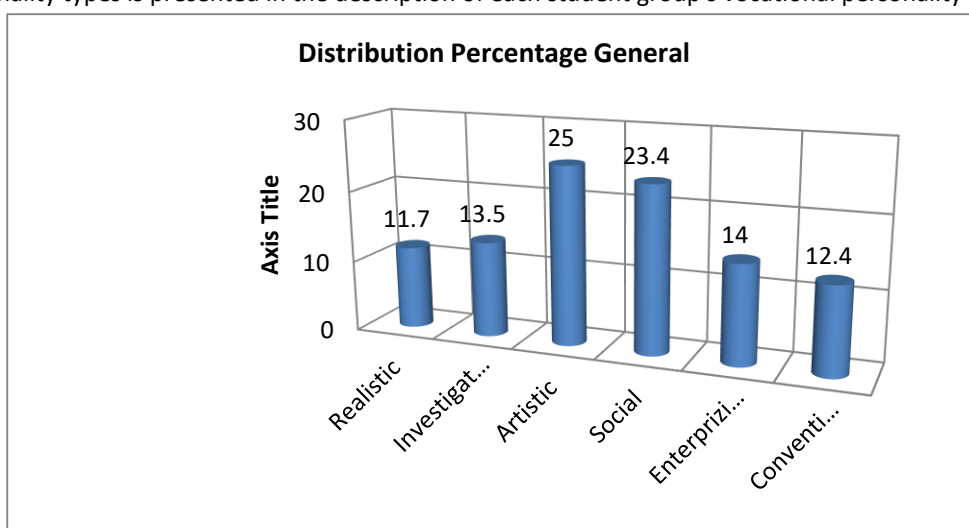
Figure 1. Distribution of the percentage of students in six general personality types.

B. Vocational personality type profile based on the popularity of the student's school of origin (Popular-Unpopular)

Data on the distribution of personality types of secondary school students based on the popularity of the student's school of origin (Popular-Unpopular) in six categories: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC) can be seen in Figure 2.
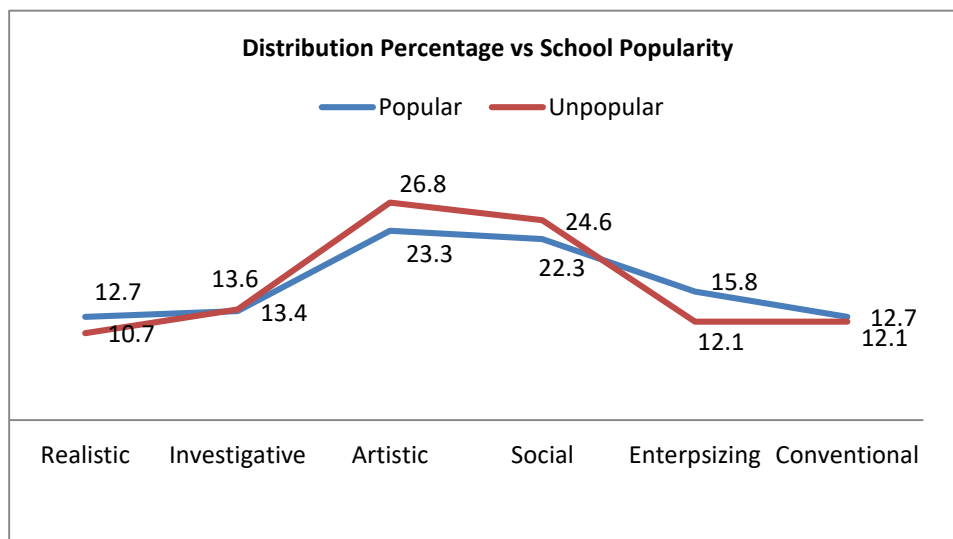
Figure 2. Distribution of the percentage of students in six personality types based on the popularity of the student's school.

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

In Figure 2 above, it can be seen that the percentage distribution of students from popular high schools is first in the Artistic Personality Type (23.3%), while the lowest is seen in the Realistic and Conventional Personality Types (12.7% each). Meanwhile, the second largest percentage is the Social Personality Type (22.3%) and the next rank is occupied by the Enterprizing personality type (15.8%) and the next order of percentage distribution is the Investigative Personality Type (13.4%). Based on this distribution data, the vocational personality profile of middle school students from popular high schools looks almost the same as the vocational personality pattern of students in general, namely: Main personality type: Artistic. Vocational personality patterns: Artistic—Social—Enterprising with Summary Code: ASE. Meanwhile, the complete picture of their vocational personality is based on six personality types: Artistic—Social—Enterprising—Investigative—Conventional/Realistic.

Meanwhile, students from "Unpopular" schools also indicated that their vocational personality was the first most similar to the Artistic Personality Type (26.8%) and the least similar to the characteristics of the Realistic Personality Type (10.7%). The second largest distribution percentage is also the Social Personality Type (24.6%), while the third largest is the Investigative personality type (13.6%). Next in line are the Enterprising and Conventional personality types (12.1% each). Based on this distribution data, the vocational personality profile of students from unpopular secondary schools is as follows: Main personality type: Artistic. Vocational personality patterns: Artistic—Social—Investigative with Summary Code: ASI. Meanwhile, the complete picture of their vocational personality is based on six personality types: Artistic—Social—Investigative—Enterprising/Conventional—Realistic.

C. Vocational personality type profile based on student residency

The distribution of vocational personality data on six personality types based on where students live (Urban and Suburban) can be seen in Figure 3. The data shown in Figure 3 shows that the vocational personality of students who live in urban areas turns out that the first largest percentage distribution is in the Artistic Personality Type (25.7%) and the lowest percentage distribution is seen in the Realistic Personality Type (11.8%) . The second largest percentage appears to be the Social Personality Type (22.1%), and the third largest is the Investigative Personality Type (14.3%). The next order of percentage distribution is the Conventional Personality Type (13.9%) and the Enterprising Personality Type (12.1%). Thus, the vocational personality profile of secondary school students living in urban areas is as follows: Main personality type: Artistic. Vocational personality pattern: Artistic—Social—Investigative with Summary Code: ASI, the same as the vocational personality pattern of students who come from unpopular high schools. Meanwhile, the complete picture of their vocational personality is based on six personality types: Artistic—Social—Investigative—Conventional—Enterprising—Realistic.
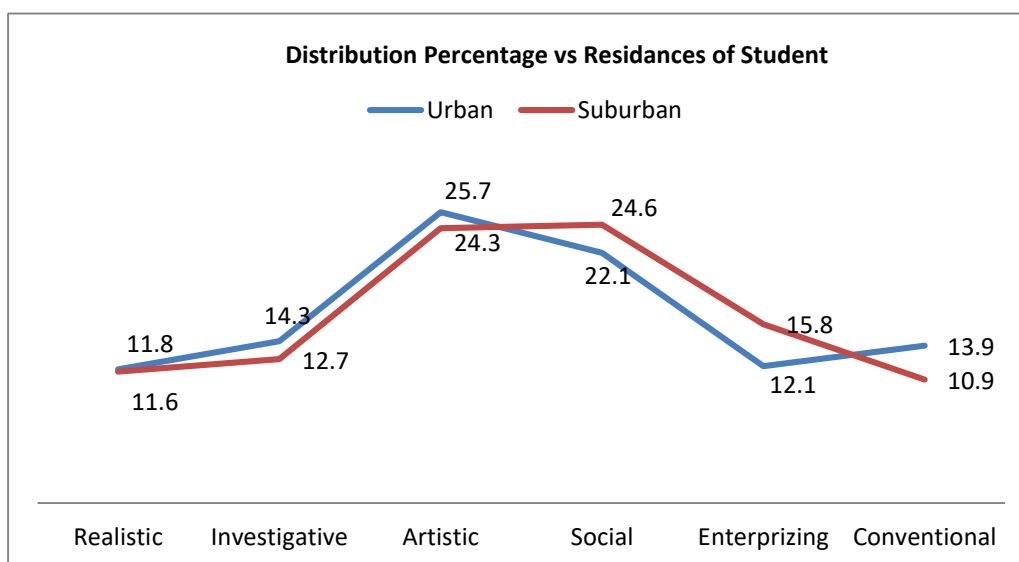
Figure 3. Distribution of the percentage of students in six personal based on where students live.

Meanwhile, students who come from residences in the Suburban area show the highest similarity in vocational personality, the first being the Social personality type (24.6%) and the least conventional (10.9%). The second largest distribution percentage is the Artistic Personality Type (24.3%) and the third largest is the Enterprising Personality Type (15.8%). The other vocational personalities of this group of students are spread across the Investigative (12.7%), Realistic (11.6%) personality types. Based on the percentage distribution shown, the vocational personality profile of secondary school students residing in the Suburban area can be described as follows: Main personality type: Social. Vocational personality patterns: Social—Artistic—

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

Enterprising with Summary Code: SAE. Meanwhile, the complete picture of their vocational personality is based on six personality types: Social—Artistic—Enterprising—Investigative—Realistic—Conventional.

The suitability of vocational personality with a career choice is always the main consideration in making a career decision. In various career guidance and counseling literature studies, discussion of the match between vocational personality and work environment has always been an important part of career intervention studies. Therefore, career counselors recognize that understanding vocational personality types is the first step in making career decisions.

This study has examined the vocational personality profiles of secondary school students referred to Holland's six personality types: Realistic, Investigative, Artistic, Social, Entrepreneurial, and Conventional. The student's personality profile is described following their distribution of the six personality types which are grouped according to the area of residence and popularity of the school where they study. Each type is characterized by a number of personal traits that constitute a particular set of potentials for achieving certain successes and aspirations.

In general, research finds that the vocational personality of high school students shows the following profile: Main personality type: Artistic. Vocational personality patterns: Artistic—Social—Enterprising with Summary Code: ASE. Meanwhile, the complete picture of their vocational personality is based on six personality types: Artistic—Social—Enterprising—Investigative—Conventional—Realistic.

This informs that in general high school students show the main vocational personality type which is similar to the Artistic Personality Type. This personality type has a number of distinctive characteristics, such as: preferring ambiguous activities involving the manipulation of physical objects to create art forms or products. On the other hand, this type makes people reluctant to activities that are direct, systematic and rigidly organized. Such individual behavioral tendencies, in turn, lead them to acquire artistic competencies—language, art, music, drama, writing—and less competence in business or creative systems. Apart from the characteristics above, this Artistic type tends to emphasize the nature of being unsocial, open-minded, difficult to adapt, expressive, and disorganized. This type often suffers from high emotional demands; prefer to use Artistic competence in dealing with solving problems in other settings.

The next sequence of students' vocational personality characteristics is similar to the Social Personality Type. The characteristics of this type lead people to prefer activities that require manipulation of other people in order to inform, develop, care, or explain. On the other hand, this type makes people reluctant to activities that are systematic, neat and direct and involve tools, objects (materials) or machines. Such behavioral tendencies in turn lead them to acquire human relations competencies such as educational and personal relations competencies, as well as lacking technical and manual competencies.

Enterprising Personality Type is the third sequence of students' vocational personality patterns. The distinctive characteristics of this type lead people to prefer activities characterized by the Artistic and Social Types. They also generally prefer activities that require manipulation of other people in order to achieve organizational goals or obtain economic benefits. Those who are similar to this type are reluctant to activities that are systematic, symbolic and observational. Such behavioral tendencies, in turn, lead to an acquisition of persuasive, interpersonal, and leadership competencies, as well as a lack of scientific competence. Apart from the characteristics above, people who are classified as the Entrepreneurial type also tend to show the nature of being adaptable, optimistic, likes to talk, passionate, energetic, ambitious, dominates the atmosphere, attaches importance to their appearance or appearance. They accept themselves as people who have leadership abilities, are confident, aggressive, popular, and like to socialize or be friendly.

Furthermore, the Investigative Personality Type appears to be in fourth place in the overall pattern of students' vocational personality similarities. The characteristics of this type encourage people to prefer activities that require creative, systematic, symbolic and observational examination of physical, biological and cultural phenomena in order to understand and control the phenomena in question. This kind of person likes to avoid activities that are competitive, social and persuasive.
Such behavioral tendencies, in turn, lead to the acquisition of mathematical and scientific competition, and lead to a deficiency in persuasive competence. Apart from the characteristics above, people who are classified as investigative types tend to show traits that are more task-oriented, theoretical, rational and free. They prefer to use thinking skills in solving a problem rather than immediately acting emotionally; They also like activities or work tasks that are vague in nature; has scientific values and characteristics.

The order of similarities between students' vocational personalities in the next complete pattern is Conventional Personality Type. The characteristics of this personality type enable people to prefer activities that require systematic, orderly and direct manipulation of data such as storing records, archiving materials, producing materials, organizing business machines and data processing machines for achieve economic goals and organizational goals, and are reluctant to activities that are ambiguous, free, exploratory, or that are not systematized. Such behavioral tendencies, in turn, lead them to a lack of competition in the business system, and a lack of artistic competition. Apart from the characteristics above, people who are

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

classified as the Conventional type tend to display conformist, rigid, careful, thrifty, neat, and obedient traits. They place a high value on things based on status and wealth.

The Realistic Personality Type is in last place in the complete pattern of students' vocational personality. This personality characteristic leads people to prefer activities that require the manipulation of objects, tools, machines and animals directly, regularly and systematically, and to avoid therapeutic and educational activities. These behaviors, in turn, lead to the acquisition of technical, electrical, agricultural, mechanical and manual competencies, and lead to a deficiency in educational and social competencies. Apart from the characteristics above, people belonging to this type tend to show maleness, physical strength, unsociality and aggressiveness. They have good motor skills and coordination, but lack verbal and human relations skills. They prefer concrete rather than abstract problems; considers himself as someone who is aggressive and manly, and has conventional economic and political values.

In the students' vocational personality profiles found in this study, it turns out that the group's vocational personality patterns look almost the same as their general vocational personality patterns. The same pattern is especially visible in the Main Personality Type and the second similarity type: Artistic—Social, except for the pattern in the Suburban group which has the opposite pattern: Social—Artistic. Meanwhile, in order of similarity to the third personality type, the pattern appears to vary. Urban Groups and Unpopular Groups: Investigative, while Suburban Groups and Unpopular Groups: Enterprising.

The vocational personality profile of secondary school students shows that the majority of them (25%) are similar to the Artistic personality type. The findings of this research suggest and support the existence and implementation of a Language and Culture Department in high school. Ironically, the reality of practice in the field of this department is very rare. Even in the current academic year, especially in Lampung, there are no high schools that have opened this major. So far there has been no scientific reason put forward by the school why language and cultural studies departments are not held in schools. One classic reason that is often put forward by the school as to why this department is not held is that there are so few students who are interested in the Language and Culture department that it is not possible for the school to open a class for this department, the number of students is not sufficient for one major class.

This symptom of inequality is of interest to us. Although the reality shows that when students are still in high school, almost no one is interested in majoring in languages. However, this inventory study found that the number of high school students who showed a vocational personality similar to the Artistic Personality Type was quite large. Likewise, if we look at school graduates who are interested in entering the language and culture department, especially in the Department of Language and Arts Education at the Faculty of Teacher Training and Education or the College of Teacher Training and Education, it turns out that their number is quite large. A number of questions can be raised regarding the symptoms of this inequality. Is the lack of organizing language and cultural studies majors in high schools due to students' disinterest in language majors in high schools or because of the lack of career information available at school? Or is it because there are other factors that cause this department not to be implemented in schools? The answers to these questions require special studies and further studies until adequate empirical evidence is obtained.

IV. CONCLUSION

1. In general, high school students show a vocational personality profile with a summary code pattern: Artistic—Social—Enterprising (ASE) and complete: Artistic—Social—Enterprising—Investigative—Conventional—Realistic.
2. Students' vocational personality profiles vary based on where they live. The Urban group students showed the Summary Code pattern: Artistic—Social—Investigative (ASI) and its complete: Artistic—Social—Investigative—Conventional—Enterprising—Realistic. Meanwhile, the Suburban group students showed a Summary Code pattern: Social—Artistic—Enterprising (SAE) and the complete: Social—Artistic—Enterprizing—Investigative—Realistic—Conventional.
3. Students' vocational personality profiles based on school popularity are relatively the same. Popular school group students show the Summary Code pattern: Artistic—Social—Enterprising (ASE) and the complete pattern: Artistic—Social—Enterprising—Investigative—Conventional—Realistic. Meanwhile, the group of students from Unpopular schools showed the Summary Code pattern: Artistic—Social—Investigative (ASI) and the complete: Artistic—Social—Investigative—Conventional—Enterprising—Realistic.

V. RECOMMENDATIONS

Research finds that the vocational personality profile of secondary school students varies based on where they live and the popularity of the school where they study. Therefore, it is recommended that counselors pay attention to students' demographic characteristics in efforts to optimize career intervention services, especially career planning services for secondary school students.

Vocational Personality Profile Based on Where Students Live and School Popularity: Classification of the Holland Model in Lampung Society, Indonesia

REFERENCES

1) Ajayi, O. B., Moosa, M., & Aloka, P. J. O. (2023). Relationship Between Career Interest and Career Decision-Making of Grade 12 Learners in Township Secondary Schools in South Africa. *Athens Journal of Education*, *10*(2), 307–322. https://doi.org/10.30958/aje.10-2-7

2) Akpochafo, G. O. (2020). Career decision-making difficulties among secondary school students in Nigeria. Universal Journal of Educational Research, 8(11), 5918–5925. https://doi.org/10.13189/ujer.2020.082226

3) Brown, S. D. & Andreas Hirschi. (2013). Personality, career development, and occupational attainment. In S. D. Brown & R. W. Lent (Eds.), Career development and counselling: Putting theory and research to work (2nd ed., pp. 299–328). John Wiley & Sons.

4) DiFabio, A., Palazzeschi, L., Levin, N., & Gati, I. (2015). The role of personality in the career decision-making difficulties of Italian young adults. Journal of Career Assessment, 23(2), 281–293. https://doi.org/10.1177/1069072714535031

5) DiFabio, A., Palazzeschi, L., Peretz, A. L., & Gati, I. (2013). Career indecision versus indecisiveness: Associations with personality traits and emotional intelligence. Journal of Career Assessment, 21(1), 42–56. https://doi.org/10.1177/1069072712454698

6) Dahlan, S (2021). Self-Assessment Based Counseling: A Further Study Planning Service in High School.*International Journal of Instruction.*14 (1): 411-426. http://www.e-iji.net/dosyalar/iji_2021_1_24.pdf

7) Dahlan, S, Idris, E, dan Susanto, E (2020).Improve student career certainty using self-information: A career counseling in the school. *Cypriot Journal of Educational Sciences*. 15(6) December: 1480-1494. **https://un-pub.eu/ojs/index.php/cjes/article/view/5292** DOI: https://doi.org/10.18844/cjes.v15i6.5292

8) Dahlan, S. 2010. Model konseling untuk memantapkan pilihan karier konseli (Studi pengembangan berdasarkan teori pilihan karier Holland pada siswa SMA di Bandarlampung). Disertasi Doktor. SPs UPI. Bandung. Tidak diterbitkan.

9) Goliath, D. (2012). Career indecision amongst undergraduate university students at an academic institution in the Western Cape. University of the Western Cape.

10) Hidayat, D. R., Kustandi, C., & Alfan, R. (2019). Career Decision-Making Difficulties Among High School Students in Jakarta and West Java: A Need Analysis For Career Guidance Application Development. *International Journal of Innovation, Creativity, and Change*, *5*(4), 719–727. www.ijicc.net

11) Holland, J.L. (1997). *Making vocational choices: A theory of vocational personalities & work environments.* (3nd Ed.). Odessa. FL: Psychological Asssement Resources.

12) Holland, J. L. (1994). *The Self-Directed Search* (4th ed., Form R). Psychological Assessment Resources.

13) Holland, J.L. 1985. Making vocational choice: Theory of vocational personalities & work environments (2nd. Ed.). Englewood Cliffs, New Jersey: Printice-hall.

14) Kazi, A. S., & Akhlaq, A. (2017). Factors affecting students' career choice. Journal of Research and Reflections in Education, 11(2), 187–196.

15) Krapp, A. 2007. "An educational-psychological conceptualisation of interest". *International Journal for Educational and Vocational Guidance.* Springer Science+Business Media. Tersedia pada Email:andreas.krapp@unibw.de.

16) Milsom, A., & Coughlin, J. (2017). Examining person-environment fit and academic major satisfaction. *Journal of College Counseling*, 250-262.

17) Perdue, S. V., Reardon, R. C., Peterson, G. W. (2007) "Person-environment congruence, self- efficacy, and environmental identity in relation to job satisfaction: a career decision theory perspective". *Journal of Employment Counseling.* Alexandria: Mar 2007. 44, (1): 29-40.

18) Rounds, J., & Su, R. (2014). The nature and power of interests. Current Directions in Psychological Science, 23(2), 98–103

19) Sack, M. A. (2015). Job Search Success: A review and integration of the predictors, behaviours, and outcomes. In S. D. Brown & R. W. Lent (Eds.), Career development and counselling: Putting theory and research to work (3nd ed., pp. 155–179). John Wiley & Sons.

20) Su, R.; Murdock, C.; Rounds, J. Person-environment fit. In APAHandbook of Career Intervention, Volume 1: Foundations; Hartung, P.J., Savickas, M.L., Walsh, W.B., Eds.; APAHandbooks in Psychology®; American Psychological Association: Washington, DC, USA, 2015; pp. 81–98. [CrossRef]

21) Sullivan, B.A., Hansen, J. C. (2004). "Mapping associations between interests and personality: Toward a conceptual understanding of individual differences in vocational behavior". *Journal of Counseling Psychology.* Washington: Jul 2004. 51, (3): 287.

22) Tracey, T. J., Allen, J., & Robbins, S. B. (2012). Moderation of the relation between person–environment congruence and academic success: Environmental constraint, personal flexibility and method. Journal of Vocational Behavior, 80(1), 38–49.

23) Vaiopoulou, J., Papavassiliou-Alexiou, I., & Stamovlasis, D. (2019). Career decision-making difficulties and decision statuses among Greek student teachers. Hellenic Journal of Psychology, 16(1), 74–94.

24) van Vianen, A. E. M. (2018). Person-environment fit: A review of its basic tenets. *Annual Review of Organizational Psychology and Organizational Behavior, 5*(1), 75-101. https://doi.org/10.1146/annurev-orgpsych-032117-104702

25) Wilkins, K.G.; Tracey, T.J.G. Person environment fit and vocational outcomes. In Psycho-Social Career Meta-Capacities: Dynamics of Contemporary Career Development; Coetzee, M., Ed.; Springer International Publishing: Cham, Switzerland, 2014; pp. 123–138.

26) Wille, B., Tracey, T. J., Feys, M., & De Fruyt, F. (2014). A longitudinal and multi-method examination Of interest–occupation congruence within and across time. Journal of Vocational Behavior, 84(1), 59–73.

27) Wilkins, K.G.; Tracey, T.J.G. Person environment fit and vocational outcomes. In Psycho-Social Career Meta-Capacities: Dynamics of Contemporary Career Development; Coetzee, M., Ed.; Springer International Publishing: Cham, Switzerland, 2014; pp. 123–138.

28) Wu, S., Zhang, K., Zhou, S., & Chen, W. (2020). Personality and career decision-making self-efficacy of students from poor rural areas in China. *Social Behavior and Personality*, *48*(5). https://doi.org/10.2224/sbp.8753

Cross Cultural Dynamics of Violence Against Women in Nigeria A Multivariate Analysis Approach

Etim, Godswill Efiom Ph.D.[1], Ita, Akom Nya[2], Ofem, Usani Joseph Ph.D.[3]
[1]Department of Educational Foundations
[2]Director of Programs Women's Health and Equal Rights Initiative, Abuja
[3]Department of Educational Foundation University of Calabar, Calabar

ABSTRACT: The purpose of the study was to examine Cross Cultural Dynamics of Violence against Women in Nigeria. A multivariate analysis approaches. To achieve this purpose, three research question were raised to guide the study. Literature were reviewed conceptually, empirically and theoretically according to the focus of the study. The study adopted a survey research design with stratified random sampling techniques used to choose participating states in two geopolitical zones, South-South and South -East. A total of 6 states were chosen randomly for the study. The researchers purposively selected 200 respondents from each state, thus having a total of 1200 respondents for the study. A questionnaire title 'Violence Against Women Scale (VAWS)' was the instrument that was used for data collection. The instrument was developed by the researchers and the face validity was ascertained using experts in Measurement and Evaluation and the reliability of the instrument was ascertained using Cronbach Alpha technique. The coefficient of the sub scale was high for the instrument to be adjusted reliable. The data collection was done using Google form administered to various people in different states as well as face to face contacts. The data collected were analysed using factor, cluster analysis and one way analysis of Variance (ANOVA) and the results showed that four dimensions were obtained explaining a total of 62.001% of the observed variation in the scale. More so, the result showed that for physical violence Cross River State indigenes are more violent physically compared to other six states followed by Enugu state indigene and then Anambra and Akwa Ibom State. For social violence, Akwa Ibom indigenes are more socially violent followed by Cross Riveriana and Anambra people. For sexual violence, Anambra indigenes are more involved followed by Enugu people, Cross River and then Anambra. Finally, for economic violence, Anambra is more involved, followed by Cross River, and Akwa Ibom and Enugu state. It was recommended that that strong legal enforcement should be carried out, properly monitored to bring perpetrators to books among others.

KEYWORDS: Cross cultural dynamics, violence against women, economic violence, social violence, physical violence.

INTRODUCTION

Nigeria is a signatory to both the African Human Rights Commission (AHRC) Charter and the Universal Declaration of Human Rights (UDHR), which both seek to safeguard people against acts of violence and other conduct that infringe upon their basic human rights and dignity. Furthermore, human rights were acknowledged and enshrined as fundamental principles in Chapter Four of the Federal Republic of Nigeria's constitution in 1999. The social order of the Nigerian state is clearly based on the concepts of Freedom, Equality, and Justice, and discrimination on the basis of sex, religion, and ethnic ties, among other things, is forbidden, according to Chapter 2 of the constitution. As in other underdeveloped nations, GBV is yet pervasive in the nation. (Ajayi, 2019).

As a violation of Fundamental Human Rights, violence against women is recognised on a global scale. More studies have brought attention to the negative impacts of such violence on people's health, their future generations, and demographic trends. The Violence Against Persons (Prohibition) Act 2015 was passed in Nigeria in 2015. It intends to outlaw all forms of violence in both the public and private domains and grants the right to housing and other forms of social support to those who have been the victims of violence.

Intimate partner violence, including physical and/or sexual assault, and non-partner sexual assault, affect 35% of women worldwide, according to a 2013 World Health Organization (WHO) report. Women from all socioeconomic backgrounds and

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

educational levels are affected by gender-based violence, but according to the United Nations (UN), those who fall into particular social categories are more likely than others to be victims of violence. This was revealed at the 1995 World Conference on Women in Beijing. Minority groups, refugee women, migrant workers, poor women, women in institutions or detention, female children, women with disabilities, elderly women, displaced women, and returned women are only a few examples of the social categories of women. Despite the fact that these types of violence against women occur everywhere, the Middle East, Southeast Asia, and Africa have the highest reported rates of such violence. Gender-based violence (GBV) continues to be a barrier to the realisation of equality (SDG goals 5 and 10), peace, and justice as the international community sets and works towards achieving the 17 Sustainable Development Goals (SDG) by the year 2030.

The act takes several forms in Nigeria depending on various factors. Physically, it can include being burnt or stabbed, as well as being slapped, shoved, smacked, punched, pushed, tossed downstairs or across the room, kicked their arms twisted, or choked. In terms of psychology, it is exerting control over others through actions like managing finances, cutting off relationships with loved ones, subjecting them to constant humiliation, threatening to harm or kill children, or isolating oneself from social groups. Controlling another person's money or other possessions against their will falls under this category financially. A victim may also be denied access to financial decisions, denied financial control, or denied employment.

There hasn't been much progress made in eliminating this canker worm despite the efforts of the United Nations General Assembly and all relevant United Nations conventions, many of which are signed by different countries. Even countries with local legislation aimed at eradication have not achieved the desired results. It is clear that recent times have seen a number of protests against the prevalence of violence against women and girls both globally and in Nigeria. The widespread anxiety and outrage in favour of justice for women generally is therefore not surprising. The truth is that having a life free from violence is a fundamental human right, but millions of women and girls experience violence at a disproportionately high rate, both during times of peace and during times of war.

The diversity of cultural and religious practices in Nigeria initially led people to believe that these practices were ingrained in all cultures, particularly those in the country's North. In fact, because a man can get married as many times as he wants and divorce anybody he wants to divorce, this violence is practiced in that region of the country even on children. As time went on, the dynamics altered. Everywhere in the nation, there are ongoing reports of abuse, making it unclear to the public in which region the majority of violence against women occurs. Given the prevalence of the issue, it is unclear why certain states cluster together in terms of the severity of the abuse meted out to women. Finding efforts

Theoretical framework

Albert Bandura developed the Social Learning hypothesis, which was first proposed in 1977. According to the hypothesis, people pick up on other people's behaviour tendencies. According to the hypothesis, people behave a certain way because of their social environment. In accordance with Bandura's theories (1986, p. 29), modelling parental behaviour may also be helpful in understanding violence against women. Accordingly, it is generally accepted that a man is more likely to commit VAW than a man who did not witness it while he was a child if he witnessed it. According to the Social Learning theory, exposure to violence at a young age imbues children's cognitive ideas that justify using violence against others, increasing the risk that they would use it (Eriksson & Mazerolle, 2015). They contend that exposure to violence at a young age increases children's likelihood of participating in and endorsing it in later years (Delaney, 2015; Gage, 2016).

These statements apply to many VAW offenders in Nigeria today. As many women as possible experience violence at the hands of their romantic partners, the majority of the time the assault takes place in front of kids. And this usually has a big impact on how they see women and how they ought to be treated in a relationship. In Anderson and Kras's (2005) study on interpersonal and intergenerational violence, the effectiveness of Bandura's Social Learning theory in explaining violence is clear. However, in addition to learning through observation, there are additional elements including culture, religious beliefs, and the low status of women that have an impact on violence against them.

Feminist theory

The Feminist theory uses the conflict approach to examine the reinforcement of gender roles and inequalities, highlighting the role of patriarchy in maintaining the oppression of women (Thompson, 2016, para. 3). According to the Liberal Feminist theory, neither men nor women benefit from gender discrimination as both of them are harmed, and that explanation for gender inequality lies in societal culture and values rather than its structures and institutions. In this vein, socialization into gender roles produce rigid expectations of men and women (Thompson, 2016, para. 4).

The theory is derived from the liberal political philosophy in the enlightenment period which centred on the core ideas of equality, freedom, universal rights and democracy (Tong, 2009).

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

The conflict approach is used by feminist theory to explore how gender roles and inequalities are maintained, emphasising how patriarchy keeps women underrepresented and oppressed (Thompson, 2016, para. 3). The Liberal Feminist perspective holds that gender disparity is caused more by societal culture and beliefs than by the institutions and structures of a society, and that neither men nor women benefit from gender discrimination since both of them suffer consequences. In this way, inflexible expectations of men and women result from socialisation into gender roles (Thompson, 2016, para. 4).

The theory was derived from the liberal political philosophy of the Enlightenment period, which was based on the fundamental values of equality, freedom, universal rights, and democracy (Tong, 2009). Therefore, in contrast to Radical Feminists, Liberal Feminists are opposed to radical reforms in a democratic setting as a means of resolving the gender discrimination issue. Instead, they are in favour of several measures that would advance gender equality in all spheres, such as laws and adjustments to the current political structure. The fundamental objective is to fully include women in the development process by increasing their participation, increasing their share of the resource distribution, employment, and income, and greatly improving their living conditions (Peet and Hartwick, 2009).

Conceptual Framework

These four terms-gender-based violence, violence against women, domestic violence, and intimate partner violence—form the basis of our analysis. They are to be imagined in this part. Gender-based violence (GBV). This refers to any gender-based socially harmful act, threat of act, or omission against an individual. Despite the fact that the terms are sometimes used interchangeably, sex and gender are not the same. While gender refers to the socially attributed differences that make people either masculine or feminine, sex refers to the biological traits that give them those qualities. Sex is a key factor in determining the duties and responsibilities that men and women are allocated in various cultures, which in turn determines their respective genders and provide them with various possibilities and benefits. It is GBV regardless of the genders of the victim and the perpetrator once the victim's gender is the basis for any kind of violent act. Therefore, GBV can affect both genders equally. VAW: Violence Against Women As a result, DV make up a sizable portion of VAW in many nations. Any abusive behaviour in a man/woman relationship is referred to as intimate partner violence (IPV). Typically, one person engages in such abusive behaviour to seize or keep control over their partner. The victim's social and emotional ties to the abuser serve as the foundation for this form of violence.. Therefore, IPV can affect either sexe, much like GBV and DV. However, females, particularly those who are married, are the majority of the time the victims because of their perceived physical and cultural inferiority. If the couples reside together as a family, IPV may also be regarded as DV.

Violence against Women in Nigeria

Nigerian women have long faced political, social, and economic inequality. While fighting for social, political, and economic rights, they face rape, physical assault, verbal abuse, incest, Female Genital Mutilation (FGM), denial of food, forced marriage, and underage marriage, among other forms of violence. GBV has become a common occurrence for most women in many groups around the country as a result of cultural and religious norms, fast urbanisation, and westernisation. The rate of VAW in Nigeria is rising by the day, with a shocking number of women facing violence in diverse communities. According to the Women At Risk International Foundation (WARIS), over 30% of women in the country experience some kind of DV in a given year. , In a similar vein, according to the 2018 Nigeria Demographic and Health Survey (NDHS), 31% of women between the ages of 15 and 49 have experienced physical violence in some capacity since they turned 15, and 14% have experienced it in the 12 months prior to the survey. In order to quantify the prevalence of GBV in Sub-Saharan Africa, Muluneh (2020) conducted a systematic review and meta-analysis. They gathered information on the prevalence of IPV among women in the Sub-Saharan African countries, ages 15 to 49, from 25 studies. The results showed that the prevalence varied widely, reaching as high as 97% in a study of rural Nigerian women. The prevalence was as low as 13.9% in a study on perinatal women with depression symptoms in South Africa. According to the review's findings, GBV against women has been most prevalent over the years in Nigeria and other parts of Eastern and Western Africa.

Ezeilo and Ohia (2006) sampled 2000 respondents for a study on torture and women in Nigeria, with 1052 women and 948 men included in the sample. Their research showed that women in Nigeria were subjected to a variety of forms of torture, including beatings, wage deductions, denial of needs, repression, sexual harassment, rape, forced widowhood practises, abusive speech, property destruction, deprivation, threats, and child abuse, to name a few. These also affect women in all social classes, according to the study.

Lower-income women, particularly full-time housewives and those working in the informal sector, are more vulnerable to GBV than those from the middle and higher classes, particularly those working in the formal sector (Adebayo, 2003,). In other words, women's victimisation is influenced by their social class and economic dependence on men. As a result, many women in the country are seeking economic independence through entrepreneurship, skilled and unskilled labour. Domestic violence, among

other forms of GBV, has just recently become so prevalent in the society that even highly educated and strong women are not entirely free of it.

The reasons for wife battery range from silly offences like refusal to respect a husband to more serious ones like having extra marital affairs. Others include refusal to have sex,, leaving the house without permission, keeping bad company, drinking alcohol, cooking bad food or cooking late and disrespect shown to in-laws. Adebayo (2003, p. 19) cited poverty, stalking, direct interference in husband's supposed secret affairs,, wickedness, lack of trust, uncaring nature, power tussle and impatience as factors leading to wife battery.. It goes without saying that the practice of wife battery is very injurious to the women's health. It is linked with a multitude of adverse physical health outcomes including acute injuries, chronic pain, gastrointestinal illness and substance abuse (Taft and Watson 2008).

Others health consequences of the act are, mental instability, gynecological problems, miscarriage, permanent disabilities, depression and haemorrhage. In fact, it is a significant cause of female morbidity and mortality. Even widows are not spared as many have, over the years, found themselves at the receiving end of harmful widowhood practices which prevent them from living normal life and even forced some to engage in risky sexual practices to sustain themselves and their children. Widows are often accused of killing their husbands and are consequently either ostracized from the community or subjected to degrading widowhood rites to prove their innocence. The resulting stigma of such rites is often too much for many to bear regardless to whether or not they are immediately proved guilty. While only malicious reasons make some in-laws to dispossess widows of all family belongings and or evict them from their homes, some cultures in the country out rightly exclude women from inheriting their husbands' (or even fathers') properties.

Victims of sexual assaults, like those of wife battery, experience significant health, social and economic consequences which may be immediate or delayed. It is noteworthy that the violence involved in an attempted sexual assault can have the same impact on the victim as a completed one (Akinlusi 2014, para14). The health consequences of sexual assault include sexually transmitted diseases, unwanted pregnancies, unsafe abortions, physical injuries, immediate psychological reactions such as shock, shame, guilt and anger; and long-term psychological outcomes like depression, post-traumatic stress disorder, suicidal ideation, lack of sexual enjoyment, and fear (Furthermore, a review on violence against women by WHO (2013) showed that women who have been sexually assaulted by non-partners are 2.3 times more likely to use alcohol and 2.6 times more likely to experience depression or anxiety, while those abused by partners are 1.5 times more likely to have sexually transmitted diseases including HIV. This is because most of them hardly disclose their predicament to anyone to seek help due to fear or the fear of stigmatization. Of course, Nigeria has one of the lowest rates of help-seeking behaviour in the world with north east geopolitical zone – where only 23% of female survivors of IPV were reported to have sought help – having the lowest rate in the country (World Bank, 2019, p.13).

Female Genital Mutilation (FGM) is another violent cultural practice which many women in Nigeria are now facing its negative consequences having being subjected to it as children. Over 1 in 4 Nigerian women (27%) aged 15-49 have undergone FGM, with the absolute number being about 20 million, a figure that makes the country the third with the highest absolute number of FGM victims worldwide (UNICEF, 2018,). The practice existed in many societies across the world for various reasons but has now greatly declined. It has even totally disappeared in many societies due to its obvious health consequences and enlightenment. Unfortunately, there are many communities in Nigeria that still justify its continuation on grounds of perceived moral obligation or desire to preserve girls 'virginity for family honour.

Similarly, in a meta-analysis on the effect of rural-urban residence and education on IPV, Nagabbala (2021) analysed IPV data on 233,585 women aged 15-49 years from 44 demographic and health surveys conducted between 2000 and 2018 in 29 Sub Saharan African countries. Their findings revealed that women living in rural areas were more likely to have experienced higher rates of IPV compared to women living in urban areas. They further revealed that the prevalence of any form of IPV was generally higher among women living in rural areas (60% of the surveys) and the less-educated women (73% of the surveys) with the most common forms of IPV reported being physical (31.5%), emotional (27.4%) and sexual (12.9%). Finally, it is important to mention that although women are the primary victims of GBV, its overall social and economic costs negatively affect the developmental trajectory of the t entire country. The economic costs of GBV include expenditures on service provision, foregone income for women and their families, decreased productivity, and negative impacts on human capital formation, which are burdensome to developing economies (World Bank, 2019). Therefore, being key actors in the developmental process, the freedom of Nigerian women is directly linked to the country's development. Thus, there is a dire need to address this problem

Research Questions
The following research questions were raised to guide the study:

    i.   What are the dimensions of the violence against women scale?
    ii.   What are the psychometric properties of the instruments?

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

iii.   What are the similarities and differences in violence against women based on geopolitical zones?

METHODOLOGY

The study adopted a survey research design with stratified random sampling techniques used to choose participating states in two geopolitical zones, South-South and South -East. Each of the Geopolitical zone was made a strata. In each of the strata, 3 states were chosen. A total of 6 states were chosen randomly for the study. The researchers purposively selected 200 respondents from each state, thus having a total of 1200 respondents for the study. A questionnaire title 'Violence Against Women Scale (VAWS)' was the instrument that was used for data collection. The instrument was developed using a focus group discussion and extensive literature review. The instrument was developed by the researchers and the face validity was ascertained using experts in Measurement and Evaluation and the reliability of the instrument was ascertained using Cronbach Alpha technique. The coefficient of the sub scale was high for the instrument to be adjusted reliable. The data collection as done using Google form administered to various people indifferent states as well as face to face contacts. The data collected were analysed using factor, cluster analysis and one way analysis of Variance (ANOVA) and the result is presented beloww

Presentation of result

Research question one

What are the dimensions of the violence against women scale? To answer this research question, factor analysis and the result is presented in Table 1, 2 and 3. The result in Table 1 and 2 showed that principal component analysis was used for extraction of factors and orthogonal rotation (varimax option) was used to obtain non-correlated. Kaiser criterion was used for the choice of the number of factors in factor analysis (Eigen value of >1.0) which was also based on the Eigen plot (scree plot). Scree plot also shows the total variance associated with each other. The KMO value as found to be 0.890 and acceptable principal component analysis. another indicator of the strength of the relationship among variables is the Bartletts test of sphericity. in this study, the observed significance level was p< .001. it was concluded that the strength of the relationship among variables was strong.

Factor analysis obtained total 14 components, from which only 4 components were significant according to Kaiser Criterion. The components are numbered in ascending scale according to amount of variance explained. These four factors extracted from factor analysis, explain the variation of violence against women (VAW) by 45.094, 7.403, 4.924 and 4.520 percentages respectively. These factors in total explains about 62.001% of the observed variation in the scale. Table 1, 2 and 3 illustrates the eigenvalues, percentage of variation explained by each eigenvalue and the cumulative percentage of variation explained by those eigenvalues. The first extracted factor (the factor which explained highest variation) have high factor, named physical violence with 10 items. The second factor have high loadings with 7 items Third obtained factor from factor analysis have high factor loadings with 8 number of items and the fourth factor have high loadings with 5 number of items.

Table 1: Sample adequacy and test of …..

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.890
Bartlett's Test of Sphericity	Approx. Chi-Square	51783.356
	df	703
	Sig.	.000
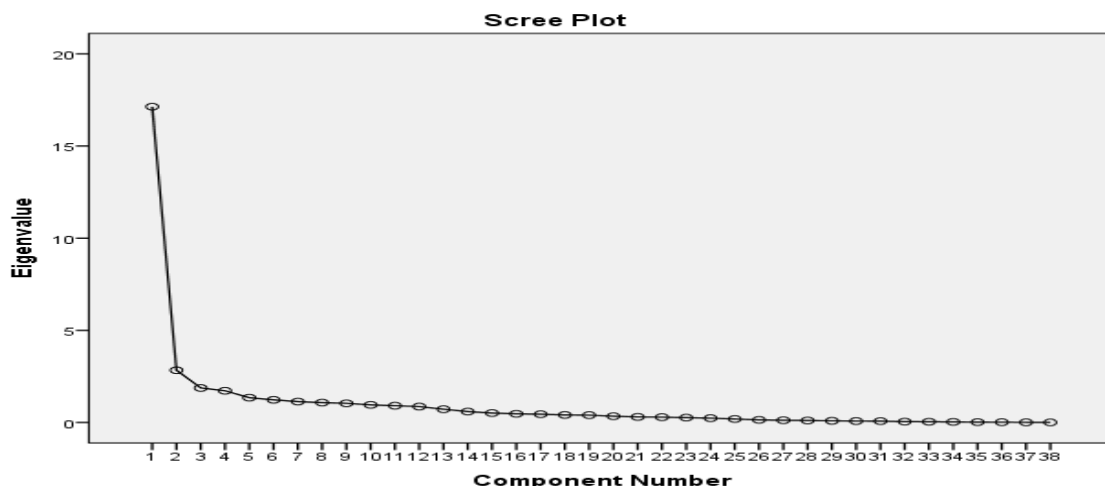
Fig 1. Scree Plot of the components of factors that were produced in the analysis

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

Table 2: Factor structure and loading of violence against women

S/N	Physical violence	PV	SV	SVI	EV
1	Sometimes, making a woman to get bruises make them humble	.971			
2	I have no sympathy in slapping a woman who is stubborn	.962			
3	Most times, you lock a woman inside the house to control her	.958			
4	Some communities do not see anything bad in harassing a woman	.951			
5	Members of my community do not allow molestation of a woman	.941			
6	Beating a woman in my community is a capital offence	.936			
7	Most times, I beat beaten women to calm their mouth	.934			
8	It is not necessary to raise a hand on a woman to get compliance	.925			
9	Men that beat their women, do so sometimes to mould their behaviour	.918			
10	There is no moral need of using legs on a woman	.910			
	Social violence		.895		
11	My wife is not allowed to visit anybody anywhere		.892		
12	I sometimes stay a month without saying a woman to my woman		.887		
13	In most communities, women do not sit where men are sitting		.837		
14	In my community, women are only allowed to join their ages grade and not any other club		.815		
15	My wife has no right to visits anybody without my consent		.793		
16	The woman can only be part of a community meeting but has no right to say anything		.740		
17	I have no time to sit and discuss with a woman for anything		.666		
	Sexual violence				
18	Sleeping with a woman without consents is not a bad thing			.636	
	Most women are rapped without any arrest			.628	
19	The body parts of a woman are not sacred			.695	
20	The man has the right to sleep with as many women as he likes			.671	
21	Touching a woman private part is not			.653	
22	Most women don't take it kindly with men that touches them carelessly			.618	
23	It is a taboo for a woman to report that a man rapes her in the community			.582	
24	Most times, nobody cares about the sexual offences that are meted on women in the community			.425	
	Economic violence				
25	The woman has no right in the man's money				.688
26	The man alone device what to do with money				.594
27	Sometimes, the man allows the woman to work for the family upkeep				.519
28	The woman has the right to own her money				.447
29	I don't think men have issues with women holding to money for themselves				.426

PV=Physical violence, SV=Social Violence, SVI=Sexual Violence, EV=Economic violence

Research question two

What are the similarities and differences in violence against women based on geopolitical zones? To answer this research questions, cluster analysis was used, and the result is presented in Table 3. The result in Table 3 showed the characteristics of each group according to their distances from the centroid. The result showed that for cluster one, Akwa Ibom with an Euclidean distance of .6039 was very integral in that cluster. In cluster2, Cross River State with an Euclidean distance of .3515 was at the heart of the cluster. In cluster 3, Enugu state with an Euclidean distance of .3769 was close the centre and for cluster four, Anambra with an Euclidean distance of .2782 was at the heart of that cluster. The characteristics of each cluster and the Euclidean distance of each status Table 3.

Note that the smaller the Euclidean distance, the closer the variable is to the centre and the more characteristics it possesses of that group

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

Table 3: Clusters analysis based on states and their Euclidean characteristics

Cluster one	Euclidean distance from the centre	Cluster two	Euclidean distance from the centre
Akwa Ibom	.6039	Cross River	.3515
Enugu	.6037	Akwa Ibom	.3500
Anambra	.6043	Enugu	.4774
River State	.8076	Rivers	.4794
Cross River	.8067	Anambra	.5111
Abia State	1.020	Abia state	.5975
Cluster three		Cluster four	
Enugu	.3769	Anambra	.2782
Akwa Ibom	.3760	Akwa Ibom	.2780
Cross River	.4778	Cross River	.2954
Abia	.4841	Rivers	.2950
Rivers	.5875	Enugu	.3299
Anambra	.6396	Abia	.4774

Similarly, in Table 4, the result showed that physical violence against women, those in Cluster two and in specifics people from Cross River State are more prone to this act as they have the smallest distance to the centred (.3515) followed by those in Enugu State (.3769) in Cluster three and then, those from Akwa Ibom in cluster one (.6039) and those from Anambra State (.2782) in cluster four. This implies people from Cross River state are more physically violent to women compared to those from other geographical zones. In terms of social violence against women, the result showed that those in Cluster one and in specifics people from Akwa Ibom State are more prone to this act as they have the smallest distance to the centred (.6039) followed by those in Cross River State (.3515) in Cluster two and then, those from Enugu in cluster three (.37692) and those from Anambra State (.2782) in cluster four. This implies people from Akwa Ibom are more socially violent to women compared to those from other geographical zones. Furthermore, for sexual violence against women, the result showed that those in Cluster one and in specifics people from Akwa Ibom State are more prone to this act as they have the smallest distance to the centred (.6039) followed by those in Anambra State (.2782) in Cluster four and then, those from Cross River in cluster two (.37692) and those from Enugu State (.37692) in cluster three. This implies people from Akwa Ibom are more sexually violent to women compared to those from other geographical zones. More so, for economic violence, the result showed that those in Cluster four and in specifics people from Anambra State are more prone to this act as they have the smallest distance to the centred (.2782) followed by those in Cross River State (.3515) in Cluster two and then, those from Akwa Ibom in cluster one (.6039) and those from Enugu State (.37692) in cluster three. This implies people from Anambra State are more economically violent to women compared to those from other geographical zones

Table 4: Final cluster centres of the variables

	Cluster			
Components of violence	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Physical violence	-.29587	1.08274	1.07248	-.90684
Social violence	.75567	.06147	-.59389	-.26064
Sexual violence	1.04072	-.24982	-.18132	-.43763
Economic violence	-.34101	1.09847	-1.44825	.19853

To strengthen the claims in Table 4, One Way Analysis of Variance (ANOVA) was carried out and the result as presented in Table 5 showed that for physical violence ($F=1222.646$, $p<;05$), for social violence ($F=139.209$, $p<.05$), for Sexual violence ($F=138.278$, $p<.05$) and for economic violence ($F=643.365$, $p<.05$). since $p(.000)$ is less than $p(.05)$ for all the dimensions of violence against women, this implies that the clusters differ according to various dimensions of violence against women.

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

Table 5: One way analysis of variance (ANOVA) result on the influence of the clusters on violence against women

Violence dimensions	Cluster	N	Mean	Std. Deviation
Physical violence	Cluster 1	242	10.276	2.894
	Cluster 2	228	14.087	2.274
	Cluster 3	168	12.072	2.231
	Cluster 4	396	10.909	2.138
	Total	1034	21.220	5.511
Social violence	Cluster 1	242	15.896	2.841
	Cluster 2	228	14.061	2.890
	Cluster 3	168	13.593	2.846
	Cluster 4	396	13.331	2.818
	Total	1034	19.546	4.131
Sexual violence	Cluster 1	242	15.961	2.829
	Cluster 2	228	14.249	1.003
	Cluster 3	168	11.181	2.849
	Cluster 4	396	13.766	3.748
	Total	1034	20.098	5.165
Economic violence	Cluster 1	242	12.354	3.562
	Cluster 2	228	13.098	3.639
	Cluster 3	168	11.448	3.430
	Cluster 4	396	15.198	2.635
	Total	1034	22.543	4.109

Dimension	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Physical violence	Between Groups	806.520	3	268.840	1222.646*	.000
	Within Groups	226.480	1030	.220		
	Total	1033.000	1033			
Social violence	Between Groups	298.010	3	99.337	139.209*	.000
	Within Groups	734.990	1030	.714		
	Total	1033.000	1033			
Sexual violence	Between Groups	296.590	3	98.863	138.278*	.000
	Within Groups	736.410	1030	.715		
	Total	1033.000	1033			
Economic violence	Between Groups	673.555	3	224.518	643.365*	.000
	Within Groups	359.445	1030	.349		
	Total	1033.000	1033			

*=significant at .05 level

DISCUSSION OF FINDINGS

A fifty items scale was developed measuring violence against women with a view of finding out the cross-cultural perspective of the insidious activities of selected six states in the two geopolitical spaces in Nigeria, (South-South and South -East). The instrument was developed using a four-point modified Likert scale. The Violence Against Women Scale (VAWS) was subjected to factor analysis for determining the dimensions that can be used for the study and four factors accounting for 62.001% of the observed variation. Our sample of 1034 according to Tahachnick and Fidel (2001) is sufficiently large to allow meaningful factor analysis to scrutinize the construct validity of the VAWS. The four factors derived were Physical violence, social violence, sexual violence and economic violence. Cronbach alpha reliability was used to estimate the degree of consistency of the new instrument. The coefficients of the subscales ranged from 0.71-0.85 which is a string indication that the instrument was valid and reliable (Ofem, Ovat, Nwogwugu and Effiom, 2021). It was concluded that the instrument was valid and reliable for utilization.

Cross Cultural Dynamics of Violence Against Women in Nigeria. A Multivariate Analysis Approach

To further ascertain the characteristics of each state in respect cluster analysis was used with Hierarchical and K-means clustering to get four clusters and the characteristics of each cluster. The result showed that for physical violence Cross River State indigenes are more violent physically compared to other six states followed by Enugu state indigene and then Anambra and Akwa Ibom State. For social violence, Akwa Ibom indigenes are more socially violent follow by Cross Riverians and Anambra people. For sexual violence, Anambra indigenes are more involved followed by Enugu people, Cross River and then Anambra. Finally, for economic violence, Anambra is more involved, followed by Cross river and the, Akwa Ibom and Enugu state. The findings of this study could be in line with the assertion of Gregory (2021) that noted that most people believe that these violence against women is rooted in the North, probably because of their cultural and religious perception of women, but it has gradually permeated in the south and most women are suffering it severely

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it is concluded that violence against women has taken roots in the south especially in states like Cross River, Akwa Ibom, Anambra and Enugu states. These practices are silent in states like Rivers and Abia that appeared very far from the centroids. Based on the findings, it was recommended that such practices against women should be properly monitored to bring perpetrator to books. That value reorientation should be carried out to ensure that abuse of all forms is avoided with strong legislative implementation.

REFERENCES

1) Adebajo, K. (2019, July 3). Fact check: No, it is not true Nigeria has recorded only 18 convictions in rape cases. *International Center for Investigative Reporting*. https://www.icirnigeria.org/fact-check-no-it-isnt-true-nigeria-has-recorded-only-18-convictions-in-rape-cases/

2) Adebayo, A. (2003). Family violence against women: A comparative study of families in formal and informal business sectors in Ibadan metropolis. *Nigeria Institute of Social Economic Research*.

3) Akinlusi F. M., Rabiu, K. A., Olawepo, T. A., Adewunmi, A. A., Ottun, T. A., Akinola, O. I. (2014) Sexual assault in Lagos, Nigeria: a five year retrospective review. *BMC Women's Health* 14, 115. http://bmcwomenshealth.biomedcentral.com/articles

4) Anderson. J. F. and Kras's (2005). Revisiting Albert Bandura's social learning theory to better understand and assist victims of intimate personal violence. *Women & Criminal Justice*: 17 (1).

5) Delaney, A. X. (2015). Violent socialization and youth violence across different nations: international variations in familial and contextual factors. in violence and crime in the family: patterns, causes, and consequences. Emerald Group Publishing Limited.

6) Erikson, L., & Mazerolle, P. (2015). A cycle of violence? Examining family-of-origin violence, attitudes, and intimate partner violence perpetration. *Journal of Interpersonal Violence*, 30 (6): 945-964.

7) Ezeilo, J. and Ohia, N., (2006). *Torture and the female gender: report of a National Survey on Torture in Nigeria*. Women's Aid Collective.

8) Gage, P. (2016). *Violence against women: an urgent public health priority*. Bull World Health Organisation. 2-10.2471/BLT.10.085217.

9) Muluneh, M. D., Stulz, V., Francis, L., Agho, K. (2020). Gender based violence against women in sub-saharan Africa: a systematic review and meta-analysis of cross-sectional studies. *International Journal of Environmental Research and Public Health*, 17, 903. https://doi:10.3390/ijerph17030903

10) Nagabbala, M. S., Reddy, T., Manda, S. (2021). Effects of rural–urban residence and education on intimate partner violence among women in Sub-Saharan Africa: a meta-analysis of health survey data. *BMC Women's Health*. 21:149. https://doi.org/10.1186/s12905- 021-01286-5.

11) Ofem, U., Ovat, S, Nwogwugu, C and Effiom, A. (2021).Development and validation of scale to measure statistical anxiety among undergraduate Students in Universities in Cross River State. *Multidisciplinary Journal of Research and Development Perspective 10*(1)

12) Peet, R.,Hartwick, E. (2009). *Theories of development: contentions, arguments, alternatives*. The Guildford Press.

13) Thompson, K. (2006, July 6). Liberal, marxist and radical feminist perspectives on society: an introduction. *Revise Sociology.* https://revisesociology.com/2016/07/11/liberal-radical-marxist-feminist-perspectives-society-sociology/

14) Tong R (2009). *Feminist thought: a more comprehensive introduction.* West view Press, University of North Carolina, Charlotte.

15) World Bank (2018). Nigeria GBV risk portfolio report. Washington, DC.

16) World Bank (2019). Gender Based Violence: An Analysis of the implications for the Nigeria for women Project. Washington D C.

17) World Health Organization (2013, Oct. 20). Global and regional estimates of violence against women. https://www.who.int/publications/i/item/9789241564625 Women at Risk International Foundation (n.d.). Rape Stats in Nigeria

Female Participation in Creative Arts Practice and Sustainable Development in Selected Primary Schools in Cross River State, Nigeria

Dr. Godswill Efiom Etim[1], Prof. Elizabeth U. Apebende[2], Rosemary A. Enoh[3]

[1,2,3]Department of Educational Foundations University of Cross River State

ABSTRACT: The aim of this paper was to discuss on how active participation of primary school pupils in creative art can bring sustainable development in the society. Generally, people do not see the subject "art" as an important course. They place more emphasis on other courses such as engineering, medicine, law and what have you. Art is of no value to most people in the society. Meanwhile everywhere man is, there is artistic presence. Right from the clothes we wear, the food we eat, chairs in our sitting room, the pots, plates and spoons in our kitchen, the desk, chairs and table in our schools. Our hair dos and decoration and even music from our radios and televisions are all artistic. So in order to recognize its importance and for the fact that we need these artistic values everyday of our lives we must lay more emphasis on the training of our children right from their tender age on the idea of Art Creativity. To discuss effectively on this topic, the following were looked into: Definition of creative art, Arts Creativity and the primary school child, problems of teaching and learning of arts, Arts creativity and sustainable development, Summary and conclusion were finally drawn

KEYWORDS: female, creative arts practice, sustainable development, primary schools, Nigeria

INTRODUCTION

Art is the process by which people express their inner feelings and emotions. The Online Dictionary (2020) defined art as the expression or application of human creative skills and imagination, typically in a visual form, such as painting or sculpture, producing works to be appreciated primarily for their beauty or emotional powers. Also Wikipedia (2020) sees art as a diverse range of human activities in creating visual or performing artifact (art work) expressing the authors imaginative conceptual ideas or technical skills intended to be appreciated for their beauty or emotional powers.

Robinson (2015) states that art is the ability to bring to mind things that are not present in our senses. This has a lot to do with imagination which is the root of creativity. Owogbonwan (2011) defined art as a means to express thoughts and observation. According to him, it explores, arouses and often intend to appeal, connect with human emotions and can be understood in several ways. Gune (2015) sees it as a tool which exists in human nature, supports his creativity and helps him express himself. According to him, art is important for all individual as it helps to develop aesthetic view point have contributed directly or indirectly to the cultural development of societies. According to Gevceker (2018), Art is a phenomenon from which people perceive the world aesthetically. He also went on to say that arts can be recognized in every human life. That is, it can be seen in the morning breakfast plate and even the cloths people wear. Arts expression can be done through different areas. These may be through literacy works which has to do with skillful use of woods imagery and language in creating visual images as in painting or graphic art. In this, element such as line, shape, texture, stroke, light, space, social value and colour may be applied. In another aspect of visual form the artist may engage in artistic designs using cement, wood, ceramic, plastic, rod, stones etc. as in sculpture. In performing art, music, drama, dance, film and poetry feature prominently. In music vocalization and instrumentation are employed to achieve harmony. In drama an event either real or imagine is acted on stage, radio or television. In dance series of movement and steps are made to match the speed pattern and rhythm of music. Films have to do with recorded moving pictures of a story or event shown in a television. Poetry has to do with the collection of poems such as epic, lyric, dramatic symbolist performance may be in form of poetry reading. These are the different ways by which arts can be expressed.

Female Participation in Creative Arts Practice and Sustainable Development in Selected Primary Schools in Cross River State, Nigeria

Art expression most often is done creatively. The artist may be so creative that what he brings out may be so outstanding, and original or natural. Maxim (1989) states that art experience is a creative process that encourages self-expression and original thinking. Idowu (2010) also states that art creativity is the production of a new entity or idea as never before known. Dere (2019) states that creativity is a procedure of man to create original things. It involves certain activities like sensitivity to problem analysis and synthesis fluency flexibility originality resourcefulness discovery or inventiveness and curiosity. Okoro (2009) states that art creativity is not forced, it flows out of individual freely. It does not need any copy work. It should be original and outstanding.

ART CREATIVITY AND THE PRIMARY SCHOOL CHILD

At the age of six every child is expected to be at school. The Federal Republic of "Nigeria has made education compulsory for all children and so all children from age six are expected to be at school. Before entry into school children must have had experiences that has to do with arts. As children play everyday their different activities are full of artistic expressions. For instance in their play groups some can take the role of parents, mothers, fathers and children. Some can pretend to cook delicious food to serve to others. At school, children should be more exposed to series of activities according to the well prepared curriculum for that purpose. The child therefore should be given every opportunity to be active in art activities. At this age of development the child is mature enough to acquire any knowledge. Also whatever is acquired at this stage cannot be easily forgotten. When children are provided with the necessary materials they can put in all their best to bring out something natural. The child's mind is creative; when he is asked to draw, or paint he goes into action to do whatever he thinks in his heart. Looking at what he does many adults may not feel comfortable with what he has drawn or paint. But to him it is wonderful work he had done. All the child needs is encouragement. He needs to be praised from time to time so that he can put in more effort. Let the teacher not feel that paint work is messy or the drawing is not beautiful. The teacher should note that art work should not be copied. Sometimes some teachers would draw something on the board and ask the pupils to draw what he has drawn. This is very wrong because creativity does not have to do with copy work. Creativity has to do with self-expression. What is expressed should be peculiar to the individual concerned. According to Maxim (1989) artistic expression is an excellent avenue through which children release their creative abilities. Also idowu (301 l) supports the idea that art education encourages pupils to think for themselves and develop their creative activities and increase muscle control.

There are a verity of material within any given environment that children can make use of to express their inner feelings. Apart from painting and drawing materials such as old newspapers, calendars, and even empty cartons can be used to produce items such as paper beads, and paper marche where soaked papers mixed with gum can be used to produce beautiful items that can be used for decoration. Children can also learn how to make greeting cards, hats, bags with raffia. Bottle tops can be used to produce foot mats. Apart from these already mentioned, children can be taught to make use of their hands in sewing. Needle craft use to be very important in those days where children were taught how to make designs on handkerchiefs, table cloth, and even on dresses. This can still be done because that is supposed to be a first step to fashion and design. There are lots and lots of things that children can produce with materials from the environment. Children just need the guidance of well-trained and dedicated teachers.

Also of great importance is the area of drama music and dance. Right from the nursery children learn a lot of poetry. They like to recite poems frequently. Infact the researchers have observed that before any lesson starts. poems are recited, this makes the children excited and ready for the next lesson. The area of drama and dance is also of great importance. So from childhood stage, the child should be encouraged to participate actively in plays. Roles are usually assigned to them and they learn to act according to those roles. When this is done continuously the idea of stage fright will not be there as they grow to maturity. They also learn how to dance in unison to the beatings of the drums and music. Children can be taught these which can be used for entertainment during celebrations in the school or even outside of schools.

PROBLEMS OF CREATIVE ARTS IN PRIMARY SCHOOLS IN NIGERIA

There are many problems facing the teaching and learning of creative art in primary school in Nigeria. Creative art is like any other subject in the primary school. But one of the major problems is that it is not recognized like other subject. Mathematics, science, social studies, English etc. are taken seriously. They are taught as their appropriate time, continuous Assessment and Examination are conducted on these subjects. But creative art does not seem to exist. When it is time for creative art something else would be done such as picking around the school environment copying notes or sometimes used for other periods that might have been skipped. The only art activity the researchers have observed in schools is the production of brooms. This is found mostly in rural schools where palm trees are easily found and children can enter the bush easily. Those in the cities buy their brooms from the market. This is a very wrong attitude. Art creativity need to be done creatively. Children need to make use materials within the environment and with their creative minds produce items not only brooms.

Female Participation in Creative Arts Practice and Sustainable Development in Selected Primary Schools in Cross River State, Nigeria

Another of the major problems of arts is lack of equipment and materials. Other subjects like sciences have laboratories where experiments are carried out but creative art does not have any. Creative art need art rooms or studios where the room is spacious enough for pupils to move freely. Also there are some equipment that individual pupil may not be able to acquire. A research study carried out by Barnabas as presented by Okonkwo (2014) revealed that most schools are faced with issue of art materials and arts studios. There are lots and lots of materials that are needed for art activities. There are many that children themselves can get from the environment such as materials from the palm tree, raffia old papers, starch, gum, clay, bottle tops etc. but the art room or studio is what is really lacking. Children cannot operate effectively without these. The normal classroom space is usually too small to carry out art practical.

The next point is that there are no trained teachers in arts. There is no specialist to handle the subject in these schools. Okonkwo (2014) also states that despite the fact that National Policy on Education has recognize the teaching of arts in all levels of education the subject is faced with the problem of shortage of teachers. He went on to suggest that there should be a deliberate and purposeful training of art teachers. Since society look at this course as down-grading, no one feels comfortable taking it up as an area of specialization. Some people feel it is messy and can make one become dirty easily. For instance in painting, wood work, molding etc. these may be messy but at the end of it one can clean up. But be it as it may one can make money at the end of the day.

Generally art is not seen as a special subject. People do not have any regard for it. There is no parent who will purposely ask the child to fill admission form for Art. To them it is not as lucrative as medicine, engineering, law, etc. so people disregard it. Okonkwo (2014) agree to this also when he said that one of the problems of teaching and learning art in Nigeria is the negative attitude of the society and even the government towards the subject. Also Mbahi (2000) noted that there is the misconception in the society that because art is practical work and not academic, that art teacher is inferior in personality. This has made many teachers to loss interest in art.

CREATIVE ARTS AND SUSTAINABLE DEVELOPMENT

Even though creative art is not given proper attention in the primary school level, it is of great importance to the development of our society. One of the objectives of primary education according to Okujagu (2005) is to give the child opportunity for developing manipulative skills that will enable him function effectively in the society within the limits of his capacity. Creative Arts in its various forms provides every child with a variety of manipulative skills. The production of baskets with just ordinary materials from the palm tree can provide the child with lots of financial benefits.

When properly and well established at the foundation the child can contribute a lot to the development of the society and nation as a whole. Idowu (2011) agree that through the different art practices the child is exposed to. it can naturally be retained and can easily be recalled when needed.

Creative Art has been so important to people of all nations of the world. Art work can be found in our every aspect of life. These can be found in our homes, school, offices, the dresses we wear, the food we eat, entertainment etc. Oladime (2005) agree that the subject Creative art has been relevant and will continue to be relevant to the society. Art practices can empower individuals to be independent in their daily living. Many people through the idea of arts have open up workshops and studios and have become employers of labour. Those in the music and entertainment industry have offered a lot to the society. Making life enjoyable for many. It provides amusement relaxation and pleasure to many in the society. Oladimeji (2004) mentioned others such as painting, sculpture, graphic, ceramic, textile and fashion designs, Industrial arts and design, printing and theoretical studies are career opportunities in Nigeria art for national development. All these area of art can provide job opportunities in placed of the white collar jobs that cannot be readily seen.

Creative arts though not seen as an important course of study is closely related to almost all the courses. Artistic students, with the help of art can express themselves through diagrams and paintings e.g. in geography, maps are drawn and location of places are shown. In sciences such as engineering there are technical drawings which aid planning and production. In architecture, series of architectural drawings and designs are made through artistic creativity. All these are sources of national development.

Culturally, creative arts have a lot to offer. Nigeria has a rich cultural background. Behind every culture there are different dress codes, hair dos relationships in the society, mode of greetings, variety of food and different procedure that the foods are prepared. These are usually expressed creatively in drawings, paintings, sculpture and even drama, writing or poetry forms and folklore. Cultural dance groups are found in every ethnic groups. The duty of these groups is to provide entertainment in cultural ceremonies. Different ethnic groups have their ways of expressing their feeling in the song they while moving bodies their bodies and steps in unison to the songs and beatings of drums and other music instrument.

Female Participation in Creative Arts Practice and Sustainable Development in Selected Primary Schools in Cross River State, Nigeria

Decoration is one of the aspects of Arts that is in Vogue. Different ceremonies such as weddings, both traditional and white, birthdays, thanksgivings, and even burial ceremonies make use of decorations to beautify the environment where the ceremonies are to take place. Artistic designs are used to make the place beautiful. These usually cost a lot of money and people who want the decorations pay easily this a great means of livelihood.

In a country such as this where thousands of students Graduate from school every year, one who read art can as a matter of fact establish himself instead of waiting for employment from government. Through this he can establish himself and provide for himself, his family open job opportunities for those who cannot make it. Through this effort development of the immediate community can be established.

SUMMARY

The importance of Creative art can never be over-emphasized. The definition of art and creativity was looked at from different authors. All point to the fact that it is a means by which feelings and emotions are expressed. The primary school is the first step of education for every child. At this stage the child learns actively and whatever he learns is the foundation on which other things will come to be established. So children should be exposed to a lot of art or creative art activities and practices. This may be a stepping stone to better performance in arts.

Some major problems of teaching and learning of creative arts in schools were identified. Some of which includes lack of art equipment and materials, lack of trained teachers and poor societal attitude towards the subject. Also how creative art can help to sustain and develop the society in which we live was discussed.

CONCLUSION

No reasonable individual would start to build a house without a solid foundation. The primary school is likened to a foundation of a building. If not well structured it may finally collapse. Children need to be provided with art activities frequently from the base to enable them stand firm and then move to higher heights. In conclusion therefore, the government should place more emphasis on this subject by training teachers on this course, and providing the necessary materials. Parents too should see this course not as a lazy man's course but a means by which they can make money and provide job opportunity for their children who cannot easily find a job after National Youth Service. Parent should always assist their children financially to enable them participate fully in arts practices.

REFERENCES

1) Armagon, G. (2015). Examining secondary school students' attitudes towards Visual Arts. *Journal of Computer and Education*, June, 2015 3(5) 166.
2) Dene, Z. (2019). Investigating the Creativity of Children in Early Childhood Education, institution. *Universal Journal of Education Research*, 7(3) (652-655).
3) Gerceker, (2018). An investigation of fine art students' attitude towards arts education based on some variables. *Educational Research Review* Vol. 13 (l 7) 622-637.
4) Idowu. O. O. (2011). Refocusing Fine and Applied Arts Education for Economic Development in Nigeria in the 21" Century. In P. Egbuele, J. E. Tabotndip, and D. A. Aboho. Eds. Refocusing Education in Nigeria. in the 21" Century. West and Solomon Publishing Company Limited. Onitsha.
5) Maxim, G. W. (1989). The very young. Macmillan Publishers.
6) Mbari, A. A. (2000). Art teachers. Kings well publisher Ltd. Maidugri.
7) Ohiogbonvvan, G. (2011). The Impact of the Global Economic Meltdown on Visual Arts in Nigeria. *International Journal of Research and Development,* 5 (1).
8) Okonkwo. I. E. (2014). Towards quality Art Education: Challenges and opportunities. *Journal of Arts and humanities*. Unizik.
9) Okoro, G. (2006). Philosophy Pre-primary Education. Ballin Publishers Nig. Ltd. Onitsha
10) Oladimeji, T. A. G. (2004) Entrepreneurship Opportunities Indigenous Craft for People with Special Needs. A research paper presented at the 5th National Conference of the School of Vocational Education, Abeokuta held 14th -17th June, 2004.
11) Robinson, K. (2015). Retrieved from https//www.2keged.org/mindshift.2015 /04/22/2ir-ken.robinson
12) https://www.google.com.se
13) https://en.m.wikipedia.org.wiki

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

Acep Aripudin[1], Jujun Junaedi[2]
[1,2]Universitas Islam Negeri Sunan Gunung Djati

ABSTRACT: Islam is a religion that contains doctrine and historical values that are visible in missionary activities. This practice cannot be separated from two aspects of Islam including the development of ideas and social change. Therefore, this research aims to ensure that the practice of da'wah also encourages the development of Islamic thought patterns in the Indonesian context. By searching the literature and sharp interpretation with a hermetic approach to Nurcholish Madjid's preaching thoughts which are scattered in several of his writings and lectures. The results can be seen in the da'wah themes presented as a response to social changes that continue to develop, such as human rights, moral violations, corruption, environmental degradation, religious conflict, politics, intolerance, discrimination, the importance of quality education, and gender equality challenges played by Muslim intellectuals. In addition, ethical values in Islamic doctrine are observed and reconceptualized to ward off moral and social violations, correlated with existing challenges as done by Cak Nur (Nurcholish Madjid). Providing responsive and contextual da'wah practices as carried out by intellectuals appears to be more substantive and targets the conceptual and operational problems of society. Therefore, the contribution of da'wah activities is clearly visible in the change and progress of society.

KEYWORDS: Substantive Da'wah, Islam Reconceptualization, Operationalization, Intellectualism, and Social Change.

INTRODUCTION

Islam is considered a preaching religion as stated by Max Muller, which comprises the teaching and spread of the doctrines to humanity.[1] The religion was first preached by Prophet Muhammad in Mecca, but the community rejected the teachings. Consequently, the Prophet was expelled from the region and migrated to Medina to continue the teachings. Medina, originally named Yathrib, became the region where Islam flourished for approximately 23 years.[2] Da'wah, also known as the preaching of Islam, was carried on by the Prophet's companions and subsequent generations, both individually and collectively. The expansion continued beyond the social and cultural boundaries of the Arabian Peninsula. Currently, da'wah has reached nearly every country or nation globally as practiced by American Muslims, either in the physical or virtual worlds.[3]

Islam was introduced to Indonesia by the Arab, Persian, and Indian (Gujarat) communities through cross-border trade routes among the countries. During the development phase, da'wah is conducted through various activities such as marriage, education, arts, and others, as well as the *ulema's* role (religious scholars).[4] The variety and variants of da'wah continue to evolve from the pre-independence era to the current generation with all challenges.[5]

---

[1] Thomas W Arnold, *The Preacing Of Islam A History of the Propagation of the Muslim Faith* (Lahore: SHM. Ashraf, 1965), 1.

[2] Syed Ameer Ali, *Api Islam Sejarah Evolusi Dan Cita-Cita Islam Dengan Riwayat Hidup Nabi Muhammad Saw*, Terj. HB. (Jakarta: Bulan Bintang, 1978), 92-233.

[3] Thomas W Arnold, *The Spread of Islam in the World: A History of Peaceful Preaching* (New Delhi: Goodword Books, 2012), 13.

[4] Azyumardi Azra, *Pendidikan Islam:Tradisi Dan Modernisasi Menuju Millennium Baru* (Jakarta: PT.Logos Wacana Ilmu, 2002), 24.

[5] M. Bambang Pranowo, "Islam Di Indonesia: Mengusung Demokrasi Dengan Basis Budaya," *Jurnal Studia Lslamika* 3, no. 1 (2006): 1–23, https://doi.org/http://dx.doi.org/10.15408/sdi.v13i1.579.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

During the New Order era, modernization prompted the "reconstruction of da'wah" to remain relevant by considering the conditions of the *mad'u* (the recipient of da'wah), including cultural systems and social structures. The change was accepted by more progressive Muslim intellectuals, impacting the development of Islamic thought patterns and strategies for the dissemination of da'wah.[6]

Da'wah movement further experiences a formulation change, including the methods.[7] Similarly, the orientation of the movement shifted from emphasizing Sufism to contemporary social challenges, such as moral dilemmas, environmental concerns, politics, violence, and religious intolerance, relevant in the modern context of Indonesia.[8] The question is how to find an Islamic format for da'wah that meets societal needs while preparing for future necessities, such as providing balanced opportunities for rational empowerment and spiritual fulfillment.[9]

The initial step adopted by Muslim intellectuals is constructive criticism, as carried out by Nurcholis Madjid (Cak Nur). The scholar perceived da'wah practice as more prominent and oriented towards the narrative of 'prohibition' (nahi munkar) rather than 'enjoining good' (amar ma'ruf) as observed in religious lectures.[10] Another criticism voiced by Cak Nur relates to the strategy of Muslim community, focusing on the struggle of da'wah through politics. Despite participation in human resource investment, the movement strategically neglects cultural transitions.[11] Studying the concept in this framework is significant in elucidating ideas about da'wah, thereby becoming a reference and guide for future activities.

Cak Nur is among Muslim intellectuals and religious leaders whose thoughts on Islam as well as da'wah deserve recognition. The essence of da'wah in Cak Nur's perspective includes various components such as the segments of thought, innovation, and actualization in Indonesia.

Hermeneutic (interpretation) methods and social theories are commonly used to approach someone's thought products, as frequently practiced by Cak Nur.[12] The interpretation method also signifies the transformation of something or a situation of ignorance into an understandable approach.[13] This method aims to comprehend the text thoroughly and to understand the author's deeply. Consequently, interpretations are made by meticulously clarifying the challenges in advance.[14] Another profound method used in understanding the overall concept of thought is philosophy.[15] The concept of da'wah is deeply comprehended according to Cak Nur's books and journal articles relating to the preaching of Islam through content analysis.[16]

Cak Nur Biography

Cak Nur, commonly called Nurcholish Madjid, was widely known both domestically and internationally as a prominent Muslim scholar and intellectual leader from Indonesia who evolved in the 1970s. Cak Nur's thoughts were recognized for being open, inclusive, and tolerant, which were qualities acquired during the upbringing in the family environment. Cak Nur's parents were sympathizers of the Council of Indonesian Muslim Associations (Masyumi) but also had close ties to Nahdatul Ulama (NU) through the grandfather, who was very close to the founder of NU named Hadratusyeikh Kyai Hasyim Asy'ari. Cak Nur studied at Islamic boarding schools, madrasas, and universities before becoming a religious scholar specializing in Arabic literature from Syarif Hidayatullah State Islamic University Jakarta, in 1961.

---

[6] Fachry Ali and Bahtiar Effendy, *Merambah Jalan Baru Islam* (Bandung: Mizan, 1986). A. Wahab Suneth, *Problematika Dakwah Dalam Era Indonesia Baru* (Jakarta: Bina Rena Pariwara, 2000), 11.

[7] Muhammad Quraish Shihab, *Lentera Hati* (Bandung, Cet.20: Mizan, 2000), 70.

[8] Johan Meuleman, "Dakwah, Competition for Authority, and Development," *Bijdragen Tot de Taal-, Land- En Volkenkunde* 167, no. 2/3 (2011): 236–69.

[9] Tabroni and Syamsul Arifin, *Islam Pluralisme Budaya Dan Politik* (Yogyakarta: Sipres, 1994).

[10] Nurcholish Madjid, *Islam Kerakyatan Dan Keindonesiaan* (Bandung: Mizan, 1993), 200.

[11] Bahtiar Effendy, *Islam Dan Negara: Transformasi Pemikiran Dan Praktik Politik Islam Di Indonesia* (Jakarta: Paramadina, 1998), 123.

[12] Acep Aripudin and Mudhofir Abdullah, *Perbandingan Dakwah* (Bandung: Remaja Rosdakarya, 2014), 27.

[13] Lauren Swayne Barthold, *A Hermeneutic Approach to Gender and Other Social Identities* (New York: Palgrave Macmillan, 2016), 79.

[14] Nashr Hamid Abu Zayd, *Hermeneutika Inklusif-Mengatasi Peroblematika Bacaan Dan Cara-Cara Pentakwilan Atas Diskursus Keagamaan* (Jakarta: ICIP, 2004), 89.

[15] Fred Dallmayr, *Critical Encounters: Between Philosophy and Politics* (Notre Dame, IN: Notre Dame University Press, 1987), 135.

[16] Klaus Kripendorff, *Content Analysis: Intoduction to Its Theory and Methodology* (Jakarta, Tr. F. Wajdi : Rajawali Press, 1991), 48.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

During the student years, Cak Nur, born on March 17, 1939, was active at the Al-Azhar Grand Mosque in Kebayoran Baru and became close to prominent leaders of Islam in Indonesia including M. Natsir, Andi Mapaseng Fatwa, and Haji Abdul Malik Karim Amrullah (Hamka).[17] Cak Nur's intellectuality and leadership skills were developed in Muslim Students' Association (HMI) after participation in the Indonesian Islamic Student (PII) before becoming branch chairman. The Muhammadiyah Student Association (IMM) did not exist at that time, while the Indonesian Islamic Student Movement (PMII) was a minor initiative.[18] Cak Nur was also active in the Southeast Asian Student Association (Pemiat) as chairman, which allowed visitation to cities in the United States and the Middle East.[19] Due to the visitation across the region, Madjid became close to various Indonesian leaders in the organization including Soejatmoko, Ruslan Abdul Gani, Gus Dur, and Anwar Ibrahim, thereby broadening the insights and experiences.

On January 2, 1970, Cak Nur presented a groundbreaking study on "the liberalization of Islam" (secularization, freedom of thought, and the idea of progress) at the Taman Ismail Marjuki Building in Jakarta. Cak Nur's name became increasingly popular and valued by the media due to various ideas. An example of the experience was being a reviewer in seminars and workshops funded by the Ford Foundation through LIPI (Indonesian Institute of Sciences) in 1976, endorsed by Leonard Binder. This program served as conditioning before departing to the University of Chicago in the United States.[20] Cak Nur pursued studies in political science at the university campus in 1978 and subsequently commenced Islamic philosophy under the guidance of Leonard Binder and Muslim neomodernist Fazlur Rahman. The education focused on the *Kalam* thought of Ibn Taymiyyah until returning to Indonesia in 1984.

Cak Nur resumed several unfinished tasks during the education period, such as teaching at the Graduate School of Syarif Hidayatullah State Islamic University Jakarta, establishing the Paramadina Waqf Foundation, sponsoring the idea of founding the Indonesian Association of Muslim Intellectuals (ICMI), establishing and becoming the rector of Paramadina University as well as Madina Education Foundation. Other activities included participating in seminars, writing articles and books, engaging in social activities, and delivering religious lectures, which was perceived as the operationalization of da'wah ideas. Cak Nur passed away on Monday, August 29, 2005, leaving a profound loss in the Ismal community.

Islamic Da'wah Context in Indonesia

The entry and spread of Islam in Indonesia were manifestations of the success of da'wah. Agents who contributed to the spread of Islam or da'wah included Muslim traders from various parts of the Islamic world, specifically Gujarat and India in the Middle East and South Asia, respectively.[21] Furthermore, Sufism (*tasawuf*) served as a dominant strategy, both factually and conceptually,[22] for the Islamization of the archipelago due to the social and cultural considerations of the local community. This strategy distinguished the da'wah from the power-centric Islamization methods in other Islamic regions such as the Middle East and the fringes of Europe.[23]

Indonesia as a new territory for Islamization possessed a dynamic and heterogeneous social culture posing complex cultural challenges to da'wah, particularly in terms of ethnicities, languages, religions, and cultures. An approximate of 260 million individuals inhabited about 7,000 large and small islands with 633 major ethnic groups, comprising 1,331 subgroups. Additionally, there were between 456 to 749 regional languages in the country. This diversity presented opportunities and challenges in the operationalization of da'wah, distinguishing the movement from the practices in more homogenous Islamic regions.

Various methods were used for operationalizing da'wah in Indonesia. Besides Sufism method producing prominent preachers including the Walisongo, there were organizational strategies, exemplified by Muhammadiyah,[24] Nahdlatul Ulama (NU), and other Islamic organizations. Furthermore, polarization existed in diverse forms, patterns, and methods grounded in the concept of da'wah as well as Islam in general.[25]

---

[17] Muhamad Wahyuni Nafis, *Cak Nur Sang Guru Bangsa Biografi Pemikiran Prof. Dr. Nurcholish Madjid* (Jakarta: PT. Kompas Media Nusantara, 2014), 31.

[18] M. Wahyuni Nafis, *Cak Nur Sang Guru Bangsa Biografi Pemikiran Prof. Dr. Nurc*holish Madjid, 39.

[19] Jane Farlez, "Moderate Islam," *New York Times*, 2005. https://www.nytimes.com/2005/09/01/world/asia/nurcholish-madjid-66-advocate-of-moderate-islam-dies.

[20] Nafis, *Cak Nur Sang Guru Bangsa Biografi Pemikiran Prof. Dr. Nurcholish Madjid*, 79.

[21] Hamka, *Sejarah Umat Islam: Pra-Kenabian Hingga Islam Di Nusantara* (Jakarta: Gema Insani Press, 2020), 47.

[22] AH Johns, "Islamization in Southeast Asia: Reflections and Reconsiderations with Special Reference to the Role of Sufism," *Southeast Asian Studies* 31, no. 1 (1993): 37.

[23] Arnold, *The Preacing Of Islam A History of the Propagation of the Muslim Faith*, 93.

[24] Meuleman, "Dakwah, Competition for Authority, and Development," 182.

[25] Hamidulloh Ibda, "Thuggery and Cultural Da'wah: A Case Study of Jama'ah Pasrah Foundation, Pati, Indonesia," *Jurnal Penelitian* 16, no. 1 (2019): 1–18.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

Sufism method in da'wah was among the earliest strategies adopted by Islamic advocates because it resonated closely with the community's social culture. In this current era, the methods persisted through various tariqas *(*Sufism orders) with all innovations, including in education. The methods used included *dhikr* (remembrance of Allah) and *riyadhah* (spiritual exercises), as well as therapeutic strategies targeting individuals with mental or psychological challenges.[26] Tariqas generally engaged in da'wah using a traditional method similar to that practiced in Islamic boarding schools (*pesantren*). Therefore, tariqas and Islamic boarding schools often played similar roles that were difficult to separate.[27]

Pesantren was a traditional Islamic institution and subsequently developed similarly to tariqas. The school was not only a place for Islamic studies but also a center for the spread of Islam in Indonesia, eventually advancing educational institutions such as *madrasas diniyah* (Islamic schools).[28] Before independence, the contributions of Islamic Boarding schools and religious institutions were significant in the struggle against colonialism alongside other Islamic forces under the motto "*jihad*".[29] This struggle further laid the groundwork for the evolvement of political Islam until the Indonesian independence period. Furthermore, the forces' influence was observed in the early and final stage of the post-independence period in Indonesian social and political change processes.[30]

The shift in the orientation of Islam from the cultural to the political sphere was situational, therefore, the influence cannot be disregarded as a historical process impacting the patterns and practices of da'wah in Indonesia. The pattern of "political da'wah" was advocated by Islamic groups, such as those aspiring to establish the Islamic State of Indonesia (NII) in the sense of Islamic political ideology.[31] Although this political method formally failed due to the lack of historical roots in the Islamic tradition,[32] the mission to preach Islam continued individually or collectively through Muslim organizations or institutions.

Personal da'wah was largely carried out by da'is (Islamic preachers) with varying ideologies and actions. Religious lectures characterized the phenomenon of da'wah in urban and rural areas, leading to the stigma that preaching of Islam solely included lectures and tabligh da'wah (to make known about Islam) emphasizing oral skills.[33] Furthermore, tabligh da'wah produced popular da'is such as Kosim Nurseha, Abdullah Syafi'i, A.F Ghazali, Tuty Alawiyah, and Zainuddin MZ.[34] Young da'is further evolved, including Abdul Shomad, Das'ad Latif, Jujun Junaedi, and Ade Hidayat, who appeared in the popular culture media.[35]

Da'wah practice was performed by intellectual da'is who were active in social, political, and economic spheres with cultural methods. The Islamic teachers included Abdurrahman Wahid (Gus Dur), Jalaluddin Rakhmat, M. Quraish Shihab, Adi Sasono, M. D Raharjo, Alwi Shihab, and Cak Nur. These teachers were better known as Muslim intellectuals, although the preachers' thoughts and activities were deeply rooted in religious perspectives. The da'is mentioned have a significant fundamental commitment to publishing and implementing ethical values of Islam to society as well as internationally.

Muslim intellectuals not only delivered religious lectures but exceeded that by engaging in fundamental reconceptualization and reorientation of da'wah, in response to the evolving developments. After the fall of Soeharto and the 1998 reform era in political parties such as the Justice Party (PK), Crescent Star Party (PBB), and the Indonesian Islamic Propagation Council (DDII), the teachers critiqued da'wah carried out by Salafi and ideological Muslims who remained enthusiastic.[36]

---

[26] Sri Mulyati and Zahrotun Nihayah, "Sufi Healing in Indonesia and Malaysia: An Updated Study of Rehabilitation Methods Practiced by Qadiriyya Naqshbandiyya Sufi Order," *Esoterik: Jurnal Akhlak Dan Tasawuf* 20, no. 20 (2020): 1–32, https://doi.org/http://dx.doi.org/10.21043/esoterik.v6i1.7085.

[27] Zamakhsyari Dhofier, *Tradisi Pesantren Studi Pandangan Hidup Kyai Dan Visinya Mengenai Masa Depan Indonesia* (Jakarta: LP3ES, 2011), 46.

[28] Karel A Steenbrink, *Pesantren Madrasah Sekolah Pendidikan Islam Dalam Kurun Modern* (Jakarta: LP3ES, 1986).

[29] B.J Boland, *The Struggle of Islam in Modern Indonesia* (Netherlands: Springer, 1986), 37.

[30] Alvin Noor Sahab Rizal, "Pergerakan Islam Indonesia Masa Jepang (1942-1945)," *Jurnal Indo-Islamika* 4, no. 2 (2014): 1–22, https://doi.org/https://doi.org/10.15408/idi.v4i2.17394.

[31] Karl D Jackson, *Kewibawaan Tradisional, Islam Dan Pemberontakan Kasus Darul Islam Jawa Barat* (Jakarta: Pustaka Utama Grafiti, 1990), 72.

[32] Ahmad Syafii Maarif, *Islam Dan Masalah Kenegaraan: Studi Tentang Percaturan Dalam Konstituante* (Jakarta: Lembaga Penelitian Pendidikan dan Penerangan Ekonomi dan Sosial (LP3ES), 1985), 67.

[33] Julian Millie, *Oratorical Innovation and Audience Heterogeneity in Islamic West Java* (Jostor: Cornell University Press, 2012).

[34] Idris Thaha, *Dakwah & Politik Da'i Berjuta Umat K.H. Zainuddin MZ* (Bandung: Mizan, 1997).

[35] Eva F Nisa, "Creative and Lucrative Daʿwa: The Visual Culture of Instagram amongst Female Muslim Youth in Indonesia," *Jurnal ASIASCAPE: Digital Asia* 1, no. 5 (2018): 1–16.

[36] Meuleman, "Dakwah, Competition for Authority, and Development," 92.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

Da'wah method was observed to be unresponsive, unsubstantive, and counterproductive, as it was irrelevant to the strategic themes for the advancement of the community. These themes included education, freedom of speech and association importance, political ethics, corruption, environmental issues, religious intolerance, and wealth disparity problems in the community.[37]

Muslim intellectuals have increasingly justified da'wah method in the mid-New Order and the current reform era. Political da'wah faced more challenges and appeared to be gradually marginalized, while a more substantive cultural method became urgent in terms of improving the quality of community resources and welfare. Therefore, the relevance and significance of Cak Nur's ideas should be mapped in the context of Indonesian Islamic da'wah.

Cak Nur's Da'wah Perspective

Cak Nur's thoughts on da'wah were inseparable from general views with a specific limited study on the preaching of Islam. Studies typically addressed Cak Nur's thoughts both domestically and internationally on religious themes such as politics, human rights, democracy, civil society, pluralism, and others.[38] However, Cak Nur paid attention to da'wah issues in the broader framework of the thought, comprising various aspects of human life in the context of Islam, Indonesian identity, and modernity.

Da'wah was a dimension of Islam where the teachings contained doctrines calling on humanity and the community to "be Islamic," as experienced and practiced by Muhammad as a prophet and messenger (QS, Yunus (10):10, 25; an-Nahl (16):125).[39] Referring to the Qur'an, da'wah was often interpreted as a "call," "invitation," and "summons" to Islam, or in a specific sense, a call to Allah.[40]

Cak Nur interpreted da'wah to be similar to the interpretation by the Qur'an, derived from the Arabic word, دعا – يدعو- دعوة (da'a-yad'u-da'watan). The word suggested to call or summon, to affirm or defend, and to propagate, with the understanding of da'wah as a request filled with hope.[41] Furthermore, Cak Nur re-interpreted the basic definition of the word da'wah and explored the term with explanations from other Qur'an verses such as the comprehensive interpretation of what was right and wrong.[42] This action unintentionally revised the previous understanding of da'wah as often expressed by activists and scholars.[43] The re-interpretation also categorized da'wah as providing an Islamic understanding in the context of Indonesian identity and modernity to Muslim community.[44]

The idea of Cak Nur about da'wah was gleaned from articles such as *"Dakwah Dengan Hikmah"* (Da'wah with Wisdom) in Tabloid Tekad,[45] and a study titled *"Dakwah Islam di Indonesia: Tantangan Pasca Kolonialisme dan Perubahan Sosial dalam Masyarakat Plural"* (Islamic Da'wah in Indonesia: Challenges Post-Colonialism and Social Changes in Plural Society).[46] Cak Nur's role as a renewer of Islamic thought was challenging due to insufficient discussions on da'wah. However, the thoughts on Islam appeared comprehensive for all to understand.

The article titled "Dakwah dengan Hikmah" by Cak Nur, signifying the main idea expressed about da'wah commenced with a quotation from the Qur'an, "*It was ˹only˺ those who were faithful and did not tarnish faith with falsehood1 were guaranteed security and ˹rightly˺ guided*" (QS, Al-An'am 6: 82). According to Cak Nur, da'wah provided a sense of security, peace, and understanding as a manifestation of Islam to the world.[47] Unlike other ulema and intellectuals who defined da'wah in long and boring sentences with the formalization of religious language, Cak Nur explained the teaching of Islam in a short and essential

---

[37] Madjid, *Islam Kerakyatan Dan Keindonesiaan* (Bandung: Mizan, 1996).

[38] Mark R Woodward, "Piety and Politics: Nurcholish Madjid and His Interpretation of Islam in Modern Indonesia," *Sojourn: Journal of Social Issues in Southeast Asia* 22, no. 2 (2007): 289–94.

[39] Mubasyaroh, "Da'wah Model of Prophet Muhammad In Madina," *Jurnal QIJIS: Qudus International Journal of Islamic Studies* 2, no. 2 (2014): 1–19.

[40] Ken Chitwood, "Da'wah," in *Encyclopedia of Latin American Religions* (Springer, 2017).

[41] Ibn Mandzur, *Lisan Al-'Arab*, Jilid XIV (Beirut: Dar al-Fikr, 1990).

[42] Nurcholish Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural* (Yogyakarta: Tiara Wacana, 1997), 172.

[43] Toha Yahya Umar, *Ilmu Dakwah* (Jakarta: Widjaya, 1985), 37.

[44] Nurcholish Madjid, *Khutbah Jumat Cak Nur Menghayati Akhlak Allah Dan Khutbah-Khutbah Pilihan Lainnya. Seri Legenda Ulama Indonesia* (Bandung: Mizan, 2016), 114.

[45] Nurcholish Madjid, *Cendekiawan Dan Religiusitas Masyarakat Kolom-Kolom Di Tabloid Tekad* (Jakarta: Paramadina, 1999), 36.

[46] Nurcholish Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural* (Bandung: Mizan, 1997).

[47] Nurcholish Madjid, *Islam, Kerakyatan, Dan Keindonesiaan Pikiran-Pikiran Nurcholish Muda* (Bandung: Mizan, 1993), 18.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

statement as "an invitation or call to what was good and better".[48] Therefore, da'wah was a continuous process that was relatively progressive and futuristic rather than being in a stagnant state.

The interpretation of da'wah by Cak Nur was dynamic, constantly increasing, and evolving according to the demands of space and time.[49] This explanation also reminded the public of the legal maxim in fiqh, "*al-muhafdzatu ala al-qadim as-Shalih wa al-akhdzu bi al-jadid al-ashlah*" (retaining the good from the past while accepting even better innovations from the present), which Cak Nur often cited as the basis for the renewed movement.[50] As defined by Madjid, the practice of da'wah was negative-oriented, instilling fear, opposition, criticism without providing solutions, and denigration. Essentially, da'wah depended more on resistance, but less towards goodness, unity, and ideals.[51] Cak Nur also observed this tendency in sermons, sharing a similar orientation with general da'wah practices lacking emphasis on promoting what was right.[52]

According to Cak Nur, this attitude consequently led to the society's underproactiveness in participating in the development or modernization role of Muslim community.[53] The role that Cak Nur referred to was da'wah through a cultural method and not the political aspect. The slogan "Islam Yes, Islamic Party No" in the context of the idea was relevant because political methods often resulted in suspicion of Muslim community.[54]

Cak Nur referred to the idea as suggesting to Muslim community to adopt rational, modern, dynamic, scientific, and objective attitudes. Muslim community should experience secularization to achieve this objective. The secularization was not to implement secularism as understood in Western countries[55] but to change the traditional mindset of Muslim community into a modern structure, as explained in Cak Nur's ideas about modernization. Cak Nur's method was observed to approach Islam more substantially and ethically.[56] To strengthen the argument, Cak Nur referred to the Qur'an (QS, 3:104) in the sentences of *da'wah ilal khair* related to idealistic goodness, *amar ma'ruf* with practical goodness, and *nahi munkar* implying the prevention or prohibition of bad things.[57] All three sentences were interconnected and should not be separated from each other or treated alone.

Various instances of da'wah focused more on nahi munkar, which was emotionally easier than performing *amal ma'ruf*, frequently lacking a basis in the speaker's understanding. Emotional and sentiment-driven speeches have more probability of gaining the audience's attention, resulting in applause for the speaker. Consequently, *amal ma'ruf* required additional perseverance, analysis, problem-solving, and rationality, which may appear colder and less appealing to lay audiences and those less educated.[58]

The Qur'an references to da'wah were *ila al-khayr*, *al-amru bi al-ma'ruf*, and *nahy an al-munkar*. When rendered into a verbal noun form in Indonesian, *al-khayr* and *al-ma'ruf* signified "goodness", although the word implied in the two definitions have different connotations. The initial reference expressed universal and ideal goodness applicable in all situations, conditions, as well as places. Conversely, the second reference denoted temporal and contextual goodness bound by space as well as time.[59] *Al-khayr* represented normative goodness operating "as it was," and *al-ma'ruf* signified temporal goodness operating in "how it should be". "As it was" referred to the goodness as stated in the teachings of Allah, while "how it should be" suggested temporal goodness and how it should be implemented in space as well as time.

Operating solely in the domain of normative goodness presented challenges in the implementation due to clashes with the conditions of space and time without considering the counterproductive surrounding society, which may cause antipathy promoting virtue. Therefore, the community should consider temporal virtue such as socio-cultural context to actualize normative

[48] Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural* (Jakarta: Paramadina, 1997), 120.

[49] Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural* (Jakarta: Paramadina, 1997), 123.

[50] Nurcholis Madjid, *Islam, Kemodrenan, Dan Keindonesiaan* (Bandung: Mizan, 1992), 72.

[51] Madjid, *Islam, Kemoderenan…*, 92.

[52] Madjid, *Islam Kerakyatan Dan Keindonesiaan*,..200.

[53] Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural* (Jakarta: Paramadina, 1997), 97.

[54] Madjid, *Dakwah Islam*, …, 198.

[55] Harvey Cox, *The Secular City, A Celebration of Its Liberties and an Invitation to Its Dicipline* (New York: The MacMillan Company, 1965), 63.

[56] Nurcholish Madjid, *Islam Kemodernan Dan Keindonesiaan* (Bandung: Mizan, 1997), 97.

[57] Madjid, *Islam Kemoderenan*, …., 98.

[58] Madjid, *Islam Kemoderenan*, ….., 99.

[59] Madjid, *Islam Kemoderenan*, ….., 201.

goodness and implement *al-khayr*. A compelling example was the obligation to protect the aurah (body parts to be covered) as a normative and applicable aspect at all times and places. However, it included customs and traditions during implementation.[60]

Da'wah normative goodness was necessary but grounding the teaching in reality required adaptation into practical goodness and comprised intellectual insights, such as knowledge about society, culture, and history with all variations.[61] The orientation of da'wah towards amar ma'ruf should be interpreted ethically and not by-passing judgments such as labeling things forbidden, disbelief, hypocrisy, and misguidance. Consequently, it should be done sympathetically by offering peace and tranquility, as well as providing the audience with accurate understanding, good choices, and opening space for dialogue and reflection.

The idea of positive-oriented da'wah comprised several logical consequences in the application, including (1) should be performed with a pure, clean, and humble heart, (2) should be based on noble morals and awareness of inclusive religious manifesting Islam as a mercy to all creation, (3) providing security to humanity by exploring solutions and improving conditions for all, (4) avoiding from negative words, and (5) offering space for dialogue and thought to the audience, thereby fostering a dialogical atmosphere and keeping away from fanaticism and communalism.[62] The objectives of da'wah were implicitly stated by Cak Nur as follows, (1) "Fundamentally, the preaching of Islam served as an avenue of teaching religion aimed at becoming a mercy for all and introducing positive values including peace (al-amn), tranquility, as well as coolness", and (2) according to the Qur'an. "Those who believed and did not taint the faith with injustice were the ones who will obtain peace" (QS, 6:82). Therefore, da'wah aimed to communicate religious teachings in correlation with Islam's compassionate stance, serving as a mercy to all creation.[63]

Examining Cak Nur's thoughts about humanity was considered necessary regarding the more detailed objective of da'wah. Humans were Allah's vicegerents on Earth, gifted with knowledge and *fitrah* (natural disposition) that could not be changed including the spirit of exploring goodness, beauty, truth, and refinement (*Hanif*). Vicegerents were active, creative, and rich in wisdom, possessing broad knowledge, free-thinking, broad-mindedness, and openness. The representatives were also tolerant, forgiving, and willing to follow the truth wherever it came from. Negative tendencies, such as causing harm and hostility, excessive love for life, wealth, pleasure, idolizing desires, being constantly tempted by demons, as well as being weak, hasty, and forgetful were the attributes of the vicegerents. Consequently, da'wah was essential in enabling humans to develop significant qualities and avoid being dominated by detrimental attitudes due to the positive and negative aspects.[64]

Based on religious teachings, da'wah aimed to keep humans in fitrah condition, fulfill the vicegerency mandate consistently, enhance moral character, and instill *taqwa* towards Allah as well as noble virtues.[65] Essentially, it was formulated that the objective of da'wah in Cak Nur's thought was to motivate humans to fulfill the roles of *Abdullah* (servants of Allah) and as *khalifatullah* (vicegerents of Allah) in the context of nationhood and statehood.

Operationalization of Da'wah

Referring to Cak Nur's concept of da'wah, the perspective appeared highly idealistic. However, the idealism about da'wah was possible to implement because it showed consistency in administering the concept built in terms of material, message, subjects, methods, themes, and targets of da'wah (its objects). The targets of da'wah comprised social issues, as examined by the author.[66]

Cak Nur's da'wah material consisted of all messages of invitation and calls with themes covering various aspects of life, including human relations with Allah and nature in vertical and horizontal methods, respectively. Barton's analysis showed that Cak Nur's thought was a convergence between the community, faith, and the nation. Cak Nur strived to obtain the truth[67] and echoed Islam through Indonesia, explaining modernity and da'wah until both understandings became inseparable.

Da'wah provision methods referred to Allah's command in Surah An-Nahl, verse 125, in summoning humans with good teachings and discussions. The content of da'wah was the teachings of Islam, which implied submission to Allah. The definition was broader and deeper than Islam in historical-sociological terms because it was the universal message of prophethood and

---

[60] Nurcholish Madjid, *Tradisi Islam Peran Dan Fungsinya Dalam Pembangunan Di Indonesia* (Jakarta: Paramadina, 1997), 108.

[61] Madjid, *Tradisi Islam*, ..., 93.

[62] Madjid, *Tradisi Islam*, ..., 94.

[63] Nurcholish Madjid, *Budaya Nasional, Masyarakat Madani Dan Masa Depan Bangsa: Jika Rakyat Berkuasa, Upaya Membangun Masyarakat Madani Dalam Kultur Feodal*, Tim Maula (Bandung: Pustaka Hidayah, 1999), 97-100.

[64] Nurcholish Madjid, *Indonesia Kita* (Jakarta: Gramedia, 2004), 194.

[65] Budhy Munawar Rachman, *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban* (Bandung: Mizan, 2006), 97.

[66] Ahmad Aiman Ismail, A. Munawar, Mujani, Wan Kamal, Juhaily, "Methods of Da'wah and Social Networks in Dealing with Liberalism and Extremism," *Islamiyyat* 40, no. 2 (2018): 73.

[67] Greg Barton, "Indonesia's Nurcholish Madjid and Abdurrahman Wahid as Intellectual Ulama: The Meeting of Islamic Traditionalism and Modernism in Neo-Modernist Thought," *Islam and Christian–Muslim Relations* 8, no. 3 (2011), 1–10.

prophecy as the core of da'wah applicable throughout time and space.[68] The explanation did not imply da'wah's message to be solely about religion but rather that faith should be human governance activities core on Earth in various fields, such as religious, political, and educational matters.

Concerning religious affairs, Cak Nur started by interpreting all aspects related to modernization. According to Cak Nur, modernization should be interpreted as being or often identical to rationalization.[69] This suggested a transformation of old irrational patterns of thought and work to new rational patterns.[70] The positive attitude towards modernization was subsequently correlated with the Qur'an verses, such as the truth (*haq*) and not falsehood (*bathil*) (QS. 16:3; 38:27), the dominated sunnah of Allah (QS. 7:54; 25:2), the Creator of the universe with goodness, pleasure, and harmony (QS. 21:7; 67:3), the commandment to observe and study the laws presented in Allah's creation (QS. 10:101), and to be critical (QS. 2:170, 43:22-25). [71]

Cak Nur responded to some Muslims' ideas about modernization that religion or belief was important in modern society. Without religion, a society or nation cannot have a noble civilization. Modernization should be accepted and not synonymous with secularism, which needed to be rejected due to the rise in liberalism and Westernization as well as the separation of religion and politics. Humans were not to be free from Allah's supervision according to the measure of Islam.[72] However, Harry J. Benda stated that the separation of religion and politics in Islam was unrealistic as well as a temporary symptom of the religion experiencing decline.[73] In the era of Islamic revival, the separation of religion and politics cannot be sustained, either in independent or non-Muslim Islamic countries.[74]

Cak Nur began a renewal of Islamic thought with two interrelated actions namely, freeing oneself from traditional values and exploring values oriented toward the future (liberalization).[75] Among the three elements of liberalization, secularization was the most important component because it comprised the other two factors, namely the process of liberation (liberating development) including *worldizing* values that should inherently be worldly and giving freedom to Muslims from the tendency to desacralization of the religion "weakening the spirit of ijtihad."[76]

Since the 1980s and 1990s, Cak Nur began to propose various views on Islamic universalism that were not bound by exclusivity due to geographical, racial, and linguistic barriers. The main basis was the Islamic ideology concerned with humanity because barriers were not bound. The ideology existed with humans without limitation by space, time, and material qualities.[77] Islamic universalism substantively comprised the word "Islam" including the attitude of submission to Allah, signifying that religious matters were not by compulsion but by human beings. The true religion was the attitude of submission, as taught by the Qur'an and the Prophet as a natural *fitrah* that implied a tolerant and inclusive pluralism.[78]

Pluralism comprised building internal interactions among and between religious communities, enabling harmonious and peaceful coexistence, as well as being willing to solve common issues actively and proactively. This signified that pluralism guaranteed both religious and social freedom simultaneously.[79] Although religious inclusivity was more prominent, it consisted of cultural interaction, ethnicity, race, and others. The interactions should be understood as genuine engagement of diversities within the bonds of civility.[80]

---

[68] Madjid, *Cendekiawan Dan Religiusitas Masyarakat Kolom-Kolom Di Tabloid Tekad*, 97-100.

[69] Madjid, *Islam Kemodernan Dan Keindonesiaan*, 172.

[70] Madjid, *Cendekiawan Dan Religiusitas Masyarakat Kolom-Kolom Di Tabloid Tekad*, 173.

[71] Madjid, *Islam Kemodernan Dan Keindonesiaan*, 173.

[72] Madjid, *Islam Kemoderenan*, 175.

[73] Harry J Benda, *Bulan Sabit Dan Matahari Terbit Islam Indonesia Pada Masa Pendudukan Jepang*, Terj. D. D (Jakarta: Pustaka Jaya, 1980), 79.

[74] Madjid, *Islam Kemodernan Dan Keindonesiaan*, 177.

[75] Nurcholish Madjid, *Keharusan Pembaruan Islam, Dalam Islam Keindonesiaan Dan Kemodernan* (Jakarta: Paramadina, 1989), 207.

[76] Madjid, *Keharusan*, 176.

[77] Nurcholish Madjid, *Islam Doktrin Dan Peradaban: Sebuah Telaah Kritis Tentang Masalah Keimanan, Kemanusiaan Dan Kemoderenan* (Jakarta: Paramadina, 1992), 425.

[78] Madjid, *Islam Doktrin*, 432.

[79] Rachman, *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban*, 2694.

[80] Rachman, *Ensiklopedi*, 2676.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

According to Cak Nur, pluralism did not suggest all religions to be equal but acknowledged each faith's right to exist and practice freely.[81] This attitude was interpreted as a hope for all existing religions and humanity to surrender to the One God until the truth, common platform, or ground was discovered.[82]

Concerning the religious mission brought by each faith, there should be a spirit of mutual respect, appreciation, and tolerance. Additionally, the Prophet emphasized that the best religion in the sight of Allah was *al-hanifiyyah samhah*, implying the spirit of exploring tolerant, broad-minded, un-fanaticism, and un-shackle truth. The important implication of this idea can be understood as the essence of being crucial in religion. While the instruments were more dynamic and not the sole avenue for advancing Islam, it became increasingly evident that Cak Nur was oriented toward substantive Islam.[83] When Islam equated with other principles including political ideology, both philosophies became equal signifying dangerous consequences.[84]

Cak Nur perceived the basics of the 1945 Constitution in Indonesia as Islamic, equated with the Charter of Medina providing a foundation for tolerance among diverse communities. This constitution served as a formulation of the agreement between Muslim community in Medina under the leadership of the Prophet and various non-Muslim groups to build a common political society. In this context, religion played a role not only in politics but also broader than the intention. Therefore, the struggle for religion should serve as a source of inspiration rather than passing through political parties.[85] Political affairs should be inseparable from religion, with human jurisdiction based on ijtihad governing formal structures and technical aspects. Historical Islam has experienced various variations across time and region, though not all have been considered doctrinally valid (except during the time of the rasyidah caliph).[86]

The relationships between Islam and politics, as well as Pancasila with the Charter of Medina, was an important example of realizing a civil society. This was evident in a society with three distinct characteristics namely, democracy, civil society, and civility. According to Cak Nur, democracy was the home of civil society, while civility was perceived to be an ethical quality,[87] such as tolerance, openness, and responsible freedom. Other specific characteristics included pluralism, tolerance, ethics (ethics and morality), legal order, predictability, and justice[88]. Additionally, the ability to realize an egalitarian, participatory society, and portray a fair, open, as well as democratic society,[89] as pioneered by the Prophet.[90]

Cak Nur observed the significant importance of education in operational aspects in achieving the central aspirations. Education served as an investment in humans, with the outcome solely felt after passing through a generation that was motivated, empowered, and civilized[91], including Islamic education (*tarbiyah*).[92] Cak Nur emphasized comprehensive education for the holistic development of individuals, comprising cognitive, affective, and psychomotor aspects.[93] As a manifestation of the operational idea, various educational institutions were established, such as Paramadina University, Madania High School, and the religious academy in the Religious Studies Club (KAA).[94]

Further observation proved that Islamic education still focused on the cognitive aspect including fiqh, and neglected philosophy, Sufism, tafsir (the Qur'an interpretation), and other disciplines.[95] However, the primary and highest objective of educational efforts was the enhancement of human values sanctity in the innate nature bestowed by Allah, both *khalifatullah* and *Abdullah*. The aim was to enhance character and high skills by improving knowledge as mandated by the Qur'an.[96]

---

[81] Rachman, *Ensiklopedi*, 172.

[82] Rachman, Ensiklopedi, 809.

[83] Rachman, Ensiklopedi, 126.

[84] Nurcholish Madjid, *Cita-Cita Politik Islam Era Reformasi* (Jakarta: Paramadina, 1999), 46-47.

[85] Madjid, *Cita-cita*, 57.

[86] Nurcholish Madjid, "Islam Dan Politik Suatu Tinjauan Atas Prinsip-Prinsip Hukum Dan Keadilan," *Jurnal Pemikiran Islam PARAMADINA* 1, no. 1 (2011): 1–15.

[87] Madjid, *Cendekiawan Dan Religiusitas Masyarakat Kolom-Kolom Di Tabloid Tekad*, 144.

[88] Rachman, *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban*, 1746.

[89] Madjid, *Islam Doktrin Dan Peradaban: Sebuah Telaah Kritis Tentang Masalah Keimanan, Kemanusiaan Dan Kemoderenan* (Jakarta: Paramadina, 1992), 114.

[90] Madjid, *Cita-Cita Politik Islam Era Reformasi*, 10.

[91] Rachman, *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban*, 2430.

[92] Nurcholish Madjid, *Pesan-Pesan Takwa: Kumpulan Khutbah Jum'at Di Paramadina* (Jakarta: Paramadina, 2000), 83.

[93] Nurcholish Madjid, *Reorientasi Pendidikan Islam* (Jakarta: Pajar Dunia, 1999), 3.

[94] Nafis, *Cak Nur Sang Guru Bangsa Biografi Pemikiran Prof. Dr. Nurcholish Madjid*, 25.

[95] Nurcholish Madjid, *Bilik-Bilik Pesantren Sebuah Potret Perjalanan* (Jakarta: Paramadina, 1992), 64.

[96] Madjid, *Pesan-Pesan Takwa: Kumpulan Khutbah Jum'at Di Paramadina*, 95.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

Character education had two dimensions in practice, namely the dimension of divinity and humanity. The divinity dimension commenced with the fulfillment of formal religious obligations in the form of worship accompanied by individualized appreciation through the cultivation of Islam, faith, excellence, piety, sincerity, reliance, gratitude, and patience. The dimension of humanity was embodied in the divinity facet and concerned with the realization of behavior that gives rise to noble character or morals (*akhlakul karimah*), such as fostering relationships, brotherhood, equality, justice, good intentions, humility, keeping promises, openness, trustworthiness, chivalry, thriftiness, and generosity.[97]

The secondary objective of education was the advancement of students' skills and morals strengthening. The Qur'an motivated Muslim community to be cautious about leaving behind weak offspring who could cause concerns (QS, 4:9).[98] Both the primary and secondary objectives should be the basis for fostering the spirit of Allah to obtain Allah's consent and fear.[99] Education for Cak Nur was continuous between processes and objectives, not overly segmented as al-Attas portrayed.[100]

Cak Nur's effort of continuity-synthesis between traditional and future-oriented education resulted in convergence. This synthesis was conducted to avoid dangerous educational dualism that would result in a split of personality, as observed in Western countries.[101] Therefore, the educational curriculum should be built comprehensively, comprising the development of Islamic knowledge as well as mastery of general technology-related sciences, such as chemistry, physics, and others.[102]

Cak Nur's perspective on other aspects of da'wah contributed to a clearer understanding of both the concept and operationalization of da'wah. In Cak Nur's studies, two aspects of da'wah can be distinguished but inseparable, namely concerning content, substance, and form, as well as message, essence, and method. The material or content, substance, message, and essence of da'wah were always universal and not bound by space or time. Furthermore, the second aspect regarding form, format, and delivery method mentioned in the Qur'an as sharia and *minhaj* have a temporal dimension varying according to space and time demands.[103]

Regarding this issue, Cak Nur quoted the words *syi'ah* and *minhaj* (QS. Al-Maidah: 48) and (QS, 45: 18-19), with *Minhaj* serving as the thariq (path, method) (QS, 72: 16-17). An Arabic proverb stated that al-thariq ahammu min al-maadah, the method, was more important than the material. This was further subdivided by Ibn Rusyd's perspective on the levels of human beings in receiving and achieving truth into three categories, namely those who attained the truth through the *burhani* (demonstrative), *jadali* (dialectical), and *khitabi* (rhetorical) methods.[104] These three levels of human beings were confirmed textually by the Qur'an in Surah an-Nahl verse 125: "*Invite all to the Way of the Lord with wisdom and kind advice, while only debating in the best method*."

Although humans differed in intellectual levels, Cak Nur advocated the wise Arabic saying that "the language of reality was better than the language of speech". Therefore, the awareness of the importance of da'wah with this "language of reality" can be interpreted as an approach rooted in essence rather than formality. This signified that the burhani or jadali methods should be prioritized, thereby motivating individuals to prioritize essence over formality.[105] The variety of levels of these methods was also practiced by Cak Nur on every occasion, specifically in the regular post-Jum'at prayer dialogue in the hall of the Paramadina Foundation.[106]

Motivating critical historical and philosophical thinking was crucial to fostering freedom of thought, promoting critical analysis and broad insight, as well as motivating openness to diverse information and positive thinking.[107] With this method, Cak Nur aimed to cultivate open-mindedness and tolerance among Muslims, essential for building a pluralistic and diverse civil society. The consequences of the material and methods of da'wah proposed by Cak Nur's main operational targets included students (the

---

[97] Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural*, 1997, 18.

[98] Madjid, *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural*, 1997, 19.

[99] Madjid, *Dakwah Islam di Indonesia*, 20.

[100] Syed Muhammad Naquib Al-Attas, *The Concept of Education in Islam: A Framework for an Islamic Philosophy of Education* (Bandung: Mizan, 2018), 11.

[101] Madjid, *Tradisi Islam Peran Dan Fungsinya Dalam Pembangunan Di Indonesia*, 77-78.

[102] Madjid, *Cita-Cita Politik Islam Era Reformasi*, 9.

[103] Madjid, *Budaya Nasional, Masyarakat Madani Dan Masa Depan Bangsa: Jika Rakyat Berkuasa, Upaya Membangun Masyarakat Madani Dalam Kultur Feodal*, 99.

[104] Ibn Rusyd, *Makalah Penentu Tentang Hubungan Antara Filsafat Dan Syari'at*, terj. Nurc (Jakarta: Yayasan Obor Indonesia, 1994), 214-1125.

[105] Rusyd, *Makalah*, 217.

[106] Ahmad Gaus AF, *Api Islam Nurcholish Madjid: Jalan Hidup Seorang Visioner* (Jakarta: Kompas Media Nusantara, 2010), 12.

[107] Juhaya S. Praja, *Filsafat Dan Metodologi Ilmu Dalam Islam Dan Penerapannya Di Indonesia* (Jakarta: Teraju, 2002), 193-205.

educated), such as Muslim Students' Association (HMI) and the Indonesian Islamic Students Association (PPI).[108] For students, Cak Nur introduced the Basic Islamic Values (NDI) and initiated the concept into the 9th HMI Congress in Malang to be formalized into the organization's official document.[109] Additionally, other targets of da'wah included Islamic community organizations that have been criticized as being stagnant, including Islamic parties through the renewal efforts.[110]

The slogan "Islam Yes, Islamic Party No" sounded sharp in the ears of Islamic politicians and political groups as a new idea.[111] Cak Nur appeared disappointed because Islamic parties failed to build a positive and sympathetic image as well as the opposing groups. Simultaneously, it was a criticism of Islamic politicians who still considered an individual's faith based on party affiliation.[112] Since 1971, Cak Nur advocated the idea of the need for a loyal opposition party in Indonesia to remain grounded in the constitution as a check and balance in the political sphere.[113] During the period, there was only a single ruling party called Golkar, which was the government group in parliament.[114] Therefore, another target of Cak Nur's da'wah was the ruling authority or government in the form of constructive criticism, including the request for the long-sitting president to step down.[115] When Gus Dur became president and criticized various challenges caused by the leadership style, such as economic issues and the incomplete implementation of openness, accountability, and transparency, patience was considered necessary.[116]

Through the Islamic renewal movement, Cak Nur had a tremendous influence on the lives of the Indonesian nation, particularly Muslim community.[117] The steadfast attitude, not swayed by the currents and the wise teachings, was voiced, transcending religion, age, and groups, making Cak Nur a figure of inquiry for various segments of society. The educational approach during dialogues with Cak Nur made anyone feel intelligent. Not just a scholar but an inspiration to the nation, with ideas that often preceded the time.[118]

Cak Nur's ideas about secularization, liberalization, modernization, and others have opened the minds of Muslims from the captivity of romanticized history. The thoughts of Cak Nur on pluralism, democracy, human rights, civil society, and education have placed the preacher as a national teacher, a place where any individual desires.[119] Both NU and Muhammadiyah have welcomed Cak Nur's presence, as well as non-Muslims connect and sometimes misunderstand the guardianship. Hardline Muslims considered Cak Nur to be weak and over-tolerant towards other religions. However, followers of other religions perceived Cak Nur to be a true santri (a student of Islam) who spreads Islam in a cool, intellectual, and sympathetic method.[120]

The cultural Islamic movement seemed to have been successfully developed by Cak Nur with the evolvement and strengthening of the Islamic middle class. Many individuals performed the Hajj pilgrimage and engaged in worship activities in places that represented pop culture. According to Robert Hefner, this movement triggered the evolvement of Islamic intellectuals in government agencies or the business world, making Muslims a group with political power alongside the formation of the Indonesian Association of Muslim Intellectuals (ICMI) in 1990.[121]

The movement provided a new awareness for Muslims to advocate for Islam beyond the political domain from a cultural perspective.[122] The intellectuals who spearheaded this renewal, as Leonard Binder stated, "played a role as a cultural bridge

---

[108] Nurcholish Madjid, *Dialog Keterbukaan Artikulasi Nilai Islam Dalam Wacana Sosial Politik Kontemporer* (Jakarta: Paramadina, 1998), 80.

[109] Nurcholish Madjid, *Gagasan Dan Latar Belakang Perumusan NDP HMI", Dalam, HMI Menjawab Tantangan Zaman* (Jakarta: Gunung Kulabu, 1990), 9.

[110] Madjid, *Islam Kemodernan Dan Keindonesiaan*, 204.

[111] M. Syafii Anwar, *Pemikiran Dan Aksi Islam Di Indonesia. Sebuah Kajian Politik Tentang Cendekiawan Muslim Orde Baru* (Jakarta: Paramadina, 1995), 50.

[112] Nurcholish Madjid, *Islam Doktrin Dan Peradaban: Sebuah Telaah Kritis Tentang Masalah Keimanan, Kemanusiaan Dan Kemoderenan* (Jakarta: Paramadina, 1992), 205.

[113] Madjid, *Dialog Keterbukaan Artikulasi Nilai Islam Dalam Wacana Sosial Politik Kontemporer*, 7.

[114] Rachman, *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban*, 2146.

[115] www.tempo interaktif.com, edisi. 28/XXXIV/05-11 September 2005, di akses 11 Mei 2011

[116] Nurcholish Madjid, "Manusia Modern Mendamba Allah: Renungan Tasawuf Positif" (Jakarta: IIMaN & Hikmah, 2002), 105-106.

[117] Fachry Ali, *Dialog Keterbukaan Artikulasi Nilai Islam Dalam Wacana Sosial Politik Kontemporer* (Jakarta: Paramadina, 1998), 11.

[118] www.kompascom/kompas-cetak di akses 11 Mei 2011

[119] www.kompascom/kompas-cetak di akses 12 Mei 2011

[120] Kompas Cetak Online, Selasa 30 Agustus 2005, di akses 14 Mei 2011

[121] Jamhari, *Islam Di Indonesia, Dalam Ensiklopedi Tematis Dunia Islam*, Jilid 6 (Jakarta: PT. Ichtiar Baru van Hoeve, 2001), 345.

[122] Jamhari,*Islam*, .346.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

between Islam and Indonesian new national culture".[123] The newest culture regained momentum when the nation was threatened with disintegration by radicalism claiming to represent Islam.[124] This was reported in several cases related to religious radicalism, acts of violence, and social unrest, such as those reported by the Center for Religious and Cross-cultural Studies (CRCS)[125] as well as incidents in Cirebon.[126]

As a pluralistic nation consisting of various ethnicities, languages, cultures, customs, and religions, Indonesia showed vulnerability to numerous forms of violence, including religious, political, and economic nature. In this context, Cak Nur summoned Muslim community to unite with other communities, without theological barriers, to build the nation based on universal values of equality, freedom, and mutual respect toward realizing a civil society. To achieve the aim, it was necessary to develop attitudes of pluralism, inclusiveness, openness, freedom, tolerance, and others among religious communities, as exemplified by the Prophet Muhammad and followed by *Khulafa al-Rasyidin*.[127]

Polytheism included various attitudes such as exclusivism, fundamentalism, fanaticism, and cultism which were to be avoided.[128] Cak Nur's thoughts on da'wah felt relevant and contextual to be appreciated by Muslims in the present era. The idea of da'wah emphasized *al-khayr* (goodness) and *al-ma'ruf* (what was right) rather than *nahy al-munkar* (forbidding evil). The aim was to motivate Muslims to play an active role in development and develop positive change. This ma'ruf-oriented da'wah will steer Muslims away from feeling self-righteous and the prevention from adopting negative as well as destructive attitudes.

CONCLUSION

In conclusion, da'wah in the conceptual framework of Cak Nur motivated Muslims to actively participate in societal, national, and state affairs. This action was accompanied due to the capacity of Muslims to be the vicegerents of God on Earth by comprehensively understanding Islamic teachings. The aim was a call oriented towards positive da'wah (commanding what was right) rather than focusing on negative Islamic teaching (forbidding what was wrong). Furthermore, the objectives were to motivate individuals to have piety, noble character, broad insight, and awareness of social realities, as well as possess knowledge, openness, and a polite and inclusive personality.

Islamic teachings formed the subject of da'wah, comprehended in the framework of Indonesian identity, Islam, as well as modernity, comprising religious, political, educational, and other themes, all based on piety towards Allah. The content included the necessity of constantly renewing Islam through secularization, liberalization, and rationalization as efforts to contextualize Islamic teachings. This laid the foundations for democracy, pluralism, human rights, the realization of civil society, the development of intellectualism, the cultivation of divine awareness, and religious devotion through education, among other aspects.

The strenuous efforts made by Cak Nur regarding da'wah and Islam were closer to the substance of da'wah and the ethical values of Islamic teachings. However, this ideal passed through stages of arduous struggle by exploring the epistemology in the Islamic tradition. The exploration included the application of dialogical methods such as jadali or burhani providing space for thought and the intellectual development of the community in a historical-sociological context. Therefore, the universal messages of Islamic teachings could be implemented contextually in a specific time and space, targeting a more elite audience such as intellectuals and educated society.

---

[123] Bahtiar Effendy, *Masyarakat Agama Dan Pluralisme Keagamaan* (Yogyakarta: Galang Press, 2001), 125.

[124] M. Zaki Mubarak, *Geneologi Islam Radikal Di Indonesia* (Jakarta: LP3ES, 2008), 23.

[125] http://crcs.ugm.ac.id/posts/general/582/Siaran-Pers-Launching-Diskusi-Laporan-Tahunan-CRCS-2010.html, Kompas. Com., Selasa, 21 Juni 2011, diakses 21 Juni 2011

[126] http://www.detiknews.com, http://magazindo.info/bom-bunuh-diri-di-masjid-polresta-cirebon/, http://www.republika.co.id/

[127] Nurcholish Madjid, *Islam Doktrin Dan Peradaban* (Jakarta: Paramadina, 1992), 18.

[128] Nurcholish Madjid, *Islam Agama Kemanusiaan Membangun Tradisi Dan Visi Baru Islam Indonesia* (Jakarta: Paramadina, 2003), 134–36.

Actualization of Islam: Conceptual Analysis and Operationalization of Intellectual Substantive Da'wah by Nurcholish Madjid In Indonesia

REFERENCES

1) Al-Attas, Syed Muhammad Naquib. *The Concept of Education in Islam: A Framework for an Islamic Philosophy of Education*. Bandung: Mizan, 2018.

2) Ali, Fachry and Effendy, Bahtiar. *Merambah Jalan Baru Islam Rekonstruksi Pemikiran Islam Indonesia Masa Orde Baru*. Bandung: Mizan, 1986.

3) Ali, Fachry. *Dialog Keterbukaan Artikulasi Nilai Islam Dalam Wacana Sosial Politik Kontemporer*. Jakarta: Paramadina, 1998.

4) Ali, Syed Ameer. *Api Islam Sejarah Evolusi Dan Cita-Cita Islam Dengan Riwayat Hidup Nabi Muhammad Saw*. Terj. HB. Jakarta: Bulan Bintang, 1978.

5) Anwar, M. Syafii. *Pemikiran Dan Aksi Islam Di Indonesia. Sebuah Kajian Politik Tentang Cendekiawan Muslim Orde Baru*. Jakarta: Paramadina, 1995.

6) Aripudin, Acep, and Mudhofir Abdullah. *Perbandingan Dakwah*. Bandung: Remaja Rosdakarya, 2014.

7) Arnold, Thomas W. *The Preaching Of Islam A History of the Propagation of the Muslim Faith*. Lahore: SHM. Ashraf, 1965.

8) ———. *The Spread of Islam in the World: A History of Peaceful Preaching*. New Delhi: Goodword Books, 2012.

9) Azra, Azyumardi. *Pendidikan Islam: Tradisi Dan Modernisasi Menuju Millennium Baru*. Jakarta: PT.Logos Wacana Ilmu, 2002.

10) Barthold, Lauren Swayne. *A Hermeneutic Approach to Gender and Other Social Identities*. New York: Palgrave Macmillan, 2016.

11) Barton, Greg. "Indonesia's Nurcholish Madjid and Abdurrahman Wahid as Intellectual Ulama: The Meeting of Islamic Traditionalism and Modernism in Neo-Modernist Thought." *Islam and Christian–Muslim Relations* 8, no. 3 (2011): 1–10.

12) Benda, Harry J. *Bulan Sabit Dan Matahari Terbit Islam Indonesia Pada Masa Pendudukan Jepang*. Terj. D. D. Jakarta: Pustaka Jaya, 1980.

13) Boland, B.J. *The Struggle of Islam in Modern Indonesia*. Netherlands: Springer, 1986.

14) Chitwood, Ken. "Da'wah." In *Encyclopedia of Latin American Religions*, 1–5. Springer, 2017.

15) Cox, Harvey. *The Secular City, A Celebration of Its Liberties and an Invitation to Its Discipline*. New York: The MacMillan Company, 1965.

16) Dallmayr, Fred. *Critical Encounters: Between Philosophy and Politics*. Notre Dame, IN: Notre Dame University Press, 1987.

17) Dhofier, Zamakhsyari. *Tradisi Pesantren Studi Pandangan Hidup Kyai Dan Visinya Mengenai Masa Depan Indonesia*. Jakarta: LP3ES, 2011.

18) Effendy, Bahtiar. *Islam Dan Negara: Transformasi Pemikiran Dan Praktik Politik Islam Di Indonesia*. Jakarta: Paramadina, 1998.

19) Effendy, Bahtiar. *Masyarakat Agama Dan Pluralisme Keagamaan*. Yogyakarta: Galang Press, 2001.

20) Farlez, Jane. "Moderate Islam." In *New York Times*. 2005. https://www.nytimes.com/2005/09/01/world/asia/nurcholish-madjid-66-advocate-of-moderate-islam-dies.

21) Gaus AF, Ahmad. *Api Islam Nurcholish Madjid: Jalan Hidup Seorang Visioner*. Jakarta: Kompas Media Nusantara, 2010.

22) Hamka. *Sejarah Umat Islam: Pra-Kenabian Hingga Islam Di Nusantara*. Jakarta: Gema Insani Press, 2020.

23) Ibda, Hamidulloh. "Thuggery and Cultural Da'wah: A Case Study of Jama'ah Pasrah Foundation, Pati, Indonesia." *Jurnal Penelitian* 16, no. 1 (2019): 1–18.

24) Ismail, A. Munawar, Mujani, Wan Kamal, Juhaily, Ahmad Aiman. "Methods of Da'wah and Social Networks in Dealing with Liberalism and Extremism. Metode Dakwah Dan Jaringan Sosial Dalam Menghadapi Liberalisme Dan Ekstremisme." *Islamiyyat* 40, no. 2 (2018): 131–39.

25) Jackson, Karl D. *Kewibawaan Tradisional, Islam Dan Pemberontakan Kasus Darul Islam Jawa Barat*. Jakarta: Pustaka Utama Grafiti, 1990.

26) Jamhari. *Islam Di Indonesia, Dalam Ensiklopedi Tematis Dunia Islam*. Jilid 6. Jakarta: PT. Ichtiar Baru van Hoeve, 2001.

27) Johns, AH. "Islamization in Southeast Asia: Reflections and Reconsiderations with Special Reference to the Role of Sufism." *Southeast Asian Studies* 31, no. 1 (1993): 37.

28) Kripendorff, Klaus. *Content Analysis: Introduction to Its Theory and Methodology*. Terj.Farid. Jakarta: Rajawali Press, 1991.

29) Maarif, Ahmad Syafii. *Islam Dan Masalah Kenegaraan: Studi Tentang Percaturan Dalam Konstituante*. Jakarta: Lembaga Penelitian Pendidikan dan Penerangan Ekonomi dan Sosial (LP3ES), 1985.

30) Madjid, Nurcholis. *Islam, Kemodrenan, Dan Keindonesiaan*. Bandung: Mizan, 1992.

31) Madjid, Nurcholish. *Bilik-Bilik Pesantren Sebuah Potret Perjalanan*. Jakarta: Paramadina, 1992.

32) Madjid, Nurcholish. *Budaya Nasional, Masyarakat Madani Dan Masa Depan Bangsa: Jika Rakyat Berkuasa, Upaya Membangun Masyarakat Madani Dalam Kultur Feodal*. Tim Maula. Bandung: Pustaka Hidayah, 1999.

33) Madjid, Nurcholish. *Cendekiawan Dan Religiusitas Masyarakat Kolom-Kolom Di Tabloid Tekad*. Jakarta: Paramadina, 1999.

34) Madjid, Nurcholish. *Cita-Cita Politik Islam Era Reformasi*. Jakarta: Paramadina, 1999.

35) Madjid, Nurcholish. *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural*. Yogyakarta: Tiara Wacana, 1997.

36) Madjid, Nurcholish. *Dakwah Islam Di Indonesia: Tantangan Pasca Kolonialisme Dan Perubahan Sosial Dalam Masyarakat Plural*. Bandung: Mizan, 1997.

37) Madjid, Nurcholish. *Dialog Keterbukaan Artikulasi Nilai Islam Dalam Wacana Sosial Politik Kontemporer*. Jakarta: Paramadina, 1998.

38) Madjid, Nurcholish. *Gagasan Dan Latar Belakang Perumusan NDP HMI", Dalam, HMI Menjawab Tantangan Zaman*. Jakarta: Gunung Kulabu, 1990.

39) Madjid, Nurcholish. *Indonesia Kita*. Jakarta: Gramedia, 2004.

40) Madjid, Nurcholish. *Islam, Kerakyatan, Dan Keindonesiaan Pikiran-Pikiran Nurcholish Muda*. Bandung: Mizan, 1993.

41) Madjid, Nurcholish. *Islam Agama Kemanusiaan Membangun Tradisi Dan Visi Baru Islam Indonesia*. Jakarta: Paramadina, 2003.

42) Madjid, Nurcholish. "Islam Dan Politik Suatu Tinjauan Atas Prinsip-Prinsip Hukum Dan Keadilan." *Jurnal Pemikiran Islam PARAMADINA* 1, no. 1 (2011): 1–15.

43) Madjid, Nurcholish. *Islam Doktrin Dan Peradaban: Sebuah Telaah Kritis Tentang Masalah Keimanan, Kemanusiaan Dan Kemoderenan*. Jakarta: Paramadina, 1992.

44) Madjid, Nurcholish. *Islam Doktrin Dan Peradaban: Sebuah Telaah Kritis Tentang Masalah Keimanan, Kemanusiaan Dan Kemoderenan*. Jakarta: Paramadina, 1992.

45) Madjid, Nurcholish. *Islam Doktrin Dan Peradaban*. Jakarta: Paramadina, 1992.

46) Madjid, Nurcholish. *Islam Kemodernan Dan Keindonesiaan*. Bandung: Mizan, 1997.

47) Madjid, Nurcholish. *Islam Kerakyatan Dan Keindonesiaan*. Bandung: Mizan, 1993.

48) Madjid, Nurcholish. *Keharusan Pembaruan Islam, Dalam Islam Keindonesiaan Dan Kemodernan*. Jakarta: Paramadina, 1989.

49) Madjid, Nurcholish. *Khutbah Jumat Cak Nur Menghayati Akhlak Allah Dan Khutbah-Khutbah Pilihan Lainnya. Seri Legenda Ulama Indonesia*. Bandung: Mizan, 2016.

50) Madjid, Nurcholish. "Manusia Modern Mendamba Allah: Renungan Tasawuf Positif." Jakarta: IIMaN & Hikmah, 2002.

51) Madjid, Nurcholish. *Pesan-Pesan Takwa: Kumpulan Khutbah Jum'at Di Paramadina*. Jakarta: Paramadina, 2000.

52) Madjid, Nurcholish. *Reorientasi Pendidikan Islam*. Jakarta: Pajar Dunia, 1999.

53) Madjid, Nurcholish. *Tradisi Islam Peran Dan Fungsinya Dalam Pembangunan Di Indonesia*. Jakarta: Paramadina, 1997.

54) Mandzur, Ibn. *Lisan Al-'Arab*. Jilid XIV. Beirut: Dar al-Fikr, 1990.

55) Meuleman, Johan. "Dakwah, Competition for Authority, and Development." *Bijdragen Tot de Taal-, Land- En Volkenkunde* 167, no. 2/3 (2011): 236–69.

56) Millie, Julian. *Oratorical Innovation and Audience Heterogeneity in Islamic West Java*. Jostor: Cornell University Press, 2012.

57) Mubarak, M. Zaki. *Geneologi Islam Radikal Di Indonesia*. Jakarta: LP3ES, 2008.

58) Mubasyaroh. "Da'wah Model of Prophet Muhammad In Madina." *Jurnal QIJIS: Qudus International Journal of Islamic Studies* 2, no. 2 (2014): 1–19.

59) Mulyati, Sri, and Zahrotun Nihayah. "Sufi Healing in Indonesia and Malaysia: An Updated Study of Rehabilitation Methods Practiced by Qadiriyya Naqshbandiyya Sufi Order." *Esoterik: Jurnal Akhlak Dan Tasawuf* 20, no. 20 (2020): 1–32. https://doi.org/http://dx.doi.org/10.21043/esoterik.v6i1.7085.

60) Nafis, Muhamad Wahyuni. *Cak Nur Sang Guru Bangsa Biografi Pemikiran Prof. Dr. Nurcholish Madjid*. Jakarta: PT. Kompas Media Nusantara, 2014.

61) Nisa, Eva F. "Creative and Lucrative Daʿwa: The Visual Culture of Instagram amongst Female Muslim Youth in Indonesia." *Jurnal ASIASCAPE: Digital Asia* 1, no. 5 (2018): 1–16.

62) Praja, Juhaya S. *Filsafat Dan Metodologi Ilmu Dalam Islam Dan Penerapannya Di Indonesia*. Jakarta: Teraju, 2002.

63) Pranowo, M. Bambang. "Islam Di Indonesia: Mengusung Demokrasi Dengan Basis Budaya." *Jurnal Studia Lslamika* 3, no.

1 (2006): 1–23. https://doi.org/http://dx.doi.org/10.15408/sdi.v13i1.579.

64) Rachman, Budhy Munawar. *Ensiklopedi Nurcholish Madjid Pemikiran Islam Di Kanvas Peradaban*. Bandung: Mizan, 2006.

65) Rizal, Alvin Noor Sahab. "Pergerakan Islam Indonesia Masa Jepang (1942-1945)." *Jurnal Indo-Islamika* 4, no. 2 (2014): 1–22. https://doi.org/https://doi.org/10.15408/idi.v4i2.17394.

66) Rusyd, Ibn. *Makalah Penentu Tentang Hubungan Antara Filsafat Dan Syari'at*. Terj. Nurc. Jakarta: Yayasan Obor Indonesia, 1994.

67) Shihab, Muhammad Quraish. *Lentera Hati*. Cet. 20. Bandung: Mizan, 2000.

68) Steenbrink, Karel A. *Pesantren Madrasah Sekolah Pendidikan Islam Dalam Kurun Modern*. Jakarta: LP3ES, 1986.

69) Suneth, A. Wahab. *Problematika Dakwah Dalam Era Indonesia Baru*. Jakarta: Bina Rena Pariwara, 2000.

70) Tabroni, and Syamsul Arifin. *Islam Pluralisme Budaya Dan Politik*. Yogyakarta: Sipres, 1994.

71) Thaha, Idris. *Dakwah & Politik Da'i Berjuta Umat K.H. Zainuddin MZ*. Bandung: Mizan, 1997.

72) Umar, Toha Yahya. *Ilmu Dakwah*. Jakarta: Widjaya, 1985.

73) Woodward, Mark R. "Piety and Politics: Nurcholish Madjid and His Interpretation of Islam in Modern Indonesia." *Sojourn: Journal of Social Issues in Southeast Asia* 22, no. 2 (2007): 289–94.

74) Zayd, Nashr Hamid Abu. *Hermeneutika Inklusif-Mengatasi Peroblematika Bacaan Dan Cara-Cara Pentakwilan Atas Diskursus Keagamaan*. Jakarta: ICIP, 2004

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

Bagus Naufal Anindito[1], Helpris Estaswara[2], Mashadi Said[3]

[1,2,3]Faculty of Communication Sciences, Universitas Pancasila, Jakarta

ABSTRACT: Smoking is prevalent in various places in Indonesia, even in designated non-smoking areas. The Government of the Republic of Indonesia has implemented various measures to reduce the number of smokers, such as mandating the inclusion of graphic health warnings on cigarette packages. The purpose of this article is to determine the influence of visual communication of smoking hazard warnings on the attitudes of smoking students at Pancasila University. This article employs the concepts of visual communication and attitude. The concept of visual communication is broken down into three dimensions: identification, information, and presentation, while the concept of attitude is also broken down into three dimensions: cognitive, affective, and conative. The paradigm used is positivism with a quantitative approach. The unit of analysis is individuals who are active smoking students at Pancasila University. The data collection technique is accidental random sampling by distributing questionnaires via social media platforms such as Instagram, Line, and WhatsApp to 96 respondents. In this article, respondents agree with identification, information, and presentation, as well as cognitive and affective dimensions. However, they disagree with the conative dimension. The results show that visual communication of smoking hazard warnings influences attitudes, with an impact of 17.2%. This condition indicates that there are still many influences on smoking beyond those examined, such as peer influence, lifestyle, psychological factors, and others. Additionally, the visual communication on cigarette packaging is ineffective in raising awareness among smokers, indicating the need for other policies.

KEYWORDS: Smoking Hazard Warnings, Visual Communication, Attitude

INTRODUCTION

Indonesia is one of the countries with the highest number of smokers in the world, with 39.9% of its total population being smokers. This places Indonesia as the country with the highest number of smokers in Southeast Asia and the seventh largest smoking nation in the world (Mahardika et al., 2020). On the other hand, Indonesia is the fifth-largest tobacco producer, with a total production of 258 million cigarettes in 2011, where *kretek* cigarettes are consumed by the majority of smokers, followed by hand-rolled cigarettes consumed by 5.6% of smokers, and the remaining 3.7% consuming white cigarettes (Salsabila et al., 2022).

Smoking involves the act of inhaling tobacco contained in paper rolls. Various diseases can result from smoking, including lung disorders, oral cancer, gastric disorders, pregnancy complications, skin cancer, and hypertension (Dismiantoni et al., 2020). With the increasing number of smokers in Indonesia, the number of lung disease patients is also rising. This is due to the high per capita cigarette consumption, with the majority of smokers coming from the lower to middle economic classes (Satriawan, 2022).

Furthermore, smoking causes significant harm to users and is a leading cause of preventable diseases and premature deaths in many countries (Mahardhika, 2020). Additionally, smoking is a major cause of cancer, with a strong correlation between smoking and cancers of the head, neck, liver, bladder, cervix, esophagus, and colon (Mahardhika, 2020). According to the World Health Organization (WHO), from 2008 to the onset of 2030, smoking-related deaths reach 10 million per year, with an estimated 70% occurring in developing countries (Farkhah, 2021).

Based on the Basic Health Research data from 2007, the trend of smoking initiation among teenagers aged 10-14 years was around 1.1%, while teenagers aged 15-19 years were at 44.4%. This data increased in 2013, with teenagers aged 10-14 years initiating smoking at around 15.9%, and teenagers aged 15-19 years at 60.3% (Pertiwi, et al., 2018). Furthermore, according to the Central Bureau of Statistics (BPS), the percentage of Indonesian smokers aged over 15 has been declining since 2020 until 2022. In 2020, the percentage of smokers over the age of 15 was 28.69%, which then increased to 28.96% in 2021, but decreased to 28.26% in 2022. These figures are relatively high compared to the total population in Indonesia, which exceeds 270 million (BPS,

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

2022).

The Indonesian government has implemented various measures, from enacting smoking restrictions outlined in Government Regulation No. 38 of 2000 to issuing policies mandating the inclusion of graphic health warnings on cigarette packaging by 40% (Ministry of Health, 2018). This is stipulated in Minister of Health Regulation No. 28 of 2013 concerning the Inclusion of Health Warnings and Health Information on Tobacco Product Packaging. The regulation mandates that every cigarette pack sold in Indonesia, as well as every cigarette advertisement, must contain images warning the public about the dangers of smoking (Ministry of Health, 2018).

According to Adiayatama (2016), there are five types of images and warning texts about the dangers of smoking that must be included in every cigarette pack. These include images with the text "Smoking kills you," "Smoking can cause throat cancer," "Smoking causes lung cancer and chronic bronchitis," "Smoking causes mouth cancer," and images with the text "Smoking near children is dangerous for them."

The inclusion of graphic warning labels on cigarette packaging is related to visual communication. Kusrianto (2007, p. 10) defines visual communication as the transmission of information to others using visual media that can be perceived by the sense of sight. This visual language is the primary strength in conveying messages with specific meanings, goals, and purposes. Meanwhile, Andhita (2021, p. 3) states that visual communication is the exchange of visual messages between communicators and recipients that result in direct or indirect feedback, depending on the accuracy of the feedback, which serves as a measure of success for visual object design. This condition can be achieved if visual object designers (communicators) can deliver relevant messages to recipients effectively.

To ensure the conveyed message is appropriate, such as warnings about the dangers of smoking on cigarette packaging, several basic functions of visual communication must be considered. Cenadi (1999, p. 4) explains that visual communication has three basic functions: first, as an identification tool, which represents the recognition of identity, such as a person's, company's, or product's identity. This identity must reflect the essence of the object. If it has an identity, whether it is in the form of images or text, that identity will be a recognizable quality mirror of the product. Second, as an information tool. Visual communication aims to show the relationship between one thing and another in terms of instructions, directions, positions, and scales. This information is useful when conveyed to the right people, at the right time and place, in an easily understandable manner. Third, as a presentation tool. Visual communication aims to attract visual attention and make messages easy to remember. To achieve this goal, the images and text used must have persuasive meanings and also attract attention (attention) from the audience.

This article examines the visual communication of smoking hazard warnings on cigarette packaging to influence the attitudes of students. As for attitude, according to Notoatmodjo (2005, p. 174), it is a collection of several indications in responding to impulses or objects associated with reason, feelings, attention, and indications related to the soul. Attitude reflects suggestion through the alignment of reactions and impulses in daily life. Emotional responses to social stimuli are attitudes. On the other hand, according to Widayatun (2009, p. 67), attitude is a mental and nerve readiness controlled by experience and directly impacts an individual's response to related objects and situations. Then, according to Lapierre (Azwar, 2015, p. 5), attitude is defined as a behavior, tendency, and anticipatory loneliness, a predisposition to adapt in social situations.

Notoatmodjo (2005, p. 83) states that there are several aspects of attitude. The first aspect is cognitive, which is based on an individual's information about the attitude object. This aspect arises based on knowledge or understanding of the attitude object. The second aspect is affective, which is related to emotional feelings such as agreement and disagreement. This aspect arises based on what humans feel about the object, or it can be said to be feelings related to emotional aspects, such as beliefs and acceptance of the object. The third aspect is conative, which is human precision in behavior related to their attitude object. This aspect contains tendencies in acting or reacting to the object in a certain way, such as doing something for oneself, spreading what is inside the attitude object, and so on.

In addition, several studies on the influence of smoking prohibition images on attitudes have been conducted. Muhammad Ali (2020) conducted a study titled "The Influence of Visual Messages Prohibiting Smoking on Campus A of Satya Negara University Indonesia (USNI) on the Attitudes of Communication Science Department Students of the 2016 Cohort". This research employed concepts of communication, messages, and attitudes, using a survey technique with a quantitative approach. The results indicated an influence of the visual messages prohibiting smoking at Campus A of USNI on the attitudes of students, amounting to 41.1% out of 128 students from the Communication Science Department, 2016 cohort (Ali, 2020).

Furthermore, a study by Indah and Manggaga (2020) in Kanang-Kanang Hamlet, Tino Village, Tarowang District, Jeneponto Regency, utilized a quantitative descriptive method by administering questionnaires to 100 respondents, and the data were processed using Spearman's rank correlation. The results of this study showed that the attitudes of smokers were influenced by the warnings on cigarette packaging (Indah & Manggaga, 2020). Additionally, a journal-based study by Adelina et al. (2018) utilized a sample of young smokers in Surabaya City, comprising 96 respondents obtained through accidental sampling. The

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

findings showed that young smokers in Surabaya City had a significant impact of 47.6% on attitudes when health warning messages were displayed on graphic labels on cigarette packaging (Adelina et al., 2018).

Based on the explanations above, this article aims to determine the influence of visual communication of smoking hazard warnings on cigarette packaging on the attitudes of student smokers. The hypothesis of this article is that there is an influence of visual communication of smoking hazard warnings on cigarette packaging on the attitudes of student smokers.

METHODS

This article adopts a positivism paradigm with a quantitative explanatory approach. Positivism paradigm, as described by Neuman (2014, p. 97), is a philosophical perspective that stems from a researcher's thoughts on how cause-effect relationships are logically derived from causal laws that are possible in theories or general concepts. Thus, the concepts of visual communication and attitudes are used to demonstrate the existence of cause-effect relationships from causal laws.

According to Creswell (2014, p. 32), quantitative research is an approach that combines data in the form of numerical or statistical information to produce results. In this article, data is collected through questionnaires using survey techniques and analyzed using linear regression. Meanwhile, explanatory research, as explained by Singarimbun and Effendi (2012, p. 72), explores the relationship between variables by testing hypotheses. The relationship can be two-way or one-way, so the understanding of the relationship in this article can also be interpreted as a one-way or causal relationship. Therefore, there is a hypothesis that needs further testing, namely the influence of visual communication of smoking hazard warnings on attitudes.

Sampling is conducted using non-probability sampling principles with the accidental sampling technique. Sugiyono (2017, p. 67) defines accidental sampling as a random sampling technique with suitable criteria that can be used as samples. Since the population in this article is Pancasila University students, where the number of smokers is unknown, meaning the population is unknown, the sample is calculated using the Lameshow formula (Roflin et al., 2022, p. 8) as follows.

$$n = \frac{z^2 \times P(1 - \mathrm{P})}{d^2}$$

Notes:
n = number of samples
Z = Z-score at 95% confidence level = 1,96
P = Maximum estimation = 0,5
d = *Sampling error* 10% (0,10)

Based on the formula above, the calculation to determine the sample size is as follows:

$$n = \frac{(1.96)^2 \times 0,5(1 - 0,5)}{(0,10)^2}$$

$n = 96,05 = 96$

After conducting the calculation, the determined sample size is 96 respondents. The questionnaire distribution was carried out using the Google Form application to smoking students at Pancasila University. Data collection was conducted both in-person and online by distributing the link for seven days from December 27, 2022, to January 2, 2023.

The data in this study was analyzed using the linear regression analysis method. Linear regression analysis, according to Ghozali (2018, p. 96), is used to measure the relationship between two variables in a study. This technique is used to determine the extent of the influence of visual communication about the dangers of smoking on attitudes. For this purpose, the analysis requires the T-test and R Square. The T-test is used to support the hypothesis, to determine whether the independent variable affects the dependent variable. Meanwhile, the R Square test is used to determine the extent to which the independent variable, namely visual communication about the dangers of smoking, influences the dependent variable or the attitudes of Pancasila University students (Ghozali, 2018, p. 179).

To assess whether the data can be used, validity and reliability tests are conducted. The results of the validity testing indicate that both variables are considered valid because the calculated r-value is greater than the r-table value. As for the reliability test, both variables are considered reliable because they both have Cronbach's Alpha values greater than 0.60."

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

Table 1. Validity Test

Variable	Statement	The value of r calculated	The value of r-table N=96, α=5%	Conclusion
Visual Communication	Q1	0.625	0.200	Valid
	Q2	0.867	0.200	Valid
	Q3	0.868	0.200	Valid
	Q4	0.815	0.200	Valid
	Q5	0.886	0.200	Valid
	Q6	0.700	0.200	Valid
	Q7	0.811	0.200	Valid
	Q8	0.762	0.200	Valid
	Q9	0.832	0.200	Valid
	Q10	0.820	0.200	Valid
	Q11	0.828	0.200	Valid
	Q12	0.849	0.200	Valid
	Q13	0.729	0.200	Valid
	Q14	0.848	0.200	Valid
	Q15	0.366	0.200	Valid
	Q16	0.665	0.200	Valid
Attitude	Q1	0.332	0.200	Valid
	Q2	0.385	0.200	Valid
	Q3	0.355	0.200	Valid
	Q4	0.350	0.200	Valid
	Q5	0.333	0.200	Valid
	Q6	0.287	0.200	Valid
	Q7	0.673	0.200	Valid
	Q8	0.673	0.200	Valid
	Q9	0.539	0.200	Valid
	Q10	0.271	0.200	Valid
	Q11	0.252	0.200	Valid
	Q12	0.314	0.200	Valid
	Q13	0.680	0.200	Valid
	Q14	0.494	0.200	Valid
	Q15	0.343	0.200	Valid
	Q16	0.674	0.200	Valid
	Q17	0.678	0.200	Valid
	Q18	0.597	0.200	Valid

Table 2. Reliability Test

Variable	*Cronbach's Alpha*	Criteria	Conclusion
Visual Communication	0.951	0.60	Reliable
Attitude	0.752	0.60	Reliable

RESULTS AND DISCUSSION

Characteristics of Respondents

The research respondents are smoking students from seven faculties at Pancasila University. Based on the processing results, the Faculty of Communication Sciences has the highest percentage, accounting for 38.5%. The Faculty of Pharmacy and the Faculty of Psychology each have 4.2%, which are the two faculties with the lowest numbers. Regarding gender, the data shows

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

that the majority of respondents are male, accounting for 78.1%, while the rest are female, accounting for 21.9%. This indicates that male students are smokers within the Pancasila University environment. In the Indonesian Journal of Health Economics, a national survey by the Ministry of Health of the Republic of Indonesia in 2011 revealed that male smokers outnumber female smokers by 30 times (Salsabila et al., 2022).

Data Findings

Regarding visual communication of smoking hazard warnings on packaging, three dimensions were examined: identification, information, and presentation. First, for the identification dimension, one can observe the images and text displayed on cigarette packaging. In this regard, the majority of respondents agreed (64.6%) with the identification dimension. This means that they interpret the depiction (images and text) of the prohibition of smoking as a warning against cigarette consumption.

Table 3. Identification Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Identification	7	20	62	11	96
	7,3%	20,8%	64,6%	11,5%	100%

Secondly, as a means of information, the visual communication of smoking hazard warnings on the packaging contains information intended to compel people to adhere to it. Regarding the information dimension, the majority of respondents agreed (63.5%). This means that these respondents interpret the information on cigarette packaging about the dangers of smoking as known to them and that the information is intended to compel people not to smoke.

Table 4. Information Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Information	6	22	61	11	96
	6,3%	22,9%	63,5%	11,5%	100%

Thirdly, it concerns the presentation issue related to the message that is easily remembered on cigarette packaging. The memorable message uses persuasive images and text to capture attention. Based on the table below, a significant number of respondents agreed with this presentation (47%). This means that they pay attention to and remember the presentation of smoking warning messages on cigarette packaging.

Table 5. Presentation Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Percentage	15	24	47	10	96
	15,6%	25%	49%	10,4%	100%

For the students' attitudes, there are also three dimensions: cognitive (knowledge), affective (feelings), and conative (action) towards the visual communication of smoking hazard warnings on packaging. First is the cognitive dimension, and from the table below, it is evident that the majority of respondents agreed (66.7%). This means that these respondents are aware of and understand the messages in the visual communication of smoking hazard warnings displayed on packaging.

Table 6. Cognitive Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Cognitive	0	0	64	32	96
	0%	0%	66,7%	33,3%	100%

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

Secondly, the affective dimension, which involves emotional feelings, can be either agree or disagree. It is observed that the majority of respondents agreed with the affective dimension (57.45). This means that respondents feel agreement with the information provided through the visual communication of smoking hazard warnings displayed on packaging.

Table 7. Affective Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Affective	13	13	55	15	96
	13,5%	13,5%	57,4%	15,6%	100%

Thirdly, the conative dimension refers to the tendency to act or react to an object in a particular way. In this regard, a significant number of respondents actually disagreed (34.4%). This means that these respondents do not act in accordance with the visual communication message about the warning of smoking hazards displayed on packaging.

Table 8. Conative Dimension

Dimension	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Conative	21	33	29	13	96
	21,8%	34,4%	30,3%	13,5%	100%

Referring to the results of the T-test analysis in the table below, it shows that the Visual Communication variable has a t-value of 4.425 with a Sig. value of 0.000. Considering that the T-table value with a distribution of 0.05 is 1.661, the calculated T-value is greater than the T-table value, indicating that the Visual Communication variable of smoking hazard warnings on packaging influences the attitudes of smoking students. Based on these results, the hypothesis can be accepted.

Table 9. T-Test Results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	39,918	2,473		16,142	0,000
	Total_X	0,246	0,056	0,415	4,425	0,000

Based on the information below, the R Square value is 0.172, which when converted to a percentage is 17.2%. This means that visual communication of smoking hazard warnings on cigarette packaging influences 17.2% of the attitudes of smoking students at the University of Pancasila. The remaining 82.8% is attributed to other factors not examined in this article.

Table 10. Coefficient of Determination Test Results

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0,415[a]	0,172	0,164	5,008	0,172	19,583	1	94	0,000

In Indonesian society, including university students, smoking is considered a primary need and part of the lifestyle (cnn.indonesia.com, 2016). This is further emphasized by The Tobacco Control Atlas ASEAN Region 4th Edition, which shows Indonesia as having the highest number of smokers in the ASEAN region, with 36.3% of people aged 25-64 being smokers (Salsabila et al., 2022). Regarding gender in this article, it shows that 78.1% of respondents are male and 21.9% are female smokers at Universitas Pancasila. Although not within the age range as mentioned by Salsabila et al., (2022), considering that students are

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

typically between 19-23 years old, the proportions reflect a similar trend, with about 66% of smokers being male and the remaining 6.7% being female smokers.

University students are considered to have a high level of education in Indonesia. This is interesting when considering research in China, which suggests that individuals with higher levels of education are less likely to smoke (Wang et al., 2018). Furthermore, about 80% of the world's smokers are in low- and middle-income countries, with 226 million of them being poor (WHO, 2020). Although the focus is on students, it would be interesting to explore the characteristics of respondents regarding family income or spending, or at least their pocket money, which is not examined in this article. If they are students from families with lower-middle income, then the habit of smoking could be justified.

This is also similar to research conducted by Fikriyah and Febrijanto (2012), Adiayatama (2016), and Juliana (2017) on student smokers. Although Adiayatama (2016) and Juliana (2017) did not provide reviews on why students smoke, Fikriyah and Febrijanto (2012) explained that students are teenagers. According to them, smoking can be a way for teenagers to feel free and mature when adapting to peers who smoke. Various peer pressures, self-appearance, curiosity, stress, boredom, wanting to look tough, and rebelliousness are factors that can contribute to the start of smoking (Fikriyah & Febrijanto, 2012).

Furthermore, according to the research by Adiayatama (2016), the graphical format of warning images on cigarette packaging is crucial. The images should be positioned prominently, proportional in size, accompanied by explanatory text, and use appropriate colors. The content of the warning images should rationalize the dangers of smoking both for health and the environment. Regarding the visual communication of warning about the dangers of smoking on cigarette packaging in this article, one of its functions as identification is interpreted by respondents as a form of prohibition. It means that respondents understand the meaning of the images and text on the cigarette packaging, where the size of the images and text is appropriate and easy to understand.

Visual communication of smoking hazard warnings also provides information about the dangers of smoking, such as using easily understandable language, informative wording, and precise language. Thus, it creates knowledge that forces or reminds students about the harmful effects of smoking on health. In this regard, respondents also understand that the images and text on cigarette packaging are made as persuasive as possible to discourage smokers from smoking.

In its function as a presentation tool, visual communication of smoking hazard warnings on cigarette packaging must provide useful information and be presented attractively to generate attention, making the information easy to remember. In this article, visual communication of smoking hazard warnings on packaging can provide information with an attractive appearance and persuasive wording to encourage smokers to quit smoking, thus garnering attention and making the warning message easily remembered.

Based on the explanations above, regarding identification, information, and presentation of visual communication of smoking hazard warnings on packaging, respondents understand, interpret, and remember the smoking prohibition on cigarette packaging. It means that respondents understand the images and sentences as a form of prohibition on cigarette packaging. This also affects their cognitive aspect, where respondents are aware of and understand various diseases caused by smoking to themselves and others. As stated by Juliana (2017), smoking has negative effects not only on smokers themselves but also on others around them, especially pregnant women or unborn babies.

As for the affective aspect, which concerns emotions and beliefs about stimuli that influence attitudes, respondents feel fear about graphic warning messages that give a frightening impression (fear arousing) due to the dangers of smoking, causing anxiety about their health. They also believe that smoking can cause various dangerous diseases that can affect themselves or others, as well as air pollution caused by cigarette smoke. In addition, they believe that the content of smoking hazard warning messages is intended to raise awareness among smokers.

In the conative aspect, which concerns human precision in acting in certain ways, some respondents reduce their smoking habits after seeing smoking hazard warnings but do not decide to quit smoking altogether. Although they already know and even feel cognitively (knowledge) and affectively (attitude) about the dangers of smoking, they still smoke. This is consistent with the research by Adiayatama (2016), which shows that the cognitive and affective aspects of the smokers studied already know and can feel the dangers of smoking, but their conative aspect still engages in smoking activities. However, some student smokers apparently spread the smoking hazard warnings on cigarette packaging to their closest relatives to help the government reduce the number of smokers and create a smoke-free environment.

This study conducted a T-test aimed to determine how the independent variable affects the dependent variable. The results showed that visual communication of smoking hazard warnings on cigarette packaging has an influence on the attitudes of student smokers at Universitas Pancasila. These results indicate that the hypothesis is accepted. This study also conducted statistical testing of R Square aimed at measuring how much influence the independent variable has on the dependent variable. The results showed that visual communication of smoking hazard warnings on cigarette packaging has an influence of 17.2% on

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

the attitudes of student smokers at Universitas Pancasila. The remaining 82.8% is caused by other factors not examined in this study.

Interestingly, the influence of visual communication of smoking hazard warnings, at 17.2%, is smaller compared to the studies by Adelina et al. (2018) and Muhammad Ali (2020), which reported 47.6% and 41.1% respectively. The two previous studies also examined the influence of images and text on cigarette packaging on attitudes, but in different locations. Muhammad Ali (2020) conducted research in the Department of Communication Science, Universitas Satya Negara Indonesia, while Adelina et al. (2018) studied young smokers in the city of Surabaya. This difference is due to the use of different theories. This article uses the concept of visual communication, while the other two articles use the concept of message. Furthermore, in the study by Adiayatama (2016), the written messages and images of smoking hazard warnings on cigarette packaging influenced changes in smokers' behavior by 25%.

This condition indicates that there are still many influences on smoking beyond the images and text on cigarette packaging, such as peer influence, lifestyle, psychological factors of smokers, and so on. Additionally, the government's images and text related to the dangers of smoking on cigarette packaging are not effective in raising awareness among smokers. Therefore, to change smoking behavior, warnings about the dangers of smoking need to be accompanied by other policies that restrict smokers' movements, thereby reducing opportunities for smoking activities. The government has issued regulations banning smoking in public places. The Joint Regulation of the Minister of Health and the Minister of Home Affairs No. 188/Menkes/Pb/I/2011 No. 7 of 2011 concerning Guidelines for the Implementation of Smoke-Free Areas stipulates the need for the establishment of Smoke-Free Areas in health facilities, places of learning such as schools, playgrounds, places of worship, public transportation, workplaces, public places, and other designated places to protect the public from cigarette smoke (Pertiwi et al., 2017).

CONCLUSION AND SUGGESTION

Based on the findings of this study, it can be concluded that visual communication of smoking hazard warnings on cigarette packaging influences the attitudes of students. However, in terms of behavior, this attitude is not influenced by visual communication of smoking hazard warnings because they still continue to smoke.

This article discusses students where students are interpreted as individuals with higher education who can set an example for society. Therefore, with this status, students should not smoke and should set an example for society that smoking can harm their health, others, and the environment.

Regarding Minister of Health Regulation No. 28 of 2013 concerning the Inclusion of Health Warnings and Health Information on Tobacco Product Packaging, which apparently does not have a significant influence on students, there is a need for specific policies related to smoking in universities that restrict students from smoking.

REFERENCES

1) Adelina, E., Burhan, B., & Rachmawati, N. (2018). Pengaruh Pesan Komunikasi pada Kemasan Rokok Terhadap Sikap Perokok Muda di Kota Surabaya (The Influence of Communication Messages on Cigarette Packaging on the Attitudes of Young Smokers in Surabaya City). Jurnal Representamen, Vol. 4(1), 1-8.

2) Adiayatama, I., Suryatna, U., & Kusumadinata, A. A. (2016). Pengaruh Pesan Gambar Bahaya Merokok Terhadap Perubahan Perilaku Perokok (The Influence of Graphic Warning Messages on Smoking Behavior Change among Smokers). Jurnal Komunikatio, Vol. 2(1), 67-95.

3) Ali, M. (2020). Pengaruh Pesan Visual Larangan Merokok di Kampus A Universitas Satya Negara Indonesia (USNI) terhadap Sikap Mahasiswa Jurusan Ilmu Komunikasi Angkatan 2016 (The Influence of Visual No-Smoking Signs at Campus A, Satya Negara University Indonesia (USNI), on the Attitudes of Students in the Department of Communication Science, Class of 2016). Jakarta: Universitas Satya Negara Indonesia.

4) Andhita, P. R. (2021). Komunikasi visual (Visual communication). Purwokerto: Zahira Media Publisher.

5) Azwar, S. (2015). Penyusunan skala psikologi (Development of psychological scales). Yogyakarta: Pustaka Belajar.

6) BPS. (2020). Jumlah dan distribusi penduduk (Population count and distribution). Retrieved from https://sensus.bps.go.id/main/index/sp2020#:~:text=Jumlah%20dan%20Distribusi%20Penduduk&text=Persebaran%20penduduk%20menurut%20jenis%20kelamin,133.542.018%20untuk%20penduduk%20perempuan

7) BPS. (2022). Persentase merokok pada penduduk umur $\geq$ 15 tahun menurut provinsi (Persen), 2020-2022 (Percentage of Smoking Among Population Aged $\geq$ 15 Years by Province (Percent), 2020-2022) . Retrieved from https://www.bps.go.id/indicator/30/1435/1/persentase-merokok-pada-penduduk-umur-15-tahun-menurut-provinsi.html

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

8) Cenadi, C. S. (1999). Elemen-Elemen dalam desain komunikasi (Elements in communication design). Jakarta: Visual

9) CNN Indonesia. (2016). Di Indonesia, rokok sudah jadi kebutuhan 'primer' (In Indonesia, cigarettes have become a "primary" necessity.). Retrieved from https://www.cnnindonesia.com/gaya-hidup/20160531020808-277-134583/di-indonesia-rokok-sudah-jadi-kebutuhan-primer

10) Creswell, J. W. (2014). Research design, qualitatives, quantitative, and mixed methods approcahes. California: Sage Publications, Inc.

11) Dismiantoni, N., Anggunan, N. T., & Rina, K. (2020). Hubungan merokok dan riwayat keturunan dengan kejadian hipertensi (The relationship between smoking and family history with the incidence of hypertension). Jurnal Ilmiah Kesehatan Sandi Husada, Vol 9(1), 30-36.

12) Farkhah, L. (2021). Hubungan tingkat pengetahuan dan sikap remaja terhadap perilaku merokok (The relationship between adolescents' knowledge level and attitudes toward smoking behavior). Jurnal Keperawatan Muhammadiyah Bengkulu, Vol. 9(2), 32-37.

13) Fikriyah, S., & Febrijanto, Y. (2012). Faktor-Faktor yang memengaruhi perilaku merokok pada mahasiswa laki-laki di asrama putra (Factors influencing smoking behavior among male students in the men's dormitory). Jurnal STIKES, Vol. 5(1), 99-109.

14) Kusrianto, A. (2007). Pengantar desain komunikasi visual (Introduction to visual communication design). Yogyakarta: Andi Offset.

15) Mahardhika, D. W., Cindyagita, Z. I., Akbar, M. T., & Sihaloho, E. D. (2020). Pengaruh status merokok terhadap kemampuan kognitif seseorang: studi kasus indonesian family life survey (ifls) (The influence of smoking status on cognitive abilities: a case study of the indonesian family life survey (IFLS)). Jurnal Ekonomi dan Pembangunan, Vol 28(2), 41-53.

16) Manggaga, I., & Jufri, P. (2020). Pengaruh komunikasi visual gambar peringatan bahaya merokok pada kemasan rokok terhadap sikap perokok (Studi kasus masyarakat Dusun Kanang-Kanang Desa Tino Kec. Tarowang Kabupaten Jeneponto) (The influence of visual communication of smoking hazard warning images on cigarette packaging towards smokers' attitudes (Case study of the community of Kanang-Kanang Hamlet, Tino Village, Tarowang District, Jeneponto Regency)). Jurnal Komunikasi dan Organisasi, Vol 2(2), 83-92.

17) Neuman, W. L. (2014). Pearson new international edition social research methods: qualitative and quantitative approaches. Harlow: Pearson Education Limited.

18) Notoatmodjo, S. (2005). Prinsip dasar kontruksi sosial dalam dinamika kontemporer (Basic principles of social construction in contemporary dynamics). Jakarta: Kencana Prenada Media Group.

19) Pertiwi, C. M. P., Engkeng, E., & Asrifuddin, A. (2018). Pengaruh promosi kesehatan terhadap pengetahuan dan sikap merokok pada pelajar laki-laki di SMK Negeri 2 Kota Bitung (The influence of health promotion on knowledge and attitudes towards smoking among male students at SMK Negeri 2 Kota Bitung). Jurnal KESMAS, Vol. 7(5), 1-9.

20) Roflin, E., Pariyana, & Iche, A. L. (2022). Metode Menghitung Besar Sampel pada Penelitian Kesehatan (The Method for Calculating Sample Size in Health Research). Pekalongan: NEM.

21) Salsabila, N. N., Noormarina, I., & Budi, S. (2022). Gambaran kebiasaan merokok di indonesia berdasarkan indonesia family life survey 5 (IFLS 5) (Overview of smoking habits in indonesia based on indonesia family life survey 5 (IFLS 5)). Jurnal Kesehatan Indonesia, Vol 7(1), 13-22.

22) Satriawan, D. (2022). Gambaran kebiasaan merokok penduduk di indonesia (Overview of smoking habits among the population in Indonesia). Jurnal Litbang Sukowati. Vol 5(2), 51-58.

23) Singarimbun, M., & Sofian, E. (2011). Metode penelitian survei (Survey research method). Jakarta: LP3S.

24) Sugiyono. (2017). Metode penelitian kuantitatif, kualitatif, dan R dan D (Research methods: quantitative, qualitative, and R&D). Bandung: Alfabeta.

25) Widayatun, T. R. (2009). Ilmu perilaku (Behavioral science). Jakarta: Sagung Seto.

The Influence of Visual Communication of Smoking Hazard Warnings on Students' Attitudes

Changes in the Agreement Clause between the Parties in the Insurance Policy That Has an Impact on Losses Reviewed From the Perspective of Legal Sociology

Christin Apriyani Purba[1], Catharina Dewi Wulansari[2]

[1,2]Faculty of Law, Parahyangan Catholic University Jl. Ciumbuleuit No.94, Hegarmanah, Kec. Cidadap, Kota Bandung, Jawa Barat 40141

ABSTRACT: Insurance is an agreement that has been mutually agreed upon between the insurer (insurance company) and the insured (someone who buys insurance services), where in the agreement the insured must pay a certain amount of money within a certain period of time, which is called a premium. Life insurance premiums depend on life chances and interest rates that represent financial market dynamics. Insurance is a financial means in household life to face basic risks such as the risk of death or the risk of loss of property. One type of life insurance is dual-purpose life insurance, namely insurance that provides dual benefits in the form of life insurance protection and savings at the end of the policy year if the insured is still alive. Compensation for a risk that may be suffered due to certain events is obtained from the payment of a premium. There are two types of premiums, namely net premiums and gross premiums. The net premium plus certain costs charged to the insured is the gross premium.

KEYWORDS: Agreement Clause; Insurance Policy; Impact on Losses; Legal Sociology; Changes

I. INTRODUCTION

Insurance is an effort made by many parties to deal with uncertainty in the future and the possibility of risks that lead to losses in the form of loss of life and loss of goods owned by a person. Uncertainty in the future as a condition that will actually occur is almost entirely a risk to humans and the goods they own (Sastrawidjaja Suparman, 2019). Among the many risks that humans will face, the risks that lead to loss of life and loss of property are losses that no one expects to occur. Insurance is a form of risk management that has been around for a long time and is one of the businesses that has a fairly rapid development. The development of this insurance business is due to the increasing public awareness of the importance of protection against risks that can occur. Currently, there are many insurance products offered by insurance service providers, such as accident insurance, life insurance, vehicle insurance and other insurance products (Mokhamad Khoirul Huda, 2019).

Basically, insurance is a form of agreement based on trust between the insured and the insurer. The insurer believes that the insured will provide actual information about the object of insurance, while the insured believes that the insurer will provide appropriate compensation if the object of insurance suffers a loss. In other words, this insurance must be carried out on the basis of good faith between the two parties. However, in practice, there is always the potential for fraud committed by the parties involved in the insurance agreement. In this case, fraud is defined as a deliberate act with the intention of obtaining benefits from other parties. Fraud in insurance can be committed by the insurer, the insured, the insurance agent or even other parties who are also involved in the insurance agreement (Abdulkadir Muhammad, 2019).

The direct relationship between insurance and the risks and losses that must be accepted by many parties that may occur in the future can be observed from Article 1 (1), Law Number 40 of 2014 concerning Insurance which states that: "Insurance is an agreement between two parties, namely an insurance company and a policyholder, which is the basis for the receipt of premiums by the insurance company in return for: a. providing compensation to the insured or policyholder for loss, damage, costs incurred, loss of profit, or legal liability to third parties that may be suffered by the insured or policyholder due to the occurrence of an uncertain event; or b. providing payments based on the death of the insured or payments based on the life of the insured with benefits whose amount has been determined and / or based on the results of fund management ". Thus, insurance as an agreement has the substance of risk transfer for losses experienced by the insured, both loss of life and loss of property. Therefore,

Changes in the Agreement Clause between the Parties in the Insurance Policy That Has an Impact on Losses Reviewed From the Perspective of Legal Sociology

there are various types of insurance that can generally be categorized into life insurance and property and casualty insurance. Specifically about property loss insurance can consist of various types of insurance including commercial property insurance, which offers a very broad indemnity guarantee designed for business needs and interests (Djoko Prakoso & Ketut Murtika, 2019).

In many cases of insurance fraud, fraud is often found that is actually committed by the insured by utilizing compensation for insurance claims provided by the insurance company as the insurer. In accordance with Law Number 40 of 2014 concerning Insurance, the insured has the right to receive payment or coverage for insurance claims submitted if the insurance object concerned suffers a loss. This is often utilized by the insured to benefit themselves through the submission of claims that are not true. It is unfortunate that Insurance Law Number 40 of 2014 has not provided special protection to insurance companies against the threat of fraud in this insurance claim. Goods transportation accidents as a risk of the transportation of goods by sea can be held liable to the party who caused and at the same time caused the goods transportation accident. If the goods affected by the accident in the transportation of goods have been protected by the insurance of the transportation of goods, then the accident of the transportation of goods can still be requested from the party that caused the accident of the transportation of goods. The request for indemnity from the party who suffered the loss to the party responsible for the transportation of goods accident is basically the right of subrogation. Subrogation is a right of one person, having indemnified another under a legal obligation to do so, to stand in the place of that other and avail himself of all rights and remedies of that other, whether already enforced or not. The principle of subrogation is emphasized in insurance, because the insurer or insurance company that has compensated the insured party is entitled to receive back from the insured something that the insured received from other sources in connection with the insured loss. The principle of subrogation is a supporter of the concept of indemnity because the concept of subrogation prevents the insured from recovering more than the loss he received (Ahmad Miru & Sutarman Yodo, 2020).

In the context of problem identification, there are two key questions that need to be answered. First, how is the legal regulation of the insurance industry in Indonesia, given the importance of the regulatory framework in ensuring sustainability and protection for industry players and consumers. Second, how changes in the agreement clause between the parties in the insurance policy that have an impact on losses, which is the focus in seeing how the dynamics of contractual relations in insurance can affect the parties involved, both legally and socially. Thus, the purpose of these two questions is to understand and analyze both from a legal and social perspective, on how legal arrangements and changes in the agreement clause in insurance in Indonesia affect the industry and the parties involved in it.

II. LITERATURE REVIEW

In the context of insurance policy agreements, changes in the clauses between the parties can significantly impact losses. From a legal sociology perspective, it is essential to consider the societal and legal implications of these changes. The sociology of insurance provides insights into how insurance agreements are constructed and how they impact various societal aspects. Additionally, understanding the impact of policy changes on losses requires a multidisciplinary approach, incorporating insights from economics, public policy, and risk analysis.

1. Tanninen (2020) discusses the sociology of insurance and its intersection with critical data studies, providing a foundation for understanding the societal perspectives of behavior-based insurance. This is relevant as it offers insights into how changes in insurance policy clauses can impact societal behavior and perceptions.
2. Johnson et al. (2005) evaluate the policy impact of significant flood disasters, providing a framework for understanding how policy changes are catalyzed by external events. This is pertinent as it offers a perspective on how changes in insurance policy clauses may be influenced by external factors, thereby impacting losses.
3. Hagendorff et al. (2014) highlight the role of insurance in sharing catastrophe losses, emphasizing the societal impact of insurance in mitigating financial consequences. This is relevant as it underscores the societal implications of changes in insurance policy clauses and their impact on losses.
4. Penning-Rowsell et al. (2014) provide insights into the incremental changes in UK flood insurance over six decades, shedding light on the relationship between stability and change in insurance agreements. This is pertinent as it offers a nuanced understanding of how changes in insurance policy clauses unfold over time and their societal implications.
5. Wijaya et al. (2021) discuss the balance of contracts in online insurance agreements, providing a legal perspective on the agreements between parties. This is relevant as it offers insights into the legal framework governing insurance agreements and their societal implications.

In conclusion, changes in the agreement clauses between parties in insurance policies have a profound impact on losses from the perspective of legal sociology. Understanding these changes requires a multidisciplinary approach, incorporating insights from the sociology of insurance, public policy, risk analysis, and legal frameworks.

Changes in the Agreement Clause between the Parties in the Insurance Policy That Has an Impact on Losses Reviewed From the Perspective of Legal Sociology

III. METHOD

The type of research used by the author is legal sociology, namely legal research conducted by examining library materials called library legal research (Peter Mahmud Marzuki, 2014). The author's consideration in using this type of research is to find out, analyze, and explain the changes in the Agreement Clause between the Parties in the Insurance Policy which has an impact on Losses Viewed from the Perspective of Legal Sociology. In this normative juridical legal research, the author uses a legal sociology approach. This research uses the type of statutory approach because the main study material is the legislation on the Amendment to the Agreement Clause between the Parties in the Insurance Policy Which Impacts on Losses Viewed from the Perspective of Legal Sociology.

IV. RESULT AND DISCUSSION

Legal Arrangements Regarding the Insurance Industry In Indonesia

The Indonesian legal system has its roots in the civil law brought by the Dutch royal government to Indonesia during the colonial period. The Civil Law can trace its roots to Civil Law in France to Roman Law. The existence of insurance law in Indonesia stems from the Codification of Civil Law (Code Civil) and Commercial Law (Code de Commerce) in the early nineteenth century during the reign of Emperor Napoleon in France. At that time, the Dutch Commercial Code only contained articles on marine insurance until the promulgation of the draft Code of Commerce (Wet Boek van Koophandel) in 1838 which contained regulations on fire insurance, crop insurance and life insurance. This system was also adopted for the Dutch East Indies in the past which is still valid in Indonesia today (Muhammad Syaiffuddin, 2019). Insurance as a legal phenomenon in Indonesia, both in its understanding and in its current form, comes from Western Law. It was the Dutch Government that imported insurance as a legal form (rechtsfiguur) into Indonesia by promulgating the Burgerlijk Wetboek and Wetboek van Koophandel, with one announcement (publicatie) on April 30, 1847, and contained in Staatsblad 1847 Number 23 (Kanon Armiyanto, 2019). The two codes regulate insurance as an agreement. Subsequently, along with the dominance of the United Kingdom as the origin of modern insurance and countries that adhere to certain Anglo-Saxon systems in the development of the insurance industry internationally, especially in the provision of reinsurance capacity and as a source of insurance knowledge, the development of insurance internationally, including in Indonesia, is strongly influenced by the notions and legal practices and precedents originating from these Anglo-Saxon countries. In Indonesia, the first law regulating insurance as a business was born in 1992 with the enactment of Law Number 2 of 1992 concerning Insurance Business. Prior to the birth of Law Number 2 of 1992, insurance as a business was regulated through various Government Regulations (PP) and Presidential Decrees (Kepres) along with the regulations below them (Harjono, 2020). To distinguish the regulation of insurance as a business from the regulation of insurance as an agreement, hereinafter, Law Number 2 of 1992 concerning Insurance Business will be referred to as the Insurance Business Law. The Insurance Business Law regulates insurance as a business by making rules regarding licensing, management, and the role of the government in the guidance and supervision of insurance businesses. As stated in Article 27 of the Insurance Business Law, this law replaces the Ordonnantie op het Levensverzekering bedrijf (Staatsblad Year 1941 Number 101) which was declared invalid upon the enactment of the law (Ajeng Permata Putri & Henny Setyo Lestari, 2014). The implementation of the Insurance Business Law is regulated by Government Regulation Number 73 of 1992 (hereinafter referred to as PP Number 73 of 1992). As stated in Article 46 of Government Regulation Number 73 of 1992, with the enactment of this Government Regulation, Presidential Decree Number 40 of 1988 concerning Business in the Field of Loss Insurance is declared invalid. In 1999, the Government issued Government Regulation No. 63 of 1999 (hereinafter referred to as PP No. 63 of 1999) on the Amendment of Government Regulation No. 73 of 1992 which replaced some of the provisions in PP No. 73 of 1992. The second amendment was enacted through Government Regulation Number 39 of 2008 concerning the Second Amendment to Government Regulation Number 73 of 1992. Finally, the government issued Government Regulation Number 81 of 2009 concerning the Third Amendment to Government Regulation Number 73 of 1992. Each of the aforementioned Government Regulations was followed by various Decrees of the Minister of Finance (hereinafter referred to as Kepmen) and Minister of Finance (hereinafter referred to as PerMen) and various decisions under them, all of which became regulations for the implementation of the management, guidance and supervision of the Indonesian insurance business. Both life insurance companies that have health insurance products, to general insurance that offers various guarantees of compensation for collateralized assets such as property, must comply with the legal basis of insurance in Indonesia. The implementation is guided by five basic insurance laws, namely: Law Number 2 of 1992 concerning Insurance Business, the Criminal Code (KUHP) Article 1320 and Article 1774, the Code of Commerce (KUHD) Chapter 9 Article 246, Government Regulation (PP) Number 73 of 1992, and PP Number 63 of 1999. Insurance basically provides a guarantee of protection to a person from various bad events that can happen to him at a certain time beyond the person's predictions and expectations. Judging from the process of insurance activities, there must be a binding agreement, where someone who agrees

Changes in the Agreement Clause between the Parties in the Insurance Policy That Has an Impact on Losses Reviewed From the Perspective of Legal Sociology

to the insurance must pay a certain amount of premium within a certain period of time, where the premium is a substitute for the protection guaranteed by the insurance company.

Changes in Agreement Clauses between Parties in Insurance Policies Affecting Losses Reviewed from the Perspective of Legal Sociology

The definition of insurance according to Article 1 of the Insurance Business Law is an agreement, which means that two parties are involved, namely between the insurance company as the insurer and the other party as the insured. The insurance company as the party that receives the transfer of risk from the insured, is responsible for compensating the losses suffered by the other party, namely the insured due to the destruction of goods or the death of a person who is the object of insurance, due to a cause or event that was not expected before (Marlina et al, 2013). Insurance as a risk transfer, which means that the nature of insurance is a company engaged in the transfer of risk from the insured to the insurer or insurance company for the occurrence of an unexpected loss and also befalls the insured object (Fitriani et al, 2009). Although it is clear about the rights and obligations in the insurance agreement, the reality is very different, because it turns out that the insurer does not fulfill its obligations at the time of an unexpected event such as the case below: Handoyo insured himself and his family at the Allianz Limited Liability Insurance Company (hereinafter abbreviated as PT Allianz) with a life insurance policy with benefits, among others: Normal death is paid Rp150,000,000.00 (one hundred and fifty million rupiah). Death due to accident amounting to Rp300,000,000.00 (three hundred million rupiah) plus or including investment fund. If Handoyo lives until the end of the contract, all investment funds will be paid as well. The insurance with a coverage period of 10 years began when the insurance agreement was closed, namely September 10, 2006 until September 10, 2016 with an insurance premium of Rp8,154,000.00 (eight million one hundred fifty four thousand) per year paid for 5 years (www.kompcyber, Insurance Claims) (Andhayani et al, 2012). All insurance closing requirements, such as Life Insurance Request Letter (hereinafter referred to as SPAJ), medical examination by a doctor/clinic/laboratory appointed by the insurer have been fulfilled by the insured. When the policy had only been running for 13 months and 9 days, the insured passed away at home without being taken to a doctor beforehand. The body was cremated at Nirwana Crematorium, Bekasi. The heirs demanded the insurer to pay the policy benefit of Rp150,000,000.00 (one hundred and fifty million rupiah) by previously fulfilling the conditions for submitting a claim that had been determined by the insurer as stipulated in the General Policy Provisions Article 7. However, the insurer refused to pay the claim on the grounds that, after research by the insurer, it was discovered that at the time of submission of the SPAJ there had been material misrepresentation. This is based on Article 251 of the KUHD and related articles in the policy (Derbali, 2014). The insurer stated that (Detiana, 2012): First, From the results of the research they conducted, it was found that the insured before entering the insurance had received treatment or consultation to: Siloam Hospital, Lippo Karawaci on December 10, 2004 with a diagnosis of acute hydrocephalus and CP-Shunt; Siloam Hospital, Lippo Karawaci on April 27, 2005 with a diagnosis of bronshiectasis; Medistra Hospital, Jakarta was treated on March 12-29, 2006 with a diagnosis of duplex bronchopnemonia with retentio sputum; All of these examinations and treatments were not disclosed in the SPAJ. Secondly, these diseases cannot be detected by the type of examination required by the insurer, but can only be detected by special examination if the insured has disclosed it. Third, that based on these matters the insurer concludes that the insured has been proven to have bad faith and committed misrepresentation or non-disclosure of facts. Fourth, with the proof of misrepresentation, the insurer has conducted reunderwriting or also re-selection of insurance acceptance to determine if the materiality of the misrepresentation. The result is that if the fact of treatment had been known to the insurer earlier, coverage would not have been issued on the same terms. Thus, it has been proven that the misrepresentation that has occurred is material. Fifth, based on these facts and Article 251 of the KUHD, General Policy Provisions Article 7 and Article 8 of the SPAJ, the insurer rejected the claim submitted by the Heirs. Taking into account the description above, it can be explained that PT Allianz rejected the claim submitted by Handoyo on the grounds that the insurer did not provide information regarding his actual medical history. Based on such a description, what is at issue in this paper is whether the rejection of the claim by PT Allianz submitted by Handoyo can be justified according to the law, and what legal remedies are taken by Handoyo to obtain a claim for the losses that have been suffered (Harjono, 2003). The practice of insurance in the culture of Indonesian society in a non-formal way has often been done. This can be seen, for example, when one member of the community dies, other members of the community will provide assistance in the form of death contributions. These death contributions are usually withdrawn regularly from all members of the community and coordinated by a designated person. Every time there is a death, the donation will be given in accordance with the agreement that has been made together. There are many other insurance practices that occur in the community, including celebration donations and other donations that are more social in nature. These non-formal insurance practices have long been practiced by the Indonesian people with full awareness and sincerity. The community realizes that death donations and other donations have great benefits to help ease the burden of someone who is in a disaster or has a celebration. Therefore, the practice

of non-formal insurance is easily accepted and implemented by the Indonesian people. The question is what is the attitude of the community towards formal or institutionalized insurance practices? Indonesian people apparently still do not utilize the existence of insurance companies as a means of protecting themselves and their families and property from unexpected events. The public is still very unfamiliar with insurance and not much familiar with the types of insurance products available. Not to mention, coupled with the understanding of most Indonesian Muslims who are half-hearted or irresponsible about the law of insurance in the view of Islamic teachings. It is more based on the general opinion of Indonesian Muslims and their ulemas that the law of insurance is absolutely haram. In today's economic world, insurance institutions are also able to act as non-bank financial institutions that can organize, collect and channel funds from the public for the purpose and interests of the community. Insurance can also function as savings. This is evident in the benefits offered by life insurance. Basically, the results received at the end of the maturity period are a collection of premium savings plus interest. In addition to providing benefits to customers, insurance indirectly benefits business people who definitely need credit from banks for their business capital, because the premiums paid by insurance customers will be deposited with national banks in the form of deposits or others. Then the money that has been collected, either from personal or corporate bank customers, is credited by the bank to entrepreneurs.

V. CONCLUSION

Based on the previous description and discussion, it can be concluded that the rejection of claims made by PT Allianz submitted by Handoyo is not justified by law, because PT Allianz Insurance does not recognize the insurance policy. In the policy it has been clearly mentioned including as a form of loss guaranteed by the insurance company. This means that the fact that is not disclosed includes a loss guaranteed by the insurance as stated in the insurance policy, therefore it cannot be used as a basis for rejecting the insured's claim by PT Asuransi Allianz. What legal efforts were taken by Handoyo to get a claim for the losses suffered to amicably resolve the problem of the rejection, because PT Allianz could not cancel the policy unilaterally. Because it has been bound by an insurance agreement with Handoyo and the agreement has actually fulfilled the elements of insurance and the terms of the insurance agreement in accordance with Article 1 number 1 of Law No. 2 of 1992. PT Allianz can be qualified as having made a default, namely not fulfilling the obligations arising in the insurance agreement. Charges PT Asuransi Allianz to pay insurance claims along with reimbursement of costs, losses and interest in accordance with the provisions of Article 1243 jo Article 1246 of the Civil Code.

REFERENCES

1) Andhayani, R., & Norita. (2012). Analisis Pengaruh Solvabilitas dan Underwriting Terhadap Profitabilitas Perusahaan Asuransi Kerugian. Fakultas Ekonomi Bisnis Universitas Telkom
2) Armiyanto, K. (2019). Fraud dalam Industri Asuransi: Suatu Tinjauan Hukum. Makalah disajikan pada Seminar Sehari "Kecurangan (fraud) dalam Jaminan/Asuransi Kesehatan", di Hotel Bumi Karsa: PAMJAKI
3) Derbali, A. (2014). Determinants of Performance of Insurance Companies in Tunisia the Case of Life Insurance. International Journal of Innovation and Applied Studies, 6(1), 90-96
4) Detiana, T. (2012). Financial Early Warning Signal Terhadap Perubahan Harga Saham pada Perusahaan Asuransi yang Terdaftar di Bursa Efek Indonesia. Jurnal Bisnis dan Akuntansi, 14(3), 239-245
5) Djoko Prakoso dan Ketut Murtika, 2019, Hukum Asuransi ndonesia, Bina Aksara, Jakarta
6) Fitriani, A., & Dorkas, A. (2009). Tinjauan Empiris Terhadap Kinerja Industri Asuransi Yang Go Public Di Bursa Efek Indonesia Periode 2004-2008. Jurnal Ekonomi dan Bisnis, 15(2), 103-119
7) Hagendorff, B., Hagendorff, J., & Keasey, K. (2014). The impact of mega-catastrophes on insurers: an exposure-based analysis of the u.s. homeowners' insurance market. Risk Analysis, 35(1), 157-173. https://doi.org/10.1111/risa.12252
8) Harjono. (2020). Eksaminasi Putusan Pengadilan sebagai Manifestasi Kepedulian dan Keterlibatan Masyarakat terhadap Peradilan. Yustitia Edisi Nomor 63 Oktober-Desember. Universitas Sebelas Maret
9) Huda, M. K. (2019). Prinsip Ktikad Baik Dalam Perjanjian Asuransi Jiwa. FH UII Press
10) Johnson, C., Tunstall, S., & Penning-Rowsell, E. (2005). Floods as catalysts for policy change: historical lessons from england and wales. International Journal of Water Resources Development, 21(4), 561-575. https://doi.org/10.1080/07900620500258133
11) Marlina, Reni, & Puryati, D. (2013). The Influence of Risk Based Capital to Profitability in Jasindo Insurance Company. South East Asia Journal of Contemporary Business, Economics and Law, 2(1), 8-16
12) Marzuki, P. M. (2014). Penelitian Hukum (edisi Revisi). Kencana
13) Miru, A., & Yodo, S. (2020). Hukum Perlindungan Konsumen. Raja Grafindo Persada

Changes in the Agreement Clause between the Parties in the Insurance Policy That Has an Impact on Losses Reviewed From the Perspective of Legal Sociology

14) Muhammad, A. (2019). Pengantar Hukum Pertanggungan. Sinar Grafika

15) Penning-Rowsell, E., Priest, S., & Johnson, C. (2014). The evolution of uk flood insurance: incremental change over six decades. International Journal of Water Resources Development, 30(4), 694-713. https://doi.org/10.1080/07900627.2014.903166

16) Prakoso, D., & Murtika, K. (2019). Hukum Asuransi Indonesia. Bina Aksara

17) Putri, A. P., & Lestari, H. S. (2014). Faktor Spesifik Yang Menentukan Kinerja Perusahaan Asuransi Yang Terdaftar di Bursa Efek Indonesia. E-Journal Manajemen Fakultas Ekonomi Universitas Trisakti, 1(2)

18) Suparman, S. (2019). Aspek-Aspek Hukum Asuransi. PT. Alumni

19) Syaiffuddin, M. (2019). Hukum Kontrak: Memahami Kontrak dalam Perspektif Filsafat, Teori, Dogmatik dan Praktik Hukum (Seri Pengayaan Hukum Perikatan). Mandar Maju

20) Tanninen, M. (2020). Contested technology: social scientific perspectives of behaviour-based insurance. Big Data & Society, 7(2), 205395172094253. https://doi.org/10.1177/2053951720942536

21) Wijaya, F., Pakpahan, K., & Toknado, V. (2021). The balance of contract in online insurance agreements in the era of revolution 4.0 (insurance products of several banks in indonesia). https://doi.org/10.4108/eai.14-4-2021.2312838

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

Najeba Rashed MAHAMED

Technical institute Kirkuk

ABSTRACT: Compared to pupils whose sole language is English, ELLs (students whose first language is not English) have a more difficult time reading grade-level information. Because of their poor performance on these tests, students with this profile are at increased risk of being diagnosed with a learning impairment. In order to assist educators create more effective strategies for teaching English language learners (ELLs), this article gives a synopsis of a research that investigated strategies to aid ELLs in word acquisition and presents the results. Several strategies have shown to be quite effective for ESL students, according to the study. Making ensuring that ELLs understand basic terminology, providing them with enough practice and reinforcement, and using cognates from their native language are all tactics that may be used to teach English as a second language. The challenges of creating effective vocabulary courses for ESL students are finally addressed.
The short time that is usually available for direct vocabulary training, the huge vocabulary gaps that ELLs have in their second language, and the decision of which terms to teach are all substantial obstacles.

KEYWORDS: investigated strategies, ELLs, ESL student, learning impairment, second language

I. INTRODUCTION

While the purpose of this article is to highlight the need of providing ELLs with regular vocabulary training, the aim of this study is to review the literature on effective ways for ELLs' vocabulary development. We will present the study's results and emphasize key points to keep in mind while developing initiatives to expand ELLs' vocabulary.

The rationale for this is because having a large vocabulary impacts several advanced language processes, such as processing grammar, building schemas, and text modeling [1]. Previous models of reading believed vocabulary knowledge to be a major source of variation in reading comprehension specifically because of its influence on these processes. Skilled readers are able to endure a small percentage of unfamiliar terms in a book without causing any disturbance to their understanding, and they are even able to deduce the meanings of such words from contexts that are sufficiently rich.

In contrast, understanding is hampered when there is an excessive amount of terms that are unfamiliar to the reader [2]. Research has shown that vocabulary has an influence on earlier reading and reading-related skills such as phonological, orthographic, and morphosyntactic processes ([3][4][5]. As a result, vocabulary has recently established itself as a more central component in models of reading.

According to the statistics collected at the national level, there are significant and ongoing disparities in the reading abilities of children who speak a language other than English and those who speak exclusively English. performance on the National Assessment of Educational Progress (NAEP) Fourth-grade student examination According to the National Center for Education Statistics, children who were raised in households where a language other than English was never used had a 21–27 point advantage on the scale scores compared to children who were up in homes where a language other than English was always spoken. This was contrasted with youngsters who were in households where English was consistently used. Individuals who are acquiring English as a second language (ELLs) and have a sluggish growth in their vocabulary skills have a reduced capacity to understand written material at the same level as their counterparts who are acquiring English as a second language (EO). These people may be susceptible to being labeled with learning difficulties, while in fact, their restriction is from a restricted English vocabulary and inadequate understanding resulting from this constraint. This option is emphasized in a document that Was published not too long ago and was supported by the United States Department of Education [6]. There is a huge city school system that is mentioned in the report, where:

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

There is a scarcity of credentialed professionals, which is a problem for LEP pupils Period. Specifically, there is a shortage of special educators who are proficient in many languages and school psychologists who are bilingual, both of whom can contribute to the assessment process. Identifying children at an early stage is especially challenging in the district due to instructors often lacking the expertise to distinguish between a learning disability and a delay in the acquisition of English language skills.This poses a substantial difficulty in identifying students.

Additionally, the survey reveals that in The primary sources of information used for allocating assistance to students who are learning English as a second language (LEP) and enrolled in special education were achievement and subject area tests (85.2% of sampled school districts) or oral proficiency tests in English (79% of districts).

Within the eleven sources of information that were used in the process of making judgments about instructional services, six of those sources directly evaluated English.

One indirectly evaluated English reading ability, and one or more English language competence assessments (including but not limited to: achievement/content exams, oral proficiency exams, writing samples, instructor judgments of proficiency, and literacy tests).

II. RESTRICTED LEXICON OF ENGLISH LANGUAGE LEARNERS (ELLS)

There has been a substantial rise in the population of English Language Learners (ELLs) in schools throughout the United States. Since the 1990–1991 academic year, the population of English Language Learners (ELL) has grown by around 105 percent, whereas the total student population has only risen by 13 percent. In the academic year 2000-2001, there were about 4,584,946 students who are enrolled in public schools and are studying English as a second language (ELLs). About 9 % of all students in grades pre-K through 11 fell into this category.

Prior to receiving formal reading instruction in schools, students who read in their native language have typically acquired a vocabulary of around 4,000-6,000 words [7]. However, this is not often the situation for those learning a second language when evaluated in that language.

For instance, [8] conducted a study to assess the receptive vocabulary of Hispanic children in Miami in both Spanish and English. The group of first-graders consisted of 109 students who were fluent in two languages. These students were from families with a moderate to high socioeconomic position compared to the national average. They were separated into two groups based regarding the language spoken in their households, it might be either Spanish and English or exclusively Spanish. Both groups attained scores that were in close proximity to the mean of 89 in Spanish. Although the group composed of people from bilingual families obtained an English score that was more than one standard deviation higher than the group that only spoke Spanish, both groups fared considerably below the average of the reference sample in English. This remained true even when the socioeconomic level of the English learners surpassed that of the reference group.

Understanding a word involves having knowledge about multiple aspects of the word, including its literal definition, its different implied meanings, the different ways it can be used in sentences, the different forms it can take, and a wide range of related words such as synonyms and antonyms [9]. These different components are interconnected with the level of lexical proficiency, which is equally significant to acquiring a large vocabulary (lexical breadth). Research has shown that individuals who are learning a second language have a reduced ability to fully understand and comprehend the meaning of words, especially for phrases that are often used [10].

Evidence from four schools in Virginia, Massachusetts, and California showing fourth graders who spoke Spanish and those who spoke English only (EO) shows that ELLs have a limited vocabulary and lack depth in their vocabulary knowledge [11]. Students' vocabulary breadth was evaluated using the Peabody Picture Vocabulary Test Revised (PPVT-R) in two forms: the L form (pretest) and the M form (posttest). The results supported the information given by [12], showing that ELLs and EO speakers had significantly different vocabulary levels. Moreover, the research showed that this disparity is constant all year round. Also examined in this study was the gap between native English speakers' and English Language Learners' (ELLs') extensive vocabulary. The breadth and depth of the child's vocabulary were gauged by two exercises that tested their understanding of word meanings.

. The first challenge included comprehending polysemy. A sentence judgment task was used, whereby students were required to determine the coherence of sentences such as the ones provided:

"We were growing goatee last week" "Their hate to each other grew" "The inches grew two cm"

The phrases included many polysemous words, such as "grow," which have various meanings. The student's objective was to determine whether the use of these terms made sense in English. Table 1 once again showed a discrepancy in the ratings between EOs and ELLs. The discrepancy may perhaps be wider due to the fact that the EO youngsters were near the maximum level (15) in the spring.

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

The second assignment was a production exercise where students were instructed to provide several interpretations for the phrases " light," " hand," bug "," and ".ring " .Their replies were encoded with more emphasis placed on meanings that were farther afield from the central meaning. For instance, the term "bug" is primarily used to refer to an insect, but its use to describe a flaw in a computer program is less common.

Regrettably, this examination was not conducted during the spring season. During the autumn, English Language Learners (ELLs) achieved scores that were almost half as high as their English Only (EO) counterparts. The average score for 33 ELLs was 3.04 , while the average score for 133 EO students was 10.03.

To summarize, prior studies suggest that English Language Learners (ELLs) possess a smaller repertoire of English vocabulary compared to monolingual English speakers. Furthermore, they also have a worse understanding of the meanings of these terms.

Table 1: The study examines the accuracy of English Language Learners (ELLs) and native speakers in understanding the many meanings of words, as assessed by the Polysemy Comprehension Task.

Group	Fall		Spring	
	Mean	N	Mean	N
English language learners	13.10	109	12.94	32
English only	14.69	203	15.05	43

III. COGNATE KNOWLEDGE TRANSFER

Researchers who study how people learn a second language have found that transfer is an important part of the process. Transfer is "the effect that comes based on the parallels and dissimilarities between the target language and everything previously learned before (and maybe not perfectly)" [13]. One very noticeable thing that Spanish and English have in common is that they both have a lot of related pairs. These give the chance for transfer to happen for a relevant number of words. [14] Says that this busy language has between 11,000 and 14,000 words.

It has been looked into that cognate transfer affects how well people understand English reading and draw conclusions from words. [15] The study focused on examining the level of cognate awareness among a sample of fifth-grade English Language Learners (ELLs) who were instructed to actively seek for and use cognate connections as a strategy for acquiring English language skills. The pupils who received instruction in the approach were better than a control group at inferring meaning for cognates that they had not been taught. However, there was variation in how this knowledge source was used across cognates. The level of phonological transparency between cognates was a major factor in the fifth-grade English Language Learners' proficiency in identifying cognate relationships. Identifying connections between pairs of sounds that are phonologically distinct (such as amorous–amoroso) was simpler than identifying connections between pairs of sounds that are less distinct (such as obscure–oscuro). Furthermore, considering the significant variation in reading proficiency among upper-grade English Language Learners (ELLs), it is crucial to contemplate the linguistic knowledge that is common to all Spanish speakers.

Speakers, no matter how well they know their native or home language, can use to find cognate pairs, or the spoken forms of the words in question.

In a different study with elementary school students, [16] It was shown that fifth and sixth grade English Language Learners (ELLs) who spoke Spanish were unable to comprehend the meanings of English terms that were similar to known Spanish vocabulary. Additionally, they failed to recognize the correlations between cognate pairings that had significant similarities in terms of spelling and meaning.

On the other hand, [17] discovered that Latino sixth- and seventh-graders who were fluent in reading English often and effectively used their knowledge of Spanish to figure out what English words meant. [18] also looked into how cognate awareness affected the English reading ability of ELLs. They found that even though students didn't know much about cognate links, what little knowledge they did have was useful for learning how to read in a second language. Additionally, [19] looked into whether or not cognate recognition skills changed over time. From grade 4 to grade 8, they found that kids got much better at recognizing cognates very quickly.

Another type of information that might be easier to transfer comes from the regular correspondences between Spanish and English endings. For example, the English words {ity}, {ing}, and {ly} are all the same as their Spanish counterparts {idad}, {a/endo}, and {mente}.

[20] Looked into how Spanish–English bilinguals use grammatical information to recognize cognates in both their first and second languages. In particular, they looked at how well students in grades 4–8 could spot how English and Spanish endings are related in a structured way. It was easier for students to identify Cognate stems in suffixed words, such as "amicably," have a

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

higher frequency compared to noncognate stems in suffixed words, such as "shortly." These findings indicate that the transfer of knowledge across different languages may assist students in acquiring English derivational morphological principles. An examination of the findings indicates that understanding the cognate connections between Spanish and English is a compelling illustration of beneficial transfer due to

It helps people understand what they read in English; (2) how much cognate relationships are perceived depends on how much their semantic.

IV. EFFECTIVE TEACHING OF VOCABULARY

Knowing words is important for understanding spoken and written language [21]. It's surprising that in the last 30 years there haven't been many quasi-experimental or experimental studies on teaching English vocabulary to children from language minority families in elementary school. This is different from the large body of studies on vocabulary learning among English-only learners, which is why the National Reading Panel report made vocabulary a key part of reading teaching. The National Reading Panel looked at more than 45 experimental intervention studies that were all about language.

In [22] wrote about a study that looked at how 76 language-minority Mexican American third-graders learned new words. The kids learned about word meanings out loud every day for 20 minutes for about three months, with a focus on complex words, synonyms, antonyms, and words with more than one meaning. One group was shown how to say the words and was told to remember what they meant. The second group used the same list of words but focused on making semantic maps and guessing what the words meant. A third group made a grid that showed how the words related to each other and what they were thought to mean. The fourth group did the same chart as the third group and also did cloze lines. On the second and third days of learning and again 4 weeks later, kids in all groups were asked to write down things they remembered about the social studies chapter. They also took language tests with multiple choice answers. The group that worked on speech and remembering meanings did worse than the group that made relationship maps and finished cloze sentences. The first group also did better on recalling the text than the speech and memory group. This study shows that actively thinking word meanings helps people remember and understand them better. However, it was only a short learning experiment with one list of words, so we can't say what it means in the long run.

Another study on vocabulary with ELLs looked at how well different ways of teaching words to first-grade Spanish-speaking children worked. Children were randomly put into two groups for this doctoral research. During a daily 35-minute English as a Second Language class, both groups learned new words.

In one group, people worked on learning words that were used in single sentences. The other group worked on words that were used in important stories, wrote their own lines using the target words, and looked at picture cards that showed what the words meant. Each group learned 31 words over the course of three weeks of lessons. By the end of the training, the second group (which got more detailed instructions than the first) knew more English words than the control group (9 words learned vs. 21 words learned).

Planned, carried out, and analyzed an intervention for 254 bilingual and monolingual fifth-graders from nine classes in four schools in Massachusetts Virginia and California. The goal was to improve their reading comprehension and word understanding. The 15-week intervention was based on the topic of immigration and used a range of text types, such as fiction, diaries, newspaper stories, and first-person tales of the immigrant experience. Four days a week, lessons lasted 34 to 47 minutes. Every fifth week, the goal words from the previous four weeks were gone over again.

The researchers taught the teachers of the students how to give the lessons. According to research that shows words are best learned in situations with a lot of meaning, the words chosen for the vocabulary list came from short, interesting readings. A small group of vocabulary words were taught every week (12). These were words that students at this level would likely see again and again in different types of books. Even though only a few each week, the children were instructed in a set of terms. The exercises facilitated the children in establishing associations between words and concepts, so enhancing their comprehension of a word's definition and enabling them to acquire knowledge of other words and concepts that are related to the target word. According to the study's recommendation, the classes also instructed students on using roots, affixes, cognates, grammatical linkages, and comprehension tracking to deduce the meaning of words depending on their context.

The English Language Learners (ELLs) did not demonstrate improved performance on the Peabody Picture Vocabulary Test (PPVT) after the intervention. However, they exhibited enhanced performance on several language and comprehension assessments. Students demonstrated higher performance on cloze readings, assessments of word meaning proficiency, and evaluations of word association and grammatical aptitude. Additionally, their performance improved when they included terms with several interpretations into their sentences. Students performed. Much better on a cloze test that was used to measure comprehension,

but the effect on comprehension was not as strong as the effect on word learning. These results make it clear that the different types of training helped people learn the words better.

A recent study in El Paso, Texas, looked at how to help limited English fluent third-graders who spoke Spanish learn a wider range of words The students were from eight elementary schools in two school districts. Since kindergarten, both the experimental group and the control group had been taught reading, language arts, and other subjects in Spanish. Their teachers had told them they were "ready to begin their transition into English." The material was taught as part of a 90-minute reading block over the course of about 23 weeks. It was taught in two ways: through books that could be decoded and through books for kids. DVDs were used to show the words so that people could learn them through decodable writings. There were skits on the DVDs that used key words from the decodable books to show what they meant.

Also, grade-level children's reading was the focus of 30 minutes of speaking language tasks every day.

This second location was the main way that kids learned new words. Teachers taught words before reading them, helped students learn them by reading and talking about each book, and made sure they remembered them by having speaking language tasks after the story was read. Reader's and Writer's Workshops were held for the kids in the control group. The Reader's Workshop was a place where people could focus on reading every day. Students worked with their teacher and other students to improve their understanding skills, read more quickly, and make sure they understood what they were reading during assisted reading, group reading, and solo reading. Through book discussions and tasks that helped them learn new words and better understand what they were reading, students got a better grasp of what they were reading, learned how to draw conclusions and make connections between what they were reading, and became better, more confident readers. The Writer's Workshop made it possible to teach and learn how to write. The class structure set aside time every day to focus on writing. The focus was on the writing process, which mirrored the steps that professional writers take: from coming up with ideas to putting them on paper or the computer, from drafting to getting feedback and using it, and from rewriting to finishing to make sure everything is clear and correct. When students released their work and showed it to their peers, it was the end of the writing process.

V. WHAT WE LEARNED FROM THE STUDY

This part talks about what the study taught us that could help us come up with better ways to help ELLs build their language in the future. It is important to remember that the interventions we talked about earlier were made up of different tactics. Because of this, it is hard to say if some methods used in a solution worked better than others. That being said, it is possible to draw some conclusions from this study. First, it's clear that the approaches used in the studies build on a number of approaches that have been shown to work with English as a Second Language (EO) students. Some of these strategies are giving students definitions and background information about each word; getting them to actively learn words by discussing, comparing, analyzing, and using them; giving them multiple chances to see useful information about each word; and teaching word analysis. Second, it looks like there are a few techniques that may be especially helpful for ELLs. They are talked about in the next part.

Use the students' first language to your advantage.

Students' first language skills if that language has words that sound like English words. For instance, the Vocabulary Improvement Project (VIP) taught students how to use what they already knew about cognates to figure out what new English words mean. Did a study to see how much VIP students used their knowledge of cognates to figure out what words meant. They found that cognate performance was somewhat affected by the features of cognate pairs. Among these factors were (1) the amount of phonetic openness between the cognates and (2) the amount of orthographic overlap that the cognate pair shared. The study's results suggest that students who can read and write Spanish would have access to both orthographic and phonological sources of information about cognate relationships. However, students can also make connections between cognate pairs based on sound alone. This means that students who can speak Spanish well but can't read or write will likely benefit from learning cognate awareness just as much as students who can read and write.

It is very helpful to teach children who can read and write in Spanish how to use their cognate knowledge. This is because many English words that are cognates with Spanish are high-frequency in Spanish but low-frequency in English. This means that students probably know the Spanish words (idea and label) but not the English name. A lot of these words are also what Beck, call "Tier 2 words." Tier 2 words are important and useful. They are used a lot in a wide range of situations and are typical of adults who speak a language. They can be used to teach (words that can be used in different ways so that students can build rich images of them and how they relate to other words and ideas, and words that students already have a good understanding of). Students understand the general idea behind these words, but they need to be precise and specific when explaining it. Some examples are chance (coincidencia), hardworking (industrioso), and lucky (afortunado). The study being done by August, Carlo, and Calderon is looking into whether students need to be at a certain stage of growth in their first language in order to benefit from related knowledge. The experimental study adds to what we already know about

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

transfer and how to teach words well. 160 ELL third graders from two Miami-Dade County Public School District schools have been chosen to take part. Even though they are not new to the United States, the district still helps them by giving them English lessons. The kids can also read and write in Spanish because they get consistent and organized Spanish language arts training for about three hours a week while they are in elementary school. The same number of fifth-graders from the same schools will be asked to join again next year.

Each year, 16 teachers—eight from each school—take part in the study. Half are put in the treatment group and the other half are put in the control group. In both situations (third and fifth grade), the lessons are given four times a week for an hour after school for six weeks. Students in the control situation get lessons that help them learn how to recognize cognates and analyze structural patterns. These lessons are broken up into three theme units, each with nine lessons. The units are about exploring Antarctica, exploring space, and exploring coral reefs. In the control condition, students are shown a modified version of a publicly available program. It has five units that are grouped by theme and are meant to help students improve their language and reading skills.

There will be tests for English vocabulary mastery, Spanish derivational morphology, and English derivational morphology, as well as tests for general vocabulary (English and Spanish WLPB Picture-Word and Listening Comprehension) and reading (Spanish and English WLPB Letter-word and Passage subtests and a Sentence Verification Technique measured at the end of the year). The effects of the interventions will be looked at.

The main studies will look at how success on each result changes depending on the situation and how individual differences before training are taken into account.

VI. MAKE SURE THAT ELLS KNOW WHAT SIMPLE WORDS MEAN.

A second important teaching strategy for ELLs is to learn the names of many things that EO students already know.in Beck and his colleagues call many of these words "Tier 1 words." "Mostly basic words—clock, baby, happy—rarely requiring instruction in school" (p. 16) is what they call Tier 1. But English Language Learners (ELLs) do need help with these words, and it's not always easy to teach them. A plan was made to help teach these words (Calderon et al., in press) and it was based on four factors: concreteness (the ability to be shown or proven), related status, word meaning depth, and usefulness. Tier 1 words, also called basic words, are not one-dimensional, as you will see from the cases that follow.

Like, butterfly could be a Tier 1 word. ELLs might not know this word, but it's easy to teach by showing a butterfly picture while talking about a text. Bug could be another Tier 1 word. You can easily teach words like "March" (move like a soldier) or "bug" (insect) during a text discussion by showing a picture of a bug or moving in place. However, because these words have more than one meaning, they should be taught more to help students understand them better.

Certain Tier 1 words, such as "uncle," are both unrepresentable and lack multiple meanings, but it is nonetheless essential for pupils to acquire knowledge about them. During the process of storytelling, a concise explanation of the word's significance suffices, or a translation suffices if the instructor and pupils share a common language. Idioms and everyday phrases such as "make up your mind," "let's hit the books," and "once upon a time" are also classified as Tier 1. Teachers must educate pupils on the definitions of these terms.

Examples of Tier 1 terms that are cognates are "family" (familia) and "preparation" (preparación). These terms are often used in both Spanish and English, therefore pupils do not need much assistance in learning them since they already understand their meanings in Spanish. The instructor engages in a language exercise where they either provide the English word and the students respond with the corresponding Spanish word, or the teacher provides the English word and the students respond with both the English and Spanish words. Word that goes with it.) The teacher should also point out words that sound alike but are not, and give the right translation. Some examples of words that sound alike but are not are rope (ropa) and embarrassed (embarazada). Lastly, high utility words are those that show up a lot in different types of text or are important for understanding what is being said. Teachers need to make sure that students know these words because not knowing them makes it hard to understand what they are reading.

VII. REINFORCEMENT AND REVIEW

A third way to teach that works especially well for ELLs is to repeat and practice. Reading aloud is one way to repeat words and make them stronger [23] say that read-alouds help younger people learning Dutch as a second language pick up new words faster. English-language learners from language-minority groups in the US have also found this method useful. As with teaching basic words, the read-aloud should use different methods based on the four characteristics of the word we talked about earlier: how real it is, how closely related it is to other words, how deeply it means something, and how useful it is. Teachers can show students real words while they read, and for cognates, they can either say the cognate in Spanish or ask the students to find it.

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

Questions that make students use and understand key words that have already been taught can help them remember them. [24] Said that Tier 3 words are ones that students probably don't know and that aren't used very often in many different areas of life. If a teacher can't show or give an easy description in English for a Tier 3 word, they can give a meaning in Spanish. Some Tier 3 words, like element and region, might need to be taught ahead of time to help students understand the ideas behind them, and then they can be reinforced through conversation while reading the book.

[25] Found that after read-alouds, teacher-directed language development exercises helped students improve their spoken language skills and review and reinforce the meaning of the words taught in the exercise. The exercises were designed to fit the specific words given by the narrative, since various stories called for different types of activities. They learned the use of locative prepositions, for instance, from reading a narrative that included several of them. Students were then asked to utilize the vocabulary they had learned in the read-aloud in other activities, such as tale retells, story mapping, or dramatization, which helped review and reinforce what they had learned. Literary journals were useful tools for reiterating definitions with older students.

[26] The study discovered that including student-directed reinforcement activities was crucial to the intervention program. This was because there was a significant disparity in vocabulary growth between English language learners (ELLs) and English language learners (EOs), and the time available for teacher-directed activities was restricted. Teaching. For instance, we have used Spanish-language audiobooks to help students better understand English words and stories, devised activities to improve their listening and word-using skills outside of class (such as Word Wizard, where students practice what they've learned in class by finding and sharing examples of the target words), and invited parents to help their children's word knowledge grow (in their native language) by sending home word lists and interview questions.

VIII. DIFFICULTIES IN CREATING ENGAGING VOCABULARY LESSONS

Choosing which words to focus on while developing vocabulary treatments for ELLs is a common obstacle. No credible estimates of the vocabulary size of Spanish-speaking ELLs at the beginning of the school year or of their vocabulary development throughout the course of a school year exist in the US. The latest findings from the study by Micco, Tabors, [25] indicate that Spanish-speaking students in Head Start and kindergarten only gain 2.8 points in vocabulary each year on the Woodcock Picture Vocabulary Test. This is significantly lower than the rate of growth that would be required for them to catch up to their English language learner (EO) peers.

Yet, we can't tell what kinds of words kids are learning from these growth rates. Some words, like physical nouns, may be easier to learn, while others, such verbs with complicated argument structures, less imageable terms, and words representing connections, may be much more challenging. The only data available for making educated guesses about the kinds of words that these kids will know, require, and be able to pick up comes from studies of monolingual English speakers.

A lot of Spanish terms that are high-frequency in Spanish are low-frequency in English, thus certain words that are hard for EO pupils may not be so bad for literate ELLs whose first language has cognates with English.

Word choice for education is serious business. Due to time constraints, it is crucial to teach students phrases that they will encounter in real life and that they are not likely to pick up from their peers' English oral speech.

Most of the time in written and spoken forms. An encouraging starting point for word selection may be found in assessments of the vocabulary knowledge of monolingual English speakers in elementary school. [25] Suggests that EO students follow a typical pattern while learning new words. An affluent sample and an English-speaking sample were used as normative samples for the study of root word vocabulary. According to their calculations, the average normative vocabulary increased from 6,200 root words in second grade to almost 8,200 in fifth grade. The lowest 25% of pupils in grades 3-5 gained around three root words daily, whereas the top 25% added approximately 2.3 words daily. Children in the lowest quartile had a very tiny vocabulary in second grade, thus by fifth grade they had only achieved an average fourth grade level.

Another difficulty is that there isn't enough time to directly teach ELLs, and their second language vocabulary is severely lacking. The development and reinforcement of ELLs' word meaning in both school-related and non-school-related contexts necessitates innovative approaches to word exposure. supplementary scripted books aimed at reinforcing word meanings, educational games utilizing picture cards for student practice, incentives to encourage students to actively listen for new or previously taught words beyond the vocabulary lesson, and visually appealing wall displays of the most tangible or highly visualizable words are all illustrative of techniques that expose children to a greater number of words and strengthen their existing knowledge.

The Crucial Function of Vocabulary Development for Students Improving Their English Language Skills

IX. CONCLUSIONS

To summarize, while vocabulary is crucial for understanding, English language learners (ELLs) have less extensive and comprehensive vocabulary knowledge compared to their English-speaking peers. Surprisingly, there has been a scarcity of experimental research in the last 25 years that examines the progression of vocabulary in language-minority students who are learning English as a societal language.

Further investigation is required to ascertain if there exists a specific collection of vocabulary that should be instructed to English Language Learners (ELLs), how this list may vary based on their native language, and the optimal sequence for teaching these terms. Furthermore, it is necessary to evaluate the efficacy of certain techniques for teaching vocabulary to this group. This article aims to encourage and inspire more research on vocabulary acquisition and other linguistically focused treatments that might enhance the reading and educational progress of English Language Learner (ELL) students. In addition, we anticipate that by using effective strategies to enhance vocabulary and comprehension skills in English Language Learners (ELLs), there will be a decrease in the number of children who are identified as having learning disabilities due to poor performance in these areas.

REFERENCES

1) Wallace, C. (2007). Vocabulary: The key to teaching English language learners to read. Reading Improvement, 44(4), 189-194.

2) Hunt, M., & Feng, J. (2016). Improving Vocabulary of English Language Learners through Direct Vocabulary Instruction. Online Submission.

3) Irsani, N., Laila, N., Hardiana, N. D., Aisyah, N., Harahap, N. H., & Ismahani, S. (2023). The Role of the Surrounding Environment in Improving English Ability and Developing Students' Vocabulary. Edu Society: Jurnal Pendidikan, Ilmu Sosial Dan Pengabdian Kepada Masyarakat, 3(2), 1007-1012.

4) Durgunoglu, A. Y., Sagar, A., Fagan, K. E., & Brueck, A. (2021). Improving the Comprehension and Vocabulary Skills of English Language Learners with Content Integrated Language Instruction for Adults. Adult Literacy Education, 3(1), 34-48.

5) Amirzai, G. A. (2021). Assessing the effects of teaching vocabulary in developing receptive skills: A review article. Journal of World Englishes and Educational Practices, 3(3), 15-21.

6) Soro, S. H. (2019). Analysis of English Vocabulary in the Mind of Students. International Journal of Nusantara Islam, 7(2), 220-229.

7) Karoly, A. (2005). The importance of raising collocational awareness in the vocabulary development of intermediate level learners of English. Eger Journal of English Studies, (5.), 58-69.

8) Lawrence, J. F., Capotosto, L., Branum-Martin, L., White, C., & Snow, C. E. (2012). Language proficiency, home-language status, and English vocabulary development: A longitudinal follow-up of the Word Generation program. Bilingualism: Language and cognition, 15(3), 437-451.

9) Ali Mansoor, A. A., Mohammed, O. S. M., Ahmed, H. R., Munasser Awadh, A. N., Abdulfatah, H. M., & Sheikh, E. Y. (2023). English language teaching through a short story: A technique for improving students' vocabulary retrieving. Cogent Education, 10(1), 2161221.

10) Efrizal, D. (2018). Improving students' vocabulary mastery through English movie for second year students at MAN 01 Kota Bengkulu. Al-Lughah: Jurnal Bahasa, 7(1), 46-57.

11) Jannah, I. M., Kuswari, N., Muna, I., & Nabilla, K. (2020, May). Exploring the effects of using game on students' vocabulary mastery: a case study in instructional material and media development class. In International Conference on English Language Teaching (ICONELT 2019) (pp. 184-190). Atlantis Press.

12) Bhatti, M. S., Habibie, A., Noreen, S., Hussain, S., & Bajwa, S. (2021). Realia-Mediated Instruction: An Effective Tool for Improving Young Learners' Vocabulary Skills. Al-Lisan: Jurnal Bahasa (e-Journal), 6(2), 157-166.

13) Stæhr, L.S. (2008). Vocabulary size and the skills of listening, reading and writing. Language Learning Journal, 36(2), 139-152.

14) Umaralieva, M. M., & kizi Yakhyoyeva, S. K. (2023). HOW TO IMPROVE VOCABULARY THROUGH DIFFERENT STRATEGIES. Educational Research in Universal Sciences, 2(6), 445-447.

15) Wawire, B. A., & Zuilkowski, S. S. (2021). The role of vocabulary and decoding language skills in reading comprehension: a cross-linguistic perspective. International Multilingual Research Journal, 15(1), 23-42.

16) Alharthi, M., Bown, A., & Pullen, D. (2020). The use of social media platforms to enhance vocabulary Development in learning a new language: A review of the literature. Arab World English Journal (AWEJ) Special Issue on CALL, (6).

17) Neumann, H., Leu, S., McDonough, K., & Crawford, B. (2020). Improving students' source integration skills: Does a focus on reading comprehension and vocabulary development work?. Journal of English for Academic Purposes, 48, 100909.

18) Celik, B. (2019). The role of extensive reading in fostering the development of grammar and vocabulary knowledge. International Journal of Social Sciences & Educational Studies, 6(1), 215-223.

19) Clark, M. (2013). The use of technology to support vocabulary development of English Language Learners.

20) Singh, M. K. R., Singh, M. K. M., & Eng, L. S. (2015). Effectiveness of oral proficiency in English for secondary schools (OPS-English) programme in improving English language vocabulary among secondary school students. Advances in Language and Literary Studies, 6(6), 201-208.

21) Vocabulary, A. T. P., & Like, G. L. (2005). Why vocabulary instruction needs to be long-term and comprehensive. Teaching and learning vocabulary: Bringing research to practice, 27.

22) Wei, L. (2021). Teaching academic vocabulary to English language learners (ELLs). Theory and Practice in Language Studies, 11(12), 1507-1514.

23) Susanto, A., Halim, F. A., & Thasimmim, S. N. (2019). Vocabulary learning strategies, vocabulary skills, and integrative motivation levels among university students. Vocabulary Learning Strategies, Vocabulary Skills, and Integrative Motivation Levels among University Students, 8(5C), 323-334.

24) Taslim, T., Asrifan, A., Chen, Y., & Nurdania, N. R. (2019). Correlation between student's vocabulary mastery and speaking skill. Journal of Advanced English Studies, 2(2), 65-76.

25) Putu, A. A. A., & Agung, P. M. A. (2021). The Use of Flashcard in English Vocabulary Learning. Journal on Studies in English Language Teaching (JOSELT), 2(2), 25-33.

26) Fatima, B., & Khan, I. A. (2017). Crucial Importance of Vocabulary in The Process of Second Language Learning: An Exploratory Study. European Journal of Education Studies.

Development of Google Sites-Based Social Science Learning Media to Increase Students' Critical Thinking Ability

Aini Aziza[1], Kiromim Baroroh[2]

[1,2]Faculty of Economics and Business, Yogyakarta State University, Yogyakarta, Indonesia

ABSTRACT: This research aims to (1) produce social studies learning media based on google sites to improve critical thinking skills of junior high school students grade VIII (2) determine the feasibility level of social studies learning media based on google sites to improve critical thinking skills of junior high school students grade VIII (3) determine the level of practicality of social studies learning media based on google sites to improve critical thinking skills of junior high school students grade VIII (4) determine the effectiveness of social studies learning media based on google sites to improve critical thinking skills of junior high school students grade VIII.

This development research uses the ADDIE development model which stands for the stages of development, namely: Analysis, Design, Development, Implementation, and Evaluation. The subjects of this study were SMPN 5 Banjit students totaling 60 divided into 2 groups, namely the experimental group and the control group. In this study, data were obtained using test and non-test techniques. The test technique was used to obtain data on the effectiveness of the product which was carried out using a student critical thinking ability test instrument. While the non-test technique was used to collect data on the validity and practicality of the product which was carried out using product validation sheets, material validation sheets, teacher assessment sheets, and student assessment sheets.

The results of this study indicate that the socialexplore website has very high feasibility. The results of material expert validation amounted to 3.79 with a decent category. The results of media validation amounted to 4.44 with a very feasible category. Teacher validation results of 4.40 with a very practical category. The results of user validation amounted to 4.31 with a very practical category. The results also show that the socialexplore website is effective and can help students to improve students' critical thinking skills on the material of the diversity of Indonesian society. The results of the experimental class critical thinking ability test were higher than the control class with an average value of 69.43 and the control class average value of 47.93. The Gain test results of the experimental class at SMPN 5 Banjit amounted to 0.68 with a moderate category.

KEYWORDS: critical thinking, google sites, ADDIE model

I. INTRODUCTION

Education in Indonesia is progressing but is still faced with several challenges, such as low equitable access to education, low quality and relevance of education compared to other countries, and weaknesses in education management related to independence and lack of knowledge and technology. This condition also occurs at SMP Negeri 5 Banjit, a junior high school in a rural area with adequate internet access and computer facilities. However, the use of technology in learning has not been maximized by teachers, who tend to use conventional teaching methods that are less interactive. 21st century learning requires innovation in learning that is oriented to the needs of students and the demands of the times, one of which is by improving students' critical thinking skills. The pre-research survey shows the low critical thinking skills of students, so a solution is needed that can help improve these abilities. In this context, the use of web-based learning media is an attractive alternative.

The development of web-based learning media is a potential solution to improve students' critical thinking skills. It offers an interactive and up-to-date learning experience through multimedia elements such as text, images, audio and video. However, its implementation is still limited due to constraints such as limited internet access, lack of teachers' digital teaching skills, and lack of curriculum-compliant content. Therefore, it is necessary to develop web-based learning media that is effective, easily accessible, and has interactive features that encourage students' critical thinking skills. One alternative development that can be used is Google Sites, which offers a user-friendly interface and is easy to use without requiring complicated IT skills.

Development of Google Sites-Based Social Science Learning Media to Increase Students' Critical Thinking Ability

According to Rosiyana (2021), Google Sites can improve students' learning ability by allowing them to understand the material more broadly and making learning more interesting and fun. This media is free, easy to use, and accessible from various devices, and can be customized to make it more attractive to students (Salsabila & Aslam, 2022). Google Sites is an online application that allows the creation of classroom web pages without the need for complex programming or web design skills. This media is efficient, effective, and economical, and can increase students' interest in learning (Beta & Zurqoni, 2021a). With Google Sites, teachers can manage learning in a structured way and students can learn independently with materials prepared by the teacher (Rizal et al., 2023). Nevertheless, the application of Google Sites in online learning still needs to be improved to increase its effectiveness (Nadil, 2021). Based on this, this research aims to develop social studies learning media based on Google Sites for grade VIII students on the material of the diversity of Indonesian society. This media can be accessed by students and teachers at any time according to their needs. With features that can be explored, this media is expected to improve students' critical thinking skills in social studies.

II. METHODOLOGY

This study uses the Research and Development (R&D) research method by applying the ADDIE development model. The ADDIE model involves five important stages, namely: Analysis, Design, Development, Implementation, and Evaluation. The Analysis stage involves analyzing needs, materials, technology, and curriculum. The Design stage includes making flowcharts, preparing materials and content, and developing research instruments. At the Development stage, the product designed in the previous stage is created and validated by experts. The Implementation stage involves applying the product to the research subject, namely class VIII students at SMP Negeri 5 Banjit. Finally, the Evaluation stage is conducted to evaluate the products that have been developed.

III. RESEARCH RESULT

The development of this web-based learning media involves the Research and Development (R&D) method with the ADDIE model design (Analysis, Design, Development, Implementation, Evaluation), which produces a series of important steps in the development process.

At the Analysis stage, researchers conducted a needs mapping by observing and interviewing teachers. The results show that the current learning media is still limited to printed books, causing learning to be less interesting and students have difficulty understanding the material. Based on this analysis, supporting media that is easy to use and interesting, with features of images, videos, and quizzes are needed to increase student motivation and learning outcomes. Furthermore, at the Design stage, based on the results of the previous analysis, researchers designed learning website media features, materials, research instruments, learning designs, and learning devices. As a result, a dynamic and interactive learning media was created, in accordance with the needs and applicable curriculum.

The Development Stage is the step of making the components that have been designed previously, producing web-based learning media products, LKPD, and Assessment Questionnaire Instruments. Through the creation of Teaching Modules and learning media products, researchers are able to produce learning media that are in accordance with the needs of the independent curriculum used at SMP N 5 Banjit.

The implementation stage in this research involves the application of web-based learning media that has been developed to the subjects, namely social studies teachers and students of class VIII at SMP N 5 Banjit. Implementation is done through synchronous and asynchronous activities. Asynchronous learning is conducted outside of class hours, allowing students to learn more deeply by exploring the material on the website. While synchronous learning is conducted in class, focusing on group discussions and the results of students' independent exploration of online learning.

The flow of learning on the website is done by opening the website link, following the instructions for use, reading the learning objectives, filling in the attendance, accessing the material, and completing the evaluation. The developed product was then tested on a small scale and large scale. The results of the small-scale trial showed that learning media products based on Google sites were considered practical by teachers and students. While the results of the large scale trial also showed a very positive assessment from teachers and students, with a high average score for the aspects of convenience, usefulness, and interest.

At the Evaluation stage, data analysis is carried out to determine the effectiveness of learning media. The assessment was conducted by media experts, material experts, teachers, and students. The evaluation results will provide empirically and theoretically valid conclusions regarding the feasibility, practicality, and effectiveness of learning media based on google sites in learning social studies class VIII. Thus, this stage is important to measure the extent to which the learning media developed can make a positive contribution to the learning process.

Media validation was carried out by material experts and media experts using an assessment sheet that refers to the product eligibility criteria. The validation results show that this website is considered feasible by material experts with an average value of

Development of Google Sites-Based Social Science Learning Media to Increase Students' Critical Thinking Ability

3.79 and very feasible by media experts with an average value of 4.44. Suggestions from material experts and media experts are that the learning objectives and questions used should at least reach the analysis level in Bloom's taxonomy to improve students' critical thinking skills. Thus, this website is expected to help students understand concepts deeply and develop critical thinking skills in evaluating information, inferring relationships, and making informed decisions.

The results showed that the developed website-based learning media, SocialExplore, was effective in improving students' critical thinking skills on the material of the plurality of Indonesian society in social studies class VIII. Testing using the Normalized Gain (N-Gain) test showed that the experimental class, which used Google Sites-based learning media, experienced a significant increase in critical thinking skills compared to the control class that used conventional methods. The Gain value of the experimental class was 0.68, categorized as a moderate improvement, while the control class only reached 0.29, categorized as a low improvement.

Media validation was carried out by material experts and media experts using an assessment sheet that refers to the product eligibility criteria. The validation results show that this website is considered feasible by material experts with an average value of 3.79 and very feasible by media experts with an average value of 4.44. Suggestions from material experts and media experts are that the learning objectives and questions used should at least reach the analysis level in Bloom's taxonomy to improve students' critical thinking skills. Thus, this website is expected to help students understand concepts deeply and develop critical thinking skills in evaluating information, inferring relationships, and making informed decisions.

The results showed that the developed website-based learning media, SocialExplore, was effective in improving students' critical thinking skills on the material of the plurality of Indonesian society in social studies class VIII. Testing using the Normalized Gain (N-Gain) test showed that the experimental class, which used Google Sites-based learning media, experienced a significant increase in critical thinking skills compared to the control class that used conventional methods. The Gain value of the experimental class was 0.68, categorized as a moderate improvement, while the control class only reached 0.29, categorized as a low improvement.

IV. CONCLUSIONS

Based on previous research and discussion, it can be concluded that the development of learning media products based on google sites for social studies subjects grade VIII follows the ADDIE development procedure with the stages of analysis, design, development, implementation, and evaluation.

The assessment results from material experts and media experts stated that the products developed were suitable for use, with an average score of 4.12. The practicality assessment by teachers and students also showed very positive results, with a score of 4.4 and 4.25, respectively, in the very practical category.

In addition, students' responses to this learning media in improving critical thinking skills were also significant. The experimental class that used google sites-based learning media showed a higher increase in critical thinking skills compared to the control class. The results of the gain in critical thinking ability of the experimental class were in the range of values that included the medium category, while the control class was in the low category.

Thus, it can be concluded that the development of learning media based on google sites is effective in improving the quality of social studies learning in grade VIII, especially in developing students' critical thinking skills.

V. ACKNOWLEDGMENT

REFERENCES

1) Abdurrokhim, A., Kuswandi, D., & Ulfa, S. (2022). Pengembangan Pembelajaran Berbasis Web Dengan Pendekatan Guided Discovery Berbantuan Hypermedia Untuk Siswa SMP. JKTP: Jurnal Kajian Teknologi Pendidikan, 5(2), 121–131. https://doi.org/10.17977/um038v5i22022p121

2) Adam, S., & Syastra, M. T. (2015). Pemanfaatan Media Pembelajaran Berbasis Teknologi Informasi Bagi Siswa Kelas X SMA Ananda Batam. CBIS Journal, 3 No 2, 79.

3) Adzkiya, D. S. (n.d.). Penggunaan Media Pembelajaran Google Site dalam Pembelajaran Bahasa Inggris Kelas V SD. Jurnal Teknologi Pendidikan. https://doi.org/https://doi.org/10.32832/educate.v6i2.4891

4) Akker, J., Branch, R. M., Gustafson, K., Nieveen, N., & Plomp, T. (1999). Design Approaches and Tools in Education and Training (1st ed.). Springer Dordrecht.

Development of Google Sites-Based Social Science Learning Media to Increase Students' Critical Thinking Ability

5) Amri, C. (2021). Pengembangan Educational Digital Game Berbasis Teori Van Hiele untuk Menunjang Pemahaman Materi Geometro dan Motivasi Belajar. Universitas Negeri Yogyakarta.

6) Amri, M., Setyosari, P., & Ulfa, S. (2022). Pengembangan Virtual Classroom Berbasis Web Learning Pada Mata Pelajaran Bahasa Inggris Untuk Siswa Kelas VII.Jurnal Kajian Teknologi Pendidikan,5 N 2. http://dx.doi.org/10.17977/um038v5i22022p142

7) Arsyad. (2002). Media Pembelajaran. Rajawali Pers. Aslamiyah, T. Al, Setyosari, P., & Praherdhiono, H. (2019). Blended Learning dan Kemandirian Belajar Mahasiswa Teknologi Pendidikan. Jurnal Kajian Teknologi Pendidikan, 2(2).

8) Azis, T. N. (2019). Strategi Pembelajaran di Era Digital. The Annual Conference on Islamic Education and Social Science, 1 No 2. http://pkm.uika bogor.ac.id/index.php/ACIEDSS/article/view/512

9) Beta, A. R., & Zurqoni. (2021a). Learning Management System (LMS) based on Google Sites as an Effective Learning Media during the Covid-19 Pandemic. International Education Webinar of IAIN Palopo, 51–55. https://proceeding.ftikiainpalopo.ac.id

10) Beta, A. R., & Zurqoni, Z. (2021b). Learning Management System (LMS) based on Google Sites as an Effective Learning Media during the Covid-19 Pandemic. Proceedings International Education Webinar of IAIN Palopo (PROCEEDINGS IEWIP).

11) Bonk, C., & Graham, C. (2012). The Handbook of Blended Learning: Global Perspective , Local Designs. Pfeiffer Publishing

12) Branch, R. M. (2009). Instructional Design: The ADDIE Approach. Springer Science & Business Media. https://books.google.co.id/books?id=mHSwJPE099EC&hl=id&source=gbs_navlinks_s.Darmansyah.(2010). Pembelajaran Berbasis Web Teori Konsep dan Implikasi (Zulfikarni (ed.); 1st ed.). UNP Press.

13) Delamain, C., & spring, J. (2020). Teaching Critical Thinking Skills. Taylor & Francis.

14) DePorter, B. (1999). Quantum Learning. In Quantum learning.

15) Edgar Dale. (1954). Audio-visual methods in teaching. New York, Dryden Press. https://archive.org/details/audiovisualmetho00dale/page/522/mode/2up

16) Enlyft. (2023). Companies using Google Sites. Enlyft. https://enlyft.com/tech/products/google sites

17) Ennis, R. H. (1996). Critical Thinking. Prentice-Hall, Englewood Cliffs, N.J.

18) Firdaus, M. (2022). Pengembangan Media Pembelajaran Matematika Berbasis Google Sites Berorientasi Pada Pemahaman Konsep dan Computational Thinking Siswa Kelas VII. Universitas Negeri Yogyakarta.

19) Gamar, M. M., Faruq, M. S. Al, & Lina, L. (2018). Challenging the Indonesian Primary Education in Industrial Revolution 4.0 Era. Atlantis Press. https://doi.org/10.2991/coema-18.2018.12

20) Gazal, S., Aldowah, H., & Umar, I. (2018). Critical Factors to Learning Management System Acceptance and Satisfaction in a Blended Learning Environtmen. International Conference of Reliabele Information and Communication Technology.

21) George W. Rainbolt, S. L. D. (2014). Critical Thinking: The Art of Argument. Cengage Learning. https://www.google.co.id/books/edition/Critical_Thinking_The_Art_of_Argument/AkHAAgAAQBAJ?hl=id&gbpv=0

22) Gerlach, V. S., & Ely, D. P. (1971). Teaching and media : a systematic approach (2nd ed.). Prentice-Hall, Englewood Cliffs, N.J.

23) Harsanto, B. (2012). Panduan E-Learning Menggunakan Google Sites. E-Learning Unpad.

24) Herdiyana, W. (2023). Analisis Kemampuan Berpikir Kritis dan Kepercayaan Diri Siswa Dalam Memecahkan Masalah Matematika di Daerah Istimewa Yogyakarta. Universitas Negeri Yogyakarta.

25) Johnson, E. B. (2002). Contextual Teaching and Learning: What It Is and Why It's Here to Stay. Corwin Press.

26) Lee, S. J., & Reeves, T. C. (2007). Edgar Dale and the Cone of Experience. Foundations of Learning and Instructional Design Technology. https://edtechbooks.org/lidtfoundations/edgar_dale

27) Mustofiqon. (2012). Pengembangan Media dan Sumber Pembelajaran. Prestasi Pustaka Raya.

28) Nadil, S. A. (2021). Analisis Penerapan Media Pembelajaran Berbasis E-Learning Melalui Aplikasi Tools Google Sites Pada Mata Pelajaran IPS di SMPN 265 Jakarta [Univesitas Negeri Syarif Hidayatullah Jakarta]. https://repository.uinjkt.ac.id/dspace/bitstream/123456789/59583/1/11160150000066_SalsabilaAulia Nadila - Salsabila Aulia Nadila.pdf

29) Nurmanita, M. (2022). Efektivitas Pembelajaran Pancasila Berbasis Google Sites Berbantuan Quizizz untuk Meningkatkan Kemampuan Berpikir Kritis Mahasiswa. Jurnal Pendidikan, Sosial Dan Budaya, 8(1). https://jurnal.ideaspublishing.co.id/index.php/ideas/article/view/644

30) Oguguo, B. C., Fadip, N., Agah, J. J., & Christian, S. (2020). Effect of Learning Management System on Student's Performance in Educational Measurement and Evaluation. Education and Information Technologies.

31) Radhisa, F. Q. (2023). Pengembangan Modul Elektronik dengan Moda Flipped Classroom Pada Materi Virus Guna Meningkatkan Kemampuan Berpikir Kritis dan Kemandirian Belajar Peserta Didik Fase E. Universitas Negeri Yogyakarta.

32) Rafiola, R. H., Setyosari, P., Radjah, C. L., & Ramli, M. (2020). The Effect of Learning Motivation, Self-Efficacy, and Blended Learning on Students' Achievement in The Industrial Revolution 4.0. International of Emerging Technologies in Learning, 15(8). https://doi.org/https://doi.org/10.3991/ijet.v15i08.12525

33) Rakhmawati, N. I. S., Mardliyah, S., Fitri, R., Darni, D., & Laksono, K. (2021). Pengembangan Learning Management System (LMS) di Era Pandemi Covid-19 pada Pendidikan Anak Usia Dini. Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, 6(1), 107– 118. https://doi.org/10.31004/obsesi.v6i1.991

34) Rijal, A. S. (2020). Pengembangan Media Pembelajaran Berbasis Web Untuk Meningkatkan Kreativitas Guru. Jurnal Pendidikan, Sosial Dan Budaya, volume 6(issue 1). https://jurnal.ideaspublishing.co.id/index.php/ideas/article/view/238

35) Rizal, I., Mesin, D. T., Teknik, F., Padang, U. N., Tawar, K. A., Sites, G., & Pembelajaran, M. (2023). Efektivitas Media Pembelajaran Google Sites Untuk Meningkatkan Minat Belajar Mata Pelajaran Mesin Bubut Smk Negeri 1 Padang The Effectiveness Of The Google Sites Learning Media To Increase Learning Interest In Lathe Machine Lessons SMK Negeri 1 Padang. 5(1), 12–20.

36) Rosiyana. (2021). Pemanfaatan Media Pembelajaran Google Sites Dalam Pembelajaran Bahasa Indonesia Jarak Jauh Siswa Kelas VII SMP Islam Asy-Syuhada Kota Bogor. Jurnal Ilmiah Korpus, 5 no 2, 20.

37) Rudinow, J., & Barry, V. E. (2008). Invitation to Critical Thinking (3rd ed.). Harcourt Brace College Publishers, 1994.

38) Rusman. (2013). Belajar dan Pembelajaran Berbasis Komputer. Alfabeta.

39) Salsabila, F., & Aslam. (2022). Pengembangan Media Pembelajaran Berbasis Web Google Sites pada Pembelajaran IPA Sekolah Dasar. JURNAL BASICEDU, 6 Nomor 4.

40) Saluky. (2016). Pengembangan Bahan Ajar Matematika Berbasis Web dengan Menggunakan Wordpress. Eduma, 5 No 1. https://www.syekhnurjati.ac.id/jurnal/index.php/eduma/article/view/685/567 Sanaky, H. A. H. (2013). Media Pembelajaran Interaktif-Inovatif (1st ed.). Kaukana Dipantara. Saputra, M. E. Y., & Effendi, H. (2021). Pengembangan Media Pembelajaran Menggunakan Google Site Pada Mata Pelajaran Instalasi Motor Listrik Untuk Kelas XI TITL DI SMK N 2 Payakumbuh. Journal of Multidiciplinary Research and Development, Volume 3(Issue 1).

41) Sevtia, A. F., Taufik, M., & Doyan, A. (2022). Pengembangan Media Pembelajaran Fisika Berbasis Google Sites untuk Meningkatkan Kemampuan Penguasaan Konsep dan Berpikir Kritis Peserta Didik SMA. Jurnal Ilmiah Profesi Pendidikan, 7(3), 1167–1173. https://doi.org/10.29303/jipp.v7i3.743

42) Sophia Scott. (2008). Perceptions of Students' Learning Critical Thinking through Debate in a Technology Classroom: A Case Study. The Journal of Technology Studies, 34(1). https://doi.org/DOI: 10.21061/jots.v34i1.a.5

43) Suartama, I. K., Setyosari, P., Sulthoni, & Ulfa, S. (2020). Pengembangan Lingkungan Pembelajaran Ubiquitous Berbasis Sistem Manajemen Pembelajaran Moodle. Jurnal Internasional Teknologi Seluler Interaktif. https://doi.org/10.3991/ijim.v14i14.11775

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

Nhung Doan Thi Hong[1], Hang Trinh Thi Thu[2]

[1]Dai Nam University, No. 1 Pho Xom, Phu Lam, Ha Đong, Ha Noi 100000, Vietnam

[2]VNU University of Economics and Business, Vietnam National University, 144 Xuan Thuy, Hanoi 100000, Vietnam

ABSTRACT: This study aims to explore how temporary changes in VAT rates affect consumer perception and behavior in Vietnam. The research is conducted based on self-administered questionnaires collected from residents of Vietnam. The snowball sampling technique was utilized to gather the data set during 2023. A questionnaire was prepared and evenly distributed among three main subjects from three different sectors and with income levels in three groups: low; medium; and high, respectively: (1) Workers from the manufacturing and industrial sector; (2) Lecturers from the education and training sector; (3) Managers from the finance and banking sector. A total of 513 usable questionnaires were analyzed. This paper employs the multiple regression analysis model (OLS) to test the study hypothesis. Analysis results reveal that the reduction of VAT in Vietnam from 10% to 8% has significantly impacted consumer behavior, where consumer products within the daily and durable goods categories are anticipated to grow, however, expenditure on entertainment products or services tends to decrease. Additionally, reasons leading to changes in consumer behavior were also discussed in the study. The findings of this paper will offer insightful perspectives for policymakers in formulating future VAT policies, especially considering the items that significantly influence changes in consumer purchasing power following VAT changes.

KEYWORDS: VAT, consumer behavior, Vietnam

1. INTRODUCTION

Since the 1970s and 1980s, Value-Added Tax (VAT) has become a prominent feature in the tax systems of both developing and undeveloped countries, especially those classified as middle-income countries. VAT is identified as an indirect form of taxation, applied to the added value of a product or service from production and distribution to the point of sale to the consumer, and is paid into the state budget based on the level of goods/services consumption (IMF, 1996). The adoption of VAT rates is determined by the governments of these countries. Since its first introduction in France in 1954, it has now been adopted by 175 countries around the world (OECD, 2023). VAT plays a regulatory role in the income of organizations and individuals consuming goods and services subject to VAT and is an important revenue source for the national budget (Ebrill, M. L. P., Keen, M. M., & Perry, M. V. P, 2001; Hajdúchová, I., Sedliačiková, M., & Viszlai, I., 2015). Between 1985 and 2009, the share of revenue from VAT in global tax revenue increased from 11% to 19%, making it the third most important source of tax revenue after social security contributions and personal income tax. In 2014, VAT revenue in China was about 5.5% of GDP, and about 6.77% in Russia. The mobilization rate from VAT in European Union (EU) countries is especially high (Denmark at 9.9% of GDP, Finland at 8.5% of GDP). From 2018 to 2021, the VAT mobilization rate in EU countries stood at 6.7% of GDP based on the GDP weight in 2021 (OECD, 2023).

Moreover, VAT has become part of everyday life and has had a positive impact in several aspects such as encouraging investment and exports, aligning with international practices, and facilitating the economic integration of businesses; reforming administrative procedures. For instance, in Western Europe, the implementation of VAT is closely related to the broader economic integration efforts among European Community member states: VAT is particularly suitable to avoid distortions of trade associated with the indirect taxes it replaces. In South America, VAT is seen as a more efficient revenue-raising tax and is compatible with the increasingly outward orientation of economic policies. The rapid adoption of VAT in transition economies reflects the need to replace traditional revenue sources (such as taxes on state enterprises) declining due to economic transition with a tax regime suited to emerging market economies; in some cases, it also reflects VAT as a prerequisite for joining the European Union. In many developing countries, VAT has been further promoted by long-term impacts on revenue from trade reform - economic efficiency

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

arguments in favor of VAT have been reinforced when revenue from trade taxes is pressured by deepening trade liberalization commitments (Ebrill, M. L. P., Keen, M. M., & Perry, M. V. P, 2001).

Prioritizing VAT as a tax transformation tool is strongly driven by the reality that VAT involves a broad tax base, capable of distributing the tax burden across the entire economy. Carroll (2010) identified VAT as a critical factor influencing a country's general economic situation, depending on various economic objectives, countries will have different VAT rates for each product or service, most commonly around 10%-25%. EU member states must comply with EU directives and currently form the region with the highest VAT rates in the world, such as Hungary (27%), Croatia, Denmark, and Sweden (all at 25%). Luxembourg charges the lowest standard VAT rate at 16%, followed by Malta (18%), Cyprus, Germany, and Romania (all at 19%). Conversely, Asian countries have relatively stable tax rates ranging from 7% to 15%, with many countries also implementing fiscal policies related to VAT reduction to stimulate consumption following the Covid-19 upheavals such as VAT rates in China varying from 6% to 13% depending on the region; VAT is charged at 5% in the United Arab Emirates (UAE); Oman with a standard tax rate of 7%; Thailand and Vietnam have respectively reduced their standard VAT rate from 10% to 7% and 8% until mid-2024 (Global VAT Compliance, 2024).

In Vietnam, according to the State Budget Settlement of the Ministry of Finance, 11 main taxes are contributing to the budget. The budget mobilization rate from taxes generally increases with the income of country groups. Vietnam's budget mobilization from taxes is relatively high in the region, many years approaching the average of the high-income group. This reflects the relatively large tax burden on Vietnamese people. Excluding resource tax, the 10 types of taxes are divided into two categories: direct and indirect taxes. In recent years, the contribution share of direct taxes has been gradually decreasing, which corresponds to the increasing proportion of indirect taxes. During this time, Value-Added Tax (VAT) has emerged as a primary policy tool for countries in the process of tax system reform aimed at consolidating finances after the global financial crisis, particularly with the demand to strengthen national budget revenue sources. Recently, there has been a trend of shifting from direct to indirect taxes, wherein numerous measures have been implemented to enhance the mobilizing role of VAT revenue. In Vietnam, the share of indirect taxes in the total tax revenue has been increasing, exceeding 60% in 2016 and accounting for 11% of GDP. VAT revenue, which makes up 50% to 60% of the total revenue from indirect taxes from 2006 to 2019, shows the current significant role of VAT as the largest source of tax revenue for the Vietnamese budget.

However, the global economic context has changed significantly after the COVID-19 pandemic, with severe disruptions in supply chains, and economic and financial activities directly affecting the state budget deficit and public debt, as well as consumer spending. Therefore, swift actions following this crisis are essential. Amongst them, fiscal policy is regarded as the best and most popular tool available (Baldwin & Weder di Mauro, 2020). To ensure the maintenance of living standards for the population and assist businesses in overcoming bankruptcy storms, governments have introduced conditions for tax rate reductions or direct financial support packages. Accordingly, on January 11, 2022, the Vietnamese National Assembly passed Resolution No. 43/2022/QH15 on fiscal and monetary policies to support the economic and social recovery and development program. Along with this, a 2% reduction in VAT rates in 2022 was applied to groups of goods and services currently applying a 10% VAT rate. After the policy was implemented, the issue raised was evaluating the effectiveness of the policy regarding consumer reactions in an economy heavily affected by the COVID-19 pandemic. Thus, how does the policy of reducing the VAT rate from 10% to 8% by the Vietnamese government affect the perception and spending reaction of consumers, and what differences does it make for high, medium, and low-income groups for the items with reduced tax rates?

2. LITERATURE REVIEW
2.1. Value Added Tax (VAT) in Vietnam

In Vietnam, research on Value-Added Tax (VAT) commenced with the first phase of tax reform in 1990, being experimentally applied in 1993 to 11 units (in the sugar, textile, and cement industries). On May 10, 1997, the first VAT Law, No. 57/1997/L-CTN, was enacted and officially came into effect on January 1, 1999, replacing sales tax. After several amendments, on March 6, 2008, VAT Law No. 13/2008/QH was introduced to replace VAT Law No. 57/1997/L-CTN, marking a new development in our country's VAT policy. Nearly nine years into its implementation, VAT Law No. 13/2008/QH has been amended and supplemented three times (in the years 2013, 2014, and 2016) to align with the country's socioeconomic development and international economic integration.

Currently, according to the decree on VAT rates last amended in 2016, Vietnam applies three VAT rates: 0%, 5%, and 10%. Specifically, the 0% rate applies to exported goods and services consumed outside Vietnam or in duty-free zones. Some exceptions include transfer of technology, transfer of intellectual property rights abroad; reinsurance services abroad; and postal and telecommunications services. The 5% rate primarily applies to fields related to essential goods and services such as clean water, fertilizers, animal feed, certain unprocessed agricultural products, medical equipment and instruments, and teaching aids. Meanwhile, the standard VAT rate of 10% applies to other taxable cases.

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

According to annual data from the Ministry of Finance, taxes are the main source of budget revenue, usually accounting for more than 70% to over 80% of Vietnam's total state budget revenue. The proportion of indirect taxes is increasing significantly, while the share of direct taxes is decreasing rapidly. Among these, revenue from VAT continues to play the most important mobilizing role for Vietnam's current state budget. The share of revenue from VAT (excluding refunds) accounted for 24.4% of the total state budget revenue for the period 2011 - 2020, with VAT revenue from domestic production and consumption accounting for 17% of the total state budget revenue (Truong Ba Tuan, 2022).

2.2. Theoretical framework

The theory on the impact of taxation has been discussed by many scholars and researchers previously, but distinguishing clearly between the different schools of thought remains a challenge (Seligman, 1892; Mun, 1620; Petty, 1677). Essentially, theories on tax impacts often aim to determine who ultimately bears the tax burden, how changes in taxation can affect different layers or individuals with varying income levels in society, or how taxes are transferred from one individual to another. The effects of indirect taxes can be quite varied. For instance, if consumers are less responsive to the increase in the prices of goods due to taxes, the tax burden falls on the end consumer (Delipalla et al., 2022; Slemrod & Yitzhaki, 2002). On the contrary, if consumers are responsive to price increases, the burden of taxation may fall on the producer (Slemrod & Yitzhaki, 2002).

In the context of this study on Value-Added Tax (VAT), the author draws upon the doctrine of tax impact as discussed by Smith (1776), an English economist and philosopher with significant contributions in the field of taxation and economics. This theory discusses the impact of taxation with a focus on how tax policies affect the prices of goods and the distribution of utilities that accompany them. Moreover, it assumes the effect of implementing a new type of tax on prices and consumption levels of products. In an ideal market, this theory illustrates the impact of tax changes on the efficiency of all economic agents (e.g., consumers, producers, suppliers, and government) (Chetty & Bruich, 2012). It predicts that changing the rate of a tax will alter the price of the targeted product, which may also affect consumption and demand for these products, thereby influencing consumer buying behavior. For example, in the case of a VAT rate change in Vietnam from 10% to 8%, the price of goods and services would theoretically decrease, with prices potentially dropping by about 1.82% (Nguyen Duc Thanh, 2018). Thus, this study assumes that in the short term, the full impact of the VAT rate decrease would be borne by the end consumer. The impact of taxation can be investigated at various levels such as producers, consumers, income sources, income levels, regions, or countries, and across generations (Chetty & Bruich, 2012). In the context of this paper, the theory on tax impact is used to hypothesize the potential impact of VAT changes on consumer behavior towards goods or services experiencing tax reductions for three representative income levels in Vietnam - low, medium, and high - as categorized by the Vietnam General Statistics Office (GSO).

2.3. Empirical studies

Several studies have been conducted on the theme of Value-Added Tax (VAT), focusing on identifying and analyzing the impact of VAT or VAT changes on different entities in various contexts. Some researchers have made significant contributions to the field of VAT by identifying and analyzing its impact on different themes. There are studies evaluating the impact of tax reforms in countries around the world, including the research by Auerbach and Kotlikoff (1987), which analyzed a tax reform program based on simulations of the impact of tax increases on consumer welfare in a general equilibrium model with consumers of different ages. Furthermore, the theme of tax reform in developing countries was analyzed by Emran and Stiglitz (2002) based on a general equilibrium model that takes into account the existence of the informal economic sector. This group of authors focused on evaluating indirect tax reform in developing countries, based on reducing trade taxes combined with increasing VAT to increase tax revenue for the Government. The results of the model show that when the informal economic sector is outside the tax coverage area, the proposed tax reform reduces the overall welfare level in some cases.

Bye, Strom and Avitsland (2003) analyzed the impact of the tax reform program on the overall welfare of the Norwegian economy. The study utilized data from the 2001 tax reform event when the same VAT rate was applied to all goods and services in Norway. The analysis showed that tax reform based on the application of non-uniform taxes would decrease welfare compared to tax reform based on the application of a uniform tax on all goods and services.

In the study by Auziņš et al. (2008), the impact of changing VAT rates on the market equilibrium status was identified, concluding that reducing VAT rates led to lower market prices and increased consumer spending, thereby helping retail sales in stores.

Crossley, Low, and Sleeman (2014) studied the temporary VAT cut in 2008 in the UK by using other European countries as a control group. In December 2008, the UK cut VAT by 2.5% for 13 months to stimulate spending. The study estimated the impact of the cut on prices and spending using alternative strategies to identify counterfactual scenarios. While initially, companies passed on the VAT cut by lowering prices, at least part of the VAT cut was reversed within a few months. Despite this early reversal, the cut increased retail volume by about 1%, thereby generating an overall spending increase of 0.4%. The cut encouraged consumers

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

to make purchases ahead of time and also noted a significant decline in sales volume after the VAT cut period ended. Thus, temporary indirect tax cuts significantly stimulate substitution between purchasing periods.

Bánociová and Ťahlová (2018) identified whether reducing VAT rates affects changes in total household expenditure in EU member countries. Based on a regression model with fixed effects for EU member countries, they found that VAT rates play an important role in affecting total household expenditure on food, thereby affecting consumers.

The study by Behringer, Dullien, and Gechert (2021) on the VAT cut in Germany, as part of the 2020 economic stimulus package, the federal government of Germany tried to stimulate private consumption through various measures. Key measures included temporarily reducing VAT and paying bonuses to children. The study indicates most respondents believed that the price reduction was due to the VAT cut. However, only a small proportion of respondents used the tax cut to make planned purchases or additional shopping. On the other hand, the money bonus for children brought about very clear changes in consumer behavior. More than half of the money was likely used for additional spending; within 12 months, it can be predicted that about two-thirds of the child, bonus money would be used for new expenses. Therefore, targeted transfers to households with low and medium incomes seem to be a better means of supporting the economy in a crisis than temporary tax cuts.

These studies each approach the issue of VAT differently, with many focusing on refining VAT at different economic stages for the regions under study, particularly regarding VAT deductions and refunds law. Additionally, studies on VAT's impact on the economy are of general interest globally and specifically in Vietnam. These typically employ either empirically-based approaches, using econometric models to verify and assess impacts, or predictive approaches, using computable general equilibrium (CGE) models for simulation and forecasting. However, research focusing on the effects of tax cuts on consumers is not yet widespread, even though they are the ultimate tax bearers and significantly affect economic recovery. Particularly in Vietnam recently, the government's fiscal policy of temporarily reducing VAT from 10% to 8% aimed at stimulating consumer demand and thereby reviving economic growth, makes researching from a practical standpoint, tied to the implementation of tax changes, even more essential. Especially, this study specifically divides the subjects into three categories, representing three wage levels in Vietnam's labor market: low, medium, and high, thus providing a deeper evaluation of the change in consumer behavior for each group after the government implemented tax cuts in 2023.

3. AN EMPIRICAL ANALYSIS: DATA AND METHODOLOGY

3.1. Data collection

Given the research on the impact of VAT (Value-Added Tax) changes, the primary data source typically comes from secondary data obtained from annual consumer surveys conducted by government agencies. However, due to the unique nature of surveying three different groups while simultaneously assessing the participants' awareness of VAT changes, the data for this study was collected using a Self-administered Questionnaire (SAQ) method. This study employs a quantitative methodology and primary data collected through SAQs from Vietnamese citizens in 2023 to examine the impact on the populace. SAQ is a commonly used approach to address ongoing discussion issues (Balcells et al., 2010; Miguel et al., 2019). The snowball sampling method involves contacting and soliciting research participants, who were initially approached by the researcher, to involve further subjects among their connections (Naderifar et al., 2017). This method proves effective in reaching a wider audience that the researcher might not directly contact (Khalil & Sidani, 2020; Polit & Beck, 2006). The primary data source for this study comes from surveying three target groups representing key wage levels, encompassing awareness of VAT changes and the alteration in consumer behavior towards products subject to VAT reduction, specifically:

(1) Factory and industrial sector workers, representing the low-income labor group. According to the 2022 General Statistics Office's living standards survey, workers from this sector have basic monthly wages ranging from 4.5 million to 5.5 million VND.

(2) Educators and trainers; representing the intellectual labor group. Based on the same survey, instructors earn an average income, with salaries ranging from 6.5 million to 15 million VND per month.

(3) Financial and banking sector managers; representing the high-income labor group. The survey indicated that managers in this sector earn between 10 million and 25 million VND per month.

Participants were informed about the survey's purpose and assured that their responses would be entirely anonymous and confidential; collected data would solely be used for research purposes. Consent for data collection and publication was obtained before completing the questionnaire. A total of 538 individuals participated, with 14 invalid surveys and 11 incomplete responses, resulting in 513 valid completed surveys. The survey gathered comprehensive personal information regarding gender, age, living area, education level, employment status, current occupation group, and income group. Among the 513 valid surveys, 59% of respondents were female, 82% lived in urban areas, and the most common age group was 22-30 years, accounting for

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

34.9%. The survey respondents were well-distributed across the target groups, with 32.9% being factory workers, 33.7% educators, and the remaining managers. Table 1 details the survey information of the participants.

Table 1. Profile of the participants

Number of surveys delivered: 538					
Total number of respondents: 513 (97%)					
Demographics	Number of Participants	Percentage	Demographics	Number of Participants	Percentage
Age			**Income per month**		
From 18 to 22 years old	57	11,1%	Under 4.5 million VND	48	9,4%
From 22 to 30 years old	179	34,9%	From 4.5 - 5.5 million VND	94	18,3%
From 31 to 40 years old	134	26,1%	From 5.5 - 10 million VND	138	26,9%
From 41 to 50 years old	98	19,1%	From 10 - 25 million VND	168	32,7%
Over 51 years old	45	8,8%	Over 25 million VND	65	12,7%
Gender			**Education level**		
Male	225	43,9	Haven't graduated from University	181	35,3%
Female	288	56,1	Graduated from University	149	29,0%
			Postgraduate	183	35,7%
Living area			**Career**		
Cities	310	54.9	Workers	169	32,9
Rural	103	18.2	Lecturer	173	33,7
			Management	172	33,4

Source: Author's calculation

3.2. Variables measurements and study model

The Seattle Angina Questionnaire (SAQ) was designed and developed in 1995 by John A. Spertus and colleagues at the University of Washington in Seattle, Washington. In this research, the SAQ includes 14 questions aimed at measuring consumer awareness and behavioral changes. Additionally, the sample size for the study was determined as follows:

$$n = Z_{1-\alpha/2}^2 \frac{p(1-p)}{d^2}$$

n: sample size – the number of study participants;

Z: confidence coefficient (for a 95% confidence level, (Z = 1.96));

p: is the proportion estimate of successful sample size 7;

d: desired precision (with (d = 0.05) for 95% precision);

α: level of statistical significance ((\alpha = 0.05)).

Therefore, the minimum sample size is 109. The research was conducted with a survey of 150 subjects each from factories, universities, and enterprises in Vietnam. Participation in the study was voluntary and took about 20 minutes.

The SAQ consists of three parts. The first part collects demographic data of the respondents, and the second addresses the awareness of tax changes, and the consumption of goods related to the VAT change. The demographic section of the questionnaire gathered data on gender, age, residence, employment status, education level, and income group of the participants. The demographic data were used as control variables in this study. Previous documents were based on government data obtained from official data sources; however, currently in Vietnam, there is no specific government data source by sector on consumer

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

expenditure under VAT changes. Therefore, the SAQ was drafted based on the nature of the dependent and independent variables. The general multiple regression analysis model used to test the research hypotheses in this paper is as follows:

$$DVi = \alpha + \beta 1(IFCV)i + \beta 2(GEN)i + \beta 3(AGE)i + \beta 4(LA)i +\beta 5(CA)i + \beta 6(EDU)i + \beta 7(IG)i + \varepsilon i \quad (1)$$

With

- DVi = Dependent variable is the level of consumer behavior change (including PCCB = Potential change in consumer behavior for products affected by the tax change; IOSP = Impact on spending plans; ICI = Increased consumption items (if any); DCI = Decreased consumption items (if any) and RECB = Reasons for changes in consumer behavior)
- (IFCV) = Awareness of VAT change information
- Demographic characteristics of the respondent include six variables: gender (GEN); age (AGE); Place of living (LA); Occupation (CA); Education level (EDU) income group (IG); (ϵ_i) = Remaining error term).

Measurement of VAT implementation information related to the level of awareness, behavior, and reasons for changes in consumer behavior during the tax change period was carried out on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). The nature of the questionnaire components, including demographic characteristics in the survey, was chosen based on previous studies (DeCicca et al., 2021; Khalil & Sidani, 2020).

4. RESULT

4.1. Validation and reliability

The study utilized the Cronbach Alpha method to assess the consistency and reliability of variables within the research. Table 2 shows that the Cronbach Alpha value for the independent variable (1) The information on changes in VAT (IFCV) is 0.61. For the dependent variables, (1) Potential change in consumer behavior for products affected by the tax change (PCCB), the Cronbach Alpha value is 0.73; for (2) Impact on spending plans (IOSP), this value is 0.74; (3) Increased consumption items result in 0.78; (4) Decreased consumption items are 0.79, and (5) Reasons for changes in consumer behavior result in 0.84. Overall, the Cronbach Alpha values for each construct range from 0.61 to 0.84, exceeding the acceptable minimum standard of 0.50 (Khalil & Sidani, 2020; Shantz et al., 2018; AlMekhlafi, 2011), affirming the reliability and consistency of the construct. Factor analysis was conducted to ensure the validity of each measure. The explained variance for each measure also falls within an acceptable range (Table 2).

Table 2. Validation and reliability

Variables	Cronbach's alpha	Cumulative explained variance (%)
Independent variable		
(1) The information on changes in VAT (IFCV)	0.61	34.42
Dependent variables		
(1) Potential change in consumer behavior for products affected by the tax change (PCCB)	0.73	88.79
(2) Impact on spending plans (IOSP)	0.74	63,48
(3) Increased consumption items (if any) (ICI)		
- Everyday/short-term items (ESTI)	0.78	100.000
- Durable goods (DUGO)	0.78	57.29
- Expenditure on entertainment products and services(EXES)	0.78	78.90
(4) Decreased consumption items (if any) (DCI)		
- Everyday/short-term items (ESTI)	0.79	39.41
- Durable goods (DUGO)	0.79	57.29
- Expenditure on entertainment products and services (DCI)	0.79	100.00

(5) Reasons for changes in consumer behavior (RECB)		
- Deferred demand (DEDE)	0.84	76.51
- Changes in income (CAIN)	0.84	92.71
- Anticipated decrease in prices of most goods (DPRI)	0.84	80.56
- Anticipated increase in prices of most goods in the future (IPRI)	0.84	57.29
- Perception of the VAT changes (PEV)	0.84	10.000

Source: Author's calculation

4.2. Descriptive statistics and correlations matrix

The study aims to assess the correlation between independent and dependent variables. Table 3 presents the descriptive statistics of all the research variables. From the dependent variable structure, the standard deviation of the ability to change the consumption behavior of products affected by tax changes is 0.59. The standard deviation of the impact on spending plans is 1.45. The standard deviation of the consumption-increasing factor falls within the range of 0.58 to 0.82, while the consumption-decreasing factor falls within a similar range of 0.51 to 1.50. The standard deviation of the independent variable "Everyday/short-term use" in the consumption-decreasing factor is the lowest among all independent as well as other dependent variables. All research variables have a normal distribution within an acceptable range of 5 degrees for both deviation and kurtosis.

Furthermore, the correlation between the research variables is computed using Spearman's rank correlation statistics (Table 4). The study results also indicate a significant correlation between various factors of dependent and independent variables. The dependent variables, including the ability to change consumption behavior of products affected by tax changes, impact on spending plans, consumption-increasing product (if any), consumption-decreasing product (if any), and reasons for changing consumption behavior, show significant correlation with the independent variable "Information about VAT changes." The likelihood of increased consumption for durable items (ICI-DUGO) has a significant correlation with the perception of information about VAT changes (IFCV) and concurrently has a significant relationship with the ability to change the consumption behavior of products affected by tax changes (PCCB) with respective weights of .106* and .126*.

The likelihood of switching to another brand (SOB) has a significant correlation with the perception of implementing VAT (ETIA); however, it does not show a correlation between implementing VAT and its impact on prices (ETIP). Other dependent variables, including awareness of health effects (HA), information about taxable products (IUH), the impact of taxable products on health (IEPH), awareness of taxable products and health (AEPH), and the future use of taxable products (FUE), have a significant correlation with the perception of implementing VAT (ETIA). Out of the total 13 evaluated variables related to the influence of perception of information about VAT changes, in which 7 variables are evaluated as significantly correlated, the fact that only 6 variables have weak or no correlation with VAT perception shows that the reduction of VAT has not yet significantly affected people's consumption behavior. The underlying reasons related to these results will be further supported and elaborated in the subsequent regression analysis section.

Table 3. Descriptive statistics

	N	Minimum	Maximum	Mean	Std
Independent variable					
(1) The information on changes in VAT (IFCV)	513	1	5	2.18	1.52
Dependent variables					
(1) Potential change in consumer behavior for products affected by the tax change (PCCB)	513	1	5	1.52	0.59
(2) Impact on spending plans (IOSP)	513	1	5	1.85	1.45
(3) Increased consumption items (if any) (ICI)					
- Everyday/short-term items (ESTI)	513	1	5	0.79	0.58
- Durable goods (DUGO)	513	1	5	0.95	0.82
- Expenditure on entertainment products and services(EXES)	513	1	5	1.01	0.69
(4) Decreased consumption items (if any) (DCI)					

- Everyday/short-term items (ESTI)	513	1	5	1.79	1.50
- Durable goods (DUGO)	513	1	5	0.71	0.52
- Expenditure on entertainment products and services (DCI)	513	1	5	0.74	0.51
(5) Reasons for changes in consumer behavior (RECB)					
- Deferred demand (DEDE)	513	1	5	2.91	1.46
- Changes in income (CAIN)	513	1	5	0.41	0.54
- Anticipated decrease in prices of most goods (DPRI)	513	1	5	2.17	1.72
- Anticipated increase in prices of most goods in the future (IPRI)	513	1	5	1.52	1.59
- Perception of the VAT changes (PEV)	513	1	5	2.14	1.51

Source: Author's calculation

Table 4. Correlation matrix

	IFCV	PCCB	IOSP	ICI - ESTI	ICI-DUGO	ICI - EXES	DCI-ESTI	DCI-DUGO	DCI - EXES	DEDE	CAIN	DPRI	IPRI	PREV
IFCV	1													
PCCB	.105*	1												
IOSP	0.167	0.038	1											
ICI - ESTI	0.047	0.054	.125*	1										
ICI-DUGO	.106*	.126*	0.048	0.052	1									
ICI - EXES	-0.001	-0.006	−.094*	−0.045	.187**	1								
DCI-ESTI	.216**	.176**	−0.004	0.061	0.074	−0.064	1							
DCI-DUGO	.0174	0.119	0.215	0.148	0.118	0.064	.331**	1						
DCI - EXES	.135**	0.123	.145	0.034	−.109*	−0.143	.037*	.146**	1					
DEDE	.0205	−0.135	−.137**	0.038	.116**	−0.081	0.075	.106**	.127**	1				
CAIN	.113**	0.0183	0.011	0.014	0.046	−0.064	−.126**	.0063	0.178	.226**	1			
DPRI	.104**	.121*	0.158	0.048	0.045	−0.470	.196**	.148**	192**	.279**	148**	1		
IPRI	−0.025	0.024	−0.034	0.056	−.210*	0.042	0.065	−0.026	−0.066	−0.012	.152**	.512**	1	
PREV	.241**	0.092	−0.012	0.008	−0.009	0.075	0.161	−0.033	−0.023	−0.018	−0.041	−.148**	0.132	1

Note: Pearson correlation coefficients (two-tailed) are provided. * and ** indicate significance at 5% and 1% level respectively.

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

4.3. The regression analysis model (OLS)

Predicting the value of a dependent variable based on one or more independent variables requires meticulous analysis. The enforcement aspects of the Value-Added Tax (VAT) consumption tax are dissected through multiple regression analysis (Ordinary Least Squares) individually to circumvent multicollinearity and unearth dominating internal environments. Results manifested in Table 5 (Panel A) significantly indicate that awareness about the changes in VAT leads to substantial impacts on (1) the potential to alter consumption patterns concerning VAT-adjusted products, with an adjusted R-Square of 0.048 and an F-value signifying a 4.31*** importance. This outcome implies that the reduction of VAT from 10% to 8% has positively influenced consumer behavior, manifesting a heightened likelihood of altering consumption habits. Therefore, Hypothesis H1, suggesting a positive relationship between VAT changes and the ability to modify consumer behavior, gains support. A contributing factor to this result could be attributed to the price elasticity of demand, where consumers are likely to respond positively to reduced prices due to the VAT cut. Lower prices may lead to increased consumer expenditure as products and services are perceived as more affordable, increasing their likelihood of purchase. These facets of the research findings can be connected to theories concerning the influence of tax on the consumption model of individuals, thus validating our hypothesis, contrary to prior studies indicating a negative VAT impact on taxable product consumption (Barzel, 1976; Evans & Farrelly, 1998; Lesley & Muehlegger, 2010; Wang and colleagues, 2021).

However, with regards to Hypothesis H2, concerning the effect of VAT change information on (2) consumer spending plans, the outcome is deemed insignificant. With a low adjusted R of 0.11 and no noteworthy F-statistics, this infers that the awareness concerning VAT reduction scarcely affects the long-term alteration of consumer spending plans. Thus, Hypothesis H2, predicting a proportional relationship between VAT changes and modifications in consumer expenditure plans, is negated. This could be due to the possibility that while individuals might be inclined to modify their consumption behavior, such changes only affect the surface level, leading to an intention to consume differently without genuinely altering the perception and long-term consumption behavior of citizens.

Regarding Panel C, information about VAT changes significantly affects the dependent variables for Increased consumer expenditure on Everyday/short-term items (ICI-ESTI) and Durable goods (ICI–DUGO). The properties of models (3) and (4) possess adjusted R values respectively at 0.059 and 0.062 with statistically significant F values at the 1% level. Nonetheless, the model (6), about increased spending on entertainment products, exhibits a low adjusted R and insignificant F statistics. Therefore, the findings of Panel C imply that from awareness of VAT change information, the public tends to increase consumption of both everyday and durable goods, yet, does not show an increased spending inclination towards entertainment products and services. For Panel D, information about VAT changes does not substantially impact the dependent variables of Decreased consumption of Everyday/short-term items (DCI-ESTI) and Durable goods (DCI -DUGO). The characteristics of models (6) and (7) display low adjusted R values and no significant F statistics. However, it significantly influences (8) Decreased Expenditure on entertainment products and services. This suggests that the VAT reduction does not lead to a decreased consumption of durable and short-term goods but indicates a trend towards reduced spending on entertainment activities. The cause of this could stem from post-COVID-19, where many households are tightening their budgets, hence significantly cutting down on entertainment spending. Consequently, Hypotheses H3a and H3b, supposing that VAT changes positively affect the demand for purchasing short-term and durable products, are correct, however, Hypothesis H3c is not accepted due to its negligible impact on increasing consumption behavior for entertainment products and services.

The outcomes of Panel E elucidate potential reasons for changes in consumption behavior following VAT reduction awareness, including (10) income changes; due to anticipated price decreases of most goods; due to VAT change perception with a 5% significance. The attributes of models CAIN; DPRI; IPRI; and PEV adjust R values respectively at 0.076, 0.047, 0.039, and 0.086 with statistically significant F values at the 1% level. Nevertheless, the model DEDE – representing delayed purchasing needs, does not significantly affect changes in the purchasing behavior of people. This suggests that the modifications in customers' perception and buying behavior could emanate from diverse reasons, ranging from the present to the future, with the most keenly observed factor being the reduced price of products during the tax change period, which further encourages increased consumer spending. Thus, Hypotheses H4b, H4c, H4d; and H4e are accepted. The findings in this study align with previous research (Horáková & colleagues, 2020; Snowdon, 2014). The multicollinearity issue does not pose a problem in any model because the Variance Inflation Factor (VIF) is within an acceptable range of 5. The demographic characteristics of the respondents, including gender (GEN), age (AGE), region of residence (REG), occupation (OCC), and income group (IG), do not have a significant impact on the dependent variables, as shown in Table 5.

Measuring the Impact of Value-Added Tax Cuts on Consumers in Vietnam

Table 5. Regression analysis model (OLS)

	Panel A	Panel B	Panel C (ICI)			Panel D (DCI)			Panel E (RECB)
	PCCB	IOSP	ESTI	DUGO	EXES	ESTI	DUGO	EXES	DEDE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)-	(8)	(9)
IFCV	.229(4.92)***	0.134 (2.14)	0.252(6.61)***	0.223(3.14)***	0.033(5.14)	−.066 (−1.13)	−.031 (−.413)	0.150 (1.138)	0.210 (2.398)
Sex	.016(.287)	.081(1.34)	.054(1.229)	.049(.646)	.062(1.66)	−.015 (−1.45)	−.033 (−.743)	.090(.222)	.025(0.128)
Age	.013(.227)	.025 (1.44)	.060 (.236)	.066(1.239)	.039(.666)	−.061 (−1.35)	−.033(−.833)	−.040 (−.622)	.051 (1.28)
Living area	.048(.171)	−.031 (−.290)	.019(0.211)	−1.57(.056)	−.011(.024)	.104(2.21)	.131(.736)	−.014 (−.566)	−.025 (−.138)
Job	.151(2.332)	−.049 (−.602)	.024 (.203)	.048(1.233)	−.052(.562)	.157(1.43)	−.168(−2.02)	.119 (.360)	.065(.628)
Income	−.022 (−1.164)	.139 (1.075)	.018 (1.034)	−.044 (−.951)	.045(.967)	.012(.494)	−.011(−.104)	.043(.240)	.136(.041)
Constant	1.66(5.48)***	0.697 (4.07)***	1.56(5.01)***	1.51(3.68)***	2.31 (9.66)***	1.133(3.80)***	1.67(7.69)***	1.13(11.05)***	1.56(1.349)***
Radj.	0.048	0.011	0.059	0.062	0.013	0.028	0.015	0.009	0.001
D-W	2.93	1.08	1.46	2.46	2.43	2.25	2.04	2.02	2.06
F-Stat	4.31***	2.04	5.00***	6.28***	4.37	2.54	2.39	8.05***	1.08
VIF(Mx/Mn)	1.01/1.00	1.02/1.00	1.01/1.00	1.01/1.00	1.01/1.00	1.01/1.00	1.01/1.00	1.01/1.00	1.01/1.00
Valid N	513	513	513	513	513	513	513	513	513

Source: Author's calculation

4.4. Additional diagnostics tests

To ensure the reliability of the results, several additional diagnostic tests were conducted (results not shown for brevity). A two-stage least squares regression analysis was employed to ensure that there was no threat to endogeneity due to omitted variable bias. The unstandardized beta coefficients and predicted values showed similar results in both stages. Demographic characteristics, namely gender, age, region of residence, and income group were significant for the VAT reduction information. To further test for heteroscedasticity, the Breusch-Pagan test was conducted. The chi-squared test statistic and corresponding p-value indicated no sufficient evidence to conclude the presence of heteroscedasticity. To test for autocorrelation, the Durbin-Watson test was performed. The results did not suggest the presence of autocorrelation in the model as the Durbin-Watson statistic (1.9) was close to 2 and fell within the acceptable range.

5. CONCLUSIONS

This study experimentally investigates the impact of VAT changes on consumer behavior and explores the potential reasons behind such behavioral changes in the context of Vietnam. The results show that the awareness of tax information among the population is still limited, with the highest proportion being among the workers out of the three surveyed groups. The study also emphasizes that the reduction of VAT from 10% to 8% has significant effects on changing consumer behavior. Specifically, it is expected that there will be an increase in consumption of daily necessities and durable goods while spending on entertainment services will decrease. Therefore, it can be seen that the VAT reduction has played a positive role in increasing the consumption of certain products, thereby stimulating consumer demand and production, and helping to significantly restore the economy after the impact of the Covid-19 pandemic. In addition, the study also identifies the main reasons why people change their consumption behavior, including (1) changes in income; (2) anticipation of price reductions for most goods; (3) anticipation of price increases for most goods in the future; and (4) perception of VAT changes.

6. LIMITATIONS AND FUTURE RESEARCH

This study is limited in terms of its context, scope, and timeframe. On the one hand, the study is limited to examining the impact of VAT on consumer behavior. On the other hand, the study is limited in terms of the research participants, although they represent the three main income groups in Vietnamese society at present. Additionally, the products and services surveyed regarding the increase or decrease in purchasing power are also limited, as the Vietnamese government has limited the items eligible for VAT reduction from 10% to 8%. Therefore, future studies can expand the scope of taxes and the research participants to more accurately and closely assess the impact of tax changes on consumer behavior.

REFERENCES

1) Auerbach, A. J., & Kotlikoff, L. J. (1987). Evaluating fiscal policy with a dynamic simulation model. The American Economic Review, 77(2), 49-55.
2) Baldwin, R., & Di Mauro, B. W. (2020). Economics in the time of COVID-19: A new eBook. Vox CEPR Policy Portal, 2(3).
3) Bye, B., Strøm, B., & Åvitsland, T. (2003). Welfare effects of VAT reforms: A general equilibrium analysis (No. 343). Discussion Papers.
4) Bánociová, A., & Ťahlová, S. (2018). Do reduced VAT rates on foodstuffs in the EU affect consumers? Potravinarstvo, 12(1).
5) Behringer, J., Dullien, S., & Gechert, S. (2021). Wirkung des Konjunkturpakets 2020: Spürbarer Impuls vom Kinderbonus, wenig Wumms durch Mehrwertsteuersenkung (No. 101). IMK Policy Brief.
6) Chetty, R., & Bruich, G. A. (2012). Public Economics Lectures Part 1: Introduction.
7) Crossley, T. F., Low, H. W., & Sleeman, C. (2014). Using a temporary indirect tax cut as a fiscal stimulus: evidence from the UK (No. W14/16). IFS Working Papers.
8) David Williams (1996). Tax Law Design and Drafting (volume 1; International Monetary Fund: 1996; Victor Thuronyi, ed.)
9) Delipalla, S., Koronaiou, K., Al-Lawati, J. A., Sayed, M., Alwadey, A., AlAlawi, E. F., ... & Al-Farsi, Y. M. (2022). The introduction of tobacco excise taxation in the Gulf Cooperation Council Countries: a step in the right direction of advancing public health. BMC Public Health, 22(1), 737.
10) Ebrill, M. L. P., Keen, M. M., & Perry, M. V. P. (2001). The modern VAT. International Monetary Fund.
11) Hajdúchová, I., Sedliačiková, M., & Viszlai, I. (2015). Value-added tax impacts the state budget expenditures and incomes. Procedia Economics and Finance, 34, 676-681.
12) Seligman, E. R. (1892). On the shifting and incidence of taxation. Publications of the American Economic Association, 7-191.
13) Slemrod, J., & Yitzhaki, S. (2002). Tax avoidance, evasion, and administration. In Handbook of Public Economics (Vol. 3, pp. 1423-1470). Elsevier.
14) Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations: Volume One. London: printed for W. Strahan; and T. Cadell, 1776.
15) Petty, W. (1899). The Economic Writings of Sir William Petty: Introduction. A treatise of taxes and contributions. London, 1662. Verbum sapienti [1664] London, 1691. The political anatomy of Ireland [1672] London, 1691. Political arithmetic [1676] London, 1690 (Vol. 1). University Press.

Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice

Ahmad Ainun Najib[1], Putri Ayu Sutrisno[2]

[1,2]Faculty of Law, Universitas Diponegoro, Jl. dr. Antonius Suroyo, Tembalang, Semarang, Indonesia

ABSTRACT: Pancasila, as the basis of the state, continues to experience fluctuations and challenges occasionally. As the basis of the state's view of life, Pancasila directs how the process and law are carried out to fulfill justice amid state life. This doctrinal legal research reflexively examines Pancasila as the basis of the state and the source of law. The research findings show that Pancasila is the basis of the state as well as the basis of the state's view of life, which serves as a guide in the management and structuring of the state. In the legal context, Pancasila is a legal ideal (*rechtsidee*) primary source of state law. Pancasila serves to ensure justice by assessing how the law is formulated and to determine the legality of a regulation. At the praxis level, the Constitutional Court, as the guardian of the state ideology, is expected to make Pancasila a touchstone in testing every regulation.

KEYWORDS: Pancasila, Source of Law, Justice

I. INTRODUCTION

As affirmed in Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia, Indonesia is a state of law. The affirmation of the rule of law raises the understanding that all behaviors of the social life of citizens must be based on the law or by the norms that have been mutually agreed upon. However, the rule of law can only be understood in a more formal, legalistic way. As a state of law, Indonesia places Pancasila as the basis of the state and the legal ideals that direct the law to the ideals society desires. From this, it can be understood that the desired state of law could be more pragmatic. It views legal issues as limited to being resolved based on positively applicable regulations (Silalahi, 2024). More than that, in the conception of the Pancasila state of law, the law protects the noble human values manifested in the ideals of life together.

As the basis of the state, Pancasila is the basis for all elements of behavioral life, starting from the legal, economic, and political basis for social relations between citizens (Moerdiono et al., 1996). However, there is a widening gap between ideals and reality at its operational level. Pancasila is often a formality and rhetoric repeated by the government. While the scenery on the ground is even more heartbreaking, politics increasingly shows its primitive face that only pursues power. Representative democracy led by wisdom is now replaced by mass mobilization, which is increasingly exacerbated by noisy (buzzers) without substance, the exploitation of natural resources is increasingly widespread, labor rights are increasingly marginalized, and massive privatization of public services, especially in the education and health sectors. In short, social welfare still feels far away.

As a collective agreement, *kalimatun sawa*, *common platform*, Pancasila is a long-term project of the nation that needs to be maintained and actualized together (Asshiddiqie, 2016). According to Gunawan Mohammad, Pancasila is not ready for use because it recognizes the existence of creative interpretations. Pancasila opens the possibility of becoming void, a frozen and rigid doctrine (Latif, 2011). This shows that a comprehensive understanding is needed as the operational basis of Pancasila to answer the challenges from time to time.

In its journey, it is undeniable that Pancasila is perceived variously. Starting from Soekarno with his Nasakom and Soeharto, who were committed to purifying Pancasila, both tried to perceive and interpret Pancasila as the foundation of state management. But in the end, Pancasila seemed only as a means of legitimizing power (Bo'a, 2018). Moreover, in the New Order era, Pancasila appeared to be a rigid and anti-critical sacred doctrine. The values of Pancasila, which the founding parents dug from the earth of Indonesia, now need to be grounded again as a reference for steps and behavior in structuring a better state of life. Reconstruction in operationalizing Pancasila certainly needs to be pursued continuously and continuously. Although it is a small part of the effort in that direction, this paper wants to dive more sharply to examine the position of Pancasila as the Basis of Philosophy, State Foundation, and Source of Law.

Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice

Based on the above background, this research will answer the following problem formulations:

1. What is the consequence of the value of Pancasila as the basis of the state in the life of the state?
2. How does Pancasila influence as a source of law in realizing justice?

II. RESEARCH AND METHODS

This doctrinal legal research reflexively examines Pancasila as the basis of the state and the source of law, which relies on norms or library resources for argumentation. In normative research, legal principles are applied using legal systematics to analyses regulations vertically and horizontally and compare applicable laws (Sonata, 2015). The study adopts a legal norm approach by examining applicable laws and regulations comprehensively to understand the rules related to the research problem.

III. RESULT AND DISCUSSION

A. Consequences of Pancasila as the Foundation in State Life

In every country of the world, there is always either explicitly or implicitly a view of life, ideals, values and beliefs that want to be realized in concrete reality as the basis for state administration (Moerdiono et al., 1996). So, that was also the background of Dr. Radjiman Wideodiningrat, as Chairman of BPUPK, when asking BPUPK members questions regarding the basis of the independent Indonesian state. This was the beginning of the milestone where the nation's basic philosophy was discussed and debated. The fundamental and fundamental question about the basis of the state then gave rise to various responses of views(Budi, 2018).

Dozens of attendees took turns expressing their views based on the state, some of which were described by Muhammad Yamin and Soepomo. The state foundation proposed by Muhammad Yamin included Nationality, Humanity, Divinity, Democracy, and People's Welfare (Budi, 2018). As for Soepomo's offer, divinity, humanity, unity, deliberation, and justice/welfare principles were implicitly mentioned based on the integralist state Staatsidee (Latif, 2011). In the end, Soekarno carefully summarized the previous thoughts of Mohammad Yamin, Soepomo, and dozens of other speakers regarding the conception of the state foundation, which he called Pancasila. The five principles that glue all elements of the nation include Indonesian Nationality, Internationalism or Humanity, Consensus or Democracy, Social Welfare, and God with Culture (Panitia Persiapan Kemerdekaan Indonesia (PPKI), 1945).

Referring to the history of the journey of Pancasila above, it can be said that Pancasila is the basis of the state philosophy (philosofische grondslag), a view of life (weltanschauung), a belief framework that occupies an essential position in the life of Indonesian nationality and statehood (Wiguna, 2021). As the nation's philosophy of life, Pancasila incarnates a value system that is aspired to together; it forms a belief in group life and a measure of the welfare of group life (Triputra, 2017). Thus, Pancasila is a static basis that unites and is a dynamic guiding star (Leitstar) that guides the nation in achieving its goals. In such a position, Pancasila is the source of identity, personality, morality, and the direction of the nation's salvation (Aristo Evandy A.Barlian & Annisa D. Permata Herista, 2021).

As a nation, Indonesia is a community built on shared experiences. In other words, what unites Indonesia is the experience of oppression, the experience of injustice, and the experience of various atrocities and humiliations suffered together. The Indonesian nation was born to end bitter experiences and realize common ideals. Therefore, the country becomes a projection forward as well as backward (Anderson & Anderson, 1999). Pancasila, which is extracted from the soul of the nation (volksgeit), is the basis on which Indonesia stands to be a unifier and a guide in achieving the nation's goals.

In addition, Pancasila is also the basic philosophy of the Indonesian state. However, it must be understood that the nation of philosophy is broader than the Western sense. The definition of philosophy is divided into two areas: western philosophy and Eastern philosophy. According to Western philosophy, philosophy is a science with particular objects, methods, and systematics. In Western philosophy, the ratio (intellect) plays a significant role. With this ratio, humans in the Western world can develop science and technology to answer the challenges of nature. In Eastern philosophy, philosophy is a view of human life that emphasizes intuition. In Eastern philosophy, humans learn to educate humans to become wise; with human wisdom, they will live better and more perfectly. Thus, philosophy is a science and philosophy is a way of life (Darmodiharjo & Shidarta, 1995).

Pancasila, in this case, is positioned into Eastern philosophy, which implies that Pancasila contains the ideals and worldview of the Indonesian people regarding human relations with God, human relations with fellow humans, human relations with fellow nations, human relations with their homeland, and human relations with property (Pradhani, 2018). This shared ideal is called a state philosophy that functions as a *philosophische grondslag* in the context of state life. Pancasila, as the worldview of the Indonesian people, is five basic philosophical-ideological principles to realize the four ideal goals of the state, namely: to protect the entire nation and the blood of Indonesia; to improve the general welfare; to educate the country; and to participate in implementing world order based on independence, lasting peace and social justice (Pasaribu & Briando, 2019).

Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice

Pancasila, as a way of life, can be said to have undergone a crystallization process, then logically systematized to be socialized again. As a value system, Pancasila was consciously chosen by the Indonesian people and believed to be true to be realized in society, nation and state life. In such a position, Pancasila is also the ideology of the Indonesian state. Pancasila functions as the adhesive ideology of the Indonesian nation (Susanto, 2021).

As an ideology, Pancasila is interpreted as the basis of a state system for all people and nations, which is also the spiritual principle of the nation. In addition, the Pancasila ideology is based on the values of Godhead, Humanity, Unity, Democracy, and Justice (Moerdiono et al., 1996). Pancasila is believed to have high quality as an ideology because it contains three dimensions, namely:

a) Idealistic dimension, which means that the values contained in Pancasila are systematic and rational.
b) The rationalistic dimension, interpreted as an ideology Pancasila must be able to reflect the reality of the lives of its people.
c) The flexibility dimension means that the Pancasila Ideology has flexibility that allows and can stimulate the development of new thoughts relevant to the nation's value.

As a state ideology, the essence of Pancasila is values that are summarized in a complete and unified system called the Pancasila Philosophical System. As a philosophical system, the precepts of Pancasila have a mutually binding relationship with one another. According to Shidarta, as an intellectual system, Pancasila is positioned as a subject that gives judgment (*genetivus subjectivus*) to everything that concerns social life (Darmodiharjo & Shidarta, 1995). In other words, Pancasila as a way of life is a product of the Indonesian philosophical process, which is final. This philosophical system is then used for practical purposes as a guide in implementing community and state activities, including building a legal system that follows the values and goals of Pancasila (Eddyono, 2019).

Pancasila has such a rich spirit and soul that Bertrand Russell, the British philosopher, called it a creative synthesis between the Declaration of American Independence (which represents capitalist democratic ideology) and the Communist Manifesto (which represents communist ideology). Thus, the founding parents of this nation have bequeathed to us a national view of life, basic philosophy (*philosofische grondslag*), and national ideology (*staatidee*) that is so visionary far ahead (Latif, 2011).

Given the importance of the value of Pancasila as an abstract view of life, further elaboration is needed to operationalize the value into a more concrete life. During the New Order era, this effort was realized by establishing the Education Development Agency for Implementing Guidelines for the Cultivation and Practice of Pancasila (BP7). BP7 was a state institution that coordinated the implementation of the Guidelines for the Cultivation and Practice of Pancasila (P4). Along with the fall of Soeharto, BP7 was also disbanded. The absence of a reform agenda intersecting with Pancasila alienates its value from development programs (Thontowi, 2016). This condition then prompted the issuance of Law No. 54 of 2017 concerning the Presidential Working Unit for Pancasila Ideology Development (UKP-PIP), later replaced by Law No. 7 of 2018 concerning the Pancasila Ideology Development Agency (BPIP).

Despite efforts to realize the value of Pancasila into a more concrete realm through the establishment of state institutions and bodies, deviations from the value of Pancasila still need to be found. Worse, these deviations are carried out by the government itself. During the New Order era, although the government intensively campaigned for Pancasila as the state's foundation, freedom of association and voice of opinion was severely restricted. Moreover, the government seemed to be the embodiment of Pancasila itself, so the rejection of government programs was considered rejecting Pancasila. Likewise, in the following period, the absence of Pancasila values at the beginning of the reformation caused the nation to be confused in the face of globalization. In addition, corruption and nepotism flourished throughout the country.

Seeing these conditions requires serious effort to put back Pancasila as the foundation of statehood. Pancasila needs to be re-internalized into every human being of the archipelago, especially those who sit in the seat of power (Pradhani, 2018). A worldview and ideology are enough to be socialized, but more importantly, they need to be exemplified, especially by those who carry the people's mandate. So that the values of Pancasila can be internalized in every government policy product and legislation drafted by the legislature. The presence of BPIP as an institution that still exists to guide the value of Pancasila to all state administrations needs to be supervised together. Hopefully, BPIP will not fall back as it has; it will stamper government policy.

B. Juridical Review of Pancasila as a Source of Law in Realizing Justice

It has been described earlier that in the life of the Indonesian nation, Pancasila is the fundamental value of the state. As a value, of course, Pancasila is in an abstract form. The abstract value of Pancasila, if it is to be used as a guideline for society, state and nation, certainly needs to be realized in a more concrete form in the form of norms, including legal norms (Azhari, 2012). So, the task of jurists is to conceptually translate abstract accentuation into a legal system.

Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice

Pancasila, as the basis of the state, can be interpreted as a state idea (*Staatsidee*). State ideals are ideas about the ideal and best state a nation can imagine. In this state ideals, there are several sub-sections, such as legal, political, economic, and so on. The legal mind (*rechtsidee*) is the ideal picture of law according to a nation. Thus, legal ideals must be coherent with the ideals of the state. In the Indonesian context, the Indonesian legal ideal must align with the Pancasila ideology (Darmodiharjo & Shidarta, 1995).

The provision of Pancasila as the ideal of law can be seen in the Explanation of the 1945 Constitution number III. This provision is then also emphasized in MPRS Tap No. XX/MPRS/1966 which was later revoked by MPR Tap No. III/MPR/2000 also defines the legal mind as the source of all sources of law or legal order for the people of Indonesia. Further affirmation is also contained in the provisions of Law No. 10 of 2004, as revoked by Law 12 of 2011 and its various amendments, that Pancasila is the source of all sources of state law.

According to Jawahir Thontowi, in legal science, what is meant by the source of all sources of law in the context of Pancasila is the source of recognition, the source of origin, and the source of value that causes the rule of law to arise (Thontowi, 2016). Furthermore, Dahlan Thaib explained that the source of all sources of law is a view of life, awareness, legal ideals, and moral ideals encompassing a nation's psychological atmosphere and character. The view of the life of the Indonesian nation is that which contains moral and legal ideals, and the character and soul of the nation is Pancasila. So, Pancasila is a reference source for preparing Indonesian legal norms. In other words, the existing laws and regulations must be animated by the five fundamental values of Pancasila: the value of divinity, the value of humanity, the value of unity, the value of democracy, and the value of justice.

Moreover, in its position as a legal mind, the formation of law, the application of law and its implementation must be based on and not in conflict with the fundamental values of Pancasila (Wardhani et al., 2020). According to Gustaf Radbruch, the legal mind has constitutive and regulative functions. The constitutive function means that Pancasila determines the basis of a legal system that gives meaning and meaning to the law itself. Meanwhile, what is meant by the regulative function is to place Pancasila as a value guide to determine whether a positive law is fair or not (Najib, 2020).

In addition, the Constitutional Court (MK), as a high state institution authorized to interpret the 1945 Constitution, has also affirmed the same. In Decision Number 100/PUU-XI/2013(page 86), the Constitutional Court emphasized that Pancasila occupies a separate position in the framework of thinking of the Indonesian nation and state based on the constitution, namely in addition to being the basis of the state, also as the basis of state philosophy, state fundamental norms, state ideology, state legal ideals, and so on. Thus, it becomes clear that the position of Pancasila in the Indonesian legal system is as the legal ideals of the Indonesian nation (*rechtsidee*); Pancasila is the source of all sources of law.

As a legal ideal, according to A. Hamid S. Attamimi, Pancasila, is in its position as a legal idea and state fundamental norm. As a legal idea, Pancasila is located outside the legal system and functions constitutively and regulatively against existing norms in the legal system. Meanwhile, Pancasila, as the state's fundamental norm, functions to create all lower norms in the legal norm system. Making Pancasila the ideal of law means that Pancasila is the source of all sources of law. The formulation of Pancasila is contained in the Preamble of the 1945 Constitution. If referring to Nawiasky's theory, the Indonesian Staatsfundamentalnorm is the Preamble of the 1945 Constitution because it includes the formulation of Pancasila (Muttaqin et al., 2024). By placing Pancasila as the State's Fundamental Norm, the structure of Indonesian legal norms, according to A. Hamid S. Attamimi are:

   a) Staatsfundamentalnorm: Pancasila (Preamble of the 1945 Constitution)
   b) Staatsgrundgesetz: The body of the 1945 Constitution
   c) Foemell gesetz: Law
   d) Verordnung en Autonome Satzung: implementing regulations ranging from government regulations to regional regulations

However, a different view was expressed by Jimly Asshiddiqie; according to him, if the Preamble of the 1945 Constitution is a Staatsfundamentalnorm, then it has placed the Preamble of the 1945 Constitution separate from the Body of the 1945 Constitution (staatsverfassung). This split will certainly confuse when referring to Article II of the Supplementary Rules of the 1945 Constitution (amendment), which reads, "The 1945 Constitution of the Republic of Indonesia consists of a Preamble and Articles" (Asshiddiqie, 2016).

In addition, it is mentioned in the Explanation of the 1945 Constitution that the Constitution creates the main ideas contained in the preamble in its articles. It also states that "These thoughts embody the legal ideals (reconsider) that govern the basic laws of the state, both written (Constitution) and unwritten laws. The Constitution creates these ideas in its articles". By looking at the Explanation of the 1945 Constitution, according to Jimly Asshiddiqie, it appears that the Preamble of the 1945 Constitution is a unity with its articles. According to Jimly Asshiddiqie, Pancasila, which was editorially agreed upon on August 18, 1945, contained in the Preamble of the 1945 Constitution, is a unity with the articles of the 1945 Constitution (Asshiddiqie, 2020). It can also be

Reactualization of Pancasila as a Source of Indonesian Law in Realizing Justice

seen historically in the process of drafting the Preamble of the 1945 Constitution, which is a series with the discussion of the issue of the form of the state, the representative body of the people and the advisory body in the 1945 Constitution by BPUPK.

Thus, Jimly Asshiddqie emphasized that although the Preamble of the 1945 Constitution is the main idea that is highly abstract and elaborated in the articles, it is not the basis for the validity of the articles of the 1945 Constitution. The Preamble of the 1945 Constitution (including Pancasila) is a written constitution of the Indonesian nation. Placing Pancasila in the constitution also places it as an abstract norm that will provide valuation both constitutively and regulatively to the norms below it. In such a position, where the Preamble of the 1945 Constitution and Pancasila become a unified part of the constitution, the main ideas of Pancasila can genuinely become a *rechtsidee* in the development of the Indonesian legal system.

Although there are differences regarding the position of Pancasila in the hierarchy of norms, no one rejects the idea that Pancasila is a source of law in Indonesia. As a source of law, Pancasila must be operationalized in a more concrete form. Pancasila is a touchstone to measure whether a regulation can be declared valid. Therefore, the Constitutional Court is important in manifesting Pancasila in law testing. The Constitutional Court is not only the guardian of the Constitution but also the guardian of state ideology. Therefore, every decision of the Constitutional Court should be a manifestation of the values of Pancasila (Muttaqin et al., 2024). Thus, every decision of the Constitutional Court is not only a reflection of the Constitution in the narrow sense in the form of articles in the body but is a reflection of the values of Pancasila, which in turn reflects the spirit of social justice.

IV. CONCLUSIONS

As described above, Pancasila, in the conception of the state, is a shared ideal that functions as a folosofische grondslag in the life of the Indonesian nation and state. This idea aligns with the Eastern tradition that interprets philosophy as a way of life. Pancasila as a way of life is the nation's values that have undergone a crystallization process by the founding parents. These values are a guide in the management and structuring of state life. Thus, Pancasila is the basis of philosophy and the foundation of the Indonesian state. Pancasila was consciously chosen by the Indonesian people and believed to be true to be realized in society, nation and state life. In such a position, Pancasila is also the ideology of the Indonesian state.

As a state ideology, Pancasila has become a common guide in managing the state in the legal, economic, social, and other fields. In this legal field, Pancasila occupies a position as a legal system (rechtsidee). In its position as a source of law, Pancasila has a constitutive and regulative function. Therefore, operationalizing the values of Pancasila in every regulation requires the role of the Constitutional Court as the guarding state ideology. Every decision of the Constitutional Court must reflect Pancasila values that provide a sense of justice.

REFERENCES

1) Anderson, B. R. O., & Anderson, B. R. O. (1999). Komunitas-komunitas Imajiner: Renungan tentang Asal-usul dan Penyebaran Nasionalisme (Cet. 1). Pustaka Pelajar [u.a.].

2) Aristo Evandy A.Barlian & Annisa D. Permata Herista. (2021). Pembangunan Sistem Hukum Indonesia Berdasarkan Nilai-Nilai Pancasila Sebagai Ideologi Politik Bangsa. Jurnal Lemhannas RI, 9(1), 88–98. https://doi.org/10.55960/jlri.v9i1.379

3) Asshiddiqie, J. (2016). Konstitusi bernegara: Praksis kenegaraan bermartabat dan demokratis (Cetakan kedua). Setara Press.

4) Asshiddiqie, J. (2020). Teori hierarki norma hukum. Konstitusi Press.

5) Azhari, A. F. (2012). NEGARA HUKUM INDONESIA: DEKOLONISASI DAN REKONSTRUKSI TRADISI. JURNAL HUKUM IUS QUIA IUSTUM, 19(4), 489–505. https://doi.org/10.20885/iustum.vol19.iss4.art1

6) Bo'a, F. Y. (2018). Pancasila sebagai Sumber Hukum dalam Sistem Hukum Nasional. Jurnal Konstitusi, 15(1), 21. https://doi.org/10.31078/jk1512

7) Budi, J. (2018). Pendidikan Kewarganegaraan Untuk Perguruan Tinggi (1st ed.). Rajagrafindo Persada.

8) Darmodiharjo, D., & Shidarta. (1995). Pokok-pokok filsafat hukum: Apa dan bagaimana filsafat hukum Indonesia. Gramedia Pustaka Utama.

9) Eddyono, L. W. (2019). Quo Vadis Pancasila sebagai Norma Konstitusi yang Tidak Dapat Diubah. Jurnal Konstitusi, 16(3), 585. https://doi.org/10.31078/jk1637

10) Latif, Y. (2011). Negara paripurna: Historisitas, rasionalitas, dan aktualitas Pancasila. Gramedia Pustaka Utama.

11) Moerdiono, Poespowardojo, S., Hamid, A. A., Padmo, W., Sastrapratedja, Abdurrahman, W., & Selo, S. (1996). Pancasila Sebagai Ideologi. BP-7 Pusat.

12) Muttaqin, L., Atmoredjo, S., & Omara, A. (2024). Relasi Pancasila dengan Putusan Mahkamah Konstitusi Sebagai Sumber Hukum di Indonesia. Jurnal Konstitusi, 21(1), 77–97. https://doi.org/10.31078/jk2115

13) Najib, A. A. (2020). Pergeseran Peran Partai Politik dalam Mewujudkan Produk Hukum Yang Berdasarkan Pancasila. Nurani Hukum, 2(2), 1. https://doi.org/10.51825/nhk.v2i2.8641

14) Panitia Persiapan Kemerdekaan Indonesia (PPKI). (1945). Risalah Sidang Badan Penyelidik Usaha-Usaha Persiapan Kemerdekaan Indonesia (BPUPKI). Sekretariat Negara Republik Indonesia (Setneg RI).

15) Pasaribu, P. Y., & Briando, B. (2019). Internalisasi Nilai-Nilai Pancasila dalam Penyusunan Kode Etik Aparatur Pengawas Internal Pemerintah (APIP). Jurnal Ilmiah Kebijakan Hukum, 13(2), 245. https://doi.org/10.30641/kebijakan.2019.V13.245-264

16) Pradhani, S. I. (2018). KONSEPSI MANUSIA INDONESIA DALAM PERSPEKTIF IDEOLOGI HUKUM INDONESIA. Mimbar Hukum - Fakultas Hukum Universitas Gadjah Mada, 30(1), 48. https://doi.org/10.22146/jmh.29781

17) Silalahi, A. D. (2024). PARADOX OF STATE OF LAW IDEA ON PANCASILA PHILOSOPHICAL JUSTIFICATION AS SOURCES OF LAW. Jurnal Konstitusi, 21(1), 62–76. https://doi.org/10.31078/jk2114

18) Sonata, D. L. (2015). METODE PENELITIAN HUKUM NORMATIF DAN EMPIRIS: KARAKTERISTIK KHAS DARI METODE MENELITI HUKUM. FIAT JUSTISIA:Jurnal Ilmu Hukum, 8(1). https://doi.org/10.25041/fiatjustisia.v8no1.283

19) Susanto, E. (2021). SILA KE-EMPAT PANCASILA DAN IKLIM DEMOKRASI INDONESIA SAAT INI. Masalah-Masalah Hukum, 50(1), 84–93. https://doi.org/10.14710/mmh.50.1.2021.84-93

20) Thontowi, J. (2016). Pancasila Dalam Perspektif Hukum Pandangan Terhadap Ancaman "The Lost Generation. UII Press.

21) Triputra, Y. A. (2017). Implementasi Nilai-Nilai HAM Global Ke dalam Sistem Hukum Indonesia yang Berlandaskan Pancasila. Jurnal Hukum IUS QUIA IUSTUM, 24(2), 279–300. https://doi.org/10.20885/iustum.vol24.iss2.art6

22) Wardhani, L. T. A. L., Ibrahim, F., & Christia, A. M. (2020). Koherensi Sistem Pemilihan Kepala Daerah Di Indonesia Terhadap Nilai-Nilai Demokrasi Pancasila. Jurnal Pembangunan Hukum Indonesia, 2(3), 305–318. https://doi.org/10.14710/jphi.v2i3.305-318

23) Wiguna, M. O. C. (2021). Pentingnya Prinsip Kebijaksanaan berdasarkan Pancasila dalam Kehidupan Hukum dan Demokrasi Indonesia. Jurnal Ilmiah Kebijakan Hukum, 15(1), 729. https://doi.org/10.30641/kebijakan.2021.V15.729-744

Upholding Informed Consent: Experiences of Note –Taking without Audio Recording of in-Depth Individual Interviews in a Qualitative Study on the Implementation of the Pregnancy Re-Entry Policy in Zambia

Namakau Kakanda-Sinkala

University of Witwatersrand, Johannesburg

ABSTRACT: The context of the research study needs to determine the data recording method to be used in order to ensure that no harm is done to the participants. In-depth individual Interviews (IDIs) is one of the main data collecting strategy used in qualitative research on sensitive topics such as teenage pregnancy. Audio recording in capturing data during IDIs is a common practice. However, audio recording of IDIs should be done in the context of informed consent. The objective of this paper is to elaborate on how note-taking was used to capture data within the context of informed consent. The research design was multiple cohort Case studies involving Chongwe district plus national stakeholders of the Pregnancy Re-entry policy in Zambia. Semi-structured interviews were conducted with hundred (100) participants from different cohorts of stakeholders using note-taking to capture the data. Ninety percent (90%) of the interviews involved physical note-taking with 10 % being electronic notes. The results are that note-taking increased the interview time but it afforded the interviewer the opportunity to probe further as the data was being collected. The major disadvantage with note –taking is that it reduces the pace of data collection as time has to be dedicated to consolidating the notes and memory recall of information shared. The conclusion drawn is that upholding informed consent in research is key, therefore the capturing of data during IDIs should be guided by what best upholds the rights of the participants. Therefore, note-taking offers an alternative to audio recording.

KEYWORDS: research ethics, in-depth individual interviews, audio recording, note-taking,

INTRODUCTION

This study on the implementation of the Pregnancy Re-entry policy was rated as medium risk by the University of Witwatersrand institutional review board (IRB), for Human research ethics Committee (HREC non-medical). This implied that it had the potential to cause harm to participants if ethical values were not upheld. (Council for International (CIOMS) and WHO, (2016) stress that a study of a risky nature has to be scientifically conducted taking into consideration its 'social value.' This ensures that human dignity of persons participating in the study is upheld as per Belmont report recommendations (Barrow, Brannan, & Khandhar, 2024; Belmont Report, 1979).

Research ethics are key in ensuring that participants are not harmed during and after partaking in a study. Research ethics imply to guidelines to protect participants from harm by upholding their dignity, respecting them and avoiding any physical or psychosocial harm. It is important to note that ethics are not rules per say but a framework to safe guard participants in research studies. This is by way of upholding internationally set standards as well as locally by being culturally sensitive (World Health Organisation , 2009). Four keys principles of research ethics obtain in the realm of research involving human participants; autonomy of self-determination with reference to decisions of whether and how to participate, that is, informed consent; non –maleficence implying to not harming human beings when conducting research. Beneficence advocates for the study to be beneficial by helping to inform problem-solving. In other words, the benefits should outweigh the risks. Justice in terms of fairness in 'distributing benefits and burdens' (World Health Organisation, 2009; Owonikoko, 2013; Varkey, 2021; Barrow, Brannan, & Khandhar, 2024).

Upholding Informed Consent: Experiences of Note –Taking without Audio Recording of in-Depth Individual Interviews in a Qualitative Study on the Implementation of the Pregnancy Re-Entry Policy in Zambia

Upholding research ethics entails the adoption of what is referred to as a 'participant –centred approach' responsive to the context for the safety of the research participants (Hill et al., 2022). The Belmont report emphasizes on informed consent when conducting research on human subjects which should is influenced by information, comprehension of the information and voluntariness (World Health Organisation , 2009). Therefore, the data collection medium used is influenced by the informed consent of participants. Informed consent is meant to ensure that participants are respected, treated in a dignified way and their autonomy upheld through voluntariness without undue influence (CIOMS & WHO, 2016). Punjwan, (2015) points out five domains of informed consent; competence and capacity, disclosure, understanding, voluntariness and consent or refusal. The Belmont report of 1979 points out that informed consent is based on two moral requirements of recognizing that there is need to respect the autonomy of individuals and protect vulnerable individuals (Belmont Report, 1979).

DATA COLLECTION METHOD

Semi –structured In-depth- individual interviews were the main data collecting tool used in the study. This means that some questions were developed which were in line with the research question accommodating further exploration. Al-Yateem (2012) points out that interviews are ideal for collecting narrative data. Therefore, interviews are affected by the researcher, participants question format (Al-Yateem , 2012) and method used in capturing the data (Hill et al., 2022; Rutakumwa et al., 2019). The interviews were conducted in two ways; face- to- face, and electronic based on convenience on the part of the participants.

For the teenage mothers and their parents, the schools organized for the venues at the respective schools. Most of the key informants were interviewed at their workplaces. However, some were too busy to be physically present thus were given the option of electronic communication via electronic mails which were more convenient because of their busy schedules. Also outbreaks of COVID 19 like influenza symptoms was another reason for conducting electronic interviews with key informants.

Challenge of audio recording interviews in the digital age encountered in the study

The plan was to audio record the interviews. Audio recording of interviews in qualitative research data collection is perceived to be a salient golden rule (Rutakumwa & et al, 2019). However, this needs a critical analysis in the context of dealing with vulnerable groups such as poor people in developing countries (Punjwan, 2015) to avoid being coerced into being recorded or secretly recording them. There are several advantages of audio –recording in qualitative data collection. First, it can be replayed to enhance understanding of was being communicated in order to dispel doubts. Secondly, the researcher focuses on listening to the participant during the interview thus can shorten the interview whilst gathering a lot of data and production of verbatim. Furthermore, recorded information can be replayed (Rutakumwa et al., 2019).

One of the disadvantages of recording of interviews is that it tends to affect the ease of participants thus formalizing the way they respond (Al-Yateem , 2012). This concurs with the assertion by Hill et al., (2022) that recording tends to unsettle participants making them 'feel nervous and inhibited.' Moreover, recording of interviews tends to reduce openness in sharing of information about sensitive information leading to either withholding or exaggeration of information causing 'social desirability bias' (Al-Yateem , 2012).

This paper argues that despite the advantages of audio recording of interviews, the participants should be respected in terms of whether they give consent or not based on the knowledge shared about the study. As the main data collecting agent, I read out the participation sheet to the potential participants' cohorts of teenage mothers and their parents due to low literacy levels. I also verbally translated the content of the participation sheet in the local language as I explained. This is in line with the argument by (Nnebue, 2010) that the information about the study should be transmitted in the language well understood by the participants. This is supported by Punjwan, (2015) that low education levels in developing countries necessity the usage of the local languages to help potential participates to understand the study before giving consent.

I noticed the discomfort through body language and verbal concerns of the first five potential participants when it came to the request to record the interviews. When asked about recording, the general discomfort was that there has been a tendency of leaking audio recordings on social media platforms such as Facebook, and WhatsApp groups thus revealing sensitive personal information. Similar discomfort was also observed with the first two key informants with one saying that recording was like 'talking with a gun held against one's head.' This notion is situated in the social and political cultures obtaining in Zambia in relation to what Rutakumwa et al., (2019) point out that recording devices have cultural and political implications. This borders on confidentiality guarantees (Singh & Chauhan, 2012). I critically looked at the aspect of audio recording in the context of voluntary participation for the remaining interviews. I decided to remove the recording aspect from the data collecting procedure by removing it from the participate information sheets and the consent forms. I did not want to torment the potential participates by asking them because despite upholding their right, it can still somehow create doubt of participants thinking that they are being

Upholding Informed Consent: Experiences of Note –Taking without Audio Recording of in-Depth Individual Interviews in a Qualitative Study on the Implementation of the Pregnancy Re-Entry Policy in Zambia

secretly recorded. This is affirmed by Rutakumwa et al., (2019) that the intention and the existence of a recording tool can unsettle participants even after being guaranteed that they are not being recorded.

Sensitivity of research topics such as sex related subjects need to uphold confidentiality. A typical example is that of an HIV related study conducted by Rutakumwa et al., (2019) which had been ongoing for several years with trust being built overtime but had to respect the participants wish not to be recorded or photographed. I resorted to note-taking which is considered to be an alternative to audio recording in qualitative data collection. Phillippi and Lauderdale, (2018) explain that note-taking has been traditionally used in ethnographic qualitative studies with laid out procedures.

Usage of note –taking in case study interviews takes the context to shape what information is captured in line with the research question. In this context, note –taking in a qualitative research interview refers to a process of jotting down of the information shared by the participant by the researcher as the participant is talking. It is considered to be an outside memory source to facilitate comprehension and reflection of information (Couch, 2022) to help remember what was discussed (Muswazi & Nhamo, 2013) thus the need to complement it with memory recall afterwards as way of consolidating information.

The process used in note-taking was as follows;

Step 1: coding of interview guides

Ensuring that the cohort semi-structured interview guides were coded as per cohort, and also as identity codes for each participant.

Step 2: formatting of the interview guides

The interview guides were formatted in such a way that there was enough space between questions for note –taking for the respective questions plus any other which would be added during the interviews.

Step 3: printing of the interview guides

The semi –structured interview guides were then printed out. Hard copies were used in note taking considering that the researcher was faster in note-taking as compared to typing. Moreover, in some cases, the study was being undertaken in rural areas without electricity thus using a laptop computer would be risky. Even in offices, load shedding was a risk.

Step 4: Note –taking during interviews

I jotted down what the participants were saying on the hard copy interview guides. Some notes were recorded in short form in the interest of time.

Step 5: data consolidation of the notes taken and memory to make notes

After the interviews, the researcher took time in some cases days to type the scripts and at the same time incorporate memory information to make the notes.

From the experience, the researcher observed that note –taking during face-to -face interviews has the advantage of making the researcher to be more attentive to what is being said as the note taking is being done. This helped the research to reflect on what was said thus encouraging iterative questioning and probing. This concurs with the conclusion drawn by Muswazi and Nhamo, (2013) that note taking enhances analysis process of the data. The researcher also observed that participants had time to also reflect on their responses as the researcher was jotting down notes thus they could add more information or ask questions. It also made the participants to be relaxed and open up as the interview progressed.

The major disadvantage with note-taking during interviews is that the interviews were longer than expected in most cases. It was also a bit costly due to the printing of the interview guides. On the other hand, it was difficult to probe key informants who opted to respond to the semi-structured interview guides electronically because even getting the first responses was a challenge needing a number of reminders to be sent to them.

CONCLUSION

Do no harm to participants should be taken as a serious ethical issue in research. The researcher needs to respond to what makes the participants comfortable to participate voluntarily. One such context is that of considering the confidentiality of audio recording in the digital age as information can easily be shared thus putting participants in harm's way. Note –taking though seemingly tedious is an alternative to audio recording which has the advantage of gaining more insight through reflections as the notes are being taken.

DECLARATION OF INTEREST

This study was undertaken for a PhD program.

Upholding Informed Consent: Experiences of Note –Taking without Audio Recording of in-Depth Individual Interviews in a Qualitative Study on the Implementation of the Pregnancy Re-Entry Policy in Zambia

REFERENCES

Journals

1) Al-Yateem , N. (2012). The effect of interview recording on quality of data obtained: A methodological reflection. Nurse Researcher, 31-36.
2) Barrow, J. M., Brannan, G. D., & Khandhar, P. B. (2024). Research Ethics. StatPearls [Internet].
3) Rutakumwa, R., & et al. (2019). Conducting in-depth interviews with and without voice recorders: a comparative analysis. Qualitative Research, 565–581.
4) Al-Yateem , N. (2012). The effect of interview recording on quality of data obtained: A methodological reflection. Nurse Researcher, 31-36.
5) Belmont Report. (1979). Ethical Principles and Guidelines for the Protection of Human Subjects of research. .
6) Couch , D;. (2022). Taking and Organizing Notesfor Research Papers. University of Idaho Writing Center.
7) Council for International (CIOMS); WHO;. (2016). International Ethical Guidelines for Health-related Research Involving Humans. CIOMS .
8) Hill, Z., & et al. (2022). Are verbatim transcripts necessary in applied qualitative research: experiences from two community-based intervention trials in Ghana . Emerging Themes in Epidemiology, 2-8.
9) Kakanda- Sinkala, N. (2022). Distress Protocol for a PhD study exploring the Implementation of the Pregnancy Re-entry Policy among Stakeholders at Primary school level in Chongwe District, Zambia. International Journal of Research and Innovation in Social Science (IJRISS), 680-682.
10) Muswazi, M. T., & Nhamo, E. (2013). Note taking: A lesson for Novice Qualitative Researchers. IOSR Journal of Research & Method in Education (IOSR-JRME), 13-17 .
11) Nnebue, C. C. (2010). Informed Consent In Research. AFRIMEDIC Journa, 5-10.
12) Owonikoko , T K;. (2013). Upholding the Principles of Autonomy, Beneficence, and Justice in Phase I Clinical Trials. The Oncologist , 242-244.
13) Phillippi, J; ; Lauderdale, J;. (2018). A Guide to Field Notes for Qualitative Research: Context and Conversation. Qualitative Health Research, 381–388.
14) Punjwan, S. (2015). Issues of Research Ethics in Developing World. The Aga Khan University School of Nursing, Karachi, Pakistan.
15) Singh, M; Chauhan, A;. (2012). Research Ethics: Some Basic Principles.
16) Varkey , B;. (2021). Principles of Clinical Ethics and Their Application to Practice. Med Princ Pract, 17–28.
17) World Health Organisation . (2009). Research Ethics Committee: Basic Concepts for Capacity Building. World Health Organisation.

Teachers' Utilization of Digital Tools and Confidence in Technology

Rekmel Mayantao[1], Rosalinda C. Tantiado[2]

[1,2] Department of Education, Misamis Oriental, Philippines, Southern de Oro Philippines College, Cagayan de Oro City, Philippines

ABSTRACT: The utilization of technology has emerged as a crucial instrument for educators to augment instruction and enrich the educational encounters of learners. This study sought to determine the extent of teachers' utilization of digital tools, their level of confidence in technology, and the significant relationship between the extent of teachers' utilization of digital tools and confidence in technology, among the 101 teachers from the nine (9) schools of Manolo Fortich III District, Division of Bukidnon, chosen through universal sampling. This study utilized two instruments. One was a research-made questionnaire for the teachers' utilization of digital tools and for the teachers' confidence in technology was adapted, and modified questionnaire from the study of Heather (2014). Descriptive statistics were used such as mean, standard deviation, and Pearson Product Moment Correlation Coefficient. The study revealed that most of the time teachers utilized Excel/Spreadsheets than video/Capcut. Teachers' confidence level in technology found to be Always Confident. Furthermore, teachers' utilization of digital tools such as PPT/canvas, video/caput and the like, and Excel/spreadsheets has a significant relationship to teachers' confidence in technology. Thus, to enhance video/CapCut usage, teachers need training, support, and collaboration. Schools should provide professional development, technical assistance, and recognition of achievements. These efforts boost confidence in digital tools, improve pupils' learning, and encourage creative teaching methods in the digital era.

KEYWORDS: Confidence, Digital tools utilization, Technology

I. INTRODUCTION

Educational technology is an expanding, dynamic, and critically important field in education. It aims to examine, improve, modify, and even incorporate novel teaching and learning processes by carefully applying established laws, principles, theories, and empirically derived discoveries from modern disciplines such as Psychology, Sociology, Engineering Management, Mathematics, and other foundational subjects. Therefore, educational technology encompasses more than just the sum of all the media, methods, materials, and techniques employed to enhance teaching and learning.

Moreover, educational technology has made the integration of the instructional design process and the development of instructional media possible. The convergence of advancements in educational science and optical and electronic technologies has created an ideal environment for the implementation of new developments aimed at enhancing the efficiency of the teaching and learning process. Educational technology has encouraged teachers to explore innovative approaches in school organization, curriculum development, and teaching strategies, leading to the emergence of various novel concepts.

The utilization of technology has emerged as a crucial instrument for educators to augment instruction and enrich the educational encounters of learners. The inclusion of classroom technology initiatives, encompassing mobile devices, tablets, and computers, has resulted in a change in the classroom atmosphere that benefits both instructors and students (Mosley, 2019). The ability and desire of educators to use technology in the classroom is crucial to its effective integration.

Furthermore, the incorporation of technology offers opportunities for students to complete assignments utilizing technology rather than the conventional method of using pencil and paper (Ahmadi & Reza, 2018). The integration of technology equips both educators and learners with novel resources to enhance the educational journey. In agreement with Schaffhauser (2019), teachers' confidence in utilizing technology is gradually increasing. A recent survey revealed that nearly all teachers and school leaders, approximately 99 percent, acknowledged incorporating digital technology in their classrooms. Furthermore, an almost equal proportion, approximately 96 percent, reported observing advantages resulting from its

Teachers' Utilization of Digital Tools and Confidence in Technology

implementation. Nevertheless, not all educational institutions possess access to the Internet and even computer facilities or essential devices like mobile phones, tablets, and laptops for both educators and students. The absence of Information and Communication Technology (ICT) infrastructures and equipment, including computers, institutional internet access, projectors, and similar resources, or the lack of support for educators, insufficient experience in teaching with ICT, and inadequate ICT training, are significant obstacles that impede the incorporation of ICT in teachers' education (Kennedy, 2023). It is crucial to establish teachers' training programs while also ensuring that institutions are sufficiently equipped with ICT infrastructures, as these are essential for empowering teachers to integrate ICT into their respective classrooms. In Kibirige's (2023) investigation, it was determined that notable hindrances encompassed inadequate computer availability, absence of internet connectivity, and insufficiency of ICT course books. Moreover, educators needed to improve the essential ICT competencies required for incorporating technology into their instructional approaches, while administrative backing proved inadequate.

Given the considerations mentioned above, the researcher postulated this study to assess the teachers' utilization of digital tools and confidence in technology of Manolo Fortich District III, Division of Bukidnon. The purpose of this study was to establish a baseline understanding of teachers' proficiency in using digital tools and their confidence levels. This study was based on the theory of Mishra and Koehler's Theory (2006) in Bingimlas (2018) that the Technology, Pedagogy, and Content Knowledge (TPACK) framework provides a valuable approach to the challenges faced by teachers when implementing educational technology in their classrooms. The significance of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK) is emphasized by the TPACK framework. It highlights that the integration of educational technology should be based on a solid foundation of content and pedagogy, where the technology effectively communicates the content and supports the pedagogy to enhance students' learning experience.

The utilization of particular technological tools, such as hardware, software, applications, and associated information literacy practices, is most effective in the instruction and guidance of students toward a more comprehensive and profound comprehension of the subject matter, as stated by the TPACK framework. Technological Pedagogical Knowledge (TPK) delineates the connections and interactions between technological tools and specific pedagogical practices. In contrast, Pedagogical Content Knowledge (PCK) elucidates the same relationships between pedagogical practices and specific learning objectives. Lastly, Technological Content Knowledge (TCK) explicates the associations and intersections among technologies and learning objectives. The significance of TPACK for teachers lies in the fact that it furnishes them with the necessary knowledge and skills to navigate the contemporary educational landscape. Teachers are more equipped to use technology to improve teaching and learning, considering this empowerment, thereby resulting in improved student outcomes and better preparedness for the challenges of the 21st century.

The concepts of the study were anchored on the study of Hughes (2022), the Replacement, Amplification, Transformation (RAT) framework. This framework served as both a model for integrating technology and an assessment tool for instructors. Its purpose was to enable instructors to critically analyze the effectiveness of their technology integration in serving both students and themselves. The framework focused on the development and integration of technology in teaching, learning, and curriculum development. Hughes presented the RAT framework as a means of self-assessing technology integration to achieve pedagogical and curricular objectives. In her RAT Question Guide (2022), Hughes suggests extending this self-assessment to the school/district level. The RAT framework identified three primary purposes for technology integration: Replacement, Amplification, and Transformation. These purposes involved replacing non-digital practices, amplifying existing practices, and transforming teaching, learning, and curriculum development through digital practices. The utilization of technology in the classroom by instructors significantly impacts instructional methods, student learning, and changing current courses and exercises. The primary purposes for technology integration were identified by the Replacement, Amplification, Transformation (RAT) model (Hughes, 1998).

II. METHODOLOGY

The researcher employed descriptive-correlational. Correlational research is used to establish a logical relationship between two variables. It also investigates the relationship without manipulating or controlling any of the variables. According to the correlational research definition, it reflects the strength of two or more variables and the direction of their relationship. This direction of the correlation is ideally positive or negative (Wilson, 2023). In this study, the researcher looked into the significant relationship between the teachers' utilization of the digital tools and their confidence in technology. This study employed the following statistical tools to analyze the data. For problems 1 and 2, Mean and Standard Deviation were used. For problem 3, to get the significant relationship between the teachers' utilization of digital tools and their confidence, the Pearson Product Moment Correlation Coefficient was utilized.

Teachers' Utilization of Digital Tools and Confidence in Technology

III. RESULTS AND DISCUSSION

Problem 1. What is the extent of the teachers' utilization of digital tools such as:

      1.1 PPT/Canva

      1.2 Video/Capcut and the like, and

      1.3 Excel/Spreadsheets

Table 1 shows the overall extent of the teachers' utilization of digital tools. It reveals that it has an overall Mean of 2.55 with SD = 0.86, described as Most of the time and interpreted as Very Utilized. The statement indicates that most teachers are actively using digital tools in their teaching methods. Additionally, this suggests a favorable shift towards incorporating technology in education which could result in improved teaching techniques, higher student involvement, and better classroom organization. It highlights the need to offer assistance and tools to educators to enhance their digital literacy abilities and make efficient use of technology in their teaching methods.

Table 1. Overall Teachers' Utilization of Digital Tools.

Teachers' Utilization of Digital Tools.	Mean	SD	Description	Interpretation
PPT/Canva	2.61	0.82	Most of the time	Very Utilized
Video/Capcut and the like	2.35	0.82	Sometimes	Utilized
Excel/Spreadsheets	2.69	0.94	Most of the time	Very Utilized
Overall	**2.55**	**0.86**	**Most of the time**	**Very Utilized**

Note: 1.0-1.75- Not utilized, 1.76-2.50- Utilized, 2.51-3.25- Very Utilized, 3.26-4.0- Extremely Utilized

As supported by Avidov-Ungar & Forkosh-Baruch (2018), educators in modern classrooms have access to a wide range of technological resources to improve teaching quality and enrich students' academic experience. Prior studies have shown how technology affects teaching methods and the entire educational experience. Technology has significantly enhanced instruction and influenced teachers' views on their role in education.

Moreover, the variable, *Excel/Spreadsheets,* has the highest Mean of 2.69 with SD = 0.94, described as Most of the time and interpreted as Very Utilized. This indicates that teachers predominantly utilize Excel/Spreadsheets to assist with several facets of their teaching and administrative duties. It implies that this tool is essential for tasks like lesson planning, data management, assessment, and analysis in educational settings. The widespread use of Excel/Spreadsheets highlights their flexibility and efficiency in fulfilling the various needs of teachers in their daily tasks. It emphasizes the significance of continuously offering training and assistance to teachers to improve their competence in using this tool effectively and creatively.

Thohir (2018) revealed the identified three implications in design and spreadsheet simulation in his case study. The study suggests utilizing spreadsheets for convenient, cost-effective, and adaptable purposes when constructing physics themes. Three pre-service teachers have demonstrated their ability to create several optical subjects using diverse formats and interactive elements. Secondly, designing activities necessitates knowledge, skills, and attitudes. Fundamental knowledge is essential as the primary asset in design, including understanding relevant physics concepts, technological proficiency, and pedagogical competence. Creative design facilitates the integration of technology abilities with physics issues and pedagogical knowledge simultaneously. Design creativity necessitates problem-solving and decision-making abilities in brainstorming environments. A robust imagination is also beneficial in creating a distinctive design.

On the other hand, the variable, *Video/Capcut and the like*, got the lowest Mean of 2.35 with SD = 0.82, described as Sometimes and interpreted as Utilized. As argued by Штепура (2018) that incorporating video into classroom presentations and online lectures can improve students' learning experiences. Teachers encounter obstacles include restricted technological access, inadequate finances, lack of technical skills, time constraints, copyright limits, and student diversions. Restricted access to necessary equipment, insufficient technical knowledge, and inconsistent internet connection can impede successful video integration. Time limitations and copyright regulations can impede the integration process. Potential distractions can impede students' focus on class objectives.

Teachers' Utilization of Digital Tools and Confidence in Technology

Problem 2. What is the level of teachers' confidence in technology?

Table 2 on the next page, shows the level of teachers' confidence in technology. It reveals that it has an overall Mean of 3.24 with SD = 0.61, described Agree and interpreted as Confident. This highlights the significance of promoting and maintaining a culture where teachers have confidence and expertise in technology. Having a strong belief in technology can enable teachers to confidently adopt creative teaching methods, discover new digital tools and resources, and efficiently adjust to changing educational technologies. Exploiting this confidence and improving teachers' technology skills can be achieved through ongoing professional development opportunities that concentrate on advanced technological skills, pedagogical integration tactics, and upcoming educational technologies.

Kwon et al. (2019) found that teachers with higher technology self-efficacy are more adaptable in using various technological tools and platforms to improve their students' learning experiences. Technology self-efficacy is influenced by individual attitudes, institutional support, and cultural norms on technology usage in education. It is essential to fully understand how technological self-efficacy interacts with contextual elements to design effective strategies for integrating technology successfully in educational environments. Professional development programs focusing on improving technology self-efficacy should consider factors like pedagogical beliefs, digital literacy skills, and the availability of resources and support systems. These factors can significantly influence instructional practices and enhance the effectiveness of such programs.

Table 2. Teachers' Confidence in Technology

Teachers' Confidence in Technology	Mean	σ	Description	Interpretation
I feel confident…				
1. that I understand computer capabilities well enough to maximize them in my classroom.	3.59	0.39	Strongly Agree	Very Confident
2. in my ability to evaluate software for teaching and learning.	3.29	0.57	Agree	Confident
3. that I can use correct computer terminology when directing student's computer use.	3.15	0.62	Agree	Confident
4. that I can mentor students in appropriate uses of technology.	3.17	0.66	Agree	Confident
5. that I have the skills necessary to use the computer for instruction.	3.20	0.63	Agree	Confident
6. that I can successfully teach relevant subject content with appropriate use of technology.	3.24	0.62	Agree	Confident
7. I can help students when they have difficulty with the computer.	3.24	0.65	Agree	Confident
8. I can effectively monitor students' computer use for project development in my classroom.	3.17	0.69	Agree	Confident
9. I can regularly incorporate technology into my lessons, when appropriate to students' learning.	3.26	0.63	Agree	Confident
10. about selecting appropriate technology for instruction based on curriculum standards.	3.27	0.65	Agree	Confident
11. about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.	3.16	0.61	Agree	Confident
12. about using technology resources (such as spreadsheets, electronic portfolios, etc.) to collect and analyze data from student tests and products to improve instructional practices.	3.29	0.64	Agree	Confident
13. I can be responsive to students' needs during computer use.	3.13	0.59	Agree	Confident
14. about assigning and grading technology-based projects.	3.25	0.62	Agree	Confident
15. that I can consistently use educational technology in effective ways.	3.21	0.55	Agree	Confident
16. I am comfortable using technology in my teaching.	3.28	0.59	Agree	Confident
17. that I can provide individual feedback to students during technology use.	3.15	0.61	Agree	Confident
18. that, as time goes by, my ability to address my students' technology needs will continue to improve.	3.31	0.54	Agree	Confident
19. that I can develop creative ways to cope with system constraints and continue to teach effectively with technology.	3.22	0.58	Agree	Confident

Teachers' Utilization of Digital Tools and Confidence in Technology

20. I am aware of all the resources available to me to help me successfully integrate technology into the classroom.	3.23	0.56	Agree	Confident
Overall	**3.24**	**0.61**	**Agree**	**Confident**

Note: 1.0-1.75- Not Confident, 1.76-2.50- Less Confident, 2.51-3.25- Confident, 3.26-4.0- Very Confident

Moreover, the indicator #1*, that I understand computer capabilities well enough to maximize them in my classroom,* has the highest Mean of 3.59 with SD = 0.49, described as Strongly Agree and interpreted as Very Confident. This high level of confidence in utilizing computer skills indicates a preparedness to effectively utilize technology to improve teaching and learning experiences. This implies a strong foundation of digital skills among teachers. Teachers that show this level of confidence are expected to take an active role in incorporating digital tools into their teaching methods which could result in the development of creative teaching approaches and improved educational results. Furthermore, this significant level of confidence suggests a solid foundation for acting as role models and mentors in digital literacy within their school communities. Utilizing the knowledge and skills of these teachers can motivate and enable their colleagues to adopt technology with the same level of assurance promoting a culture of ongoing learning and adjustment in the digital era. The acknowledgment of strong confidence in using computer capabilities offers a chance to utilize these strengths to advance digital pedagogy and enhance the technical proficiency of the teaching workforce.

According to Kwon et al. (2019), Teacher Self-effiacy (TSE) is highlighted as a critical component for technology integration since teachers tend to focus on tasks in which they are confident while avoiding those in which they are not confident. Teachers gain technology self-efficacy from positive past experiences with technology and positive experiences observed in others (Elstad & Christophersen, 2017; Kwon et al., 2019).

On the other hand, the indicator 13, *I can be responsive to students' needs during computer use*, got the lowest Mean of 3.13 with SD = 0.59, described as Agree and interpreted as Confident. Teachers' lack of proficiency in educational technology may be a reason for limited utilization of digital tools in education. Conversely, greater utilization of digital tools could improve their competency as shown by Marcelo and Yot-Dominiguez (2019). Previous studies have recognized that using technology in teaching has disadvantages such as limited interaction, difficulties in teaching online skills, time-consuming processes, and technology inadequacies. Educators' value beliefs influence the incorporation of technology as studied by Vongkulluksn et al. (2018).

Problem 3. Is there a significant relationship between the extent of teachers' utilization of digital tools and confidence in technology?

Table 3. Pearson's Correlation Test between the Extent of Teachers' Utilization of Digital Tools and Confidence in Technology.

Teachers' Utilization of Digital Tools	Confidence in Technology		
	r	P	Decision
PPT/Canva	0.50	0.000	Significant
Video/Capcut and the like	0.44	0.000	Significant
Excel/Spreadsheet	0.60	0.000	Significant

Note: r= r-value (Correlation Coefficient), p= p-value (Significant Level) p<0.05

The table 3 shows the Pearson's Correlation test between the extent of teachers' utilization of digital tools and confidence in technology. The test reveals moderate positive correlation between all the variables. If the teachers' utilization of digital tools variables changes its direction their confidence in technology also changes in the same direction.

Table took the analysis at the independent variable level by looking at the correlation test while holding the dependent variable constant at a time. As can be seen from the same table, extent of teachers' utilization of digital tools and confidence in technology are significant at 0.05. In summary, taking it at the coefficient level, teachers' confidence in technology is correlated and influenced by their perception in digital tools variables, with a *p* value less than 0.05. Thus, the correlation analysis yielded that the null hypothesis test (Ho1) was rejected with the following moderate positive correlation.

This infers that the significant relationship between digital tools like PPT/Canva, Video/Capcut and the like, and Excel/Spreadsheet and teachers' confidence in technology has deep implications for contemporary instructional methods. Teachers are improving their technological skills and confidence by incorporating these adaptable tools into their teaching methods. Increased confidence in using digital tools leads to a greater ability to adapt to changing educational technologies. Furthermore, when teachers integrate their knowledge and most effective methods in collaborative learning groups a culture of

constant learning and creativity thrives. The strong relationship between digital tools and teachers' confidence in technology highlights their potential to alter 21st-century education promoting more innovative and effective teaching methods to cater to the different demands of modern learners.

Correspondingly, Vongkulluksn et al. (2018) studied into how teachers value views affected how they integrated technology. The researcher discovered that value beliefs both predicted how well teachers integrated technology and had a direct association with teachers' use of it. More study is required to clarify the effects of teachers' views on the incorporation of technology in the classroom (Vongkulluksn et al., 2018). Good attitudes can be related to improved time management, attendance, and the value of utilizing technology in the classroom. (Beltran-Sanchez et al., 2020). Teachers who use proficient technology can efficiently manage resources, optimize administrative processes, and prioritize meaningful students' engagement. This technique further promotes students' regular course attendance, resulting in enhanced academic achievements. Acknowledging the significance of technology in education also enables students to cultivate their proficiency in digital literacy.

IV. CONCLUSIONS

On the basis of the aforementioned findings, the following conclusions can be made:

1. Teachers find it easy using spreadsheet software since it is widely used and essential in educational settings especially on the use for grade tracking, attendance and data management. It highlights the importance of this digital tool in organizing administrative tasks and enhancing efficiency in educational settings. Creating video lessons specifically through Capcut seems hard for them since it will take time to do it and not easy to do.

2. Teachers are confident on technology since they are using it each day. They may not know how to manipulate all the applications but they use their laptop most of the time make them confident. Teachers feel they possess sufficient knowledge and skills to make the most out of the available technological resources in their classrooms. They believe they can utilize computer capabilities to enhance their teaching methods, engage pupils more effectively, and facilitate learning experiences that utilize digital tools to their fullest potential.

3. The more teachers use the digital tools specifically powerpoint/canva, video/Capcut and the like, and excel/spreadsheets the higher their confidence level on technology. Therefore, being knowledgeable and skilled with these digital tools increases teachers' confidence in using technology.

V. RECOMMENDATIONS

Based on the findings and conclusions generated from this study, the researcher has formulated the following recommendations:

1. School can enhance teachers' utilization of CapCut by organizing thorough training in SLAC sessions, offering continuous assistance, promoting a collaborative environment, and encouraging for experimentation. These methods will equip teachers with the essential skills and confidence to efficiently utilize the tool, improving student learning experiences.

2. Teachers can benefit from tailored professional development, encouragement of cooperation, continuous technical support, and acknowledgment of their achievements to enhance their confidence in utilizing digital tools for teaching. These strategies can assist teachers in overcoming anxieties, enhancing student learning results, and motivating them to pursue creative teaching methods in the digital era

3. Schools may provide thorough training sessions, technical assistance, and chances for cooperation to boost teachers' confidence in video editing programs such as CapCut. The hands-on workshops should be interactive, allowing teachers to experiment with editing techniques and receive personalized advice. Offering online tutorials, troubleshooting instructions, and community forums can assist teachers in overcoming obstacles and promoting an supportive learning environment.

REFERENCES

1) Aflalo, E., Zana, L., & Huri, T. (2018). The interactive whiteboard in primary school science and interaction. Interactive Learning Environments, 26(4), 525-538.

2) Basuki, A. (2022). Canva for Education as a learning Tool for Center of Excellence Vocational School (SMK Pusat Keunggulan) Program to prepare competitive graduates in the field of creative skills in the digital age. https://www.academia.edu/82032113/Canva_for_Education_as_a_Learning_Tool_for_Center_of_Excellence_Vocational _School_SMK_Pusat_Keunggulan_Program_to_Prepare_Competitive_Graduates_in_the_Field_of_Creative_Skills_in_the _Digital_Age?f_ri=1197942

Teachers' Utilization of Digital Tools and Confidence in Technology

3) Bhasin, H. (2023, June 12). Causal Research – Meaning, explanation, examples, components. Marketing91. https://www.marketing91.com/causal-research/

4) Broman, K. W., & Woo, K. (2018). Data organization in spreadsheets. *The American Statistician*, *72*(1), 2–10. https://doi.org/10.1080/00031305.2017.1375989

5) Chambers, C., & Scaffidi, C. (2010, September). Struggling to Excel: A Field Study of Challenges Faced by Spreadsheet Users. 2010 IEEE Symposium on Visual Languages and Human-Centric Computing. https://doi.org/10.1109/vlhcc.2010.33

6) Churiyah, M., Basuki, A., Filianti, F., Sholikhan, S., & Fikri Akbar, M. (2022, March 1). Canva for Education as a Learning Tool for Center of Excellence Vocational School (SMK Pusat Keunggulan) Program to Prepare Competitive Graduates in the Field of Creativity Skills in the Digital Age. International Journal of Social Science Research and Review, 5(3), 226–234. https://doi.org/10.47814/ijssrr.v5i3.228

7) Djoub, Z. (2019). Teachers' Attitudes Towards Technology Integration. TPACK, 32–67. https://doi.org/10.4018/978-1-5225-7918-2.ch003

8) Dyhrkopp, C. (2021). Technology use in education by students and teachers. Retrieved January 07, 2022, from https://nwcommons.nwciowa.edu/education_masters/341/

9) Kennedy, G. M. (2023). Challenges of ICT integration in teachers' education: A case study of the College of Education, University of Liberia. INTERNATIONAL JOURNAL OF SOCIAL SCIENCE AND EDUCATION RESEARCH STUDIES, 03(05). https://doi.org/10.55677/ijssers/v03i5y2023-15

10) Kibirige, I. (2023). Primary teachers' challenges in implementing ICT in Science, Technology, Engineering, and Mathematics (STEM) in the Post-Pandemic Era in Uganda. Education Sciences, 13(4), 382. https://doi.org/10.3390/educsci13040382

11) Holisah, H. (2023, June 10). Development of Capcut Application in Natural and Social Science Learning for Elementary School. ejournal.insuriponorogo.ac.id. https://doi.org/10.37680/scaffolding.v5i2.2870

12) Ira Amalia Harahap, & Dinda Yarshal. (2023, July 31). Development of Digital Learning Media Helped Capcut on Theme Care Against Living Things in Class IV SD. International Journal of Educational Research Excellence (IJERE), 2(2), 166–172. https://doi.org/10.55299/ijere.v2i2.456

13) Kennedy, I. and Cronjé, J., 2023 The Dynamics of Access to ICT and Technology Practices of Secondary School Teachers, The Electronic Journal of e-Learning, 21(3), pp 200-210, available online at www.ejel.org

14) Kurt, S. (2019, September 16). TPACK: Technological Pedagogical Content Knowledge Framework - Educational Technology. Educational Technology. https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/

15) Lata, D. K. (2020, March 26). Digital competence and life skills a study of higher education teachers. https://shodhganga.inflibnet.ac.in/handle/10603/285777

16) Liisa Myyry, Veera Kallunki, Nina Katajavuori, Saara Repo, Tarja Tuononen, H.   Anttila, P. Kinnunen, Anne Haarala-Muhonen, E. Pyorala (2022). COVID-19 Accelerating Academic Teachers' Digital Competence in Distance Teaching. https://doi.org/10.3389/feduc.2022.770094

17) Mittoo, C. W. (n.d.). How Technology Teachers and Coaches Use Digital Tools in Instruction. ScholarWorks. https://scholarworks.waldenu.edu/dissertations/11382/

18) Myyry, L., Kallunki, V., Katajavuori, N., Repo-Kaarento, S., Tuononen, T., Anttila, H., Kinnunen, P., Haarala-Muhonen, A., & Pyörälä, E. (2022). COVID-19 Accelerating academic teachers' digital competence in distance teaching. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.770094

19) R, K. K. (2016). *Atitude and aptitude of teacher educators towards information and communication technology*. https://shodhganga.inflibnet.ac.in/handle/10603/207884

20) Read, M. (2022). RAT. *The RAT Technology Integration Model*. https://doi.org/10.59668/371.7485

21) Rezkyana, D., & Agustini, S. (2022, March 9). The Use of Canva in Teaching Writing. Proceedings Series on Physical & Formal Sciences, 3, 71–74. https://doi.org/10.30595/pspfs.v3i.267

22) Teachers' Technology Self-Efficacy and Technology Integration in Social Studies classes in Rural and Non-Rural Schools - ProQuest. (n.d.). https://www.proquest.com/dissertations-theses/teachers-technology-self-efficacy-integration/docview/2667826274/se-2

23) Teng, Y., & Wang, X. (2021, May 28). *The effect of two educational technology tools on student engagement in Chinese EFL courses*. International Journal of Educational Technology in Higher Education; Springer Nature. https://doi.org/10.1186/s41239-021-00263-0

Teachers' Utilization of Digital Tools and Confidence in Technology

24) View of CanVa for Education as a learning tool for Center of Excellence Vocational School (SMK Pusat Keunggulan) program to prepare competitive graduates in the field of creativity skills in the digital age. (n.d.). https://ijssrr.com/journal/article/view/228/171

25) View of Learning from the early adopters: developing the Digital Practitioner. (n.d.). https://journal.alt.ac.uk/index.php/rlt/article/view/1450/pdf_1

26) Wilson, L. (2023, October 30). Correlational Research Design- definition, Methods and Examples. MyAssignmentHelp Blog - Best Assignment Service Blogs. https://myassignmenthelp.com/blog/correlational-research/

27) Yundayani, A., Susilawati, S., & Chairunnisa, C. (2019). Investigating the effect of Canva on students' writing skills. English Review: Journal of English Education, 7(2), 169-176. doi: 10.25134/erjee.v7i2.1800.

Empowering Patients: The Role of Education in Pain Alleviation during IUD Insertion

Eden Estevez[1], Shivaughn M. Hem-Lee-Forsyth[2], N'Diera Viechweg[3], Sharon John[4], Stephanie P. Menor[5]

[1,2,3,4,5] St. George's University, St. George's, Grenada.

ABSTRACT: The discomfort and apprehension associated with the Intrauterine Device (IUD) insertion procedure presents a challenge to its widespread acceptance as a contraceptive modality, notwithstanding its established efficacy. Healthcare providers play a pivotal role in addressing this challenge through the provision of comprehensive educational interventions targeting young women regarding the intricacies of IUD insertion. Such proactive educational endeavors hold promise in fostering heightened acceptance and utilization of the IUD, thereby reducing the rates of unintended pregnancies. This paper delineates strategic interventions aimed at fostering IUD adoption, bolstered by empirical evidence attesting to its efficacy in curbing rates of unplanned pregnancies, childbirths, and induced abortions, particularly within the demographic of young women.

HISTORY OF INTRAUTERINE DEVICES (IUDS)

In 1909, Richard Richter created a flexible intrauterine ring made from suture material, which was said to be successful as a contraceptive method. In the decades following, the IUD was further developed by experimenting with various materials and shapes. By 1968, Hugh Davis developed the Dalkon Shield, which was a plastic, pronged crab-like IUD preventing expulsion from the uterus, which proved efficacious but not without adverse outcomes. Several women who used the shield reported developing infections and septic abortion, ultimately negatively impacting IUD use (Vranic & Delic, 2006).

Since 2009, two types of intrauterine devices have been available in the United States: a copper-containing and a levonorgestrel-releasing system. The copper IUD irritates the uterine cavity via a cytotoxic inflammatory response that prevents sperm motility and viability. The levonorgestrel-releasing IUD releases progesterone, which in turn suppresses the growth of the endometrium. The levonorgestrel-releasing IUD also thickens the cervical mucus, preventing sperm motility (Lanzola & Ketvertis, 2023).

IUD ELIGIBILITY

IUDs are a form of long-acting reversible contraceptive (LARC) that can be used by women of all ages, no matter if they are adolescents, nulliparous, or parous. They are primarily used to prevent conception, and they do not protect against sexually transmitted infections (*CDC - Intrauterine Contraception - US SPR - Reproductive Health*, 2019).

Patients on hormone replacement therapies can use the levonorgestrel-releasing IUD for endometrium protection and treatment of menorrhagia. The copper-containing IUD has a documented successful use as emergency contraception if placed within five days of intercourse (Lanzola & Ketvertis, 2023).

Although there are two kinds of IUDs, both have universal and IUD-specific contraindications listed in Table 1 of the appendix (Lanzola & Ketvertis, 2023).

Women with certain medical conditions, such as uterine abnormalities or a history of pelvic inflammatory disease, may still be eligible for IUD use after careful evaluation and consideration of individual risk factors (O'Brien et al., 2022). Healthcare providers must also assess patients in their medical history for cervical or uterine cancer, as these conditions may impact IUD eligibility and require specialized management. Furthermore, counseling regarding potential side effects such as expulsion and perforation may be needed to ensure informed decision-making (Gatz et al., 2022). Consideration of these factors allows providers to effectively determine IUD eligibility and provide appropriate contraceptive care to patients.

Empowering Patients: The Role of Education in Pain Alleviation during IUD Insertion

THREATS AND SUCCESSES

Contraception has witnessed a dynamic landscape, with numerous methods competing for recognition in family planning. Among these options, the IUD has emerged as a widely utilized contraceptive method, chosen by more than 14% of women worldwide (*Intrauterine Devices (IUDs): Access for Women in the U.S.*, 2020). Despite its widespread use, concerns were found regarding insertion-related pain as an obstacle that impedes the acceptance of the IUD, especially among younger women who face elevated risks of unintended pregnancies, which often lead to various adverse consequences (Kornides et al., 2015).

The worry of experiencing pain during insertion is a significant barrier. It arises from a lack of comprehension or misinformation regarding the procedure, directly resulting in feelings of anxiety and hesitancy (Hunter et al., 2020). Moreover, considerable apprehension exists among individuals regarding the possibility of IUD expulsion and the device moving or being removed from the uterus, adding to concerns about the dependability and efficacy of IUDs despite minimal expulsion rates linked to contemporary IUDs (Bahamondes & Bahamondes, 2021).

Additionally, adolescents contemplating an IUD may hesitate due to the fear of having a foreign object in the uterus. The perception of the IUD as a foreign entity within the body can evoke further discomfort and anxiety, influencing the decision-making process. Moreover, there is apprehension about potential physical harm resulting from the IUD. Women may have concerns regarding the device's safety and the potential risks associated with its presence in the uterus. Misconceptions or insufficient information about the safety profile of IUDs further hinder the adoption of the IUD as a contraceptive option (Hunter et al., 2020).

It is essential to tackle these fears to enhance the acceptance and utilization of IUDs among young women. Educational efforts and counseling directed at dispelling misunderstandings and emphasizing the safety and effectiveness of modern IUDs can significantly aid in fostering informed decision-making among young women and alleviate worries regarding pain and potential risks, ultimately increasing IUD usage (Akdemir & Karadeniz, 2019).

Educating clinicians and patients is crucial for enhancing the current strategies related to IUD insertion. Although obstetricians and gynecologists should present suitable contraceptive options to all patients, some clinicians tend to be excessively cautious when considering IUD methods, often excluding nulliparous or adolescent patients ("Committee Opinion No. 615," 2015). Accredited training programs in LARC for clinicians through continuing medical education can maintain enhancements in attitudes, clinician knowledge, and patient counseling (Chelvakumar et al., 2019).

Nulliparous and adolescent patients face additional barriers when considering contraception, including unawareness or discomfort with IUDs, lack of parental approval, cost of insertion and the device, and unfamiliarity with the healthcare provider establishing care. Studies indicate that educating patients on various contraception methods available at no cost can help overcome these barriers. With proper patient education, 67% of women opted for a form of LARC, with 56% of them selecting an IUD as their contraceptive method (Secura et al., 2010).

CONCLUSION

Despite being highly effective, concerns about pain during IUD insertion persist among women, influenced by various psychosocial factors such as negative perceptions of LARC, preoperative anxiety, and fear of pain. This paper identifies and investigates various barriers to IUD use and highlights the significance of patient education and counseling in managing pain and improving overall patient experiences during IUD insertion. The findings suggest that addressing negative perceptions of LARC and providing comprehensive patient education can help alleviate anxiety and fear associated with IUD insertion, thereby reducing pain perception and increasing use. Counseling interventions aimed at informing women about the advantages and drawbacks of IUDs are crucial in empowering them to make informed decisions about their reproductive health. Finally, this study offers valuable insights for public health interventions by addressing misconceptions about IUDs, alleviating pre-procedure anxiety, and providing comprehensive counseling. Healthcare providers can effectively manage pain during IUD insertion and improve patient satisfaction. Undoubtedly, further research and implementation of evidence-based interventions are necessary to optimize reproductive healthcare delivery and promote women's reproductive autonomy and well-being.

REFERENCES

1) Akdemir Y, Karadeniz M. The relationship between pain at IUD insertion and negative perceptions, anxiety, and previous mode of delivery. *The European Journal of Contraception & Reproductive Health Care*. 2019;24(3):240-245. doi:https://doi.org/10.1080/13625187.2019.1610872.

2) American College of Obstetrics and Gynecology. Long-Acting Reversible Contraception: Implants and Intrauterine Devices. https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2017/11/long-acting-reversible-contraception-implants-and-intrauterine-devices. Accessed February 14, 2024.

3) Bahamondes MV, Bahamondes L. Intrauterine device use is safe among nulligravidas and adolescent girls. *Acta Obstetricia et Gynecologica Scandinavica*. 2021;100(4):641-648. doi:https://doi.org/10.1111/aogs.14097.

4) Centers for Disease Control and Prevention. Intrauterine Contraception. https://www.cdc.gov/reproductivehealth/contraception/mmwr/spr/intrauterine.html#:~:text=IUDs%20are%20long%2 Dacting%2C%20are. January 16, 2019. Accessed March 19, 2024.

5) Chelvakumar M, Jabbarpour Y, Coffman M, Jetty A, Glazer Shaw J. Long-acting Reversible Contraception (LARC) Provision by Family Physicians: Low But on the Rise. *The Journal of the American Board of Family Medicine*. 2019;32(1):10-12. doi:https://doi.org/10.3122/jabfm.2019.01.180215.

6) Committee Opinion No. 615. *Obstetrics & Gynecology*. 2015;125(1):250-255. doi:https://doi.org/10.1097/01.aog.0000459866.14114.33.

7) Gatz JL, Mary Anne Armstrong, Postlethwaite D, et al. Association between intrauterine device type and risk of perforation and device expulsion: results from the Association of Perforation and Expulsion of Intrauterine Device study. *American Journal of Obstetrics and Gynecology*. 2022;227(1):57.e1-57.e13. doi:https://doi.org/10.1016/j.ajog.2022.03.062.

8) Hunter TA, Sonalkar S, Schreiber CA, Perriera LK, Sammel MD, Akers AY. Anticipated Pain During Intrauterine Device Insertion. *Journal of Pediatric and Adolescent*

9) Kaiser Family Foundation. Intrauterine Devices (IUDs): Access for Women in the U.S. https://www.kff.org/womens-health-policy/fact-sheet/intrauterine-devices-iuds-access-for-women-in-the-u-s. September 9, 2020. Accessed March 19, 2024.

10) Kornides ML, Kitsantas P, Lindley LL, Wu H. Factors Associated with Young Adults' Pregnancy Likelihood. *Journal of Midwifery & Women's Health*. 2015;60(2):158-168. doi:https://doi.org/10.1111/jmwh.12258.

11) Lanzola EL, Ketvertis K. Intrauterine Device. Treasure Island, FL: StatPearls Publishing; 2023. https://www.ncbi.nlm.nih.gov/books/NBK557403. Accessed March 19, 2024.

12) Mirena® (levonorgestrel-releasing intrauterine system). https://www.accessdata.fda.gov/drugsatfda_docs/label/2008/021225s019lbl.pdf. Accessed March 19, 2024.

13) O'Brien K, Russell C, Frances Fei Y, Rosen MW. Use of Two Levonorgestrel Intrauterine Devices in a Patient with a Uterus Didelphys: A Case Report. *Journal of Pediatric and Adolescent Gynecology*. 2022;35(6):718-721. doi:https://doi.org/10.1016/j.jpag.2022.07.009.

14) Paraguard® T380A intrauterine copper contraceptive. https://www.paragard.com/pdf/PARAGARD-PI.pdf. Accessed March 19, 2024.

15) Secura GM, Allsworth JE, Madden T, Mullersman JL, Peipert JF. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *American Journal of Obstetrics and Gynecology*. 2010;203(2):115.e1-115.e7. doi:https://doi.org/10.1016/j.ajog.2010.04.017.

16) Vranic E, Delic T. Intrauterine Devices - Past, present, and future perspectives. *Farmacevtski Vestnik*. 2006;57(1):14-23. https://www.dlib.si/details/URN:NBN:SI:DOC-XJZ8XJU9. Accessed March 19, 2024.

APPENDIX

Table 1: Contraindications to IUD insertion

Diagnosis or suspicion of pregnancy

Congenital or acquired uterine anomaly

Acute pelvic inflammatory disease

History of postpartum endometritis or septic abortion within the last three months

Acute liver disease or liver tumors, whether benign or malignant[b]

History of previously inserted IUD before removal

Hypersensitivity to any component of the IUD

Known of suspicion of breast malignancy[b]

Uterine bleeding of unknown etiology

Wilson's disease[a]

Copper sensitivity[a]

Untreated acute cervicitis, vaginitis, or lower genital infection

Empowering Patients: The Role of Education in Pain Alleviation during IUD Insertion

IUD = intrauterine device
aSpecific to copper-containing IUD
bSpecific to levonorgestrel-releasing IUD

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

Tuhin G M Al Mamun [1], EHSANULLAH [2*]

[1,2] Department of Economics, Hannam University, Hannam Ro, 70, Daeduck Gu, 34430 Daejeon, South Korea

ABSTRACT: This paper investigates labor market dynamics from 1990 to 2023 using the McCall dynamic programming search model, offering insights into individual decision-making, economic conditions, and policy implications. Convergence trends in wage predictions underscore the model's reliability, highlighting its utility for predicting wage outcomes over time. The policy implications emphasize the importance of balancing the duration of unemployment and the considerations of the wage level in policy design. In light of the analysis, policymakers and employers should consider the trade-offs between unemployment duration and wage level when designing policies and compensation practices. The insights provide guidance for policymakers, employers, and job seekers in navigating the complexities of the job market.

INTRODUCTION

Unemployment is a big problem that affects many people in South Korea and around the world. Even though the country is doing well economically and technologically, it can still be hard to find a job because the job market is always changing and can be challenging. To fix this problem, we need to understand how unemployment works and use that knowledge to create policies that can help people find work and make the economy stronger.

There is a model called the McCall search model that helps us understand how people look for jobs and what they think about when they decide which job to take. This model considers things like how much money they expect to make, how long it will take to find a job, and if there is any government help for people who can't find a job.

This model can help us understand why it can be hard to find a job in South Korea. The country has gone through a lot of changes over the years, from farming to factories to knowledge-based work. This means that the types of jobs that are available, the skills people need, and how secure a job is have all changed.

South Korea has some big challenges, like an aging population and not enough babies being born. Because of these things, it can be hard for people to find a job. There are also some rules and policies that make it hard for people to find work, and some people don't have the same chance to get a good education or a good job. All of these things together make it hard for people in South Korea to find a good job that they like and that is secure.

Therefore, studying how the McCall search model can be used to understand unemployment in South Korea can provide us with insights on how to make the job market more accessible to the people and, in turn, make the economy more stable.

LITERATURE REVIEW

Unemployment has been a persistent issue that has affected many economies for a long time. Several studies have been conducted to gain a better understanding of this problem. The McCall search model is a theoretical framework that has aided in comprehending how individuals make decisions regarding their labor market. The McCall model which was introduced by McCall[6] in 1970 which offers valuable insights of an individual decision-making process on job search.

This model also explores the trade-offs between accepting a job offer immediately or continuing to search for a job for more better opportunity. Though 50 years have passed,still the McCall search model is considered relevant in ccontext of present labor market.Researchers such as Alvarez and Veracierto (2000)[9] and Fujita and Ramey (2009)[3] have examined the duration of unemployment as a critical factor. They have investigated a variety of factors, including worker profiles, labor market circumstances, and policy initiatives, to better understand the length of unemployment spells.

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

These findings demonstrate the need to consider heterogeneity and dynamic interactions when assessing unemployment spells, which is consistent with the McCall model's ideas. Researchers have been investigating the influence of individual reservation wages on labor market outcomes, also known as wage determination. Elsby et al. (20100)[1] and Kroft et al. (2013)[5] conducted empirical investigations employing large-scale datasets and advanced econometric approaches to shed light on the factors that govern wage determination. These investigations are consistent with the theoretical basis of the McCall model.

Programs that offer financial aid or job search assistance to jobless people have been studied by specialists. To be effective, such programs must be designed to motivate job seekers to look for jobs. The McCall search model has helped academics understand how individuals look for employment and establish successful job-seeker assistance programs. Rothstein (2011)[8] and Farber (2015)[2] studied how unemployment insurance policies and changes in the job market affect how people look for work and their job prospects. Their research shows that it's important for the government to create policies that take into

Consideration the challenges that job seekers face. These policies should be tailored to meet the needs of jobless individuals and should be based on the McCall search model's assumptions. With the advancement of technology, researchers can now use the McCall search model to gain insights into labor market trends. Recent studies, such as Hagedorn et al. (2015) [4] and Merkl and Stolte (2016)[7], employ dynamic stochastic general equilibrium (DSGE) models and structural estimation methods to investigate how labor market frictions and search behavior impact unemployment dynamics.

These studies connect microeconomic principles to macroeconomic dynamics, leading to a better understanding of the aggregate effects of individual decision-making processes, and thus improving our understanding of labor market dynamics. Researchers have made significant progress in comprehending the intricacies of the labor market and shaping policy debates that aim to decrease unemployment and promote economic stability in contemporary settings. This progress has been achieved by merging insights from theoretical models, empirical studies, and methodological advances.

DATA COLLECTION METHOD

To study the period of unemployment rates from 1990 to 2023, we collected data from the Federal Reserve Economic Data (FRED) database. We used this database for reliable and comprehensive macroeconomic data that includes unemployment rates. We downloaded the data directly from the FRED website to ensure the accuracy and consistency of the dataset. We applied techniques to clean and process the data to handle missing values and ensure data integrity. This collected data was then used to analyze the factors influencing unemployment duration and wage determination over the given period using the McCall search model.

MODEL FORMULATION

The McCall search model comprises two fundamental equations that encapsulate the decision-making process of an unemployed worker in the labor market.

1 Bellman Equation: The first equation, known as the Bellman equation, represents the dynamic programming problem that the unemployed worker faces. It encapsulates the value function that determines the maximum expected utility or value that the worker can attain at each point in time. The Bellman equation is expressed as follows:

$$V(w) - \max\left\{\frac{w}{1-\beta}, c + \beta \sum_{i=1}^{n} V(w_i)p_i\right\} \tag{1}$$

Where:

- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.
- $V(w)$ is the value function, representing the total lifetime value associated with being in a state characterized by a wage offer w.
- $1w$ is the wage offer in the current period.
- β is the discount factor, reflecting the worker's time preference.
- c is the level of unemployment compensation.
- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.

Reservation Wage Equation

In the McCall model, the optimal policy (w) is a crucial determinant of an unemployed worker's decision-making process regarding whether to accept or reject a wage offer w.

Formally, the optimal policy is defined as:

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

$$\text{sigma}(w) - \begin{cases} 1 & \text{if } w \geq \bar{w} \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

- where $\bar{w}$ represents the reservation wage

The reservation wage is the wage level at which the worker is indifferent between accepting a job offer and remaining unemployed. It serves as a threshold: if the wage offer w is greater than or equal to the reservation wage, the worker accepts the job offer ($\sigma(w) - 1$); otherwise, the worker rejects the offer and continues the job search ($\sigma(w) - 0$).

The reservation wage equation determines the minimum wage level at which the worker is willing to accept a job offer, known as the reservation wage. It is given by:

$$\bar{w} - (1-\beta)\left\{ c + \beta \sum_{i=1}^{n} V(w_i)p_i \right\} \tag{3}$$

Where:

- $\bar{w}$ is the reservation wage.
- w_i are possible wage offers in the next period.
- p_i is the probability mass function for observing wage offer w_i.
- where c is the level of unemployment compensation,
- β is the discount factor,
- $V(w_i)$ is the value function for each possible wage offer w_i and
- p_i is the probability mass function for observing wage offer w_i.

In essence, the optimal policy guides the worker's decision to either accept or reject a wage offer based on whether it exceeds the reservation wage, thereby influencing the worker's employment outcomes and overall welfare.

These equations form the core of the McCall search model, providing a rigorous framework for analyzing individual decision-making in the labor market context. They enable us to understand how unemployed workers weigh the immediate benefits of job offers against the potential for better opportunities in the future, thereby shedding light on the dynamics of unemployment duration and wage determination

RESULT
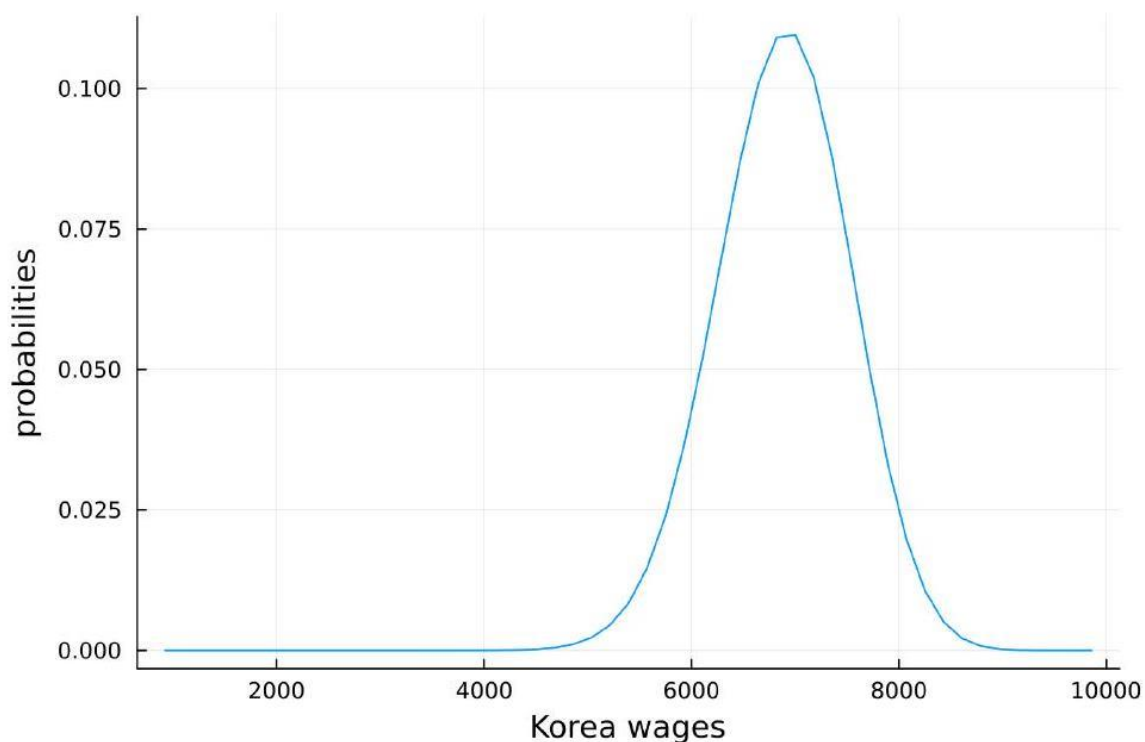
The graph shows a bell-shaped probability distribution of wages ranging from 925 to 9860 Korean won, peaking around 6000 won, suggesting a normal distribution of wages in the job market. The central concentration of wages around 6000 won indicates that this is the most probable and possibly represents the median wage in the market. The wide range of wages from 925 to 9860 won

shows a healthy diversity in job types and industries. The McCall job search model can be applied to predict job search outcomes and guide job seekers in setting realistic reservation wages based on the most probable wage offerings

CONVERGENCE OF WAGE PREDICTIONS
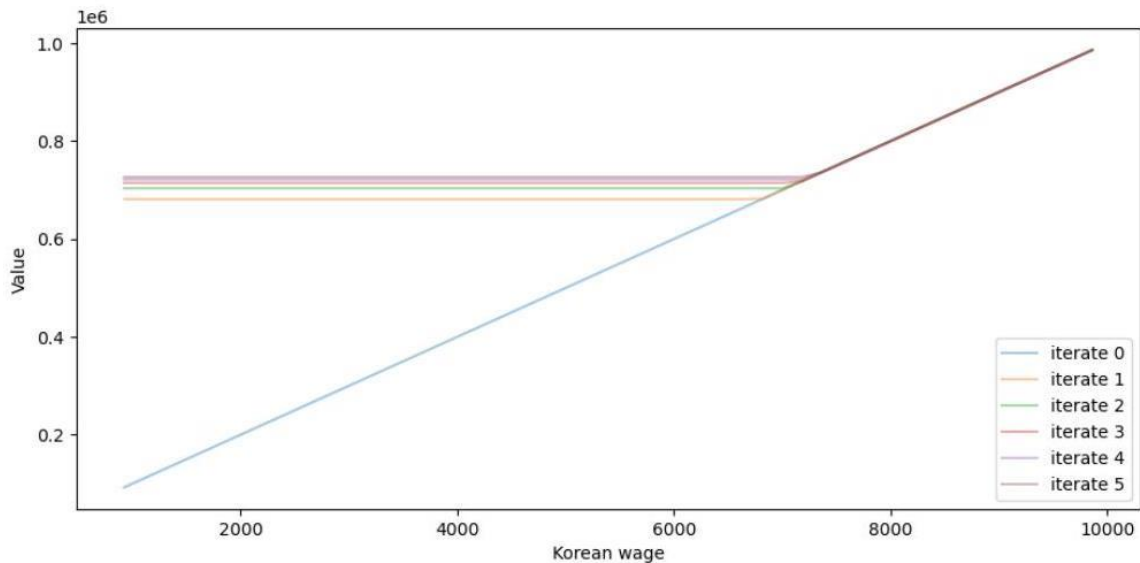
The included line graph shows the convergence of wage predictions across six iterations, indicating the model's iterative refinement and convergence behavior. The results indicate a significant convergence trend, increasing accuracy, and reliability in predicting wages. The model parameters are fine-tuned effectively, reducing the error margin and enhancing the predictive consistency. The observed convergence implies that the model is approaching an equilibrium point where further iterations do not significantly alter the outcome, which is crucial for practical applications. Additionally, the logarithmic scale on the yaxis highlights the exponential relationship between input wages and predicted outcomes, underscoring the sensitivity of the model to changes in input values.

1 Korea reservation wage
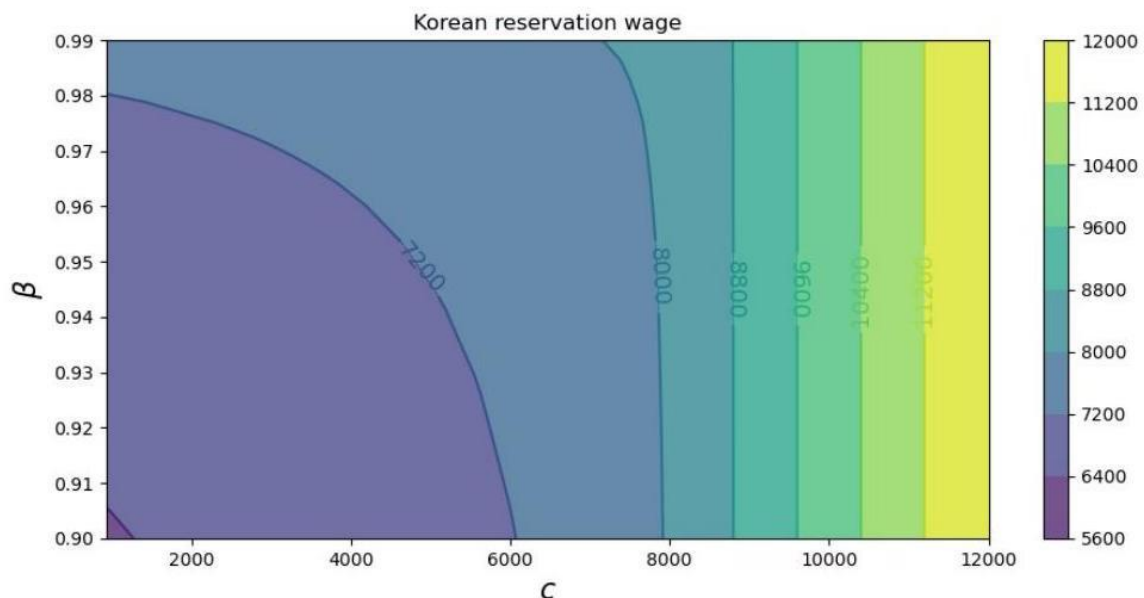
The observed phenomenon of a reservation wage exceeding the current hourly pay suggests a nuanced shift in individuals' expectations and economic dynamicswithin the labor market. The reasons for this deviation could be the evolution of individual perceptions regarding the value of their labor, macroeconomic factors such as inflation and changes in the cost of living, and shifts in the labor market's structure and demands. Policymakers and employers need to understand these nuances to ensure fair compensation practices and address the evolving needs of the workforce.

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

2 Unemployment Duration
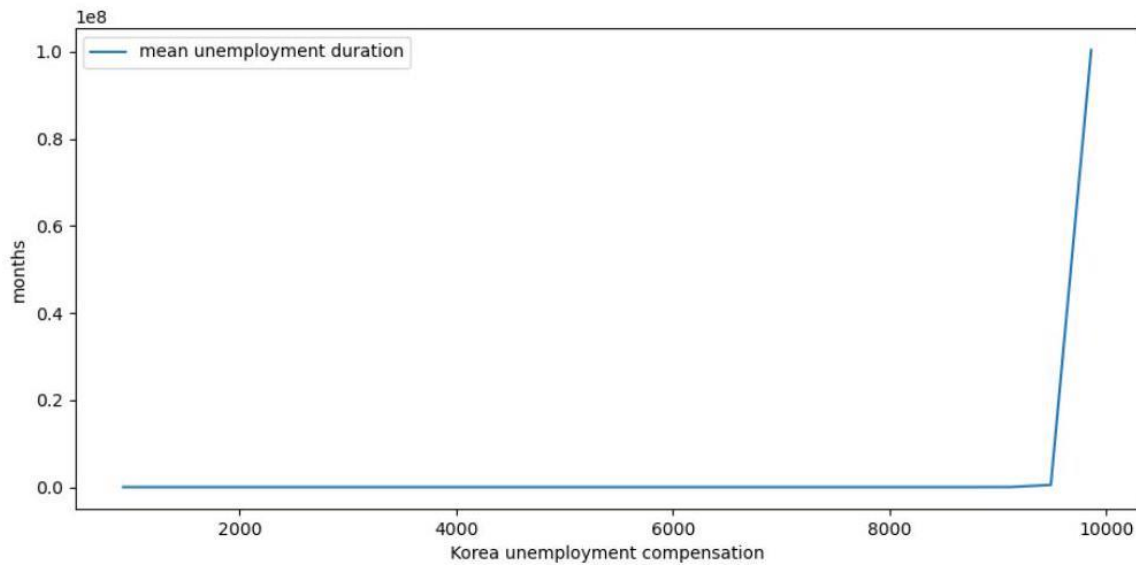
The estimation shows that the mean unemployment length stays extremely short, nearly at zero months, across the majority of the unemployment compensation range (from 2000 to about 8000 won).

But when the compensation gets closer to 10,000 won, the mean unemployment duration increases noticeably and reaches 1.0 month.

This graphic implies that longer periods of unemployment may be linked to increased unemployment benefits; this relationship is most evident at the highest

3 Wage Function
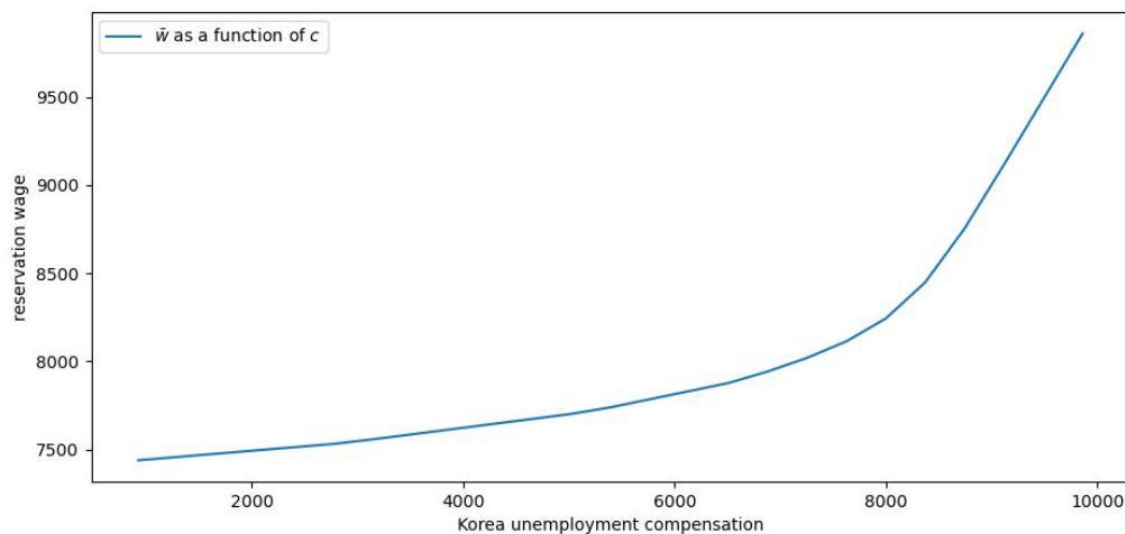
Increased unemployment benefits relieve job searchers of the need to choose low-paying offers which enable them to wait for better-paying positions.Because they have more negotiating power, people may agree to better pay and work matches, which eventually improves the economy and increases job satisfaction.

The wage as a function of c result displays a curve that rises gradually at first from 7500 as compensation rises from 2000. But when the compensation gets closer to 8,000 , the curve steepens noticeably, signaling a sharp rise in the reservation wage as the unemployment benefit gets closer to 10,000 . This implies a relationship between a higher reservation salary and greater unemployment compensation, which may lead to people holding out for better-paying jobs for longer periods.

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

4 Optimum Policy

Comparison of Reservation Wages for Different Policies
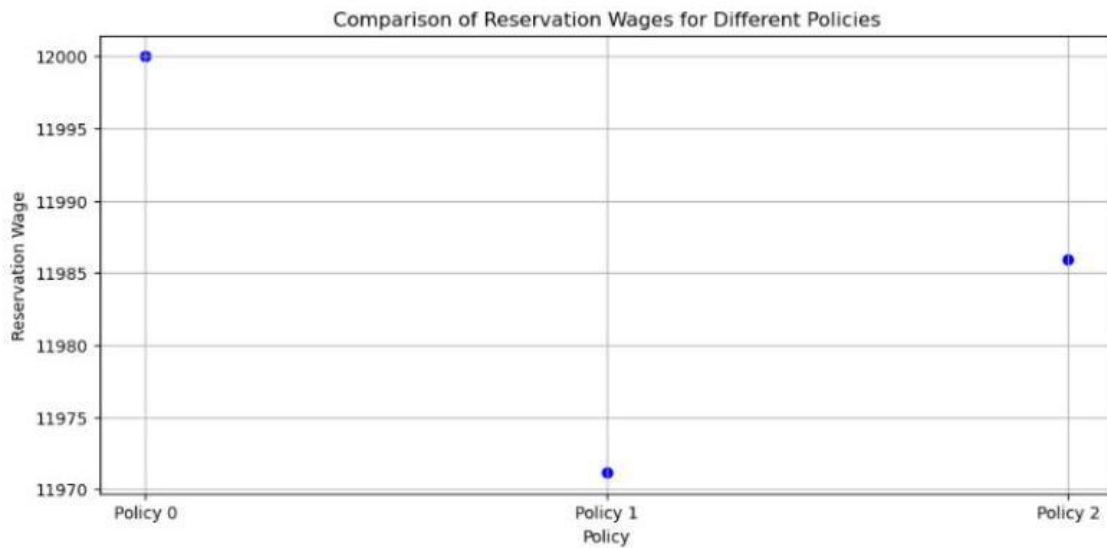
4.1 Policy 0 (Aggressive Approach)

Reservation Wage: Approximately 12000 According to Policy 0, when looking for a job, some people are very picky and only accept offers that pay more than a certain amount, around 12000. This policy focuses on getting a higher salary, but it may take longer to find a job, which can lead to longer periods of unemployment. However, when they do find a job, they are likely to earn more money.

4.2 Policy 1 (Balanced Approach)

Reservation Wage: Approximately 11971.15 Policy 1 is a fair way to look for a job where people think about how much money they can make and how long it will take to find a job. The minimum amount of money they are willing to accept for a job, which is around 11971.15, means that they are ready to accept job offers at a slightly lower pay compared to Plan 0 . This way of looking for a job tries to balance the time it takes to find a job and how much money someone can make, which helps people find a job quicker and with a good pay rate.

4.3 Policy 2 (Conservative Approach)

Reservation Wage: Approximately 11985.94 Under Policy 2, individuals adopt a conservative approach, accepting job offers more readily even if the wage is relatively low. The reservation wage, around 11985.94, suggests that individuals are willing to accept job offers at a slightly higher threshold compared to Policy 1. This approach prioritizes minimizing unemployment duration over wage level, resulting in quicker re-employment but potentially at the expense of lower-paying jobs.

4.4 Comparison

Policy 0: Highest reservation wage, indicating a more aggressive approach with a focus on securing high-paying jobs. Policy 1: Balanced reservation wage, reflecting a balanced approach considering both unemployment duration and wage level. Policy 2: Slightly lower reservation wage compared to Policy 1, suggesting a more conservative approach with a focus on minimizing unemployment duration. Overall, the choice of policy impacts individuals' decisions regarding job acceptance, influencing unemployment duration, job acceptance rates, and overall welfare. Policy selection should consider the trade-offs between unemployment duration and wage level based on individual preferences and economic conditions

CONCLUSION

In conclusion, this paper provides valuable insights into the labor market using the McCall search model.It shows how people make decisions about jobs, the role of the economy, and how policies can be made to help people.

The findings suggest that the job market is generally stable, with most people earning an average wage. Policymakers can use this information to keep the economy growing.

The McCall search model is a useful tool for predicting future earnings, which can help both policymakers and job seekers.

The analysis also highlights the importance of understanding why people want to earn more and what can be done to help them. Policymakers and employers should think carefully about how

Understanding Unemployment Dynamics and Labor Market Behavior in South Korea: Employing Mccall Dynamic Programming Approach

REFERENCES

1) Michael W Elsby, Bart Hobijn, and Aysegul Sahin. The labor market in the great recession. Technical report, National Bureau of Economic Research, 2010.

2) Henry S Farber and Robert G Valletta. Do extended unemployment benefits lengthen unemployment spells?: Evidence from recent cycles in the us labor market. Journal of Human Resources, 50(4):873-909, 2015.

3) Shigeru Fujita and Garey Ramey. The cyclicality of separation and job finding rates. International Economic Review, 50(2):415-430, 2009.

4) Marcus Hagedorn, Iourii Manovskii, and Kurt Mitman. The impact of unemployment benefit extensions on employment: the 2014 employment miracle? Technical report, National Bureau of Economic Research, 2015.

5) Kory Kroft, Fabian Lange, and Matthew J Notowidigdo. Duration dependence and labor market conditions: Evidence from a field experiment. The Quarterly journal of economics, 128(3):1123-1167, 2013.

6) John Joseph McCall. Economics of information and job search. The Quarterly Journal of Economics, 84(1):113-126, 1970.

7) Christian Merkl et al. Monetary and labor policies under market frictions. 2007.

8) Jesse Rothstein. Unemployment insurance and job search in the great recession. Technical report, National Bureau of Economic Research, 2011.

9) Marcelo Veracierto. On the cyclical behavior of employment, unemployment and labor force participation. Journal of Monetary Economics, 55(6):11431157,2008.

Ownership of Humans

Dr. Nguyen Anh Quoc

University of Social Sciences and Humanities – Viet Nam National University Ho Chi Minh City, Vietnam
https://orcid.org/0000-0002-6387-2653

ABSTRACT: Animals and species live by behavior, they possess instincts to survive. People live by their own products. Depending on natural conditions and social circumstances, people have different ways of living, ways of living, and lifestyles. A way of life is a way of making products that ensure survival and the maintenance of the species. The characteristic of this product is direct, realistic, inevitable, and natural human communication. Communicating in nature, using products as brokers, is social. Society is a product prepared for people to enjoy and satisfy. Humans do not exist, society is meaningless. The existence of society is rich so that people can live based on each other's abilities and needs. Social satisfaction makes different ways of living in the process of development. The way of life makes products not only in tools, machines, equipment, robots, computers, AI, labor, plant care, and animal domestication, but also performs the basic function of survival, maintain the race and educate fellow human beings. But there is no product as good as people. Humans are both subjects and human products. Humans are both the subject of perception and the object of perception. Mutual ownership between people in family, religion, state, company, bank by tradition, canon law, law, charter, money. This ownership is both a product of necessity and a product of freedom in the process of development.

KEYWORDS: Humans, ownership, standards, money, instincts

1. INTRODUCTION

The issue of owning property, wealth, and money is recognized by society and regulated by law but is understood very differently. Wealth is considered to be possessing a lot of assets and money, then that wealth is attributed to the origin of those assets and money. The phenomena of getting rich through robbery, corruption, money laundering, smuggling, and tax evasion are still being eliminated in practice. Inheritance, business, speculation, high-paying careers are being eliminated by progressive taxation. But now ownership is understood as the right to possess, dispose of and use property and money of the subject. Humans use, possess, and dispose of each other, becoming mutual ownership among humans who are still modestly studied. People possess, determine, and use each other in family, religion, state, company, and bank, which is mutual ownership between people. Humans become human vehicles. Assigning functions, tasks, and job positions according to traditional standards, canons, laws, and regulations, money becomes possessed, determined, and used among people. People are possessed, lose themselves and become products of tradition, canons, laws, regulations, and money. People become slaves to family, religion, state, companies, banks. It is slavery to standards, money makes people become commodity instincts. Ownership of goods becomes ownership of people. The study of property ownership and money becomes the study of human goods. That is the reason for the presentation and analysis of human property.

2. RESEARCH OVERVIEW

The issue of ownership is made by distinguishing between privately owned and private individual, which states: "If this person cannot take what is the other one to do for himself, the discussion of ownership becomes redundant. In regime matriarchy, the personal power is owned property reproductive so children are of mother. In patrilineality, the personal power gained is the possession of muscle healthy, so what eating makes is father's. Primitive communal society exists is based on reproduction, muscle health so the dispute took place out at that level. In the period of patriarchal regime the dispute appeared because The product is not only due to the strength of its own individual muscles, but also regulated by the community of people" (Quoc, N. A., et al.,2021, P.195). When discussing values and even human beings, it is said that: "Human cost demonstrated in social relations

Ownership of Humans

regards the standards as "the parity", and in economic relations regards money as "the parity". While people are as "the parity", all become goods, but when standards and money are as "the parity", people become commodities popularly" (Quoc, N. A., et al.., 2020, P.2720). When studying the nature of money, it is confirmed: "Competence, qualities and good virtues at work are the goals of real people. People are conditioned to become the needs of all. Truth is the goal, then people are honored and become the life source of society. Then, the value of man is the value of truth" (Quoc, N. A., 2021, P.632). Human corruption is a process driven by standards and money. "Human trade is sup erfluous when labor, behavior is liberty, creativity, happiness. Liberty, creativity, and happiness are human's, so only human is the need of all. If you want to possess and conquer nature, return to being human. The full, complete, and realistic recapture of the human being is to return to the individual's abilities and needs to his fellow human beings. Master or slave, liberty or prison, happiness or unhappiness is the work of man". (Quoc, N. A., Tri, N. M., Thuong, N. A., Hoang, D. T., & Bung, N. V.,2021, P.261). Based on the inheritance of ideas, the author continues to develop and present the content titled Ownership of Humans.

3. RESEARCH METHODOLOGY

When researching the topic of Human Property, the author approaches this content from the methodology of human philosophy. It considers humans as the measure of all things. All phenomena in the universe, no matter how diverse and rich, exist only inside or outside humans. Man is the balance inside and outside, man is the broker to transform the outside into the inside and the inside into the outside. Human life is a transformation between inside and outside. Internal communication is human communication using standards as a broker. External exchange is the buying and selling of goods using money as a broker. Human life becomes the standard exchange with money making humans a commodity. Possession of goods becomes possession of people.

4. RESULTS AND DISCUSSION

4.1. Natural relations become human communication

The relationship between humans and nature is inevitable, it is the relationship between direct cause and effect, the relationship between subject and product. The subject who owns the product is an inevitable and natural possession. The characteristic of human relations with nature reaching the highest level of development is realistic, direct human communication. It is an exchange between man and woman, resulting in children being born. Husband and wife, parents, and children are products of each other, possessing each other in a direct cause and effect relationship. But husband and wife, parents, and children are all human beings and should be equal. Owning each other directly, husband and wife, parents, and children use each other for what they want voluntarily, freely, and without profit. People are both subjects and products of each other. Humans are both the subject of perception and the object of perception.

Humans are valuable subjects. Value is added in a practical and effective way when you know how to invest in yourself and people. Nothing can be produced more efficiently than by producing people; Raising no animal makes as much money as raising humans; There is no joy like the joyful return of human life; There is no profession as noble as the profession of caring for people; There is nothing as good as human goodness, but the opposite of all that is also human. People are everything; Invest in people, invest in effective development. The highest level of human development is a product of each other.

Humans are the subjects who own products and become objects of mutual satisfaction, so humans are both the subject of perception and the object of perception. Human products are rich and diverse, but the best thing about humans is direct, inevitable, and natural mutual ownership. Man is a subject created by man. Human perfection is realistic communication to survive and maintain the species. But maintaining the species and survival means regularly exchanging with the external, tangible natural world such as temperature, oxygen (o2), water, food and other things, depending on abilities and needs. Realistic, direct, natural communication ensures human life. Humans are the same, they are equal, fair, therefore, they have no distinction but are different in performing the function of maintaining the species or performing the function of survival. The functions of maintaining the species and survival are unified. To survive is to maintain the race, to maintain the race is to ensure survival. The transition between survival and the maintenance of the species in historical means and ends causes population growth. Men and women have different genders but are educated, satisfy each other, and are the same people. This satisfaction is not only for survival and educating each other, but its consequences are also to maintain the race and reproduce.

Population growth is not only dictated by needs, it also occurs by capabilities. Realistic, direct, natural satisfaction in the cause and effect relationship between men and women, that is sexual satisfaction. Sexual satisfaction is natural but its consequence may or may not be the birth of a child, a son or a daughter. Giving birth is natural, taking care of children is instinctive. Giving birth and raising children is natural, it is completely free, self-aware, and selfless. Sexual satisfaction in general is instinctive, but in humans it is creative, free, and responsible. Individual responsibility in sex becomes society's responsibility, causing

Ownership of Humans

population planning to change. The gender difference in performing the natural function of caring for each other becomes the social division of labor. The functions and duties of husband and wife, parents and children are different in the division of labor. Division of labor becomes product distribution, income levels, and social benefits. Society cannot meet population conditions, social differentiation occurs, making living methods and lifestyles rich and diverse. Species live on the products of the natural world, while humans live on their own products. Rich products become the richness of life.

The diversity of needs is diversity in the ability to become creative workers. Labor is a typical human activity. Besides the time to satisfy instincts, the remaining time is labor. Labor levels were raised, manual labor was separated from verbal labor. The products of manual and oral labor become the object of human survival. Nature is the object of manual labor, people are the object of verbal labor. The product of oral labor is the survival purpose of making language rich in concepts, categories, judgments, and inferences. Life changes and developments are conceptualized and abstracted logically according to the chain of causes and effects. When comparing things according to the chain of cause and effect in the search for truth without starting from realism, specific history makes the truth strange. The question posed in a logical, cause-and-effect chain asking which came first, the chicken and the egg, and which came later becomes indeterminate.

Studying the world starts from uncertainty, causing some theoretical sciences to have no premises, or invented premises. But theoretical sciences have become living professions that have proved very popular in different eras. This scientific product is rationalized for different professions, systematic reasoning, new professions in the field of philosophy and mathematics gradually appear. Verbal and manual labor are united so there is no distinction, no discrimination between people. The population is larger, food becomes scarce, the division of labor becomes the difference between manual labor and verbal labor in terms of income and enjoyment. Manual labor continues to be maintained in hunting, gathering, animal husbandry, and farming. Oral labor is divided into different jobs depending on the level of each stage, and professions such as education, management, service, and catering appear accordingly. The division of people becomes an exchange between manual labor and verbal labor. Different lifestyles mean different jobs, but they are all the same people, there is no noble job, no lowly profession.

Invented products and inventions of unique nature are considered great and great works. People are products of each other that become popular and are devalued. Perhaps what is commonly produced becomes redundant, while patented and manufactured products that are unique and scarce become precious and highly valuable. The best thing is that the product not only allows the subject to survive but also allows others to live. Need products need people. Caring for, supporting, and compensating each other in life is inevitable and natural. The larger population needs products and needs jobs and occupations to make a living. Needing a job becomes learning each other's way of life. Learning each other's way of life is taking away each other's life. Giving each other a way to live becomes possessing each other's lives. To possess life and products is to possess people and become each other's living objects. The division between husband, wife, parents, and children appears.

But spouses, parents, and children are all human beings. People are both inside and outside the family, and the family is both outside and inside the person. The transformation inside and outside the family is the transformation outside and inside the person. The internal and external transformation of a person causes the product to appear. When a product becomes scarce, that product becomes a need; when a product becomes popular, it becomes a human ability. The product belongs to the subject, needing the product means needing the subject. Ownership of the subject and ownership of the product are the same in exchange. Owning a product is owning a person. Without people, products do not exist. When people die, all products are meaningless.

4.2. Human communication becomes social exchange

Social change and development begin with human development, which is the process of differentiating people into different professions. Work not only satisfies abilities but also satisfies needs. Job and career satisfaction is joy, a consequence of work that satisfies needs with the products obtained. The product not only satisfies the needs of the subject, but the product also gives life to others. Any product that meets the needs of others is the product's ability to be popularized, and that industry has the conditions to develop. Product richness is the richness of needs and capabilities. The richness of abilities is the diversity of occupations in the social division of labor. Diversity in the social division of labor becomes the difference not only in occupations but also in job positions, and income becomes the satisfaction of different needs. Needing products becomes needing professions in that field, needing jobs and labor becomes needing people. The richness of work is the richness of people, which becomes the diversity of methods, ways of living, and different lifestyles. The population is larger, the diversity of ways of life becomes the object of human life.

Human life is an internal and external transformation, it is a transformation between people and products in means and ends in the process of social differentiation. The social differentiation determined by products has a specific historical nature, the first being the family system. Family is where husband and wife, parents and children protect and care for each other freely, voluntarily and without profit. The internal transformation of the family is the transformation between husband and wife, parents

Ownership of Humans

and children in the division of labor, product distribution, and the appearance of patriarchy. Patriarchal habits are clearly revealed when there is an exchange of external products to ensure the survival of the family. Domineering in the matter of marriage to exchange power or money or status. Noble statuses that are lowered are compensated by money, while lowly statuses lose money (dowry) to be compensated by noble status.

Each other's products have a weak, natural nature in the cause and effect relationship, but mutual disputes cause private ownership to appear. Ownership that is natural in the relationship between cause and effect becomes social ownership, that is, human communication using the product as a broker. Internal products correspond to standards, external products correspond to money. The human interaction with products becomes the standard exchange with money. Natural human relationships become social relationships. Owning people naturally becomes owning people by standards and money. Money and standards are to possess, determine, and use people according to the standards and money wants. People use standards, money becomes standards, money uses people. Mutual ownership between people by standards and money. Owning people and owning products are the same, but when the product is the purpose, people are divided into subjects and products. Patriarchy appears as a product of the struggle for ownership of people and products in the family. The existence of the family is the work of the patriarch. Patriarchy uses people for what patriarchy wants to become the family's business.

With population imbalance, having children is a need, women are the owners of reproduction, and matriarchy appears. When food is scarce, food is a need, men are the owners of health, and patriarchy appears. Owning different products makes private ownership different between matriarchal families and patrilineal families. Differences between families become differences in social exchange but still ensure human survival. Sex becomes a broker to transfer ownership of labor outside the bloodline, species outside the family appear. Exchange outside the family, that is outside the bloodline, is the exchange of family products. It is the exchange of labor and people, the buying and selling of goods. Unsatisfied goods become mutually possessed. Mutual possession becomes mutual resistance and transformation. Mutual re-education through forced sex, labor, education becomes agreement, negotiation, consultation or through war, violence, domination makes religion and state separate from family, becoming alien force, dominating people.

From the beginning, human life is natural, in which husband and wife are products of each other, children are products of parents. This product is in direct contact, inevitably becoming the buying and selling of goods. Buying and selling goods makes people no longer human but is a destructive factor that deforms them. Human communication is no longer real, direct, but a standard exchange with money becoming the buying and selling of goods. Commodities are destructive forces that deform human life because of standards and money has a commodity instinct. Commodities make society distinguish between buyers and sellers. Each other's products are natural, so husband and wife, parents and children merge into one, they have no distinction. Performing the functions of men with women, parents with children is a natural function that becomes a duty in the division of social functions and tasks. Division of tasks, distribution of products, different living standards become buying and selling labor, jobs, goods. Buying and selling goods becomes a transfer of ownership, redistribution of products, and social differentiation in enjoyment.

4.3. Social exchange becomes the sale of people

With a difficult profession and a low standard of living, it gradually becomes unique. Any occupation that is gentle and has a high standard of living is popularized and becomes the living habit of the species. The living habits of species become widespread, humans become the object of species' survival. Possession makes people become each other's products, mutual ownership in religion, state, companies, and banks appears. Species outside the family appear not only as a product of verbal labor but also as a product of manual labor; If it is not a product of agreement, it is also a product of violence. The transformation between agreement and violence in means and ends becomes mutual possession by norms. Mutual ownership by standards makes the instincts and behaviors of species increase. Human communication becomes exchange between species, that is, the exchange of different occupations, working positions, power, and income levels. This exchange becomes semi-standard, buying money so that labor does not enjoy it, but labor does not enjoy it. The appearance of laziness causes bad habits and falsehood to increase. Family, religion, and state become objects of each other's life, possession of each other's lives between species appears to become mutual possession between humans. Selling labor means buying jobs. Labor is no longer fun, labor is a compulsion. Labor is not for the worker himself but for standards or money, so outside of standards, money makes labor lazy. Without standards, money is labor not performed.

Up to now, the family is still the place that effectively provides labor resources for the survival of religion, the state, companies, and banks. Species that are directly and realistically attached to the family are provided with resources to survive; species that are not attached to family or financial life are those species that perish. Religion, state, companies, banks are products and objects of human life. Humans create religions, states, companies, and banks to survive, and become religions, states, companies, and banks to survive by possessing humans. Religion, the state, companies, and banks that possess people from

Ownership of Humans

families do not know how to get bored, they do not know enough, they always feel lacking but do not know how to stop. Competition between species for humans in all possible forms. Even the assignment of functions, tasks, and job positions is to use each other between people to do what they want together, which is to have a job to do, to have a profession to live.

If religion were not a profession for living, religion would have disappeared long ago. If religion has a police or army, religion only exists in the past. When the profession of a monk becomes rich, the whole society competes to become monks, and religion disappears. The job of a monk is to be comfortable, satisfied, and at peace, while advancement is to enjoy everything after death to comfort oneself. Mutual possession outside of human love, outside of direct cause-and-effect relationships, outside of family becomes the behavior and instinct of species. Instincts and habits make society have a surplus of labor in the oral area but a shortage of labor in the manual area, laziness in society becomes common, poverty and other problems appear accordingly. . Tools, machines, and robots appear to increase productivity, and instinctive professions are replaced by machines, robots, and AI. Owning the object of life becomes the goal, while work and career are just different means. Mutual ownership of careers becomes mutual ownership of people.

Species are the living objects of humans, becoming humans are the living objects of species. Species possessing humans is an instinct, possessing each other, not knowing enough, not knowing how to stop becoming possessive of humans, that is, possessing each other's way of life. If a way of life is still a possibility or a need, it becomes popular and society moves according to that trend; Any way of life that is no longer a possibility or a need for survival will self-destruct. Species that are still suitable will continue to survive, species that are no longer suitable will perish. Traditional work is also a need, families have conditions to develop. The profession of clergy is still alive and well, religion has the conditions to expand its scale, reproduce, and its structure and organization become rich and diverse. The profession of civil servants is also the job of enforcing justice, the state has the conditions to expand its scale and create jobs for the majority. Businessmen also earn a lot of money, companies and banks have conditions to develop. Diversifying occupations is to enrich the lives of species. Differences in behavior cause society to differentiate into different species. The richness of species is the richness of needs, instincts, and habits that become the richness of objects of survival, the mutual possession of life between species that appears. Mutual ownership beyond sex, blood relations appear to become possession of each other's labor.

Human communication is enjoyment, satisfaction becomes product exchange, buying and selling goods changes ownership, causing new products to appear. People are natural communication, and products are social communication. Social communication outside of products changes the object of ownership and the subject of ownership. The subjects of ownership, labor, and products are different but unified in exchange. Possession of the product or labor becomes possession of the possessing subject. Mutual possession by exchanging products, buying and selling goods makes society divided into privately owned and private individual. Private individual and privately owned are different ownership entities. Satisfying needs is private, while satisfying abilities is privately owned. Privately owned creates different products, while private individuals possess goods without feeling bored, always feeling lacking but not knowing enough. Those who love standards compete for status without knowing how to stop, and those who are greedy for money don't know how to have enough.

The contradiction between privately owned and private individual, the antagonistic division of labor appears, and private ownership is born. The established regime recognizes private ownership but rationalizes the existence of private individuals. Privately owned property becomes a private individual with conditions for popularization. Privately owned property maximizes the potential of human resources and labor in society. With a larger population, private ownership (privately - owned) creates capabilities and needs, the richness of private - owned ownership is the abundance of labor and product diversity. Private individuals who possess goods become possessive of living objects, making them scarce. Speculating on living objects to increase prices to make a profit, or renting out living objects, or buying labor to make a profit is the nature of private individuals. But private individual ownership can only exist when exploiting the policies of a specific regime. Private individual's possession of goods and living objects becomes social possession, possession of the right to life.

When private individuals become popular, making living objects scarce, it becomes the cause of depleted resource exploitation, weapons production, surplus of goods, and labor shortage in this area but surplus. in the other region, causing increased distribution differences. Private individuals create barriers to social development, human resources are not fully exploited, making professions and job positions become commodity instincts. Buyers and sellers are tied together by money, sellers need money, buyers have money. The life of money becomes the instinct of the money species. Money becomes a strange, truly dominant force, bringing life back to the instinct of money.

The possessive instinct makes a product scarce, then that product is created and produced to meet the needs of society. When a product becomes popular, possessing that product becomes redundant. The instinct to possess becomes a shock to values, changing values becomes a requirement of life. Human differentiation is based on different abilities and needs. When the population is large, the universal commodity instinct creates barriers to expressing human nature. The greatest suffering is that

Ownership of Humans

human nature is not revealed. The abolition of suffering becomes the abolition of universal goods. Money is universal, money is inflationary so money is abolished. But the abolition of money is to abolish this form of money with a new form. That money is backed by the power of truth. Truth is the ultimate currency in evolution. If everyone can make money, that money becomes redundant. Eliminating excess money becomes eliminating the possessive instinct, old money-making professions fall into decline, and new jobs appear. Forms of ownership, diversity in division of labor, diversity in forms of income create conditions for human development that is, promoting each individual in accordance with the profession and job position.

Human development begins with the creation of new products; Product functions not only bind each other through private ownership but also regulate society through division of labor and social redistribution. Different owners and objects of ownership, diverse products make society different in professions and job positions. But the abundance of jobs and diversity of occupations in agriculture, industry, and services has a difference in diligence and laziness. Human development is the process of human differentiation, and products are both the driving force and barrier of that differentiation. Product perfection becomes the instinct of a species. Ownership appropriate to the profession creates conditions for full and comprehensive promotion and exploitation, with each person working according to their ability and benefiting according to their historical needs. Human happiness is not a given, it is a reality when each person acts according to their abilities and specific historical needs.

Changes in ownership lead to differences in the division of labor and job positions, but also lead to differences in distribution, levels of benefits, and income, which improves the quality of human life. Product substitution is a natural historical process. The transformation between people and products in means and ends has a specific historical nature in different production methods, lifestyles, and ways of living. Different ways of living are the habits and birth instincts of different species. The needs of one species are the capabilities of another species. The existence of the family is the object of the extra-family species becoming the extra-family species is the object of the family. The person as the object of the family becomes the family as the object of the person. Humans are objects of families that become objects of species. Species survive on human life. People do not exist and families, religions, states, companies and banks become meaningless. When people disappear, existing species become redundant. Humans are the abilities and survival needs of species. Species desperately need human existence. Population and social security policies become goals and strategies in human security.

5. CONCLUSION

Natural life is inevitable, human life is freedom. Freedom in human communication is a natural development process in humans. The most basic and best function that makes humans the product and subject of each other is forgotten. Strange things become wonderful, great things that make people lose themselves and become products of times with different natural conditions and social circumstances. Humans become slaves to nature and society and become the living instinct of families, religions, companies, and banks. Instinctual jobs and professions being replaced by robots, AI, and chatGPT are a natural development process.

REFERENCES

1) Karl Marx and Friedrich Engels, *Complete volume, volume 8*, Publishing House. National politics, Hanoi, 1993.
2) Karl Marx and Friedrich Engels, *Complete volume, volume 42*, Publishing House. National politics, Hanoi, 2000
3) Quoc, N. A. (2018). *Human issues in Karl Marx's Economic and Philosophical Manuscripts of 1844*. European Journal of Social Sciences Studies. Volume 3, Issue3, *ISSN 2510-8590, ISSN - L 2510 -8590*.
4) Quoc, N. A. (2019). *Karl Marx's theory of human nature*. European Journal of Social Sciences Studies, Volume 4, Issue 4, ISSN: *2510-8590, ISSN - L 2510 -8590*.
5) Quoc, N. A. (2019). *A discussion about personal alienation*. Journal of the Vietnam Academy of Social Sciences, ISSN 1013 - 4328, Issue 12 – 2019, p.69-77.
6) Quoc, N. A. (2020). *Human Sciences*. Journal of the Vietnam Academy of Social Sciences, ISSN 1013 - 4328, Issue 2 – 2020, P. 35-44.
7) Quoc, N. A., & Tri, N. M. (2020). *Money with perfecting human*. International Journal of Education Humanities and Social Science. Volume 3, No 3.
8) Quoc, N. A., & Tri, N. M. (2020). *Nature of Religion*. International Journal of Humanities and Social Science Invention (IJHSSI). Volume 9, Issue 6
9) Quoc, N. A., et al. (2020). *Discussion about the privately - owned and private individual*. The international Journal of Humanities & Social Studies. Volume 8, Issue 6,
10) Quoc, N. A., et al. (2020) *Humans' value and cost*. *The Journal of Critical Rewiews,* Volume 7, Issue 12, ISSN 2394-5125, JCR. 2020; 7(12): 2714-2720.

Ownership of Humans

11) Quoc, N. A,. et al. (2020). *The Nature of Education*. Indian Journal of Natural Sciences, Volume 10, Issue 62, ISSN: 0976–0997. P. 28007 – 28017

12) Quoc, N. A., et al. (2020). *The Nature of Power*, London Journal of Research Humanities and Social Sciences, Volume 20, Issue 16, Online ISSN (E): 2515-5792.

13) Quoc, N. A., et al.. (2021). *The consistency between the truth and deception during humans' development process*. PalArch's Journal of Archaeology of Egypt/Egyptology, Volume 18, No 4, ISSN: 1567-214X.

14) Quoc, N. A., et al.. (2021). *The Nature of State*. Journal of Contemporary Issues in Business and Government, Print ISSN: 2204-1990, Online ISSN: 1323-6903, Volume 27, Issue 2.

15) Quoc, N. A., et al.. (2021). *The Spirtual Goods*. Turkish Journal of Computer and Mathematics Education. Vol.12 No.6(2021), 4867-4879.

16) Quoc, N. A., et al.. (2021). *The nature of human life*, Galaxy International Interdisciplinary Research Journal (GIIRJ), ISSN: 2347 – 6915, Vol.9, Issue.6, June

17) Quoc, N. A., et al.. (2021). *Exclusive Spiritual Goods,* 2568-2584, Vol.18 No.08; Palarch's Journal of Egypt/Egyptology.

18) Quoc, N. A., et al.. (2021), *The nature of sex,* Multicultural Education, vol, 7. No 8, P. 290 -298.

19) Quoc, N. A. (2021). The nature of money. *Linguistics and Culture Review*, *5*(S3), 619-634.

20) Quoc, N. A., Tri, N. M., Thuong, N. A., Hoang, D. T., & Bung, N. V. (2021). The alienated human. *Linguistics and Culture Review*, *5*(1), 247-262.

Sustainable Cultivation of Millets

Sandhyarani S. Sonkamble[1], Aakanksha C. Kumbhar[2], Kumudini R. Pawar[3], Dr. Suraj V Nalawade[4]

[1,2,3]Department of Pharmaceutical Quality Assurance, Abhinav Education Society's College of Pharmacy, Narhe, Pune, Maharashtra, India 411041

[4]Assist.Professor, Central Sugarcane Research Center Padegaon, Maharashtra

ABSTRACT: Millets, once considered as neglected crops, have gained significant attention due to their nutritional value, climate resilience, and suitability for sustainable agriculture. This review paper synthesizes current research on sustainable cultivation practices for millets, focusing on key aspects such as soil health, water management, pest and disease control, and socio-economic implications. It explores innovative approaches such as intercropping, organic farming techniques, and precision agriculture methods to enhance millet yields while minimizing environmental impact. Furthermore, the paper discusses the role of millets in enhancing food security, promoting biodiversity, and mitigating climate change. By critically evaluating existing literature, this review aims to provide insights for policymakers, researchers, and farmers to promote the adoption of sustainable millet cultivation practices, thereby contributing to global food security and environmental sustainability.

KEYWORDS: Sustainable, Climate resilience, Socio-economic, Biodiversity

I.   INTRODUCTION:

The International Year of Millets will be observed in 2023, according to a resolution passed by the UN General Assembly. This highlights the significance of millets and how they improve food security.[1] These small-seeded grains called millets belong to the Poaceae family and are widely cultivated in tropical and arid regions of Africa and Eurasia. One of the earliest crops to be domesticated was millets is proof that millet was consumed as early as 3000 BC in the Indus Valley Civilization. These are regarded as the world's most important cereal grain crop, ranking behind only wheat, rice, maize, and barley.[2][3] Millets are more resistant to pests and diseases than other grains.[4] Although millets were once significant food crops, their promotion as the major food of the future is owing to the negative effects of climate change, which are more noticeable in ecosystems that are more sensitive.[5] Because of their many benefits, millets are referred to as "miracle crops." These benefits include their use as food and food products with added value, forage, contribution to agro-diversity, low nutrient requirements, greater C sequestration (C4 plants), ability to prevent erosion in arid regions, and confirmation that smallholders who live in harsh environmental conditions have an adequate supply of food and nutrition.[6] Among the crop's many positive traits are its quick maturity, resilience to stress and drought, and ability to be stored for a long enough period of time without suffering insect damage.[7][8] Millets are known as crop cereals or "penurious people's grains."[9] Because these grains are important for animal feed as well as food, they are cultivated. Due to shifts in consumer preferences and status symbols, the crop was formerly disregarded, but nutria crops are currently seeing a significant upturn in the global crop production industries.[10][11] Based on their importance in terms of cultivation, consumption, and economic significance, two categories of millets are sometimes distinguished using the names "major millets" and "minor millets." Sorghum (Jowar), Pearl (Bajra), and Finger (Ragi) are the major millets. On the other hand, the minor millets are composed of Kodo (Kodon), Barnyard (Sanwa), Little (Kutki/Shavan), Proso (Chenna/Barri), and Foxtail (Kakum).[12] Millets are a fantastic source of antioxidants, dietary Fiber, vitamins, and minerals. Two amino acids that are present in considerable amounts are cysteine and methionine. Unlike other cereals, millets have several bioactive minerals and bioactive components. Alpha-tocopherol, thiamine, riboflavin, niacin, and folic acid are among the vitamins that are remarkably abundant in millets, along with calcium (Ca), phosphorus (P), magnesium (Mg), potassium (K), iron (Fe), and manganese (Mn).[13][14][15] In the global food and nutrition business, millet is essential. Because of their special qualities like their quick maturity millets can be utilized in intensive cropping systems. They are long-lasting and can sustain you during a dry spell or a food crisis. In terms of macro and micronutrients, millets are quite nutritious compared to other crops.[16]

Sustainable Cultivation of Millets

## II.	NUTRITIONAL BENEFITS OF MILLETS:

Since most people on the planet consume plant-based diets, nutritional security is essential to enhancing global health. The main source of nutrients needed for healthy growth and development is plants. However, because they mostly rely on grain products for sustenance, half of the world's population particularly those from Asia and Africa suffers from nutritional deficiencies.[17] [18] Millets are an excellent source of proteins, vitamins, and minerals, millets are very nutrient-dense. The remaining 20% of millet grains are used to make alcoholic beverages and as animal feed. Approximately 80% of millet grains are utilized for food.[19] millet is a superfood because they don't contain gluten, people who are sensitive to or allergic to gluten can safely consume them. [20] Millets are a powerhouse of nutrition, offering a plethora of health benefits. These ancient grains are packed with dietary Fiber, essential minerals like iron, calcium, magnesium, and phosphorus, and are rich in antioxidants. Their gluten-free nature makes them suitable for those with gluten sensitivities, while their low glycaemic index helps in managing blood sugar levels. Millets also provide a significant source of plant-based protein, aiding in muscle function and overall well-being. Their high Fiber content promotes digestive health, prevents constipation, and supports weight management by inducing a feeling of fullness. Additionally, the antioxidants present in millets help combat oxidative stress, reducing the risk of chronic diseases. Incorporating millets into the diet can contribute to heart health by lowering cholesterol levels and supporting cardiovascular function. With their versatility in culinary applications, millets offer a nutritious alternative to traditional grains, making them a valuable addition to any balanced diet.[21]

## III.	ENVIRONMENTAL BENEFITS OF MILLETS:[22]

A.	*Drought Resistance:* Millets are hardy crops that require minimal water compared to other grains like rice and wheat, making them well-suited for arid and semi-arid regions.

B.	*Soil Health:* Millets have a beneficial impact on soil health, as they require minimal soil fertility and can even thrive in poor soil conditions, thereby reducing soil degradation.

C.	*Biodiversity:* Cultivating millets promotes biodiversity by diversifying crop cultivation, which can contribute to ecosystem resilience and sustainability.

## IV.	CULTIVATION OF MILLETS

Cereal crops have a substantial potential to contribute to global warming in addition to being a key supply of macronutrients including proteins, lipids, and carbohydrates. Of all the major cereal crops, wheat has the greatest potential to cause global warming (about 4 tons CO2 equivalent per hectare), followed by maize (about 3.4 tons CO2 equivalent per hectare) and rice. [23] Additionally, the carbon equivalent emissions of these crops are high 1000, 956, and 935 kg C/ha for wheat, rice, and maize, respectively.[24] Millets are often xerophilic capable of reproducing with little water input and thermophilic thriving at comparatively warmer temperatures. There are many distinct types of millets in different parts of the world, and each type of soil has certain requirements for healthy growth.[25] Due to the generations-long refinement of these traditional growing techniques to suit regional environmental circumstances and farming customs, millet agriculture has become more resilient and sustainable over most of the world .Depending on the particular millet type and the growing region, different traditional cultivation techniques are used for different millets. However, a few prevalent customs are as follows: [26]

A.	*Seed Selection:* In order to guarantee the crop's resilience and local adaptability, farmers typically choose seeds from robust, high-yielding plants for the upcoming planting season.

B.	*Land preparation:* In traditional methods, tillage is generally done by hand or with the help of animals to get the soil ready for sowing. This could entail leveling, harrowing, and plowing the ground to make an appropriate seedbed.

C.	*Planting (sowing):* Usually, millet seeds are spread, or manually scattered, onto the prepared soil, or they can be seeded with conventional seed drills or other tools. The local climate and rainfall patterns influence when to sow.

D.	*Water Management:* Conventional techniques for conserving water, including contour trenching or bunding (constructing little earthen dams), may be used in areas with variable rainfall to collect and hold rainwater for millet farming.

E.	*Weed Control:* To manage weeds that impede millet plants' access to nutrients, water, and sunshine, manual weeding with conventional instruments like hoes or hand-pulling is a popular technique.

F.	*Pests' management:* Natural means of controlling pests and diseases, such as intercropping with plants that repel pests, using biopesticides made from native plants, or utilizing cultural practices to reduce the load of pests and diseases, are frequently included in traditional knowledge.

G.	*Harvesting:* When the millets are completely dry and mature, they are usually picked. Using sickles or scythes to manually cut the millet stalks, then stacking them to dry in the field before threshing, are examples of traditional harvesting techniques.

Sustainable Cultivation of Millets

H. *Winnowing and Threshing:* Traditional threshing techniques involve pounding the harvested stalks with wood or trampling them with animals to separate the grain from the chaff after they have dried. The harvested millet is next cleaned by winnowing, which is the process of throwing the grain into the air to separate it from the chaff.

V.   MODERN AGRICULTURAL TECHNIQUES FOR MILLETS

A. *Crop Rotation:* To increase soil fertility and lower insect and disease levels, alternate millet crops with legumes or other unrelated crops. Millets grow well on a wide range of soil types, from rich, medium-loam to poor, shallow soils, with a typical pH of 7.5–8.0. The ideal soils are shallow, loamy, red, medium, and well-drained. Some millet crops, such as kodo millet, can be produced in soil that is stony and gravelly. A medium to fine tilth is essential for healthy crop establishment and germination.

B. *Precision Farming:* To maximize the use of water and fertilizer, apply precision farming techniques including drip irrigation, soil moisture monitors, and GPS-guided equipment. For the duration of the growing season, millets require between 450 and 650 mm of water overall. In the early stages of growth, little water is needed. Therefore, it is usually not beneficial to irrigate before planting, especially if there has been enough rainfall during that period. It is best to schedule irrigation for later development phases. The amount of water supplied should be raised in tandem with the crop's growth and peak during the transition from the vegetative to the reproductive phases. The biggest boost to production occurs when the soil is adequately hydrated during the peak time.

C. *Weed Management*: Employ various weed control methods such as manual weeding, herbicides, mulching, and cover cropping to suppress weed growth and competition with millet plants. It takes four to five weeks for millets to outcompete weeds in their early stages of growth, thus during this time the crop needs extra care. Weeds are suppressed by the adoption of preventive measures such as adequate spacing between plants to create uniform stands, good seed-bed preparation to guarantee uniform stands, covering the soil surface with cover crops or intercrops, and following a proper crop rotation with densely growing legumes. Hand weeding at 20–25 DAS after applying a single pre-emergence spray effectively suppresses the first flush of weeds.[27]

D. *Improved Varieties:* Select and cultivate improved millet varieties that are resistant to pests, diseases, and environmental stresses, and have higher yields. Grain and fodder yields were the most crucial factors for small millet; the latter was a feature that conventional breeders occasionally disregarded. Crop duration, panicle size and variety, disease resistance, and drought tolerance were other crucial features. Farmers' enjoyment of these traits in the local and improved varieties served as the foundation for their selection. [28]

E. *Integrated Pest Management (IPM):* Use IPM techniques to reduce the negative effects on the environment by controlling pests and illnesses using a mix of chemical, cultural, and biological means. Millets react favourably to fertilizer, particularly N and P. The amounts of fertilizer that are advised differ depending on the season and the state. Utilize 10 t/ha of farmyard manure along with the necessary fertilizer dosage. The use of organic and inorganic manures by judges improves the effectiveness of fertilizer.

F. *Conservation Agriculture:* Practice minimum tillage or no-till farming to reduce soil erosion, improve soil health, and conserve moisture.

G. *Fertilization:* Apply balanced fertilizers based on soil testing to provide millet crops with essential nutrients for optimal growth and yield.

H. *Post-Harvest Management:* Implement proper post-harvest handling practices including drying, cleaning, and storage to maintain millet quality and reduce post-harvest losses. Harvesting millets and pulses for fodder and reducing harvest losses through improved timing and technology are two things that should be developed and implemented. Scientific storage can assist in maximizing the nutritional value and shelf life of millets and pulses.

Harvesting, threshing, shipping, storing, milling/polishing, packing, and other processes should be coordinated and shouldn't raise costs unduly.[29]

I. *Marketing reform:* Farmers may overcome asymmetric knowledge, boost income, and save input costs by exchanging real-time information. The option to choose should be granted to the farmer by the consumer. The choice to sell directly to him without using an APMC's services should be offered if that's what he wants. Pulses and millets should also be able to benefit from e-marketing.

VI.   CHALLENGES IN MILLETS CULTIVATION

A. *Low Demand and Awareness:* As a result of their low demand and lack of promotion relative to other grains millets are frequently regarded as the diet of the poor farmers receive low prices. The lack of access to improved agricultural equipment,

like better-quality seeds, fertilizers, pesticides, and irrigation systems, limits farmers' ability to increase crop yields and improve crop quality. Usually, marginal grounds unsuitable for other crops like rice, wheat, and maize are used to cultivate millets. However, the advent of more contemporary kinds of these crops has boosted their appeal to farmers, which has resulted in a recent drop in millet farming.[30]

B. *Climate Change:* Although millets are generally more weather-resistant than other cereals, their cultivation can nevertheless be impacted by harsh weather events, unpredictable rainfall, and shifting climatic trends. Millets are frequently grown in arid and semi-arid regions that are vulnerable to the effects of climate change, including droughts and erratic rainfall, according to the FAO. Climate change and global warming will cause storm surges and cyclones to occur more frequently and with greater intensity. Flood plains and char lands will degrade somewhat to severely due to storm surges.[31]

C. *Pests and Diseases:* Millets are vulnerable to a number of pests and diseases, which, if not well controlled, can drastically lower output. Integrated pest management techniques are essential to farming that is sustainable. The susceptible nature of millet crops to pests and diseases can drastically lower production. According to the survey, one of the biggest problems facing farmers is the absence of efficient methods for managing diseases and pests. It is important to note that the incidence of illnesses and pests has sharply increased recently due to the detrimental effects of climate change, particularly the rise in temperature. [32][33]

D. *Limited Research and Development:* Millets have received less funding for research and development than other cereals like rice and wheat, which has resulted in a shortage of high-yielding varieties and effective farming methods.[34]

E. *Land Degradation:* The cultivation of millet is severely hampered by nutrient depletion, soil erosion, and land degradation. It takes sustainable land management techniques to preserve the productivity and fertility of the soil.

F. *The Lack of Water:* Although millets are typically thought to be drought-tolerant, their growth can still be impacted by a lack of water, particularly in areas with unpredictable rainfall patterns or inadequate irrigation systems.

G. *Market Access:* Farmers may face financial difficulties if they are unable to sell their millet produce at fair prices due to limited access. to markets, transportation, and storage facilities. One such issue is that millets have limited access to markets. claimed that because of their low price and restricted market appeal, millets are frequently seen as a traditional and specialized crop. According to the study, this reduces farmers' ability to cultivate millet profitably, which may deter them from making the investment in these crops. In order to bargain for fair prices for their commodities, these farmers do not belong to a farmer's cooperative or farmer's association. As a result, businesses have to charge low prices to middlemen for their goods.

VII. SUSTAINABLE SOLUTIONS

Sustainable cultivation of millets can be achieved through various practices such as following:

A. *Organic Farming:* Avoid synthetic fertilizers and pesticides, opting for organic alternatives to maintain soil health and biodiversity. Fertilizers replenish the nutrients that crops require that have been taken up by the plants or that have not been lost due to washing, erosion, or retrogradation. It is crucial to confirm that these goods are of high quality because their primary purpose is to nourish plants and enhance soil properties.[35]

B. **Agroforestry:** Integrate trees into millet fields to enhance soil structure, provide shade, and diversify income sources. The scientific soil testing documented in Soil Health Cards (SHCs), which assist farmers in determining the field-to-field requirement prior to sowing, can be the basis for a logical decision on the amount of chemical fertilizers and FYM to be employed. SHCs are being distributed widely; to date, over 18.93 crore cards have been provided, making it easier to determine the quantity of various nutrients that are accessible in the fields

C. **Seed Diversity:** Promote the use of diverse millet varieties to increase resilience to pests, diseases, and climate variability. When it comes to seed size, shape, color, and nutritional makeup, millets are remarkably diverse. Pearl millet, finger millet, foxtail millet, proso millet, and barnyard millet are a few common varieties. Because each variety has distinct qualities, it can adapt to different environmental factors and culinary tastes. Food security, climate change resistance, and nutritional diversity in diets around the world all benefit from this diversity.[36]

D. **Community Engagement:** Involve local communities in decision-making processes and traditional knowledge exchange for sustainable millet farming practices. Consumers, farmers, and the general public should all be made more aware of the nutritional benefits and adaptability of millets through ongoing initiatives. The promotion of millets as a sustainable and healthful food choice can be aided by media partnerships, educational initiatives, and promotional campaigns.

VIII. POLICY AND INSTITUTIONAL SUPPORT

A key component of our all-encompassing strategy is the policies that are necessary to encourage the expansion of best practices and seek effects that go beyond the project's intended locations. Little millets, no matter how much rural farmers and their

Sustainable Cultivation of Millets

communities come to cherish them, will not gain official backing unless the policy climate changes. The manner that official business and public sector agricultural enterprise's view millets represents a second set of policy considerations. For minor millets, for instance, there is no official seed supply industry; therefore, one project's goal was to increase local populations' capacity to generate and disperse high-quality seeds.[37]

A. **National Food Security Mission (NFSM):** Established in October 2007 it aims to promote the comprehensive growth of agriculture and related industries. Millets are cultivated as one of the components of the NFSM. In order to boost food security and farmers' incomes, it seeks to raise millets and other crop productivity.

B. **Rashtriya Krishi Vikas Yojana (RKVY):** It was introduced in 2007 as a broad initiative to guarantee the comprehensive growth of the agricultural sector and related industries. reorganized as the RKVY Cafeteria Scheme starting in 2022–2023 and combining other programs, including as the Crop Diversification Program and the Paramparagat Krishi Vikas Yojana (PKVY). RKVY offers states financial support to encourage the cultivation of millets and other crops. It encourages the adoption of better farming techniques, technological advancements, and the construction of infrastructure for millet growing.[38]

C. **National Mission for Sustainable Agriculture (NMSA):** It was developed with the goal of increasing agricultural productivity, particularly in rainfed areas. It focuses on integrated farming, water efficiency, managing soil health, and conserving synergistic resources. The goal of NMSA is to advance sustainable farming methods, which includes millets. It seeks to protect the environment, increase productivity, and assist farmers in adjusting to climate change.[39]

D. **International Year of Millets:** To encourage the production and consumption of millets worldwide, 2023 has been designated as the International Year of Millets.

E. **Promotion at Government Canteens:** To encourage staff members to make healthier dietary choices, the Department of Food and Public Distribution has ordered all of its offices and central public sector companies to introduce and promote millets in their canteens.[40]

IX.   FUTURE DIRECTIONS AND RECOMMENDATIONS

A. **Research and Development:** Make research and development investments to create millet varieties with higher nutritional value and resistance to diseases, pests, and climate change.[41]

B. **Promote Organic Farming Methods:** By reducing the use of chemical pesticides and fertilizers, organic farming methods help to minimize their negative effects on the environment.[42]

C. **Promotion and Awareness:** Raise consumer knowledge of millets' nutritional advantages by implementing marketing and educational initiatives that encourage their use.

D. **Policy Support:** To encourage farmers to cultivate millets, governments should offer policies such as subsidies, incentives, and insurance plans.

E. **Value Addition and Market Development:** To make millets more marketable and profitable for farmers, support value addition projects like turning them into flour, flakes, or ready-to-eat goods.[43]

F. **Genetic Conservation:** To preserve the genetic diversity of millet species for upcoming breeding and research, set up gene banks and conservation initiatives.[44]

By focusing on these future directions and recommendations, sustainable cultivation of millets can be promoted, contributing to food security, environmental conservation, and economic development.

X.   CONCLUSION

Millets can be cultivated sustainably as a multipurpose response to today's environmental and agricultural problems. Millets, which include a variety of species such as sorghum, finger millet, and pearl millet, have intrinsic qualities that are consistent with the concepts of sustainable agriculture. These can be grown sustainably for a variety of reasons, such as better soil health, water conservation, biodiversity preservation, and climate change adaptation. Agroecological techniques like crop rotation, intercropping, and sparing use of pesticides can help farmers strengthen rural livelihoods, increase food security, and improve the sustainability of millet production. First of all, compared to traditional crops like rice or wheat, millets are hardy crops that can grow in a variety of climates and soil types with less water and input requirements. This characteristic lessens the burden on irrigation systems, conserves water, and lowers the chance of crop failure in areas vulnerable to drought or irregular rainfall patterns. Furthermore, millets are nutrient-dense, resistant to drought, and input-light, which makes them an important part of global sustainable agriculture systems.

Sustainable Cultivation of Millets

REFERANCES

1) Antony Ceasar, S., & Maharajan, T. (2022). The role of millets in attaining United Nation's sustainable developmental goals. Plants, People, Planet, 4(4), 345–349. https://doi.org/10.1002/ppp3.10254

2) Kheya, S. A., Talukder, S. K., Datta, P., Yeasmin, S., Rashid, M. H., Hasan, A. K., Anwar, M. P., Islam, A. K. M. A., & Islam, A. K. M. M. (2023). Millets: The future crops for the tropics - Status, challenges and future prospects. Heliyon, 9(11), e22123. https://doi.org/10.1016/j.heliyon.2023.e22123

3) S. Ramashia, M. Mashau, O. Onipe, Millets Cereal Grains: Nutritional Composition and Utilisation in Sub-saharan Africa, 2021.

4) V. Verma, S. Patel, Value added products from nutria-cereals, Finger millet (Eleusine coracana), Emir. J. Food Agric. 25 (3) (2013) 169–176.

5) S. Maitra, T. Shankar, Agronomic management in little millet (Panicum sumatrense L.) for enhancement of productivity and sustainability, Int. J. of Bioresour. Sci. 6 (2) (2019) 91–96.

6) A. Kumar, P. Singh, Millets: nutritional composition, some health benefits and processing – a review, J. Food Sci. Technol. 52 (5) (2015) 2481–2495.

7) Priya, Verma, R. K., Lakhawat, S., Yadav, V. K., Gacem, A., Abbas, M., Yadav, K. K., Park, H.-K., Jeon, B.-H., & Mishra, S. (2023). Millets: sustainable treasure house of bioactive components. International Journal of Food Properties, 26(1), 1822–1840. https://doi.org/10.1080/10942912.2023.2236317

8) Amadou, I.; Gounga, M. E.; Le, G. W. Millets: Nutritional Composition, Some Health Benefits and Processing - A Review. Emir. J. Food Agric. 2013, 25(7), 501–508. DOI: 10.9755/ejfa.v25i7.12045.

9) Babele, P. K.; Kudapa, H.; Singh, Y.; Varshney, R. K.; Kumar, A. Mainstreaming Orphan Millets for Advancing Climate Smart Agriculture to Secure Nutrition and Health. Front Plant Sci. 2022, 13. DOI: 10.3389/fpls.2022.902536.

10) Bora, P.; Ragaee, S.; Marcone, M. Characterisation of Several Types of Millets as Functional Food Ingredients. Int. J. Food Sci. Nutr. 2019, 70(6), 714–724. DOI: 10.1080/09637486.2019.1570086

11) Braicu, C.; Ladomery, M. R.; Chedea, V. S.; Irimie, A.; Berindan-Neagoe, I. TheRelationship Between the Structure and Biological Actions of Green Tea Catechins. Food Chem. 2013, 141(3), 3282–3289. DOI: 10.1016/ j.foodchem.2013.05.122.

12) Malathi, B.; Appaji, C.; Rajender Reddy, G.; Dattatri, K.; Sudhakar, N. Growth Pattern of Millets in India. Indian J. Agric. Res. 2016, 50(4), 382–386. DOI: 10.18805/ijare.v50i4.11257

13) Dawson, I. K.; Powell, W.; Hendre, P.; Bančič, J.; Hickey, J. M.; Kindt, R.; Hoad, S.; Hale, I.; Jamnadass, R. The Role of Genetics in Mainstreaming the Production of New and Orphan Crops to Diversify Food Systems and Support Human Nutrition. New Phytol. 2019, 224(1), 37–54. DOI: 10.1111/nph.15895.

14) Dayakar, B.; Bhaskarachary, R. K.; Arlene, G. D.; Sudha, C. G.; Vilas, D.; Tonapi, A. Nutr. Health Benefits Millets. n.d.

15) Devi, P. B.; Vijayabharathi, R.; Sathyabama, S.; Malleshi, N. G.; Priyadarisini, V. B. Health Benefits of Finger Millet (Eleusine Coracana L.) Polyphenols and Dietary Fiber: A Review. J. Food Sci. Technol. 2014, 51(6), 1021–1040. DOI: 10.1007/s13197-011-0584-9.

16) Enhancing Nutritional security and Sustainable health through Millets in India: a Policy Perspective.

17) Rao, N. (2007). 2 Global Nutrition Report. Global Scenario of Millets Cultivation, 49(2), 33–45.

18) Padulosi, S., Mal, B., King, O., & Gotor, E. (2015). Minor millets as a central element for sustainably enhanced incomes, empowerment, and nutrition in rural India. Sustainability, 7(7), 8904–8933. https://doi.org/10.3390/su7078904

19) White, P. J., and Broadley, M. R. (2005). Biofortifying crops with essential mineral elements. Trends Plant Sci. 10, 586–593. doi: 10.1016/j.tplants.2005.10.00

20) Retrieved April 19, 2024, from Org.in website: https://www.ris.org.in/sites/default/files/Publication/DP__240%20FINAL---P%20K%20Anand%20Krishana%20Kumar%20and%20Shruti%20Khanna%20-min.pdf.

21) Vinoth, A., & Ravindhran, R. (2017). Biofortification in millets: A sustainable approach for nutritional security. Frontiers in Plant Science, 8. https://doi.org/10.3389/fpls.2017.00029

22) Shinde, R. M., Shende, R. T., Wasule, D. L., Anjali, M., & Gaharwar, N. D., Millets in India: A Nutritional Powerhouse for Sustainable Agriculture and Food Security.

23) Akanksha Chand, Madhya Pradesh State Policy and Planning Commission, Bhopal, India Gaurav Thapak, Madhya Pradesh State Policy and Planning Commission. (2023) Millets as a Key to Improving Food and Nutrition Security and Promoting Sustainable Consumption..

24) Saxena, R., Vanga, S., Wang, J., Orsat, V., & Raghavan, V. (2018). Millets for food security in the context of climate change: A review. Sustainability, 10(7), 2228. https://doi.org/10.3390/su10072228

25) Jain, N.; Arora, P.; Tomer, R.; Mishra, S.V.; Bhatia, A.; Pathak, H.; Chakraborty, D.; Kumar, V.; Dubey, D.; Harit, R.; et al. Greenhouse gases emission from soils under major crops in northwest India. Sci. Total Environ. 2016, 542, 551–561

26) Guigaz, M. Memento Del'agronome; CIRAD-GRETand Ministère des Affaires Étrangères: Montpellier, France, 2002.

27) Farmer FIRST Programme) ICAR - Indian Institute of Millets Research Rajendranagar, Hyderabad 500030, India www.millets.res. (n.d.).

28) B. Venkatesh Bhat, C.V. Ratnavathi, B. Dayakar Rao, R. Chapke, R. Swarna, P.G. Padmaja, G. Shyam Prasad, I.K. Das, C. Aruna, R. Venkateswarlu, N. Kannababu, Manual on Good Agricultural Practices in Millets.

29) Mal, B.; Padulosi, S.; Ravi, S.B. (Eds.) Minor Millets in South Asia: Learnings from IFADNUSProject in India and Nepal; Bioversity International: Rome, Italy; M.S. Swaminathan Research Foundation: Chennai, India, 2010; p. 185.

30) Kumar, A., Tomer, V., Kaur, A., Kumar, V., & Gupta, K. (2018). Millets: a solution to agrarian and nutritional challenges. Agriculture & Food Security, 7(1). https://doi.org/10.1186/s40066-018-0183-3.

31) A.K.M.G. Sarwar, J.K. Biswas, Cereal grains of Bangladesh – present status, constraints and prospects, Intech (2021), https://doi.org/10.5772/ intechopen.97072

32) FAO (Food and Agriculture Organization), Millets: Nutritious Grains for Food Security and Nutrition, 2018. http://www.fao.org. (Accessed 18 January 2022)

33) B.N. Motagi, M. Krishnappa, B.D. Biradar, Pests and Diseases of Finger Millet: Biology and Management, Springer, 2014. S.A. Kheya et al. Heliyon 9 (2023) e22123 16

34) IPCC (Intergovernmental Panel on Climate Change), Climate Change 2007. Synthesis Report: Summary for Policymakers. Intergovernmental Panel on Climate Change (IPCC), Cambridge University Press, UK, 2007.

35) P.K. Joshi, G. Srinivasan, A. Kumar, 2015. Millets: a solution to agrarian and nutritional challenges, SAT eJournal 12 (2015) 1–9.https://transformingindia.mygov.in/performance-dashboard/ last accessed on 20th March 2019.

36) Sharma, N. (2023). Editorial: Advances in millet research as a sustainable food source. Frontiers in Sustainable Food Systems, 7.

37) Policy and Research Recommendations for Millets: Addressing Challenges and Production Opportunities to Ensure Food and Nutritional Security Deepak Kumar Rawat1*, Sunil Kumar Prajapati2, Pushpendra Kumar3. (n.d.).

38) Jadhav, N., & Londhe, D. J. (2023). Policy support for the promotion of millets: Current status and its impact. Journal of Drug Research in Ayurvedic Sciences, 8(Suppl 1), S148–S151. https://doi.org/10.4103/jdras.jdras_181_23

39) Ministry of Agriculture & Farmers Welfare. Millet Production. Available from: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1796559%20%20.

40) Singh, S., Yadav, R. N., Tripathi, A. K., Kumar, M., Kumar, M., Yadav, S., Kumar, D., Kumar, S., & Yadav, R. (2023). Current status and promotional strategies of millets: A review. International Journal of Environment and Climate Change, 13(9), 3088–3095. https://doi.org/10.9734/ijecc/2023/v13i92551

41) Mbinda, W., & Mukami, A. (2021). A review of recent advances and future directions in the management of salinity stress in finger millet. Frontiers in Plant Science, 12. https://doi.org/10.3389/fpls.2021.734798

42) Chetan R Dudhagara, A. B., Mahera, S., Kumar, M., & Patel, H. D. (n.d.). Millets: The future smart food Kondala Lokesh.

43) Dharmaraj, U. (n.d.). Value Added Products from Millets. Dhan.org. Retrieved February 29, 2024, from https://www.dhan.org/smallmillets2/file/value-sm.pdf

44) Icar, E. S. (n.d.). Genetic improvement of small millets In India during Pre and Post Crop Coordinated Project era. Res.In.

Book Review:

Sommer, Doris. The Work of Art in the World: Civic Agency and Public Humanities (Durham, NC: Duke University Press, 2014)

Mohamed Idyassine

Phd Student , UIZ University Agadir, Morocco

Doris Sommer's Book *The Work of Art in the World: Civic Agency and Public Humanities* must be received as vivid recollections of anecdotal and yielding civic interventions. Most of these celebrated creative social interventions relate either to confident "high-ranking" political leaders or weird grassroots artists in some particular socioeconomic contexts already in paralysis.no doubt, such models of civic initiatives cannot be transposed to other communities; therefore, it is easy to reject Sommer's propositions as over-optimistic and operationally inapplicable. It is also acceptable here to restate the reactions of the Duke Press editors who told Doris Sommer right at the onset that this book "is too much theory" and "no one wants to read theory".[1]

The most remarkable blame Somers should take is that she overlooks pertinent contributions to the field as she must not introduce herself as a unique contributor to the subject: many other scholars attempted to reconcile humanities with democracy and social action. However, Doris Sommer tries to invite renowned philosophers to endorse her argument in her book The Work of Art in the World: Civic Agency and Public Humanities. Schiller and Kant are on top of her inspiring guests.

Sommer's attempts to answer the lately persistent question about the utility of humanities are partially pertinent. For most pragmatist views, humanities have become *useless,* as many column writers and academics argue, but for Sommer, humanities offer a wide range of creative and engaged civic action possibilities. In her book The Work of Art in the World: Civic Agency and Public Humanities, Sommer *a*dvances a convincingly mature argument favouring the utility of humanities outside museums and art galleries. Most of the chapters in this book are rather appealing than convincing. Sommer acknowledges this is a "*Beta,*" or experimental version of the project to generate commentary and criticism (12). She attests that she is only trying to pave the way for a remarriage between humanities and the civic agency grounded in the *millennial* tradition of art and democracy. As she tries to do so, she steps down the ivory tower; Sommer insists on diversifying resources to her theoretical framework by borrowing creative interventions from both extremes of the social continuum, from the elite and the grassroots, to avoid criticism for academic elitism. In subsequent paragraphs, I will see how consistent Sommer was in building her argument across the chapters of her book.

The Work of Art in the World: Civic Agency and Public takes inspiration from art projects that required more recognition than they have received. These are creative works on grand and small scales that morph into institutional innovation (14). Sommer opens her book by paying tribute to the creative

---

[1] MIT Program in Art, Culture and Technology. Doris Sommer, The Work of Art in the World: Civic Agency and Public Humanities, March 2, 2015. https://www.youtube.com/watch?v=AJANn193KD0&t=3405s

Book Review: Sommer, Doris. The Work of Art in the World: Civic Agency and Public Humanities (Durham, NC: Duke University Press, 2014)

projects that received less attention than they deserved. Sommer meticulously recalls several socially engaged projects from various fields and disciplines in the first two chapters. All of these models are appealingly inspiring and enthusing. In effect, this beautiful recollection of such successful models of civic engagement constitutes the cornerstone of Sommer's theoretical *'pragmatic defense'* in favour of the utility of humanities outside academia.

Sommer unceasingly reports the *unconventional cures* that the Anatans Mockus invented in the face of violence and corruption that paralyzed a whole city such as *Bogotá*, Columbia. This notorious nerd utilized 'relational art' (27) to generate dialogue and interaction among citizens aspiring for some social action to reduce traffic deaths and, later on tax evasions. This project received much attention as it cut down traffic casualties and refreshed the city's economy as the inhabitants willingly started to pay a significant percentage of their income to the state. Amongst the other successful projects that Sommer suggests is that of the Albanian Prime Minister Edi Rama, who managed to turn a decaying city into the safe haven of beauty and arts. These two models are branded as *'top-down'* (12) initiatives.

As for the '*bottom*-up' (13) socially engaged initiatives, Sommer devotes the second chapter of her book to projects that some disempowered social groups launched to stir the dynamics of social change. Most of these projects' effects mounted to lobbying for equitable state legislation that recognized the rights of marginalized groups. She stresses that such projects used creative artistic tools to express the needs of the oppressed. However, Sommer fails to deal with a counter-argument presented by a fellow scholar named Michael Warner, who attests in *Publics and Counter publics* (2002) that members of marginalized groups can participate in socially engaged public life projects only if they are given space to articulate their identities and interests openly. That is to say, the freedom to express *oneself* is not generalized to include all members of society, namely subcategories that still struggle for a just *sexual citizenship*. Sommer is invited to reframe her optimism in a more calculated style.

Sommer stresses the civic possibilities of arts to address the central question of her book about the utility of humanities in the wake of the twentieth century. She strives hard to inscribe her contribution to a genealogy of aesthetic philosophy and literature. Therefore, Sommer's book *The Work of Art in the World* gives insights into the operationalization of high-order theory in the down-home routines. Such a stretch in history and literature eclipses the viability of the pedagogical framework she introduces in her book. This book is so deeply grounded in the Enlightenment aesthetic philosophy that it overlooks prominent contributions of recent scholars to the heated academic debate about the utilities and value of the humanities in the twenty-first century, both in the Americas and the world.

In chapter three, Sommer states that arts are socially accountable. She writes in this respect that individuals who engage with arts will be either confused or delighted; therefore, *'develop free thinking'* (87) and 'unbiased judgment' (88), both necessary for building a democratic society. It is fair to acknowledge the presence of the Schillerian and Kantian traditions in her defence of aesthetic judgment as a model of judgment that communities need to challenge arbitrarily conventional paradigms. In this regard, she calls for training aesthetic judgment as it is free and disinterested. That is to say, it never succumbs to economic or any other interests. She further tries to differentiate disinterest from indifference because disinterest is crucial for engendering universals for agreement, whereas indifference kills every chance for civic agency and collaboration.

In the fourth chapter, Sommer falls back on her background professional experience as a high school teacher. She seems somewhat operational and mainly preoccupied with devising a pedagogical workshop for teaching about the utilities of humanities. She writes that humanistic education will advance literacy, educate taste and encourage civic participation. Sommer brings in an inspiring project called Pre-texts for analysis in this chapter. She describes *pre-texts* as follows: Pre-Texts is an

Book Review: Sommer, Doris. The Work of Art in the World: Civic Agency and Public Humanities (Durham, NC: Duke University Press, 2014)

intentionally naughty name to signal that even the classics can be material for manipulation. Books are not sacred objects; they are invitations to play (113). The overall intent behind this resonates adequately with the Freirian theory of the education of the underprivileged. Sommer is likely devising some classroom activity for students to acquire higher-order thinking skills they would later need to participate in socially engaged action.

In chapter five, Sommer falls back on a tradition of optimism about the arts' civic possibilities. Fredrich Schiller's book *On the Aesthetic Education of Man* is the cornerstone of her adventure to bridge the historical gap between Baconian reasoning and Kantian morality. Schiller introduces a third faculty called *"the Spieltribe or play drive"* (136).In general, Play brings balance between the two hemispheres of the mind by inviting reason and sentiment to a rewarding agreement. She writes in this regard that "raising man above his dual and dangerous nature . . . playfulness creates multiple perspectives that bypass the monovision of sensuousness or of reason" (137). Obviously, Sommer seems here paddling centrifugally from her initial promise to advance some *pragmatic defense* in favour of the civic possibilities that humanities offer to delve deep into the deepest oceans of Aesthetics philosophy.

Sommer's book is a work of art: I experienced plenty of delight and confusion while reading this book. She creates a near-perfect *collage* of anecdotal projects of engaged social action to endorse her account of the utility of humanities in a world that needs more civism than ever before. She wins her case for the viability of using artistic ways to solve public issues and encourage democratic participation. She brought models from all walks of life to tell us that creativity is exclusive to none.

REFERENCES
1) Schiller, Friedrich, Elizabeth M. Wilkinson, and L A. Willoughby. *On the Aesthetic Education of Man: In a Series of Letters*. Oxford: Clarendon P, 1968. Print.
2) Warner, Michael. Publics and Counterpublics. Zone Books, 2002.
3) MIT Program in Art, Culture and Technology. Doris Sommer, The Work of Art in the World: Civic Agency and Public Humanities, March 2, 2015.
https://www.youtube.com/watch?v=AJANn193KD0&t=3405s
4) Freire, Paulo. *Pedagogy of the Oppressed*. Penguin Classics, 2017.
5) Sommer, Doris. *The Work of Art in the World: Civic Agency and Public Humanities*. Duke University Press. 2014.
6) Warner, Michael. *Publics and Counterpublics*. New York: Zone Books, 2002.

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

Merdi Hajiji[1], Lisdawati Wahjudin[2]

[1,2]Faculty of Social Science and Political Science Langlangbuana University, Bandung, West Java

ABSTRACT: Community participation in the formation of local regulations is very important, because local regulations that are formed must be in accordance with the wishes and needs of the community. Implementation of community participation in the formation of local regulations will determine the quality, have an impact on the local regulations that are formed. However, community participation in the city of Bandung in the formation of local regulations is lacking. The problems raised by the author are: (1) how is the basis for the implementation of the formation of local regulations in the city of Bandung number 2 of 2013 concerning social institutions 2) how the implementation of public participation in the formation of local regulations in the city of Bandung, 3) how the process of forming a participatory and responsive local regulations in Bandung. The purpose of this study is to find out, study and analyze regarding: (1) the basis of the implementation of the formation of local regulations in Bandung City number 2 of 2013 concerning social institutions, (2) implementation of community participation in the formation of local regulations in the city of Bandung, and (3) the process the formation of participatory and responsive local regulations in the city of Bandung. This study uses a sociological juridical approach, with descriptive research specification analysis. The data used in this study are primary and secondary data, obtained through interviews and literature studies, which are then analyzed qualitatively. The results showed that: (1) community participation in the formation of local regulations can improve the quality of local regulations because the community is the object of the local regulations and the people who run the local regulations. Community participation produces input to improve the quality of decisions, and the implementation of local regulations will run more optimally; (2) The process of forming local regulations in Bandung is less participatory and not responsive, so that the resulting decisions are not yet of quality and not in accordance with the needs and expectations of the community, other than that it can not be minimized public turmoil or dissatisfaction and in the end the implementation of regional regulations is not running properly; and (3) the causes of the lack of quality community participation in the formation of local regulations in the city of Bandung are: (a) lack of understanding of the community in the process of establishing local regulations, (b) lack of decisive efforts from local governments in capturing the aspirations of the community, (c) the regulations are not made based on the interests of the community and the socialization of local regulations have not been maximized, and (d) the community is less involved. The solutions needed include: (a) a commitment from the law makers in the regions to involve the community in any discussion of the Peraturan Daerah, (b) a clear and transparent socialization and enforcement of the Peraturan Daerah is needed, (c) a more accurate study of the problems faced community, and (d) involving all elements of society. Keywords: Community Participation and Responsive Local Regulations

I. INTRODUCTION

The division of regions as mandated by Article 18 paragraph (1) of the 1945 Constitution of the Republic of Indonesia, gives authority to regions to regulate and manage their own government affairs, because regions better understand the problems they face and know better what the regions themselves need. The 1945 Constitution of the Republic of Indonesia shows that Indonesia is a unitary state, the plurality of local conditions both in terms of customs, regional government capacity, local democratic atmosphere and the background to the formation of each region requires the establishment of policies. decentralization of government administration. The political decision to grant greater autonomy to regions has provided significant changes to the Indonesian government system in general and regional government in particular.[1]

---

[1] Jazim Hamidi, Legal Optics, *Problematic Regional Regulations, Initiating Responsive and Sustainable Regional Regulations*. First Printing, Achievement Pustaka Publisher, Jakarta, 2011, p. 47.

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

The consequence of Article 18 of the 1945 Constitution of the Republic of Indonesia requires the implementation of regional autonomy. Regional autonomy according to the provisions of Article 1 number 6 of Law Number 23 of 2014 concerning Regional Government is: "The rights, authority and obligations of autonomous regions to regulate and manage their own government affairs and the interests of local communities in the system of the Unitary State of the Republic of Indonesia". In implementing regional autonomy, the government is required to implement the principles of decentralization, deconcentration and assistance tasks in the administration of regional government.

Law Number 12 of 2011 concerning the Formation of Legislative Regulations and Law Number 23 of 2014 concerning Regional Government have provided a way for democratic political interaction in Regional Regulation legislation. The formulation of the Explanation to Law Number 23 of 2014 concerning Regional Government essentially states that regional regulation legislation is in the context of improving community welfare by always paying attention to the interests and aspirations that grow in society. These two laws also stipulate the principles of openness and democracy, the community's right to participate in the formation of Regional Regulations, and the existence of orders for organs authorized to form regional regulations and publish draft regional regulations.

Democratic political interaction in regional regulation legislation is intended to build Good Governance, which demands a democratic climate with government management based on the principles of participation, accountability and transparency to produce responsive regional regulations. In other words, Good Governance requires broad community participation.

Regional regulations require planning and care in their formulation. The role of research and studies prepared in the form of Academic Papers is very important to support the formation of Regional Regulations to avoid possible conflicts with higher regulations or with the public interest. Besides that, by carrying out research and studies before the formation of Regional Regulations, overlap with other Regional Regulations (Existing Local Law) can also be avoided.

It is still felt that the formation of Regional Regulations is lacking or has not gone through planning the formation of good legislation. This is characterized by:[2]

a. There are still many problematic regional regulations found because their substance is considered to be controversial, ambiguous, overlapping and inconsistent both vertically and horizontally;

b. Has not shown commitment and character that is responsive to the development of human rights, weak and marginalized communities, gender justice values; and the formation process is less aspirational and participatory

With regard to the fact that many Regional Regulations are still found to be problematic because their substance is considered to be still controversial, less participatory, ambiguous and overlapping as well as inconsistent vertically and horizontally, generally this is triggered by the high spirit of regional autonomy, resulting in an increase in the formation of Provincial and Regency Regional Regulations/City. However, the Regional Regulation that was formed still caused many problems so it was cancelled. The Regional Regulations that are canceled are generally Regional Regulations that regulate regional taxes and regional levies because they are considered to have the potential to distort economic activities. Apart from that, there are various Regional Regulations which are controversial and problematic at the level of implementation in society related to Human Rights, discrimination, gender equality, environmental pollution and so on.

The number of Regional Regulations that have been canceled and the rejection from the community raises questions about the process of forming Regional Regulations. How does this process work? What are the shortcomings of the current process? What kind of political dynamics emerged during the formation process that ended with the formation of Regional Regulations that were controversial and problematic in their implementation to the point where human rights violations were indicated. This situation has resulted in increasing demands from many parties to integrate human rights into Regional Regulations. Therefore, the role of local governments in fulfilling, respecting and protecting human rights is very important.

The research results of the Regional Autonomy Implementation Monitoring Committee show that of the 709 regional regulations studied, 85.2% were problematic regional regulations and only 14.8% were non-problematic. Apart from that, from the results of a study by the Ministry of Home Affairs (Kemendagri) in 2016, there were 3,143 Regional Regulations that were revoked or revised, of which in detail 1,765 were Regional Regulations or district/city regional regulations that were revoked or revised by the Minister of Home Affairs. Then 111 regulations or decisions of the Minister of Home Affairs were revoked or revised

---

[2] Wicipto Setiadi, *The Strategic Role of Academic Papers in the Formation of Regional Regulations*. Paper presented at the Law Center Coordination Meeting on January 29 2011 at the Pangeran Beach Hotel, Padang, West Sumatra, p. 3

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

by the Minister of Home Affairs and 1,267 Regional Regulations or District/City Regional Head Regulations were revoked or revised by the Governor.[3]

The regulation of legal harmonization in the formation of regional regulations can be traced to several statutory regulations which directly regulate and are related to the formation of regional regulations. Some of these regulations are Law Number 23 of 2014 concerning Regional Government and Law Number 12 of 2011, along with its implementing regulations. Article 236 paragraphs (3 and 4) of Law Number 23 of 2014 concerning Regional Government reads: Paragraph (3) of the Regional Regulations as referred to in paragraph (1) contains content material:

a. Implementation of Regional Autonomy and Assistance Tasks; And

b. Further elaboration of the provisions of higher laws and regulations.

Paragraph (4) Apart from content material as intended in paragraph (3), Regional Regulations may contain local content material in accordance with the provisions of statutory regulations.

The Bandung City Government has regulated the formation of these institutions with Bandung City Regional Regulation Number 02 of 2013 concerning Village Community Institutions. However, in line with existing developments, namely with the birth of Law number 23 of 2014 concerning Regional Government and various problems in society as well as problems that conflict with the implementation of these regional regulations, it is necessary to respond by conducting an evaluation of Bandung City Regional Regulation Number 02 of 2013 regarding Village Community Institutions so that they can answer problems that occur and are in accordance with the needs and social changes of current society. This change is also necessary in order to be able to adapt to developments in laws and regulations related to the structuring of social organizations, especially Ministerial Regulation No. 5 of 2007 concerning guidelines for Structuring Community Institutions, which has now been revoked and replaced with Minister of Home Affairs Regulation number 18 of 2018 concerning Community Institutions. Villages and Village Traditional Institutions as well as as a legal umbrella for social institutions that suit the needs of the community, especially in the city of Bandung.

The presence of Bandung City Regional Regulation number 2 of 2013 concerning Village Community Institutions, the social facts are not really responded to by the community and community institutions, because this regional regulation is considered not participative and less appreciative and does not suit the needs of social institution actors, so this regional regulation has remained until now. this doesn't work effectively. Along with these social facts, Soerjono Soekanto said that the law cannot satisfy all parties and cannot solve various problems perfectly. Sociology of law understands law in a social context with the aim of evaluating its effectiveness in society.[4]

Bandung City Regional Regulation number 2 of 2013 concerning Village Community Institutions Apart from not being in accordance with various existing social institution regulations such as for Community Empowerment Institutions which have the results of the National Conference on Community Empowerment Institutions in 2020 and Presidential Decree Number 49 of 2001, Empowerment of Family Welfare has the Results of the National Working Meeting Empowerment of Family Welfare in 2013 and Presidential Decree number 99 of 2017 and Minister of Home Affairs Regulation number 1 of 2013, and Karang Taruna has the results of the Karang Taruna national work meeting and Minister of Social Affairs Regulation 77 of 2010, also for Rukun Warga (RW) and other community institutions there is an age limit, namely a maximum of 65 years, even though the social facts are that of the 100 heads of Rukun Warga (RW), 62% are over 65 years old.[5]

Government Regulation number 45 of 2017 concerning Community Participation in the Implementation of Regional Government article 1 paragraph 1 states that Community Participation in the Implementation of Regional Government, hereinafter referred to as Community Participation, is the role of the community in channeling their aspirations, thoughts and interests in the administration of regional government.

Article 2 paragraph 1 of the Government Regulation states that the community has the right to participate in the preparation of Regional Regulations and regional policies that regulate and burden the community. Furthermore, article 3 states that community participation can be carried out through:

a. public consultation;

b. conveying aspirations;

c. public hearings;

---

[3] https://news.detik.com/berita/d-3238417/mendagri-bisnis-3143-perda-yang-dicabut-atau-direvisi-government, downloaded January 18 2024, at 05.23 WIB

[4] Soerjono Soekanto, 2009 E journal, *getting to know the sociology of law*.

[5] Academic Text Revision of Regional Regulation 02 of 2013 concerning Village Community Institutions, DP3APM, 2018, page 32.

d. work visit;

e. socialization; and/or

f. seminars, workshops, and/or discussions.

As an effort to increase Community Participation as intended in the Government Regulation, it is stated that the Regional Government:

a. Socialize draft Regional Regulations and draft Regional Head Regulations through information media that is easily accessible to the public; And

b. Develop an information system for drafting Regional Regulations and Regional Head Regulations in the form of online services taking into account regional conditions and readiness.

Seeing the importance of community participation, it cannot be separated from the existence of power in the hands of the people. Popular sovereignty views that power comes from the people, so that in carrying out its duties the government must adhere to the will of the people, which is usually called democracy. Jean Jaques Rousseau was the main pioneer of the concept of popular sovereignty through his famous theory of the Social Contract (Social Contract Theory). According to Rousseau, the state was formed because of a community agreement. In this context, sovereignty is born as a result of a statement of will by the people, in 2 (two) ways, namely:[6]

1. Collective agreement between members of society to protect each other's rights, which is called "volunte generale";

2. An agreement between community members and a group of people to ensure that the agreement is implemented by community members, which is called "volunte de tous".

Community participation in the formation of regional regulations is one form of community political participation in the context of creating good governance. Community participation in the formation of statutory regulations, including Regional Regulations, is also regulated in Article 96 of Law Number 12 of 2011 which states that:

1) The public has the right to provide oral and/or written input in the formation of statutory regulations;

2) Oral and/or written input as intended in paragraph (1) can be done through:

a. Public hearings;

b. Work visit;

c. Socialization; and/or

d. Seminars, workshops and/or discussions

3) The public as intended in paragraph (1) is an individual or group of people who have an interest in the substance of the draft statutory regulations;

4) To make it easier for the public to provide input verbally and/or in writing as intended in paragraph (1), every draft legal regulation must be easily accessible to the public.

Community participation is not only community participation in the development process, but the community must also be aware of the efforts made by the government in an effort to realize people's welfare. This participation requires openness, such as openness to information because without openness it will be difficult for the government to get community participation and support in all government activities.

As in the process of making public policy in a democratic government, it will be better and more meaningful if it is able to promote the interests of the people themselves, not just the interests of elites and a group of people. The process of making public policy is more important than its content. Thus, this principle means that the process of making public policy in a democratic government lies in how the policy process is made, rather than in the content of the policy. The more opportunities for dialogue the government has with its people, the more open the path to democracy will be in government. If the door to dialogue is closed or the opening is very narrow, then people will flock to force the door to open. That is a popular demonstration that can destabilize the government.[7]

Based on the problems above, the researcher considers that community participation in the process of forming regional regulations in Bandung City needs to be researched in relation to social facts that occur in society, the rejection of Bandung City

---

[6] Eddy Purnama, *State of People's Sovereignty, Analysis of the Indonesian Government System and Comparison with Other Countries*. First Edition, Nusamedia, Bandung, 2007., p. 10

[7] Miftah Thoha, *Contemporary Public Administration Science*, First Edition, Second Printing, Kencana Prenada Media, Jakarta, 2008, p. 261

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

regional regulations Number 2 of 2013 concerning sub-district social institutions from the heads of the RW, LPM, PKK and Karang Taruna became the basis for researchers to conduct research with the title Implementation of Community Participation in the Process of Forming Responsive Regional Regulations in Bandung City (Study of Community Participation in the Process of Forming Bandung City Regional Regulations Number 2 of 2013 Concerning Village Community Institutions).

II. RESEARCH METHODS

The approach method used in this research is the sociological juridical method, that is, apart from using legal principles and principles in reviewing, viewing and analyzing problems, this research also reviews how it is implemented in practice. This research examines community participation in the process of forming regional regulations (Study of Community Participation in the Process of Forming Regional Regulations for the City of Bandung Number 2 of 2013 concerning Village Community Institutions).

III. RESULTS AND DISCUSSION

3.1. Measuring the Degree of Community Participation in the Formation of Regional Regulations in the City of Bandung

Public participation in a democratic governance structure requires public involvement in the decision-making process, which is increasingly important in the era of regional autonomy. Participation is intended to encourage the creation of public communication to increase public understanding of the government's decision-making process and better disclosure of government information, to then provide new ideas in expanding a comprehensive understanding of an issue. Participation reduces the possibility of conflict in implementing a decision and supports the implementation of accountability, as well as encouraging the public to observe what the government is doing. Public participation is reflected in the opportunity to review draft decisions. Opportunity to provide input and respond to public input from decision makers, in this case the government.

Sherry Arnstein (1969) in the ladder of participation theory, divides levels of community participation into 8 ladders or levels with different characteristics of participation in each ladder ehe 8 stairs are:

Table: Degree of Citizen Partispation

No	Tangga	Ladder	Definition	Indicator
1	Manipulation	Non Partipation	There is relatively no communication between the government and the community	Information on the Process of Forming Regional Regulations
2	Therapy		Communication is still very limited or initiatives only come from the government (still one way)	Invitation to Establish Regional Regulations
3	Informating	Tokenism	Communication between government and society is no longer limited but it is still one-way	Schedule socialization Formation of Regional Regulations to society
4	Consultation		Communication already two-way between government and society	The public can provide program suggestions directly
5	Placation		There is a process communication accompanied by a negotiation process between the government and the community	Discussion of community proposals in deliberation forums and opinion hearings
6	Pathership	Citizen Control	Conditions exist communication between government and society parallel partner position	Can supervise regional policies
7	Delegation		The government has giving authority to the community to take care of their own needs and interests in terms of public services	Trust from the Bandung City Government to the community in planning regional policies

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

8	Citizen Control		Society can actively Involved in the formulation, implementation, evaluation and control of every public policy made	vailability of facilities for the community in terms of monitoring regional policies

Source: Sherry Arnstein, 1969, processed 2024

Furthermore, the level of manipulation and therapy is categorized as the non-participation stage. The level of conveying information, consultation, and reducing anger is categorized as the tokenism stage. And finally, the level of partnership, delegation of power, and community supervision is categorized as the stage of community power.

To measure the degree of participation of the people of Bandung City in the Formation of Regional Regulations in the City of Bandung using the degree of participation from Sherry R. Arnstein (1969), a questionnaire was prepared based on three stages of the theory of the degree of community participation. This questionnaire was then distributed to 65 respondents from social institutions from 30 sub-districts throughout Bandung City who were users of Bandung City Regional Regulation number 2 of 2013 concerning Village Community Institutions. The following is a recapitulation of respondents' answers to indicators of the degree of community participation.

Table: Recapitulation of Respondents' Answers to Indicators Society participation

No	Indicator	Answer
1	There is information about plans to form regional regulations	29,23 %
2	There is information about plans to form regional regulations	10,77%
3	Socialization to the community of plans to establish Regional	4,62%
4	RegulationsThe public can provide suggestions directly	6,15%
5	Dialogue with society	1,54%
6	The community can actively supervise the implementation of the formation of Regional Regulations	1,54%
7	The level of trust of the Bandung City Government in the community to involve the community	4,62%
8	Availability of complete facilities and infrastructure for the community to monitor policies	4,62%

Source: Data Processing Results, 2024

Based on the recapitulation of the answers from respondents using 8 indicators of degree of participation, it can be seen that all the indicators asked to the 65 selected respondents received low scores. This means that all indicators regarding the level of community participation in the city of Bandung have not been met. This condition illustrates that the participation of the people of Bandung City in the formation of Regional Regulations which is a constitutional mandate as stated in Law No. 12 of 2011 concerning Guidelines for the Formation of Legislative Regulations and Law 23 of 2014 concerning Regional Government has not yet run optimally in the City of Bandung and the community as stakeholders in the formation of Regional Regulations have not been fully given access to participate. The conditions in the city of Bandung are in accordance with Arnestein's explanation of the first degree in the theory of degrees of participation, namely non-participation which consists of the steps of manipulation and therapy. The first ladder, namely manipulation or abuse, and the second ladder, therapy (repair), are not included in the context of actual participation. In this case, the community is involved in the formation of Regional Regulations, but in fact their involvement is not based on a mental, psychological impulse, and is accompanied by consequences for their participation which contributes to the formation of these Regional Regulations. The community in this position is only an object in the formation of Regional Regulations and is only used as a requirement (justification) that the aspirations and demands of the community have been fulfilled by the Bandung City Government. The results of field research on 65 respondents strengthen this position, where there are still quite a lot of community members who are not yet fully aware of the urgency of forming Regional Regulations that will enable the development of partnership conditions between the community and the Bandung City Government. Issues surrounding the formation of Regional Regulations are still controlled by only a handful of people and there has not been any massive effort from the Bandung City Government to encourage the community to be more participatory.

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

The low level of public participation in the formation of Regional Legal Products is also due to the stigma that the formation of Regional Regulations is only the responsibility of the regional government. Thus, the concept of regional autonomy which allows for higher community involvement has not been properly conveyed. Community participation, especially in the process of forming Regional Regulations, is often ignored by justifying the existence of community "representatives" as complete representatives of the entire community. To be able to increase the level of community participation in an even better direction, hard work is needed from various related parties, starting from the executive and regional legislatures. This is because the increasing involvement of the community in the administration of government and accompanied by an open attitude from the government itself will certainly be a direction for the realization of socio-political trust, thereby enabling the implementation of a democratic government process. Apart from that, with community participation, especially in the formation of Regional Regulations, it will further empower communities autonomously to be able to organize themselves and their environment.

The Process of Forming Participatory and Responsive Regional Regulations in the City of Bandung
A. Formation of Participatory Regional Regulations

Regional government is a major means of the state in strengthening national development with various positive activities. Of course, regional government participation in strengthening national development from various sectors can be realized well if regional governments are able to direct progressive and integrative policies. Apart from that, the implementation of a decentralization system which is a sub-theme of democracy must be implied in strengthening the role of regions constructively to empower local communities for the collective strength of the state. In this way, decentralization is able to form healthy competition between regions in advancing the nation. The granting of the authority to draft regional regulations to regional governments is a symbol of the independence of regional governments in regulating and managing the various potentials they have. Regional Regulations are a strategic instrument in achieving decentralization goals. Moreover, in the context of regional autonomy, the existence of Regional Regulations in principle plays a role in encouraging maximum decentralization.[8]

Article 1 (41) of Law 23/2014 concerning regional government explains that community participation is the role of community members to channel their aspirations, thoughts and interests in the administration of government. The article above provides broad space for the community to participate in government administration. However, this article does not explain in detail how and within what scope the community can participate in channeling their aspirations, thoughts and interests to the regional government. In reality, in interpreting community participation, the Regional Government is obliged to do three things, namely: 1) convey information about government administration, 2) carry out consultations with community groups/organizations to provide an active role in two major tasks, namely government administration and community strengthening, 3) provide material support in the form of money and/or facilities for community organizations to strengthen participation. Participation can be interpreted as taking part, taking part in an activity, from planning to evaluation. Community participation in the process of making regional regulations can be categorized as political participation. By Huntington and Nelson. Political participation is defined as the activities of private citizens whose aim is to influence decision making by the government.

The role of community participation in the formation of statutory regulations, including in the formation of Regional Regulations, has been juridically normative in Article 96 of Law 12/2011 which regulates community participation in the formation of statutory regulations:

1) The public has the right to provide oral and/or written input in the Formation of Legislative Regulations.
2) Oral and/or written input as intended in paragraph (1) can be done through:
a. public hearings;
b. work visit;
c. socialization; and/or
b. seminars, workshops, and/or discussions.
II. The public as intended in paragraph (1) is an individual or group of people who have an interest in the substance of the Draft Legislative Regulations.
III. To make it easier for the public to provide oral and/or written input as intended in paragraph (1), every Draft Legislative Regulation must be easily accessible to the public.

---

[8] Reny Rawasita, et.al. "*Assessing the Social Responsibility of Regional Regulations*". Jakarta: Center for Indonesian Law and Policy Studies, 2009. Pg. 60

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

Government Regulation Number 45 of 2017 concerning Community Participation in the Implementation of Regional Government is based on Article 5 paragraph (2) of the 1945 Constitution of the Republic of Indonesia and Law Number 23 of 2014 concerning Regional Government (State Gazette of the Republic of Indonesia of 2014 Number 244 , Supplement to the State Gazette of the Republic of Indonesia Number 5587) as amended several times, most recently by Law Number 9 of 2015 concerning the Second Amendment to Law Number 23 of 2014 concerning Regional Government (State Gazette of the Republic of Indonesia of 2015 Number 58, Supplement to the State Gazette Republic of Indonesia Number 5679).

Government Regulation Number 45 of 2017 concerning Community Participation in the Implementation of Regional Government provides an understanding of general provisions regarding:

1) Community Participation in the Implementation of Regional Government, hereinafter referred to as Community Participation, is the role of the Community in channeling their aspirations, thoughts and interests in the implementation of regional government.
2) Communities are individual Indonesian citizens, community groups, and/or Community Organizations.
3) Community Organization is a community organization as intended in the laws and regulations governing Community Organizations.

Community participation in the administration of regional government has an important function, including as a means for the community, both individuals, community groups and community organizations, to express their needs and interests so that the process of forming regional policies is more responsive to the needs and interests of the community. Community participation is also important in realizing community awareness and support for successful development in the region. In accordance with the provisions of Article 354 paragraph (7) of Law Number 23 of 2014 concerning Regional Government, this Government Regulation is a guideline for Regional Governments in forming Regional Regulations regarding procedures for Community Participation.

B. Responsive Regional Regulation Formation Process

The formation of laws is the most important and modern legal formation. In it, an abstract behavioral model is created, which in the future is expected to be able and can be used to solve social problems that occur and/or that may occur in the future.[9] Laws in the Indonesian context have 2 (two) functions, namely an expressive function and an instrumental function. Expressive function, namely expressing or expressing views on life, cultural values and justice. Meanwhile, the instrumental function is a means of creating and maintaining order, stability and predictability, a means of preserving cultural values and realizing justice, a means of educating and civilizing society, a means of realizing prosperity and welfare of society, and a means of renewing society (encouraging, channeling and directing societal change).[10]

The authority to form Regional Regulations is a form of regional independence in regulating regional household affairs or regional government affairs. Regional Regulations are a strategic instrument as a means of achieving decentralization goals. In the context of regional autonomy, the existence of Regional Regulations in principle plays a role in encouraging maximum decentralization. From the perspective of political empowerment, the goal of decentralization can be seen from two sides, namely regional government and central government. The aim of decentralization from the regional government side is to realize political equality, local accountability and local responsiveness. Meanwhile, the aim of decentralization from the central government side is to realize political education, provide training in political leadership and create political stability[11].

The birth of a Regional Regulation (Regional Regulation) must contain regulations that can be obeyed by the community, and to support this it is very necessary to understand the desires and social conditions of the community so that they can be implemented over a long period of time. Therefore, philosophical considerations must be clear about where society will be taken. To achieve responsive Regional Regulations in supporting Regional Autonomy, designers should pay attention to the principles of forming Regional Regulations as a frame of reference such as clarity of objectives, appropriate institutions or forming organs, suitability between content type and material and so on.

---

[9] Bernard Arief Sidharta (Translator), *Meuwissen About Legal Development, Legal Science, Legal Theory and Legal Philosophy*. Refika Aditama, Bandung, 2008, p. 10.

[10] Bernard Arief Sidharta, *Indonesian Legal Science: Efforts to Develop Systematic Legal Science that is Responsive to Changes in Society*. Genta Publishing, Yogyakarta, 2013, p. 104. Then see also Bernard Arief Sidharta, Reflections on the Structure of Legal Science: A Research on the Philosophical Foundations and Scientific Nature of Legal Science as a Foundation for the Development of Indonesian National Legal Science, Mandar Maju, Bandung, 2000.

[11] Syarif Hidayat, *Decentralization for Regional Development, Jentera: Regional Regulations*. 14th Year IV Edition, October-December 2006.

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

In the idea of responsive law put forward by Philippe Nonet and Philip Selznik, it is stated that regulations need to depend on or be adapted to appropriate historical conditions so that they can be relevant and have vitality. When the environment changes, the rules must be reorganized. This is done not only to meet policy requirements, but also to protect the authority of the regulations themselves and their integrity when applied. Whether or not a law is responsive to societal developments depends greatly on the politics of the law and the legal principles adopted.[12] Related to legislative politics, Bagir Manan stated that in general the legal politics of a country consists of permanent legal politics and temporary legal politics. Permanent legal politics is legal politics related to legal attitudes which will always be the basis for policies for establishing and enforcing laws.[13]

According to Bagir Manan, permanent legal politics for Indonesia are as follows: 1. The existence of a unified Indonesian legal system; 2. The national legal system is built based on and to strengthen the foundations of Pancasila and the 1945 Constitution; 3. There is no law that grants special rights to certain citizens based on ethnicity, race or religion. Even if there are differences, they are solely based on national interests within the framework of national unity and unity; 4. Legal formation takes into account the pluralism of society; 5. Customary law and other unwritten laws are recognized as subsystems of national law as long as they are clearly alive and maintained in society; 6. Legal formation is completely based on community participation; 7. Laws are formed and enforced for the sake of general welfare (social justice for all people), the realization of a democratic and independent Indonesian society and the implementation of a state based on law and a constitution.[14]

Permanent legal politics and temporary legal politics are the guiding principles in the formation of laws. This implies that permanent legal politics and temporary legal politics are guidelines that can be used in forming laws that are responsive to societal developments. According to Mahfud MD, there are three indicators that can be used as a measure to determine whether a legal product is responsive, namely: 1. The process of making it is participatory, that is, inviting as much public participation as possible through social groups and individuals in society; 2. The content is aspirational, that is, it contains material that is generally in accordance with the aspirations or wishes of the community being served, so that the legal product can be seen as the crystallization of the community's will; 3. Responsive legal products usually provide little opportunity for the government to make its own interpretation through various implementing regulations, and this limited opportunity only applies to matters of a technical nature.[14]

These three indicators are interrelated, the content material is aspirational and the detailed content is limitative depending on whether the production process is participatory or not. The politics of legislation adopted by Law Number 12 of 2011 mandates that every formation of statutory regulations must be participatory. This is contained in the provisions of Article 96 of Law Number 12 of 2011 which reads as follows: (1) The public has the right to provide oral and/or written input in the formation of Legislative Regulations. (2) Oral and/or written input as intended in paragraph (1) can be done through: a. Public hearings; b. Work visit; c. Socialization; and/or d. Seminars, workshops and/or discussions. (3) The public as intended in paragraph (1) is an individual or group of people who have an interest in the substance of the Draft Legislative Regulations. (4) To make it easier for the public to provide oral and/or written input as intended in paragraph (1), every Draft Legislative Regulation must be easily accessible to the public.

Based on the provisions of Article 96 of Law Number 12 of 2011, public participation is a must in every law formation. However, the extent to which community involvement is realized depends on the wishes of the legislators. Therefore, legislators should not only look at community involvement from a purely procedural perspective, but must look at community involvement from a substantive perspective.

Community involvement in producing a law that has a responsive character must be seen from the quality of community involvement itself. This means that the higher the quality of community involvement, the stronger the birth of a responsive law will be. Improving the quality of community involvement can at least minimize the crystallization of the interests of certain groups that do not side with the interests of society in general. What needs to be paid attention to in the future is how to make as much effort as possible to improve the quality of community involvement.

So far, the formation of laws has not had a responsive character. Community involvement in the formation of laws has not been grounded and is based on the interests of the community itself. The formation of responsive laws must involve complete

---

[12] Philipus M. Hadjon, *The Idea of a Rule of Law in the Indonesian Constitutional System*. In Bagir Manan (Ed), People's Sovereignty, Human Rights and the Rule of Law, Collection of Essays in Honor of Sri Soemantri Martosoewignjo, Gaya Media Pratama, Jakarta, 1996, p. 82

[13] Bagir Manan, *Legal Politics of Autonomy Throughout Regional Government Legislation*. In Martin H. Hutabarat, et.all (Editor), Indonesian Law and Politics: Analytical Review of Presidential Decrees and Regional Autonomy, Pustaka Sinar Harapan, Jakarta, 1996, p. 14. [14] Ibid.

[14] Moh. Mahfud MD, *Legal Politics in Indonesia*, RajaGrafindo Persada, Jakarta, 2014, p. 35.

community participation, because this complete involvement will affect the quality of the content contained in the law. The higher the quality of community involvement, the stronger the birth of a responsive law will be.

Forming responsive regional regulations is a necessity in order to regulate and implement regional autonomy. The implementation of regional autonomy requires the participation of society as a whole so that regional development efforts can be carried out well. Efforts to form responsive regional regulations will be achieved if they are implemented through good planning stages, a harmonization process that is carried out carefully and meticulously, and involving the community to capture community aspirations in accordance with the laws they desire. Regional regulations are autonomous laws that are oriented towards monitoring repressive power. Autonomous law focuses its attention on social conditions and realities in society. Autonomous law also has an emphasis on legal rules as the main effort to monitor official and private power. The responsive nature of regional regulations can be interpreted as serving the social needs and interests experienced and discovered, not by officials but by the people.

As has been stated by responsive legal theory, responsive law accommodates social values that support needs and justice contained in laws and regulations and policies issued by the authorities. In terms of the formation of responsive Regional Regulations, it can be interpreted that these Regional Regulations must accommodate the social needs and interests of the community, and are not a reflection of political will or the will of the authorities, but rather the people. The responsive nature implies that responsive law is useful for society. According to A. Mukhtie Fadjar, the responsive legal type has two prominent characteristics, namely: a) a shift in emphasis from rules to principles and objectives; and b) the importance of popular (populist) character, both as a legal goal and a way to achieve it.[15] Regional governments must strictly avoid repressive regional regulations. A government power is said to be repressive if that power does not pay attention to the interests of the people being governed, that is, when a power is exercised not in the interests of those being governed, or denies their legitimacy.[16]

In the event that the Regional Regulations are desired to meet the needs of the community, then the above opinion can be used as a reference that must be taken into account when designing and drafting Regional Regulations. Of course, it is not easy to do, because after all Regional Regulations are the product of political compromise which cannot be separated from various influencing factors, even the majority of power in parliament will really determine which direction the Regional Regulation leads to. Regional legal products must be able to show that they are taking sides with the community without causing burdensome pressure on the community.

IV. CONCLUSION

The conclusions that the author can draw from the various problems contained in this article are:

1. Implementation of community participation in the formation of regional regulations can improve the quality of regional regulations because the community is the object of the regional regulations that are made and it is the community that will implement the regional regulations that are made. Making regional regulations that involve community participation means that the regional regulations that are made are truly born from the interests of the community. The basic aim of community participation is to produce input and perceptions that are useful for citizens and interested communities, in order to improve the quality of decision making, because by involving communities affected by policies and interest groups, decision makers can capture their views and needs. and appreciation from the community and groups, to then pour it into one concept, and with community involvement, the implementation of regional regulations will run more optimally;

2. The process of forming regional regulations in the City of Bandung is less participatory and not responsive, so that the resulting decisions are not of high quality and are not in accordance with the needs and expectations of the community, apart from that, public unrest or dissatisfaction cannot be minimized and in the end the implementation of regional regulations does not run properly;

3. The causes of the lack of quality of community participation in the formation of regional regulations in Bandung City are: (a) lack of public understanding of the process of forming regional regulations, (b) lack of firm efforts from the regional government to capture community aspirations, (c) regional regulations are not made based on community interests and the publication and dissemination of regional regulations have not run optimally, and (d) the community is not involved enough. The solutions needed to increase the effectiveness of community participation in Bandung City include: (a) a commitment from regional law makers, in this case the regional head and the Regional People's Representative Council to involve the community in every discussion of

---

[15] W. RiawanTjandra and Kresno Budi Darsono, *Legislative Drafting*, Atma Jaya, Yogyakata, 2009, p. 63

[16] Philippe Nonet and Philip Selznick, *Responsive Law*, Nusamedia, Bandung 2010, p. 33

regional regulations, (b) the need to conducting strict and transparent socialization and enforcement of regional regulations, (c) more accurate research on the problems faced by the community, and (d) involving all elements of society.

V. REFERANCES

A.   Books:

1) Abdilla Fauzi Achmad, *State Governance in Political Perspective*. First Edition, Golden Terayon Press, Jakarta, 2012.

2) Ahmad Sukardja, *Constitutional Law & State Administrative Law in the Perspective of Siyasah Fiqh*. First Printing, Sinar Graphics, Jakarta, 2012.

3) Amiroeddin Syarif, *Basic Legislation, Types and Techniques for Making Them*. Bina Aksara, Jakarta, 1987.

4) Amirudin and Zainal Asikin, *Introduction to Legal Research Methods* Raja Grafindo, Jakarta, 2004.

5) Ateng Syafrudin, *Regional Government Coordination Arrangements*. Citra Aditya Bakti, Bandung, 1993.

6) Bagir Manan, *Basics of Indonesian Legislation*. Ind-Hill. Co., Jakarta, 1992.

7) Bambang Waluyo, *Legal Research in Practice*. Sinar Graphics, Jakarta, 1999.

8) Barda Nawawi Arief, *Kapita Selecta Criminal Law*. Third Printing, Citra Aditya Bakti, Bandung, 2013.

9) C.F. Strong, *Modern Political Constitutions*. Nusamedia, Bandung, 2004.

10) C.S.T. Kansil, *Introduction to Legal Science and Indonesian Legal Administration*. Balai Pustaka, Jakarta, 1989.

11) D. Mutiaras, General State Administration, Islamic Library, Jakarta, 1999.

12) Dasril Munir, Henry Arys Djuanda, and Hessel Nogi S. Tangkilisan, Regional Financial Policy & Management, Indonesian Public Administration Reform Foundation (YPAPI), Yogyakarta, 2004.

13) Djauhari, *Legal Politics of the Indonesian Welfare State, Study of Regulatory Policies and Institutionalization of Socio-Economic Welfare Ideas for Fishermen's Communities in Central Java*. First Printing, Unissula Press, Semarang, 2008.

14) Djoko Prakoso, *Regional Regulation Making Process*. Ghalia Indonesia, Jakarta, 1985.

15) Eddy Purnama, *People's Sovereignty, Analysis of the Indonesian Government System and Comparison with Other Countries*. First Edition, Nusamedia, Bandung, 2007.

16) Edi Suharto, *Public Policy Analysis: A Practical Guide to Examining Social Problems and Policies*. Alfa Beta, Bandung, 2005.

17) Indonesian Encyclopedia (N-Z), *Rule of Law, New Effort van Hoeven*, Jakarta, 2002. \

18) Esmi Warassih, *Legal Institutions, A Sociological Study*. Second Printing, Diponegoro University Publishing Agency, Semarang, 2010.

19) Frans Magnis Suseno, *Looking for the Figure of Democracy, A Philosophical Study*. Gramedia Pustaka Utama, Jakarta, 1997.

20) Hasan Mohammad Tiro, *Democracy for Indonesia*. Teplok Press, Jakarta, 1999.

21) Hendra Nurtjahjo, *State Science, Development of State Theory and Supplements*. Raja Grafindo Persada, Jakarta, 2005.

22) Ida Zuraida, *Techniques for Preparing Regional Regulations*. Sinar Graphics, Jakarta, 2013.

23) Irawan Soejito, *Techniques for Making Regional Regulations*. Bina Literacy, Jakarta, 1989.

24) Jazim Hamidi, *Legal Optics, Problematic Regional Regulations, Initiating Responsive and Sustainable Regional Regulations*. First Printing, Achievement Pustaka Publisher, Jakarta, 2011.

25) Joeniarto, *State of Law*. YBP Gajah Mada, Yogyakarta, 1968.

26) Juhaya S. Praja, *Legal Theory and Its Application*. First Edition, Pustaka Setia, Bandung, 2011.

27) Juniarso Ridwan and Achmad Sodik Sudrajat, *State Administrative Law and Public Service Policy*. First Printing, Nuansa, Bandung, 2009.

28) King Faisal Sulaiman, *Theory of Legislative Regulations and Aspects of Their Testing*. First Printing, Thafa Media, Yogyakarta, 2017.

29) L.J. Van Apeldoorn, *Introduction to Legal Studies*. Pradnya Paramita, Jakarta, 2004.

30) M. Solly Lubis, *Shifting Political Lines and Legislation Regarding Regional Government*. Alumni, Bandung, 1983.

31) Mardiasmo, *Autonomy and Regional Financial Management*, Andi, Yogyakarta, 2004.

32) Maria Farida Indrati S., *Legal Studies (1), Types, Functions*, Content. Kanisius, Yogyakarta, 2007.

33) Mas Achmad Santoso, *Good Governance and Environmental Law*. ICEL, Bandung, 2001.

34) Miftah Thoha, *Contemporary Public Administration Science*. First Edition, Second Printing, Kencana Prenada Media, Jakarta, 2008.

35) Miriam Budiardjo, *Basics of Political Science*. Gramedia Pustaka Utama, Jakarta, 2009.

36) Moh. Mahfud MD, *Constitutional Democracy in Indonesia*. Liberty, Yogyakarta, 1993.

37) Mukhlis Taib, *Dynamics of Legislation in Indonesia*. First Edition, Refika Aditama, Bandung, 2017.

38) Munir Fuady, *Theory of the Modern Legal State (Rechtstaat)*. First Printing, Refika Aditama, Bandung, 2009.

39) Ni'matul Huda, Indonesian Constitutional Law, Raja Grafindo Persada, Jakarta, 2005.

40) Nomensen Sinamo, *Indonesian Constitutional Law, supplemented by the 1945 Constitution and Law no. 19 of 2006 concerning the Presidential Advisory Council*, Revised Edition, Third Printing, Permata Aksara, Jakarta, 2014.

41) R. Soepomo, *Indonesian State of Law, Seminar on State Administration of the 1945 Constitution*, Jakarta, 1966.

42) Ramlan Surbakti, *Understanding Political Science*, Grasindo, Jakarta, 1992.

43) Ridwan HR, *State Administrative Law, First Edition*. First Printing, Raja Grafindo Persada, Jakarta, 2006.

44) Riswandha Ismawan, *Political Reform and National Democratization, Towards a New Indonesian Order*. Gramedia Pustaka Utama, Jakarta, 2000.

45) Robert A. Dahl, *Regarding Democracy*, translated by A. Rahman Zainuddin, First Printing, Indonesian Obor Foundation, Jakarta, 2001.

46) Ronny Hanitijo Soemitro, *Legal Research Methodology and Jurimetry*. Ghalia Indonesia, Jakarta, 1990.

47) Salim H.S. and Erlis Septiana Nurbani, *Application of Legal Theory in Theses and Dissertations*. First Edition, First Printing, Rajawali Press, Jakarta, 2013.

48) Sirajuddin et al., *Legislative Drafting: Institutionalization of Participatory Methods in Forming Legislation*. Corruption, Malang, 2006.

49) Sodikin, Election Law, *Elections as Constitutional Practice*. Gramata Publishing, Bekasi, 2014.

50) Soeratno and Lincolin Arsyad, *Research Methodology for Economics and Business*. UPP AMP YKPN, Yogyakarta, 2003.

51) Soerjono Soekanto, *Legal Effectiveness and the Role of Witnesses*. Teen Karya, Bandung, 1985.

52) Suparman Marzuki, *Politics of Human Rights Law*. Erlangga, Jakarta, 2014.

53) Syaukani, HR, Affan Gafar, M. Ryaas Rasyid, *Autonomy in a Unitary State*. Student Library, Yogyakarta, 2004.

54) W. Gulo, *Research Methods*. Gramedia Widiasarana Indonesia, Jakarta, 2002.

55) Yopie Morya Immanuel Patiro, *Discretion of Public Officials and Corruption Crimes*. First Printing, Keni Media, Bandung, 2012.

56) Zainal Arifin Hoesein and Rahman Yasin, *Direct Election of Regional Heads, Strengthening Concepts and Application*. First Printing, National Children's Education Development Institute (LP2AB), Jakarta, 2015.

57) Zainuddin Ali, *Sociology of Law*. Third Edition, Sinar Graphic, Jakarta, 2008.

B. Legislations

1) The 1945 Constitution of the Republic of Indonesia.
2) Law Number 12 of 2011 concerning the Formation of Legislative Regulations.
3) Law Number 23 of 2014 concerning Regional Government.
4) Government Regulation Number 45 of 2017 concerning Community Participation in Government Administration.
5) Presidential Regulation Number 87 Implementing Regulations of Law Number 12 of 2011 concerning the Formation of Legislative Regulations.
6) Minister of Home Affairs Regulation Number 80 of 2015 concerning the Formation of Regional Legal Products.

C. Journals/Scientific Papers/Articles:

1) Abdul Razak, *Shura and Democracy, Similarities and Differences*. Media Akademia, Vol. 25 No. 3, July 2010.
2) Iza Rumesten, R.S., *Ideal Model of Community Participation in the Formation of Regional Regulations*. Journal of Legal Dynamics, Vol. 12 No. 1, Faculty of Law, Sriwijaya University, Palembang, January 2012.
3) Muhammad Ichsan, *Democracy and Shura: Islamic and Western Perspectives*. Substantia, Vol. 16 No. 1, State Islamic College (STAIN) Zawiyah Cot Kala, Langsa, April 2014.
4) Ni Made Ari Yuliartini Griadhi and Anak Agung Sri Utari, *Community Participation in the Formation of Regional Regulations*. Kertha Patrika, Vol. 3 No. 1, Faculty of Law, Udayana University, Bali, January 2008.
5) Normina, *Community Participation in Education*. Ittihad Journal Kopertis Region XI Kalimantan, Vol. 14 No. 6, October 2016.

Implementation of Community Participation in the Process for Forming Responsive Regional Regulations in Bandung City

6) Rizal Andreeyan, *Study of Community Participation in the Implementation of Development in Sambutan Subdistrict, Sambutan District, Samarinda City*. E-Journal of State Administration, Vol. 2 No. 4, Faculty of Social and Political Sciences, Mulawarman University, Samarinda, 2014.

7) Ryan Monoarfa, *Public Participation in the Formation of Regional Regulations*. Thesis Article, Lex Administratum, Vol. 1 No. 2, April-June 2013.

8) Zenith Syahrani, *Community Participation in the Formation of Bali Province Regional Regulations in the Context of Realizing Good Governance, Special Program for State Administration*. Faculty of Law, Udayana University, Bali, No Year.

D. Website:

1) Anthonius Ibori, *Community Participation in Implementing Development in Tembuni Village, Teluk Bituni Regency District, Governance*. as accessed at https://ejournal.unsrat.ac.id/index.php/go vernance/article/view/1473/1173, 4 January 2024, time:

2) 3.21 pm.

3) Asefts63, *People's Sovereignty in the Indonesian Government System*. accessed at

4) https://asefts63.wordpress.com/materi-pelajaran/pknkls-8/kedaulatan-rakyat-dalam-sistemanggaran-indonesia/, on January 5 2024, time: 5.05am.

5) Ukti BA, *Indonesian State of Law*, as accessed at http://uktibintiarifah.blogspot.co.id/2016/01/normal-0-false-false-falsein-x-none-x.html, on March 7 2024, time: 6.34am.

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

Marison Felicidad R. Dy[1], Erick Vernon Y. Dy[2]

[1]Department of Human and Family Development Studies College of Human Ecology University of the Philippines Los Baños Philippines
[2]Office of Counseling and Guidance Office of the Vice-chancellor for Student Affairs University of the Philippines Los Baños Philippines

ABSTRACT: The study determined the relationship between connectedness to nature, spirituality, and resilience among selected Filipino adolescents. There were 116 respondents, with an average age of 19.6 years, who completed a self-administered questionnaire. Findings show that the average level of connectedness to nature was 51.05 with the majority of the scores (71.6%) in the average range. More than two-thirds (67.2%) of the respondents had an average frequency of spiritual experiences. The majority (78.4%) also had scores in the average resilience levels. Connectedness to nature had weak positive relationships with spirituality and resilience. Spirituality and resilience were also weakly and positively related. All relationships were significant. Adolescent connectedness to nature, spirituality and resilience should be enhanced as these are related to positive individual states and outcomes. Further studies can consider larger samples of adolescents from various settings and how the mentioned variables relate to each other in different adolescent contexts.

KEYWORDS: adolescence, connectedness to nature, resilience, spirituality

I.INTRODUCTION

Connectedness to nature refers to an individual's sense of affinity with and belongingness to the natural world (Mayer and Frantz, 2004; Pritchard et al., 2019). It is a stable personality trait over time and across situations (Nisbet et al., 2011). Further, it can also be a state and may shift from time to time depending on one's experiences with nature, activities in or related to nature, and frequency of time spent in nature (Vining et al., 2008; Richardson et al., 2016). Connectedness to nature is significant for positive health states (Cervinka et al., 2012).

Spiritual experiences are transcendent states or altered states of consciousness which rise above the ordinary or everyday experiences (Flower, 2004). Spiritual experiences contribute to one's spirituality, which refers to an individual's beliefs and subjective experiences that gives a sense of transcendence beyond what is material in the here and now (Kamitsis and Francis, 2013). Laski (in Bergland, 2016) stated that spiritual experiences commonly originate from nature experiences with water, trees, flowers, spring, sunrise, and sunset. Nature experiences were associated with a spiritual orientation which involve feelings of wonder, respect, and awe (Saroglou et al., 2008) or of something greater than themselves (Shiota et al., 2007). Recent studies show that connectedness to nature and engagement in nature activities were significantly positively associated with spirituality (Trigwell et al., 2014; Kamitsis and Francis, 2013; Leary, Tipsord and Tate, 2008; Diessner et al., 2008).

Resilience is a process of positive psychological adaptation with exposure to adverse events (Graber et al., 2015). It emerges due to the interactions among individual characteristics, environmental influences, and life events of the individual. Resilience can be built with the presence of protective mechanisms such as supportive and caring relationships, positive experiences, enhancement of adaptive capacities, and coping strategies (Graber et al., 2015) and the individual's capacity to reach or obtain resources in their social ecologies that foster well-being (Ungar, 2016). In the adolescent years, family functioning and the development of coping strategies reinforce the person's resilience (Ungar, 2016) although, the quality of social relationships and stress responses may also influence this.

Corraliza and Collado (2011) found that human interactions with nature in the residential and school environments fostered resilience among children. There was an observed lower stress levels with frequent nature contacts. They stated that

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

interactions with nature had a buffering effect on stress levels. Marselle (2013) found from her study on developing resilience through nature interactions, specifically, nature walks with a group that group walkers had greater mental well-being, more positive affect, and resilience against adversity than non-group walkers. Further, walking in green spaces like farmlands seem to further boost mental well-being. The increase in physical activity and reduction in perceived stress were the drivers to better mental well-being.

Spirituality and resilient outcomes have been found to be associated among individuals faced with adversities (Ponds, 2014; Smith et al., 2013). Labbe and Forbes (2010) found that individuals with higher spirituality levels manifested lower anger and respiration rates when exposed to a stressor and exhibited extraversion, agreeableness and conscientiousness which are considered as health-protective personality traits. Spirituality has protective aspects and may enhance resilience through attachment relationships, making support systems accessible, guidance of moral values and behaviors, and opportunities for personal growth (Crawford et al., 2006). Raftopoulos and Bates (2011) stated that spirituality fostered resilience by providing a sense of protection, comfort, meaning, and optimism, and, increased self-efficacy to overcome low points in the respondents' lives.

The present study focuses on determining the relationships among levels of connectedness to nature, spirituality, and resilience among Filipino university students. Studies on connectedness to nature have been confined to Europe, North America, and Australia, thus, investigations of this construct in other countries need to be done (Pritchard et al., 2019; Scopelleti et al., 2016). Miller and Kelley (2005) pointed out that studies on adolescent spirituality as related to resilience are still lacking. This study extends literature by looking into connectedness to nature, spirituality, and resilience, which are considered as psychological strengths in the context of the youth in a developing country.

The study aimed to specifically answer the following questions:
1. To determine levels of connectedness to nature of the respondents
2. To determine the spirituality levels of the respondents
3. To determine the resilience levels of the respondents
4. To determine the relationships among these variables

II. METHODOLOGY

This is a quantitative study using a cross-sectional research design which gathered data through a survey questionnaire from the university students. The study was done in an autonomous unit of the national university located in Los Banos, Laguna, a municipality located south of the national capital region.

The respondents were university students of different academic levels from three sections of a large General Education class. There were 194 enrolled students, and a complete enumeration was done. Of this, 122 respondents completed the questionnaire for a 62.9% response rate. However, due to non-accomplishment of some items or scales in the questionnaire, 6 students were not included, for a total of 116 respondents.

The research instrument was a questionnaire with four parts. The first part focused on the socio-demographic characteristics of the respondents. The second part was the Connectedness to Nature Scale by Mayer and Frantz (2004). This scale measures how emotionally connected a person is to the natural world. It is composed of 14 items rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The highest possible score is 70 and higher scores mean higher connectedness to nature. The scale's reliability is high at $\alpha = 0.82$. The third part is an adapted version of the Daily Spiritual Experience Scale (Underwood & Teresi, 2002) which measures the individual's daily personal spiritual experiences and perceptions of what is transcendent or divine. There were 14 items adapted with responses based on a 6-point Likert scale. In the study, the reliability coefficient for the measure of spirituality was strong ($\alpha = 0.93$). The highest possible score is 84 wherein higher scores reflect higher spirituality. The last part is an adapted version of the Child and Youth Resilience Measure by Ungar and Liebenberg (2011) which measures various resources available to the individual which may strengthen their resilience. In this study, 12 items were selected which reflected the three subscales: individual resources, relationships with primary caregivers, and contextual factors that enhance feelings of belongingness. The reliability coefficient for this measure of resilience was good at $\alpha = 0.76$. The highest possible score is 36 and the higher scores reflect higher youth resiliency.

The permission of the professors to conduct the study in their large classes was requested and when they granted approval, the informed consent forms were sent to the respondents. The questionnaires were, thereafter, administered to the respondents who gave their consent after the class period. The questionnaire took approximately 20 minutes to accomplish.

Data were encoded in Microsoft Excel to compute the descriptive statistics (means, frequencies, and percentages) of the variables. The Spearman Correlation Coefficient was computed to determine the relationships among the levels of connectedness to nature, spirituality, and resilience levels.

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

III. RESULTS AND DISCUSSION

A. Demographic Profile of the Respondents

There was a total of 116 respondents, 60.34% are females and 39.66% are males (Table 1). Less than half were aged 19, with nearly half in their junior year. More than three-fourths were living with their parents while studying, meaning they live in the locality. The majority reported that their parents' marriage was intact.

Table 1. Sociodemographic characteristics of the respondents

Characteristics	f	% (N=116)
Sex		
Male	46	39.66
Female	70	60.34
Age		
18	8	6.89
19	50	43.10
20	40	34.48
21	13	11.21
22 up	5	4.31
Academic level		
1st	3	2.59
2nd	20	17.24
3rd	52	44.83
4th	41	35.34
Living with parents		
Yes	90	77.59
No (dorm/apartment)	26	22.41
Parent's marriage intact		
Yes	101	87.07
No	15	12.93

B. Level of Connectedness to Nature of the Respondents

Less than three-fourths of the respondents' scores were in the average range (Table 2). The average level of the connectedness to nature of the respondents is 50.99 (s.d.=5.97). The statements with the average highest levels of agreement were the following: Statement 3- I recognize and appreciate the intelligence of other living organisms (4.38); Statement 8 - I have a deep understanding of how my actions affect the natural world (4.07); and Statement 2- I think of the natural world as a community to which I belong (3.87). These results are on the average level and the statements with the highest agreement are like the findings of Dy et al. (2016) and Dy (2019) with university students. The high agreement levels indicate that the adolescents respect other living things, are aware of the consequences of their environmental actions, and have a sense of belongingness to nature.

Table 2. Distribution of scores for level of connectedness to nature of the respondents

Scores	f	% (N=116)
Low (0-44)	18	15.52
Average (45-57)	83	71.55
High (58-70)	15	12.93

C. Spirituality Levels of the Respondents

More than two-thirds of the respondents' scores were in the average range (Table 3). The average spirituality level of the respondents is 58.53 (s.d.=14.79). The items which showed the highest frequency of experiences were Statement 11 - I feel thankful for my blessings (5.05); Statement 14- I desire to be closer to God or in union with Him (4.47); and Statement 8- I feel God's love for me directly (4.38). This sense of gratitude and spiritual relationship with the divine is significant because it

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

supports youth development and is linked to helping behaviors and coping capacity (Batara, 2015). Underwood & Teresi (2002), earlier on, already saw that spirituality is related to a better quality of life and better psychosocial states.

Table 3. Distribution of scores for spirituality level of the respondents

Scores	f	% (N=116)
Low (0-43)	16	13.79
Average (44-73)	78	67.24
High (74-84)	22	18.97

D. Resilience Levels of the Respondents

More than three-fourths of the respondents' scores were in the average range (Table 4). The average resilience level of the respondents is 28.88 (s.d.=3.25). The items with the highest levels of agreement were for Statement 4- Knows how to behave in different situations like in school, home, or church (2.84); Statement 3 – Doing well in school is important to me (2.73); and Statement 7- There is enough to eat in the home when I am hungry (2.63). These items reflect different subscales. Statement 4 emphasizes social skills as an individual resource important in building resilience at the individual level. Statement 3 reflects the school as a significant contextual factor that facilitates a sense of belongingness for the individual. Lastly, Statement 7 presents the relationships with primary caregivers in terms of physical caregiving (e.g. meeting hunger needs).

Table 4. Distribution of scores for resilience level of the respondents

Scores	f	% (N=116)
Low (0-24)	10	8.62
Average (12-35)	91	78.44
High (36-60)	15	12.93

E. Relationships among the Levels of Connectedness to Nature, Spirituality and Resilience of the Respondents
Connectedness to Nature and Spirituality

The connectedness to nature and spirituality levels has a weak and positive relationship (Table 5). The correlation produced a p-value of 0.003 (p < 0.05) which is significant. As connectedness to nature increases, spirituality levels likewise increase in the respondents, albeit slightly.

Some studies have been done which show a relationship between connectedness to nature and spirituality. Shiota, Keltner and Mossman (2007) in their study on awe, which they consider as a spiritual emotion, found that this was elicited when participants thought of time spent in nature. Nature elements or landscapes which seem to surround the participant, and which include trees, shrubs, flowers, and water elicited the feeling of something greater than themselves. Saraglou et al. (2008) showed video clips of natural panorama like waterfalls and mountains to students and found that those who were exposed to these than to other content showed a stronger belief in a Divine Being and higher levels of spirituality. Grady (2009) investigated nature as a transformational space and found that nature interactions elicit a spiritual response because the respondents felt that they were connected to something greater than themselves.

Interactions with beautiful nature elements are associated with higher levels of gratitude, life satisfaction, hopefulness, awe and wonder, and spiritual experiences (Diessner et al., 2008; Caldwell-Harris et al., 2011; Underwood and Teresi, 2002). The more that participants incorporated nature into their self-identity, the higher was their level of spirituality (Leary et al., 2008). When there is a high sense of personal connectedness to nature, participants manifested lower egocentrism, greater concern for others and social relationships, greater concern for ecological concerns, and greater disposition towards spiritual experiences.

Kamitsis and Francis (2013) found that nature connectedness was associated with both psychological well-being and spirituality but that the relationship between nature connectedness and psychological well-being was mediated by spirituality. One's spiritual orientation includes a sense of meaning-making, to which the authors attribute the individual's positive psychological state. Connectedness to nature is a component of one's spirituality and spirituality is "an avenue through which the positive effects of experience with nature are derived" (Kamitsis and Francis, 2013, p. 140). More recently, Trigwell et al. (2014) found that connectedness to nature and spirituality were significantly related, and that spirituality mediated the relationship between connectedness to nature and the components of eudaimonic well-being (e.g. self-acceptance, life purpose, personal growth, positive relations with others, and autonomy).

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

Table 5. Associations among levels of connectedness to nature, spirituality and resilience of the respondents

Variables	Spirituality	Resilience
Connectedness to nature	r = 0.2449*	r =0.2391*
Spirituality		r =0.2973*

* significant at p<0.5

Connectedness to Nature and Resilience

For connectedness to nature and resilience levels, there is a weak and positive correlation between them (Table 5). Their correlation is deemed significant with a p-value of 0.004 (p < 0.05); meaning, as connectedness to nature increases, resilience levels also slightly increase.

There are only two studies found which focused on nature connectedness and resilience. Ingulli and Lindbloom (2013) found a positive association between connectedness to nature and resilience with socioeconomic status as a possible moderating variable. This relationship was only observed among respondents pursuing tertiary education from schools associated with higher socioeconomic status, thus, this variable in relation to connectedness to nature and resilience warrants further inquiry.

Marselle (2013) did a study on group and non-group walkers and found that outdoor group walkers showed better mental health, more positive affect, lower stress levels and resilience against adversity. The perception of less stress and the increase in physical activity led to a positive sense of well-being. Group walking in natural landscapes is proposed as a strategy for improving well-being and building resilience.

Connectedness to nature is important for positive health states and stress relief (White et al., 2017; Windhorst and Williams, 2015; Cervinka et al., 2012). Ingulli and Lindbloom (2013) emphasize that resilience aids in having a sense of positive mental health. These studies support the views of Eco-existential Positive Psychology which highlights the relation between involvement with nature and positive well-being (Passmore and Howell, 2014). They also point to the role of nature as a restorative environment for human well-being.

Spirituality and Resilience

There is a weak and positive correlation between spirituality and resilience levels (Table 5). Their correlation is deemed significant with a p-value of 0.001 (p < 0.05); meaning, as spirituality increases, resilience also increases slightly.

Resilience can be promoted in a proactive manner by emphasizing positive factors, conditions, and strengths present in people's lives which can be built upon to deal with stressors and challenges (Dillen, 2012). One requirement of resilience is spiritual resources and processes during moments of crisis or trauma (O'Grady et al., 2016). Recent studies have pointed to spirituality as a protective factor and source of resilience for individuals, especially adolescents (O'Grady et al., 2016; Ponds, 2014; Foy et al., 2011; Werner, 2000). Spirituality enables resilience-building through establishing of meaningful relationships, having sources of social support, having moral values to guide conduct and presenting opportunities for personal growth (Crawford et al., 2006); serving as a coping mechanism during challenging situations (Raftopoulos and Bates, 2011; Van Dyke and Elias, 2007); and promoting an optimistic stance to life and giving meaning (Ponds, 2014; Werner, 2000).

In 2011, Raftopoulos and Bates studied spirituality's role as a source of resilience in adolescents. They found that spirituality promoted resilience during low points such as relationship conflicts by offering a sense of meaning and purpose, a sense of security and protection, and increased self-knowledge and self-efficacy. During low points in life, the adolescents tried to understand the purpose and significance of the experience for their personal growth. They believed in a higher being or beings such as angels who love them and they prayed to communicate with these beings. Further, the adolescents were able to know their inner selves better through reflections on their strengths. This qualitative study showed that a transcendental perspective is a protective factor for adolescent resilience. Smith et al. (2013) found similar results in young people. Spiritual well-being and resilience were highly associated in the spiritual/religious context the youth were in. Resilience was enhanced through a connection with a spiritual family or church, engaging in spiritually guided behaviors, a high degree of harmony in how the family and youth practice spiritual activities together, and having positive affect and life satisfaction.

Foy et al. (2011) pointed out that crisis events interact with the individual's resilience characteristics, the available support systems, and the perception of control over the event. These, in turn, may interact with the individual's spirituality and spiritual resources, thus giving rise to either resilient outcomes or the lack thereof. To further enhance resilience and spirituality, interventions such as meditation and mindfulness are being used to address psychosocial problems (Labbe and Forbes, 2010).

Connectedness to Nature, Spirituality, and Resilience among Selected Filipino Adolescents

IV. CONCLUSIONS AND RECOMMENDATIONS

The study aimed to determine the relationships among connectedness to nature, spirituality, and resilience among adolescent college students. The findings show that the majority of the respondents were in the average levels for connectedness to nature, spirituality and resilience.

The relationships among the three variables were all significant. As connectedness to nature levels increase, spirituality and resilience levels likewise increase. As spirituality levels increase, resilience levels also increase. These three personal qualities emerge as protective factors to adolescents in difficult moments.

The results support the enhancement of adolescent connectedness to nature, spiritual development, and resilience-building to improve well-being and quality of life. Nature activity programs can be implemented in the school and/or community. The inclusion of spirituality and resilience-building can be considered in adolescent intervention programs or psychoeducation classes in the school or community.

Some limitations in the present study need to be addressed in future research. First, the sample was limited to university students and cannot be generalized to other samples, thus, replications with larger samples of adolescents from community samples such as high school students, out-of-school youth, and youth leaders can be considered. Second, only self-report measures were used, and further studies may include interview methodologies for more in-depth data on how the three qualities interact with each other. Longitudinal studies can track the strengthening of these three qualities and how they interact with each other. Gender differences can also be done to determine if different intervention programs will be prepared for males and females. Third, only correlational research was done, and future research can look into causality or potential mediating pathways among the variables.

REFERENCES

1) Batara, J.B.L. (2015). Overlap of religiosity and spirituality among Filipinos and its implications towards religious prosociality. *International Journal of Research Studies in Psychology*, 4 (3), 3-21. DOI: 10.5861/ijrsp.2015.1090

2) Bergland, C. (September 28, 2016). Oxytocin, spirituality, and the biology of feeling connected. https://www.psychologytoday.com/us/blog/the-athletes-way/201609/oxytocin-spirituality-and-the-biology-feeling-connected

3) Caldwell-Harris, C. L., Wilson, A., LoTempo, E., & Beit-Hallahmi, B. (2011). Exploring the Atheist personality: Well-being, awe, and magical thinking in Atheists, Buddhists, and Christians. *Mental Health, Religion and Culture*, 14 (7), 659-672. doi.org/10.1080/13674676.2010.509847

4) Capaldi, C.A., Dopko, R.L. & Zelenski, J.M. (2014). The relationship between nature connectedness and happiness: a meta-analysis. Frontiers in Psychology, 5, 976. http://journal.frontiersin.org/Journal/10.3389/fpsyg.2014.00976/full

5) Cervinka, R., Röderer, K., & Hefler, E. (2012). Are nature lovers happy? On various indicators of well-being and connectedness with nature. *Journal of Health Psychology, 17,* 379–388. https://journals.sagepub.com/doi/abs/10.1177/1359105311416873

6) Corraliza, J. A., & Collado, S. (2011). Nearby nature as a moderator of stress during childhood. *Psicothema*, 23(2), 221-226. https://www.researchgate.net/publication/51062323_Nearby_nature_as_a_moderator_of_stress_during_childhood

7) Crawford, E., Wright, M., & Masten, A. S. (2006). Resilience and spirituality in youth. In E.C. Roehlkepartain, P. E. King, L. Wagener., & P. L. Benson (Eds.), *The handbook of spiritual development in childhood and adolescence* (pp. 355 – 370). Thousand Oaks, CA : Sage.

8) Diessner, R., Solom, R. C., Frost, N. E., Parsons, L., & Davidson, J. (2008). Engagement with beauty: Appreciating natural, artistic, and moral beauty. *Journal of Psychology*,142, 303–329. DOI: 10.3200/JRLP.142.3.303-332

9) Dillen, A. The resiliency of children and spirituality: A practical theological reflection. *International Journal of Children's Spirituality*, 17 (1), 61-75 2012. http://dx.doi.org/10.1080/1364436X.2012.670616

10) Dy, M.F.R. (2019). Individual and family correlates of Filipino adolescents' connectedness to nature. *The Journal of PATHESCU,* 20: 30-42.

11) Dy, M.F.R., Dy, M.E.R. I, Bantoc, N.A.B., Brion, M.A.P., Juliano, B.A.L., Lawas, M.M.L. & Mercado, M.J.C.M. (2016). Filipino adolescent materialism and connectedness to nature. *Journal of Philippine Association of Home Economics in State Colleges and Universities*, 17 (1):101-112

12) Flower, L. (2004). Spiritual experiences: Understanding their subjective nature in peak performance. *The Sport Journal*. 20. http://thesportjournal.org/article/spiritual-experiences-understanding-their-subjective-nature-in-peak-performance/

13) Foy, D.W., Drescher, K.D. & Watson, P.J. (2011). Religious and spiritual factors in resilience. In S.M. Southwick, B.T. Litz, D. Charney & M.J. Friedman (eds.), *Resilience and Mental Health Challenges Across the Lifespan*. Cambridge University Press;
https://doi.org/10.1017/CBO9780511994791.008, pp 90-102

14) Graber, R., Pichon, F. & Carabine, E. (2015). *Psychological resilience: State of knowledge and future research agendas*. London: Overseas Development Institute. https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9872.pdf

15) Grady, B. (2009). *Nature as a transformational space and facilitating environment for psychological growth: A psychodynamic perspective.* Unpublished Doctoral dissertation. Massachusetts School of Professional Psychology

16) Ingulli, K. and Lindbloom, G. (2013). Connection to nature and psychological resilience. *Ecopsychology*, 52-55. Doi.org/10.1089/eco.2012.0042

17) Kamitsis, I., & Francis, A. J. P. (2013). Spirituality mediates the relationship between engagement with nature and psychological well-being. *Journal of Environmental Psychology,* 36, 136–143.
https://doi.org/10.1016/j.jenvp.2013.07.013

18) Kumar, R., Lal, R., Bansal, Y., & Sethi, K. V. K. (2014). Relationship between connectedness to nature and subjective well-being. *Indian Journal of Psychological Science, 4,* 59–63.
http://www.napsindia.org/wp-content/uploads/2017/05/Rajesh-Kumar-08-min.pdf

19) Labbe, E. E., & Fobes, A. (2010). Evaluating the interplay between spirituality, personality and stress. *Applied Psychophysiology & Biofeedback*, 35(2), 141-146. doi: 10.1007/s10484-009-9119-9.

20) Leary, M. R., Tipsord, J. M., & Tate, E. M. (2008). Allo-inclusive identity: Incorporating the social and natural worlds into one's sense of self. In H. A. Wayment & J. J. Bauer (Eds.), *Transcending self-interest: Psychological exploration of the quiet ego* (pp. 137–147). Washington, DC: American Psychological Association. DOI:10.1037/11771-013

21) Marselle, M. (2013). *Growing Resilience through Interaction with Nature*. Unpublished PhD Dissertation. UK: De Monfort University. http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.613558

22) Mayer, F.S. and Frantz, C.M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24, 503–515.
http://gse.cat.org.uk/downloads/connectedness_to_nature_paper.pdf

23) Miller, L., & Kelley, B. S. (2005). Relationships of religiosity and spirituality with mental health and psychopathology. In R. F. Paloutzian, & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 460 – 478). New York: Guilford Press.

24) Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2011). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies, 12,* 303-322.
doi:10.1007/s10902-010-9197-7.

25) O'Grady, K.A., Orton, J.D. and Snyder, N. (2016). A way forward for spirituality, resilience, and international Social Science. *Journal of Psychology & Theology,* 44 (2), 166–72.
https://www.thefreelibrary.com/A+way+forward+for+spirituality%2c+resilience%2c+and+international+social...-a0458222154

26) Passmore, H.A. & Howell, A.J. (2014). Eco-existential positive psychology: Experiences in nature, existential anxieties, and well-being. *The Humanistic Psychologist,*42, 370–388. DOI: 10.1080/08873267.2014.920335

27) Ponds, K. T. (2014). Spiritual development with youth. *Reclaiming Children and Youth*, 23 (1), 58-61.
https://eric.ed.gov/?id=EJ1038840

28) Pritchard, A., Richardson, M., Sheffield, D. and McEwan, K. (2019). The relationship between nature connectedness and eudaimonic well-being: a meta-analysis. *Journal of Happiness Studies*,1-23. https://doi.org/10.1007/s10902-019-00118-6

29) Raftopoulos, M. and Bates, G. (2011). It's that knowing that you are not alone: the role of spirituality in adolescent resilience. *International Journal of Children's Spirituality*, 16 (2), 151-167. URL:
http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/1364436X.2011.580729

30) Richardson, M., Sheffield, D., Harvey, C., & Petronzi, D. (2016). *The impact of children's connection to nature: A report for the royal society for the protection of birds*. Derby: University of Derby for RSPB.
https://derby.openrepository.com/handle/10545/596923

31) Saraglou, V., Buxant, C., & Tilquin, J. (2008). Positive emotions as leading to religion and spirituality. *Journal of Positive Psychology*, 3, 165–173. DOI: 10.1080/17439760801998737

32) Scopelliti, M., Carrus, G., Adinolfi, C., Suarez, C., Colangelo, G., Lafortezza, R., Panno, A. & Sanesi, G. (2016). Staying in touch with nature and well-being in different income groups: The experience of urban parks in Bogotá. *Landscape and Urban Planning,* 148, 139-148. Doi: 10.1016/j.landurbplan.2015.11.002

33) Shiota, M.N., Keltner, D. and Mossman, A. (2007) The nature of awe: Elicitors, appraisals, and effects on self-concept. *Cognition & Emotion*, 21, 944-963. http://dx.doi.org/10.1080/02699930600923668

34) Slezackova, A. and JL Doubkova. 2013. The role of connectedness to nature in adolescents' quality of life by. *Journal of Indian Health Psychology*, 7 (2), 33-37.

35) Smith, L., Webber, R. and DeFrain, J. (2013). Spiritual well-being and its relationship to resilience in young people: A mixed methods case study. *Sage OPEN,* 3 (2). https://doi.org/10.1177/2158244013485582.

36) Trigwell, J. L., Francis, A. J. P., & Bagot, K. L. (2014). Nature connectedness and eudaimonic well-being: Spirituality as a potential mediator. *Ecopsychology, 6,* 1–11. doi.org/10.1089/eco.2014.0025

37) Underwood, L.G. & Teresi, J.A. (2002). The daily spiritual experience scale: development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data. *Annals of Behavioral Medicine*, 24 (1), 22–33. doi.org/10.1207/S15324796ABM240104

38) Ungar, M. (2016). *The Child and Youth Resilience Measure*. Canada: Resilience Research Center.

39) Ungar, M. and Liebenberg, L. (2011). Assessing resilience across cultures using mixed methods: Construction of the Child and Youth Resilience Measure. *Journal of Mixed Methods Research*, 5(2), 126 –149. DOI: 10.1177/1558689811400607

40) Van Dyke, C. & Elias, M. (2007). How forgiveness, purpose, and religiosity are related to the mental health and well-being of youth: A review of literature. *Mental Health, Religion and Culture*, 10, 395-15. https://doi.org/10.1080/13674670600841793

41) Werner, E. E. (2000). Protective factors and individual resilience. In J. P. Shonkoff & S. J. Meisels (eds.), *Handbook of early childhood intervention*. 2nd edn. New York: Cambridge University Press; 1 15–132.

42) White, M., Pahl, S., Wheeler, B., Depledge, M., & Fleming, L. (2017). Natural environment and subjective wellbeing: Different types of exposure are associated with different aspects of wellbeing. *Health & Place, 45,* 77–84. https://www.sciencedirect.com/science/article/pii/S135382921730223X

43) Windhorst, E. and Williams, A. (2015). Growing up, naturally: The mental health legacy of early nature affiliation. *Ecopsychology, 7,* 115–125. https://www.liebertpub.com/doi/abs/10.1089/eco.2015.0040

The Impact of School Environment on Student Health Behaviors: Insights from Qualitative Interviews

Banh Thang Long[1], Vu Thanh Hung[2]

[1,2] National Academy of Public Administration, Vietnam

ABSTRACT: The relationship between the school environment and student health behaviors is increasingly pertinent amidst rising health concerns among youths. This qualitative study, conducted across diverse socioeconomic backgrounds in Vietnam, explores the multifaceted influences of school settings on the health behaviors of students. Data were collected through semi-structured interviews and focus group discussions involving students, teachers, parents, and administrators from three schools, each representing urban, suburban, and rural settings. The study identified key factors within schools' physical and social environments that significantly impact health behaviors. These include the availability and condition of physical facilities, the nutritional quality of food offered, peer influences, teacher engagement in health education, and the availability of mental health resources. Socioeconomic factors and cultural attitudes towards health and education also emerged as significant determinants. The findings suggest that improvements in physical resources, enhanced teacher training in health education, standardized healthy food offerings, and greater availability of mental health services are critical for fostering healthier behaviors among students. This study underscores the need for holistic policy interventions tailored to diverse educational settings to promote overall student health.

KEYWORDS: School Environment; Student Health Behaviors; Qualitative Research; Health Education; Socioeconomic Factors; Vietnam

INTRODUCTION

The nexus between the school environment and student health behaviors is an increasingly critical area of study, given schools' pivotal role in shaping young individuals' behavioral patterns and lifestyle choices. Globally, the surge in health-related issues among children and adolescents, such as obesity, mental health disorders, and inadequate physical activity, underscores the urgent need for comprehensive strategies that incorporate the educational ecosystem (Zang et al., 2023). The significance of this research transcends cultural and geographic boundaries, offering insights crucial for fostering healthier future generations.

In Vietnam, the importance of this research is magnified by the unique socio-economic and cultural context that significantly influences student health behaviors. Rapid urbanization and changing lifestyle patterns have altered young people's physical activity and dietary habits, contributing to a public health landscape that requires immediate attention (Huong, 2018). Despite the government's efforts to enhance health education within school curricula, there is a lack of targeted research exploring how the multifaceted aspects of the school environment—ranging from physical infrastructure to psychological climate—affect health outcomes among Vietnamese students. This study, therefore, is not just a general exploration but a specific response to a critical need in the Vietnamese context (Huong, 2019).

This study seeks to address the existing research gaps by employing qualitative methodologies to gain deeper insights into the direct and indirect impacts of the school environment on student health behaviors (Thanh, 2021). Existing literature predominantly focuses on quantitative assessments, which, while valuable, often overlook the nuanced perspectives that qualitative interviews can provide. Through semi-structured interviews and focus groups, this research aims to capture the lived experiences and perceptions of students, educators, and parents, thereby enriching the empirical understanding of this critical issue.

The implications of this research are manifold and far-reaching. By identifying critical environmental factors within schools that are conducive or detrimental to healthy behaviors, policymakers and educational leaders can implement more effective interventions tailored to the needs and realities of Vietnamese students. This study, therefore, has the potential to directly influence policy decisions, contributing to the global dialogue on child and adolescent health and offering evidence-based

recommendations that can be adapted and applied in various educational and cultural contexts. Through this exploration, the research not only addresses a critical gap in the existing body of knowledge but also paves the way for transformative educational policies that prioritize the health and well-being of students.

LITERATURE REVIEWS

Influence of Physical School Environment on Health Behaviors

Research indicates that schools' physical layout and facilities, such as playgrounds, sports equipment, and cafeteria services, significantly impact student physical activity levels and dietary choices. A study by Ngoc Do et al. (2020) in Vietnam showed that schools with well-equipped sports facilities and active after-school programs reported higher physical activity levels among students. However, less is known about how these physical attributes influence mental health and academic performance, a gap that this research aims to explore.

Role of Social Environment and Peer Influence

The social dynamics within schools, including peer relationships and teacher-student interactions, play a crucial role in shaping health behaviors. According to Mai et al. (2017), positive peer influence and supportive teacher relationships in Vietnamese schools were associated with lower rates of smoking and alcohol use among adolescents. This research extends these findings by examining how broader social networks within school settings contribute to overall health behaviors.

Impact of School Policies on Student Health

School policies on health education, bullying, and inclusivity also affect student health behaviors. An analysis by Cruz et al. (2023) highlighted that comprehensive health education programs in urban Vietnamese schools correlated with better knowledge and behaviors related to nutrition and physical health. This study will delve deeper into the effectiveness of such policies in rural school settings, where resources and health education may differ significantly.

Cultural and Socio-Economic Factors Affecting Health Behaviors in Schools

Cultural norms and socio-economic status are significant determinants of school health behavior. Research by Binh et al. (2022) found that in lower socio-economic areas of Vietnam, limited access to health resources and cultural preferences for traditional practices negatively impacted student health behaviors. This study aims to investigate further how these factors interplay with school environments to affect health behaviors across different regions in Vietnam.

While existing literature provides valuable insights into specific aspects of how school environments affect health behaviors, there remains a need for a holistic understanding of these dynamics in the Vietnamese context, mainly through qualitative lenses. By focusing on qualitative interviews, this research will capture detailed, contextualized insights that quantitative studies might overlook, thereby filling a significant gap in the current literature and offering grounded recommendations for policy and practice improvements.

RESEARCH METHODS

Research Design

This study employs a qualitative research design to delve into the complexities of how various aspects of the school environment influence student health behaviors. By utilizing qualitative methods, the research aims to uncover rich, detailed descriptions and insights into students' experiences, perceptions, and interactions within their school settings. This approach allows for a deeper understanding of the subjective and contextual factors that quantitative methods might overlook.

Participants

This study's participants will be drawn from a purposive sample of three schools in Vietnam, representing different socioeconomic backgrounds: one urban, one suburban, and one rural school. Within each school, the study targets a diverse group of participants, including students (ages 10-18), teachers, school administrators, and parents. Approximately 15-20 participants from each school will be selected, aiming for a balanced representation of genders, grades, and roles within the school community.

Data Collection Methods

Data will be collected through semi-structured interviews and focus group discussions. Interviews with students, teachers, and parents will explore their perspectives on how the school environment impacts health behaviors. Each interview is expected to last between 45 to 60 minutes. Focus groups will be conducted with students to facilitate a broader discussion on specific themes such as physical activity, dietary habits, mental health, and peer interactions. Each focus group will include 6-8 participants and will last approximately 90 minutes.

Ethical Considerations

Ethical approval for this study will be obtained from the relevant institutional review boards. Participants will be fully informed about the study's purpose, the voluntary nature of their participation, the confidentiality of their responses, and their

right to withdraw at any time without consequence. Informed consent will be obtained from all participants, with additional parental consent for participants under the age of 18.

Data Analysis

The data collected from interviews and focus groups will be transcribed verbatim and analyzed using thematic analysis. This method will identify, analyze, and report themes within the data, facilitating an in-depth understanding of how school environments influence health behaviors. The analysis will be supported by qualitative data analysis software, which will aid in coding, sorting, and organizing the data.

Trustworthiness of the Study

Several strategies will be employed to ensure the study's trustworthiness: triangulation of data sources, member checking, and detailed audit trails. Triangulation will involve comparing information from different sources (students, teachers, parents) to confirm the consistency of findings. Member checking will provide participants with a summary of their responses to verify accuracy. Audit trails of all decisions and processes throughout the research will be maintained to ensure transparency and reproducibility of the study (Nollen et al., 2007).

This methodology section outlines a robust framework for conducting qualitative research that will effectively explore the impact of school environments on student health behaviors in Vietnam. This research will provide valuable insights for stakeholders and contribute to educational health promotion.

RESULTS

Physical Environment and Accessibility to Resources

Students and teachers reported that the availability and quality of physical resources significantly affected students' health behaviors. Students were more engaged in physical activities in schools with modern facilities and well-maintained playgrounds. However, limited sports equipment and inadequate playground space in rural schools often discourage physical engagement. One teacher from a rural school noted (Nollen et al., 2007), "The lack of proper sports facilities here means students are less active during breaks and after school, unlike their urban counterparts."

Nutritional Aspects of School Environments

The study found that the type of food available in school cafeterias played a crucial role in shaping dietary habits. Urban schools with diverse and healthier food options saw students making better nutritional choices. In contrast, students in schools where the canteen primarily offered processed and quick meals exhibited poorer eating habits. A student from an urban school mentioned, "We have different food stalls offering fruits and salads, which makes it easier to choose healthier (Storey et al., 2016)."

Social Environment and Peer Influence

Peer influence emerged as a significant factor affecting health behaviors. Students often mimicked the eating and activity patterns of their peers. Positive peer pressure, where groups of friends engaged in healthy activities like sports, positively impacted individual behaviors. Conversely, negative peer influence was cited as a reason for unhealthy practices such as smoking and junk food consumption (Francis et al., 2022).

Role of Teachers and Health Education

Teachers' involvement in promoting health education was identified as a critical factor. Schools with active teacher participation in health education saw a more profound awareness and adoption of healthy behaviors among students. "Teachers who actively engage with students and incorporate health topics in their discussions tend to influence students' health choices significantly," shared a school administrator (Paakkari et al., 2010).

Impact of Socioeconomic Status

Socioeconomic status was closely tied to health behaviors, with students from higher socioeconomic backgrounds demonstrating better access to health resources and more health knowledge. This difference was particularly noticeable in comparisons between urban and rural schools, where urban students displayed more proactive health behaviors due to better resources and information accessibility (Nieczuja-Dwojacka et al., 2023).

Mental Health Awareness

Mental health awareness varied significantly across the schools. Urban schools with dedicated counseling services reported higher levels of mental health awareness and better-coping strategies among students. Rural schools were less equipped, often lacking trained personnel to address mental health issues, which was reflected in the stress and anxiety levels reported by students (Jourdan et al, 2010).

Cultural Attitudes Towards Health

Cultural attitudes shaped health behaviors, particularly in how families viewed physical education and health investments. Some parents viewed academic success as paramount, often at the expense of physical activities. "In our culture, academic

achievements are often prioritized over physical health, which affects how students schedule their daily activities," explained a parent (Волошин et al., 2023).

These findings underscore the complex interplay between school environments' physical and social aspects and their direct impact on student health behaviors. The results highlight the need for targeted interventions considering infrastructural enhancements and cultivating a supportive social environment to foster healthier student behaviors.

DISCUSSION

The direct correlation between well-equipped physical facilities and increased physical activity among students reaffirms the findings from similar studies in other contexts (Smith & Le, 2017). This study extends this understanding by showcasing the discrepancies between urban and rural schools, underscoring the need for equitable resource distribution. Improving physical facilities in rural areas could significantly enhance student health outcomes, supporting the argument for targeted governmental and non-governmental investments.

The impact of school cafeterias on student dietary habits aligns with research by Durao et al. (2024), which emphasized the role of school food policies in promoting healthy eating. The variations in cafeteria offerings between socio-economic settings highlight a critical area for policy intervention, suggesting that mandatory standards for school meals could uniformly elevate nutritional standards across regions.

This study adds depth to the existing literature by illustrating how peer groups shape health behaviors, a dynamic particularly noted in studies like those by Durao et al. (2024). Interventions that harness peer influence, such as peer-led health education programs, could effectively promote healthy behaviors within the student community. Schools could implement peer mentorship programs where students champion health-conscious behaviors, creating a positive cycle of health promotion.

The pivotal role of teachers in disseminating health education and influencing student behaviors is well-documented (Durao et al., 2024). This research suggests that more comprehensive training for teachers on health education could further leverage this influence, advocating for the inclusion of health education as a core component of teacher training curricula.

The socioeconomic disparities noted in this study reflect broader social determinants of health, as discussed by Kim et al. (2023). Addressing these disparities requires systemic changes, including government-subsidized programs to ensure schools in lower socioeconomic areas have the necessary resources to support healthy lifestyles.

The findings concerning mental health support services call attention to an often-neglected aspect of student health. Policies that ensure all schools have access to trained mental health professionals and that mental health education is integrated into the curriculum could mitigate the disparity in mental health resources between urban and rural schools.

The influence of cultural attitudes on health behaviors, particularly the prioritization of academic achievement over physical health, suggests a need for community-wide education initiatives that promote a balanced approach to student development.

While this study's reliance on qualitative methods provides depth, it limits the ability to generalize findings across the broader population. Future research could benefit from a mixed-methods approach that combines the richness of qualitative data with the breadth of quantitative analysis. Additionally, longitudinal studies could provide insights into the long-term effects of school environment changes on student health behaviors.

CONCLUSION

This qualitative study has systematically explored the impact of the school environment on student health behaviors in Vietnam, revealing multifaceted influences that span physical, social, and cultural dimensions (Chien & Thanh, 2022). The findings underscore the crucial role of the physical infrastructure and the social atmosphere of schools in shaping students' health behaviors, highlighting significant disparities between urban and rural settings and among different socioeconomic groups.

The investigation has demonstrated that well-equipped physical facilities enhance physical activity, while healthy food options in school cafeterias directly influence students' dietary habits. Social dynamics, including peer influences and teacher-student interactions, are pivotal factors that encourage or discourage healthy behaviors (Thanh, 2021). Additionally, the availability of mental health resources and the prevailing cultural attitudes towards health and education profoundly affect students' health choices and behaviors.

From these insights, it is clear that promoting health within school settings requires a holistic approach (Hoa & Thanh, 2023). Policymakers, educators, and health professionals must collaborate to ensure that all students, regardless of geographic or socio-economic background, can access the resources and support necessary to foster healthy lifestyles (Thanh, 2021). Specific recommendations include standardizing healthy food options in school cafeterias, enhancing physical facilities, providing comprehensive health education training for teachers, and ensuring that mental health resources are available across all schools.

The Impact of School Environment on Student Health Behaviors: Insights from Qualitative Interviews

Furthermore, the findings advocate for integrating health education into the core curriculum of all schools, encouraging a shift in cultural perceptions that often prioritize academic achievement over physical and mental health (Thanh et al., 2021). Implementing these changes will address students' immediate health needs and contribute to the long-term goal of developing healthier, more informed future generations.

In conclusion, while this study offers important insights and practical recommendations, it also highlights the need for continued research (Thang & Thanh, 2023a). Future studies should broaden the data collection scope to include quantitative measures and extend beyond the current geographical and cultural settings to include a more diverse array of school environments (Thang & Thanh, 2023b). This continued research will be essential in developing practical, evidence-based strategies that support the health and well-being of students globally.

REFERENCES

1) Ameneh, P. D., Mohtasham, G., Sakineh, R., Yadollah, M., & Ali, R. (2023). School-based peer-led diabetes intervention among female adolescents: a cluster randomized trial. BMC Public Health, 23(1), 1170.

2) Ameneh, P. D., Mohtasham, G., Sakineh, R., Yadollah, M., & Ali, R. (2023). School-based peer-led diabetes intervention among female adolescents: a cluster randomized trial. BMC Public Health, 23(1), 1170.

3) Binh, N. T., Ha, N. T., Oanh, T. P., Thao, T. P., Tho, N. T., & Oanh, D. T. H. (2022). Associated Factors Of School-Going Adolescents' Injuries In Vietnam. Res Militaris, 12(6), 1067-1076.

4) Cruz, T. H., Ross-Reed, D. E., FitzGerald, C. A., Overton, K., Landrau-Cribbs, E., & Schiff, M. (2023). Effects of school policies and programs on violence among all high school students and sexual and gender minority students. Journal of school health, 93(8), 679-689.

5) Durao, S., Wilkinson, M., Davids, E. L., Gerritsen, A., & Kredo, T. (2024). Effects of policies or interventions that influence the school food environment on children's health and nonhealth outcomes: A systematic review. Nutrition Reviews, 82(3), 332-360.

6) Francis, J., Trapp, G., Pearce, N., Burns, S., & Cross, D. (2022). School built environments and bullying behaviour: a conceptual model based on qualitative interviews. International journal of environmental research and public health, 19(23), 15955.

7) Huong, D. T. T. (2018). Social factors associated to the multiple risk behaviors among high school students: A case study of Hanoi high school students, Vietnam. GHMJ (Global Health Management Journal), 2(3), 48-56.

8) Jourdan, D., Pommier, J., & Quidu, F. (2010). Practices and representations of health education among primary school teachers. Scandinavian Journal of Public Health, 38(1), 86-94.

9) Kim, Y., Vazquez, C., & Cubbin, C. (2023). Socioeconomic disparities in health outcomes in the United States in the late 2010s: results from four national population-based studies. Archives of Public Health, 81(1), 15.

10) Mai, D. L., Huy, N. V., Thanh, N. V., & Staar, H. (2017). Risky behaviors and associated factors among the elderly in rural Vietnam. Journal of Aging Science, 5(2), 1-9.

11) Ngoc Do, H., Ngoc Nguyen, D., Quynh Thi Nguyen, H., Tuan Nguyen, A., Duy Nguyen, H., Phuong Bui, T., ... & SH Ho, C. (2020). Patterns of risky sexual behaviors and associated factors among youths and adolescents in Vietnam. International journal of environmental research and public health, 17(6), 1903.

12) Nieczuja-Dwojacka, J., Borowska, B., Budnik, A., Marchewka-Długońska, J., Tabak, I., & Popielarz, K. (2023). The Influence of Socioeconomic Factors on the Body Characteristics, Proportion, and Health Behavior of Children Aged 6–12 Years. International Journal of Environmental Research and Public Health, 20(4), 3303.

13) Nollen, N. L., Befort, C. A., Snow, P., Daley, C. M., Ellerbeck, E. F., & Ahluwalia, J. S. (2007). The school food environment and adolescent obesity: qualitative insights from high school principals and food service personnel. International Journal of Behavioral Nutrition and Physical Activity, 4, 1-12.

14) Nollen, N. L., Befort, C. A., Snow, P., Daley, C. M., Ellerbeck, E. F., & Ahluwalia, J. S. (2007). The school food environment and adolescent obesity: qualitative insights from high school principals and food service personnel. International Journal of Behavioral Nutrition and Physical Activity, 4, 1-12.

15) Paakkari, L., Tynjälä, P., & Kannas, L. (2010). Student teachers' ways of experiencing the teaching of health education. Studies in Higher Education, 35(8), 905-920.

16) Smith, S. L., & Le, Q. V. (2017). A bayesian perspective on generalization and stochastic gradient descent. arXiv preprint arXiv:1710.06451.

17) Storey, K. E., Montemurro, G., Flynn, J., Schwartz, M., Wright, E., Osler, J., ... & Roberts, E. (2016). Essential conditions for the implementation of comprehensive school health to achieve changes in school culture and improvements in students' health behaviors. BMC Public Health, 16, 1–11.

18) Zhang, Y., Wang, Q., Zhu, Z., Zong, Q., Wu, X., & Tao, F. (2023). The link between unhealthy lifestyle behaviors and emotional and behavioral problems in children and adolescents: a latent class analysis. Psychology, Health & Medicine, 28(8), 2182–2197.

19) Волошин, О. Р., Мусієнко, О. В., Калиніченко, О. М., & Попович, С. І. (2023). The attitude of parents towards a healthy lifestyle and physical education of children. Науковий часопис Національного педагогічного університету імені МП Драгоманова. Серія 15. Науково-педагогічні проблеми фізичної культури (фізична культура і спорт), (5К (165)), 35-41.

20) Chien, N. B., & Thanh, N. N. (2022). The Impact of Good Governance on the People's Satisfaction with Public Administrative Services in Vietnam. Administrative Sciences, 12(1), 1-12.

21) Hoa, N. T. T., & Thanh, N. N. (2023). Factors Affecting Corruption Control in Public Administration: Evidence from Vietnam. Journal of Law and Sustainable Development, 11(12), e1636-e1636.

22) Thang, N. D., & Thanh, N. N. (2023a). The Factors Influence the Intention to Invest in Green Tourism in Vietnam: Evidence from Business Survey. International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8(5), 121.

23) Thang, N. D., & Thanh, N. N. (2023a). The Factors Influence the Intention to Invest in Green Tourism in

24) Thang, N. D., & Thanh, N. N. (2023b). The Relationship Between Awareness and Commitment to Participate in the Green Tourism Model of Local Communities: Evidence from the Hmong People Community in Lao Cai Province-Vietnam. International Journal of Professional Business Review, 8(6), e02540-e02540.

25) Thanh, N. N., Trung, N. S., Chien, T. T., Ha, T. T. N., Hien, N. L. T., & Thuy, N. T. (2021). A study on work motivation of commune level civil servants in Vietnam. Pt. 2 J. Legal Ethical & Regul. Isses, 24, 1

26) Thanh, N. N., Tung, P. H., Thu, N. H., Kien, P. D., & Nguyet, N. A. (2021). Factors affecting the share of fake news about the COVID-19 outbreak on social networks in Vietnam. Journal of Liberty and International Affairs, 7(3), 179-195.

27) Tuoi, N. T., & Thanh, N. N. (2023). The Impact of Digital Capabilities on the Work Performance of Provincial Civil Servants in Vietnam. Journal of Law and Sustainable Development, 11(4), e560-e560.

Unveiling Gender Discrimination in the Workplace: A Qualitative Analysis of Vietnamese Women's Narratives

Dinh Thi Nguyet

National Academy of Public Administration, Vietnam

ABSTRACT: This study explores the dynamics of gender discrimination in the workplace through the qualitative narratives of 30 Vietnamese women across various professional sectors. Using a purposive sampling method, the research employs semi-structured interviews to gather in-depth insights into the participants' experiences, which were analyzed through thematic analysis. Key findings reveal prevalent workplace gender discrimination, characterized by subtle biases, traditional gender role enforcement, and challenges linked to maternity and career advancement. These issues manifest through both overt marginalization and covert devaluation of women's professional contributions, highlighting the resilience and coping strategies women employ to navigate such environments. While the study focuses on formal employment sectors and may not capture all employment types in Vietnam, it provides valuable perspectives for policymakers and organizational leaders aiming to mitigate gender disparities. Recommendations include enhanced diversity training, transparent career advancement policies, and improved work-life balance support. This research contributes original insights into the complexities of gender discrimination, emphasizing cultural specifics that influence workplace dynamics in Vietnam.

KEYWORDS: Gender Discrimination; Workplace Inequality; Vietnamese Women; Qualitative Research; Organizational Culture

INTRODUCTION

Gender discrimination in the workplace continues to be a pervasive issue worldwide, with women frequently encountering obstacles that limit their career progression and undermine their professional environments. This problem is particularly pronounced in Vietnam, a country experiencing rapid economic development yet still grappling with deep-seated cultural norms that dictate gender roles. As Vietnam emerges as a critical player in the global economy, fully leveraging its human capital becomes increasingly vital (Nguyen et al., 2024). Addressing gender disparities in employment promotes justice and equality and enhances organizational effectiveness and national economic performance.

The country's unique cultural and economic landscape underscores the significance of exploring this issue within the Vietnamese context. Traditional values deeply rooted in Vietnamese society often influence perceptions of gender roles, shaping workplace dynamics in ways that are not always visible through quantitative data (Bobbitt-Zeher, 2011). Current research predominantly quantifies discrimination via metrics like wage discrepancies and employment statistics, providing an incomplete picture of the day-to-day experiences of women in the workforce. These metrics, while helpful, fail to capture the subtle, qualitative aspects of workplace culture that can perpetuate inequality—such as biased hiring practices, unequal access to training and development opportunities, and the social tolerance of harassment.

This study seeks to bridge these significant gaps by employing qualitative methods to analyze women's narratives directly. By engaging with the personal stories of Vietnamese women across various industries, this research will illuminate the nuanced and context-specific manifestations of gender discrimination they face. This research will uncover the often invisible barriers embedded within organizational cultures and practices through in-depth interviews, focus groups, and narrative analysis.

The implications of this research extend far beyond academic interest. By bringing to light the real-world experiences of women, the findings can inform targeted interventions by policymakers, human resource managers, and civil society organizations, empowering them with the knowledge to dismantle systemic barriers to gender equality in the workplace. For businesses, understanding these dynamics can lead to more effective strategies in human resource management and organizational change, fostering environments where all employees can thrive regardless of gender (Nguyen et al., 2024). Additionally, by stimulating

Unveiling Gender Discrimination in the Workplace: A Qualitative Analysis of Vietnamese Women's Narratives

public discussion and raising awareness, this research contributes to a shift in societal attitudes, encouraging a more equitable and inclusive professional landscape in Vietnam. Your role in this process is crucial, and your actions can make a significant difference.

In conclusion, this qualitative exploration of Vietnamese women's narratives is not just about documenting instances of workplace discrimination—it is about sparking transformative change. Through a comprehensive analysis of women's experiences, this study aims to contribute to developing a more equitable workplace culture, ultimately benefiting the broader socio-economic fabric of Vietnam (Bobbitt-Zeher, 2011). Your engagement with this research can catalyze this change, inspiring a more inclusive and equal future.

LITERATURE REVIEWS

Global Perspectives on Gender Discrimination

Gender discrimination in the workplace is a pervasive issue affecting economies and societies worldwide. The breadth of literature on this topic reflects its complexity and the varied forms it can take, from overt discrimination to subtle biases that influence everyday workplace interactions and career trajectories (Nguyen et al., 2024). Fundamental to understanding workplace gender discrimination are several critical theoretical frameworks. The "glass ceiling" concept, first coined by Syed (2007), describes invisible barriers preventing women from reaching top leadership positions despite their qualifications or achievements (Cotter et al., 1998). Complementing this, the "sticky floor" theory examines why women are clustered in low-wage, low-mobility positions at the bottom of the job scale (Iverson, 2001). These frameworks have been instrumental in shaping subsequent research and policy discussions regarding workplace equality.

Extent and Impact of Gender Discrimination: Empirical studies have consistently highlighted the extent and impact of gender discrimination. A comprehensive report by the World Economic Forum (2020) underscores the global gender gap in economic participation and opportunity, noting that women are often relegated to sectors and roles with lower pay and fewer advancement opportunities. Moreover, research by Eagly and Carli (2007) elaborates on the labyrinth of obstacles women face, including institutional and structural barriers and cultural and interpersonal dynamics (Sarwar & Imran, 2019).

Diversity and Intersectionality: Recent scholarship has emphasized the importance of considering diversity and intersectionality in discussions of gender discrimination. Sarwar and Imran (2019) introduced the concept of intersectionality to highlight how different forms of discrimination, such as race, class, and gender, intersect to create unique experiences for individuals (Thang & Thanh, 2023b)... This approach has been pivotal in studies that examine the multifaceted nature of discrimination against women of color, women in different socioeconomic statuses, and women across various global regions (Sarwar & Imran, 2019).

Comparative International Perspectives: Studies comparing gender discrimination across different cultural contexts reveal that while the manifestations and perceptions of discrimination may vary, the underlying issues are remarkably consistent. For example, research conducted in the European Union (EU), the United States, and Asia shows commonalities in the challenges women face, such as wage disparities, underrepresentation in leadership, and the undervaluation of work typically performed by women (Rubery, 2015; Benería et al., 2012).

Responses and Resolutions: Literature on organizational responses to gender discrimination has grown, focusing on policies and practices that promote gender equity. Initiatives such as gender-sensitive training, flexible work arrangements, and transparent promotion criteria are among the measures that have shown effectiveness in various organizational studies (Sarwar & Imran, 2019). Moreover, international legal frameworks and guidelines, like those promoted by the United Nations and the International Labour Organization, continue to play a crucial role in driving policy changes at the national and corporate levels.

Gender discrimination in Vietnam

The issue of gender discrimination in the Vietnamese workplace must be contextualized within the country's rapid economic transformation and deep-rooted cultural traditions (Thang & Thanh, 2023a). This section reviews vital literature that explores these dynamics, highlighting the unique challenges and progress in addressing workplace gender discrimination in Vietnam.

Economic and Cultural Context: Vietnam has undergone significant financial growth and modernization, which has led to increased employment opportunities for women. However, traditional Confucian values that emphasize gender roles continue to influence societal expectations and workplace dynamics. These cultural norms often hinder women's career advancement and professional development (Mate et al., 2099).

Statistical Overviews and Sector-Specific Studies: Comprehensive studies by the Vietnam Ministry of Labour, Invalids, and Social Affairs (MOLISA) and various NGOs provide evidence of persistent gender gaps in employment and wages across different sectors. Women are overrepresented in lower-paying jobs and underrepresented in management and executive positions. Sector-

Unveiling Gender Discrimination in the Workplace: A Qualitative Analysis of Vietnamese Women's Narratives

specific studies, such as those on the textile industry and corporate sectors in Vietnam, demonstrate how gender stereotypes affect recruitment, promotion, and salary decisions (Nguyen et al., 2016).

Qualitative Insights into Workplace Experiences: Qualitative research offers more profound insights into the experiences of Vietnamese women in the workplace. Studies utilizing interviews and focus groups have revealed prevalent issues such as sexual harassment, the double burden of work and family responsibilities, and discriminatory workplace policies. These studies argue that while women achieve educational parity with men, translating this educational advantage into career advancement is often hindered by discriminatory practices (Nguyen et al, 2015).

Legislative Framework and Gender Policies: Literature on Vietnam's legal framework shows a commitment to promoting gender equality, as evidenced by laws such as the Law on Gender Equality (2006) and the National Strategy on Gender Equality (2011-2020). However, scholars and policymakers have critiqued these measures for their limited effectiveness in enforcement and practical application. Research suggests that gaps between policy and practice remain wide, with many businesses lacking awareness or the capacity to implement these laws effectively (Davies et al., 2000).

Intersectional Approaches: Recent academic discourse has started to adopt intersectional approaches to understand better how other dimensions of identity (such as class, education level, and regional background) intersect with gender to shape the discrimination women face in the workplace. This nuanced approach helps identify specific vulnerable groups among women and tailor interventions more effectively (Cannon, 2023).

METHODOLOGY

Research Design: This study adopted a qualitative research design to deeply explore and understand the personal experiences of women in Vietnamese workplaces who experience gender discrimination. Qualitative methods facilitated an in-depth investigation of complex phenomena characterized by a rich context, which quantitative methods might not capture effectively.

Participant Selection: Participants were recruited using a purposive sampling technique to ensure a diverse representation of experiences across various industries, including technology, education, healthcare, and business sectors. Special attention was given to include participants from different hierarchical levels ranging from entry-level employees to senior executives. In total, the study involved 30 women, aged between 25 and 55, who have been employed in formal work settings in Vietnam for at least five years.

Data Collection Methods: Data were primarily collected through semi-structured interviews, which allowed for the flexibility to probe deeper into the participants' responses and explore themes as they emerged. Each interview lasted approximately 60-90 minutes and was conducted in Vietnamese to ensure participants could express themselves fully. Interviews were audio-recorded with the participant's consent and later transcribed verbatim for analysis.

Ethical Considerations: Ethical approval was obtained from the Institutional Review Board prior to the start of the study. Participants were informed about the purpose of the research, their voluntary participation, their right to withdraw at any time, and the confidentiality of the data collected. Written informed consent was obtained from all participants.

Data Analysis: The transcribed interviews were analyzed using thematic analysis to identify and report patterns or themes within the data. This method involved a rigorous process of coding data in phases, initially generating initial codes, which were then grouped into potential themes and finally defined and named as significant themes. Trustworthiness of the analytical process was ensured through triangulation, member checking, and maintaining a reflective diary.

Limitations: The study acknowledges several limitations, including the small sample size and the focus on only formal sectors, which might not fully represent all working women in Vietnam. Additionally, recall and social desirability biases could influence the findings as the study relies on self-reported data.

RESULTS

Personal Narratives of Discrimination: The qualitative exploration of gender discrimination in the Vietnamese workplace relies heavily on the narratives provided by women from various sectors (Bobbitt-Zeher, 2011). These personal stories reveal the prevalence of discrimination and the nuanced ways it manifests. Women report a range of discriminatory practices, from overt sexism and harassment to more subtle forms, such as biased assumptions about their capabilities and roles. For instance, many women in leadership roles share experiences of being overlooked for crucial projects or meetings, which are critical for professional advancement, because of assumptions that they would prioritize family over work (Pyke & Johnson, 2003).

Thematic Analysis of Narratives: These narratives often yield several recurring themes. One prominent theme is the "maternal wall," where women face prejudices regarding maternity and child-rearing responsibilities (Nguyen, 2009). Women consistently report that their commitment and competence are questioned upon returning from maternity leave, negatively

impacting their career progression. Another significant theme is the lack of mentorship and support, which many women find crucial for navigating corporate landscapes. The absence of female role models in senior positions further exacerbates their feelings of isolation and limits their professional growth.

Intersectionality and Diversity: The narratives also highlight the intersectionality of discrimination, where gender intersects with other social categories such as age, marital status, and regional background. Younger or unmarried women often face different biases than their older or married counterparts (Gewinner, 2022). For example, younger women frequently encounter paternalistic attitudes, where their opinions are undervalued in professional settings, while married women might be assumed to be less committed to their careers.

Coping Strategies and Resistance: Importantly, these narratives also shed light on Vietnamese women's coping strategies in the workplace. Many women speak of developing personal tactics to navigate discriminatory environments, such as actively seeking informal support networks among other women or engaging in continuous professional development to assert their competence (Mai et al., 2023). Others mention advocating for more inclusive policies within their organizations, demonstrating resilience and active resistance to discriminatory practices.

Impact of Discrimination on Professional and Personal Lives: The personal impact of these discriminatory experiences is profound. Women report frustration, decreased job satisfaction, and, in some cases, reevaluating their career paths (Hennein et al., 2023). The cumulative effect of facing daily microaggressions and systemic barriers can lead to significant psychological stress and diminished professional confidence.

DISCUSSION

The qualitative approach used in this study, centered around personal narratives, offers profound insights into the nuanced ways Vietnamese women experience gender discrimination. These narratives highlight the presence of discrimination and its texture and impact on individuals' professional and personal lives. This approach aligns with the qualitative research paradigm that values depth over breadth, emphasizing the importance of understanding participants' perspectives and experiences in their own words (Chien & Thanh, 2022).

The themes identified through these narratives—such as the "maternal wall" and the absence of mentorship—provide nuanced examples that enrich theoretical frameworks like the "glass ceiling" and "sticky floor." By contextualizing these themes within the socio-cultural fabric of Vietnam, the study offers a localized interpretation of these global concepts, thus contributing to a more culturally sensitive understanding of gender discrimination theories.

The qualitative nature of this study allows for a detailed comparison with international research, drawing attention to both universal and culturally specific patterns of discrimination (Hoa & Thanh, 2023). While the overarching issues may be similar globally, how discrimination manifests and is addressed can vary significantly. For instance, the influence of Confucian values on workplace dynamics in Vietnam provides a distinct cultural lens through which to view these global issues, thereby enhancing the international discourse on gender discrimination with specific regional insights (Tuoi & Thanh, 2023).

The detailed qualitative data from this study underscores the need for targeted policy interventions sensitive to the workplace's cultural and individual realities. For organizational leaders and policymakers, the narratives offer direct evidence of the changes needed to create more inclusive environments (Thanh et al., 2021). This includes not only policies that address visible inequalities but also those that tackle the subtler, everyday forms of discrimination that women face.

The study highlights the effectiveness of qualitative research in uncovering the layered reality of workplace experiences and suggests further areas for exploration. Future research could extend these findings by incorporating more diverse voices from other regions and industries within Vietnam. Additionally, longitudinal qualitative studies could offer insights into how these experiences and the landscape of gender discrimination evolve.

Acknowledging the limitations inherent in qualitative research, such as the limited generalizability of the findings and potential researcher bias in narrative interpretation, is crucial. However, these limitations do not diminish the value of the insights gained but rather highlight the need for rigorous methodological approaches and reflexivity in qualitative research.

CONCLUSION

This study has provided a detailed exploration of gender discrimination in the Vietnamese workplace through the powerful lens of women's narratives. By employing qualitative methods, we have uncovered the complex and multifaceted ways in which discrimination manifests itself, ranging from overt barriers to subtle biases that cumulatively hinder women's career progress and well-being. The narratives reveal the prevalence of such discrimination and the resilience and strategies women employ to navigate and challenge these obstacles.

Unveiling Gender Discrimination in the Workplace: A Qualitative Analysis of Vietnamese Women's Narratives

Our findings resonate with global themes such as the "glass ceiling" and "sticky floor," yet they underscore unique cultural influences shaping these experiences in Vietnam. For instance, the impact of Confucian cultural values illustrates how traditional norms can intertwine with modern workplace practices to reinforce gender disparities. These insights are crucial for crafting effective interventions that are culturally appropriate and responsive to Vietnamese women's specific needs and challenges.

The implications of this research extend beyond academic discourse. They have significant practical applications for policymakers, organizational leaders, and advocacy groups striving to create equitable workplaces. Based on the evidence provided by these narratives, it is clear that addressing gender discrimination requires comprehensive strategies that include enforcing and expanding existing gender equality laws, promoting inclusive culture through training and awareness programs, and ensuring that organizational policies reflect a commitment to diversity and equality.

Furthermore, this study highlights the need for ongoing research in this area. Future research should include a broader range of voices and experiences, potentially integrating quantitative methods with qualitative insights to provide a more comprehensive view of the issues at hand. Such research would not only enrich our understanding of gender discrimination but also enhance our ability to address it effectively.

In conclusion, the power of women's narratives in uncovering the nuanced reality of gender discrimination cannot be overstated. As we continue to advocate for and implement changes based on these findings, it is essential to recognize and amplify the voices of those who experience these challenges firsthand. Through such efforts, we can hope to move closer to a world where gender equality is not just an ideal but a reality.

REFERENCES

1) Benería, L., Diana Deere, C., & Kabeer, N. (2012). Gender and international migration: Globalization, development, and governance. Feminist Economics, 18(2), 1-33.
2) Bobbitt-Zeher, D. (2011). Gender discrimination at work: Connecting gender stereotypes, institutional policies, and gender composition of workplace. Gender & Society, 25(6), 764-786.
3) Bobbitt-Zeher, D. (2011). Gender discrimination at work: Connecting gender stereotypes, institutional policies, and gender composition of workplace. Gender & Society, 25(6), 764-786.
4) Bobbitt-Zeher, D. (2011). Gender discrimination at work: Connecting gender stereotypes, institutional policies, and gender composition of workplace. Gender & Society, 25(6), 764-786.
5) Cannon, C. (2023). Muslim women in the workplace and the Equality Act 2010: Opportunities for an intersectional analysis. International Journal of Discrimination and the Law, 23(3), 185-215.
6) Chien, N. B., & Thanh, N. N. (2022). The Impact of Good Governance on the People's Satisfaction with Public Administrative Services in Vietnam. Administrative Sciences, 12(1), 1-12.
7) Davies, H. T., & Nutley, S. M. (Eds.). (2000). What works?: Evidence-based policy and practice in public services. Policy Press.
8) Gewinner, I. V. (2022). Intersectionalities and Perceived Discrimination in German Research Organizations: A Post-Soviet Migrant Women's Perspective. In Diversity and Discrimination in Research Organizations (pp. 393-417). Emerald Publishing Limited.
9) Hennein, R., Poulin, R., Gorman, H., & Lowe, S. R. (2023). Gender discrimination and mental health among health care workers: Findings from a mixed methods study. Journal of Women's Health, 32(7), 823-835.
10) Hill, C., Miller, K., Benson, K., & Handley, G. (2016). Barriers and Bias: The Status of Women in Leadership. American Association of University Women.
11) Hoa, N. T. T., & Thanh, N. N. (2023). Factors Affecting Corruption Control in Public Administration: Evidence from Vietnam. Journal of Law and Sustainable Development, 11(12), e1636-e1636.
12) Iverson, S. V. (2011). Glass ceilings and sticky floors: Women and advancement in higher education. Women as leaders in education: Succeeding despite inequity, discrimination, and other challenges, 1, 79-105.
13) Kalpazidou Schmidt, E., & Cacace, M. (2019). Setting up a dynamic framework to activate gender equality structural transformation in research organizations. Science and Public Policy, 46(3), 321-338.
14) Lutz, H., Vivar, M. T. H., & Supik, L. (Eds.). (2016). framing intersectionality: Debates on a multi-faceted concept in gender studies. Routledge.
15) Mai, A. T. L., Dao, Q. T., Nguyen, T. T. T., Nguyen, T. T. M., Van Vu, D., & Nguyen, N. T. (2023). Coping strategies among nursing students participating in COVID-19 frontline prevention in VIETNAM. Journal of Namibian Studies: History Politics Culture, 33, 1313-1328.

16) Mate, S. E., McDonald, M., & Do, T. (2019). The barriers and enablers to career and leadership development: An exploration of women's stories in two work cultures. International Journal of Organizational Analysis, 27(4), 857-874.

17) Nguyen, K. T. (2016). Economic reforms, manufacturing employment and wages in Vietnam. LAP LAMBERT Academic Publishing.

18) Nguyen, L. T., Le Giang, M., Nguyen, D. B., Nguyen, T. T., & Lin, C. (2024). Unraveling reproductive and maternal health challenges of women living with HIV/AIDS in Vietnam: a qualitative study. Reproductive Health, 21(1), 1-9.

19) Nguyen, N. H. C. (2009). Memory is another country: Women of the Vietnamese diaspora. Bloomsbury Publishing USA.

20) Nguyen, T., Locke, S., & Reddy, K. (2015). Does boardroom gender diversity matter? Evidence from a transitional economy. International Review of Economics & Finance, 37, 184-202.

21) Pyke, K. D., & Johnson, D. L. (2003). Asian American Women and Racialized Femininities: "Doing" Gender across Cultural Worlds. Gender & Society, 17(1), 33-53.

22) Ragins, B. R., Townsend, B., & Mattis, M. (1998). Gender gap in the executive suite: CEOs and female executives report on breaking the glass ceiling. Academy of Management Perspectives, 12(1), 28-42.

23) Sarwar, A., & Imran, M. K. (2019). Exploring Women's multi-level career prospects in Pakistan: Barriers, interventions, and outcomes. Frontiers in psychology, 10, 444970.

24) Syed, J. (2007). 'The other woman'and the question of equal opportunity in Australian organizations. The international journal of human resource management, 18(11), 1954-1978.

25) Thang, N. D., & Thanh, N. N. (2023a). The Factors Influence the Intention to Invest in Green Tourism in Vietnam: Evidence from Business Survey. International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8(5), 121.

26) Thang, N. D., & Thanh, N. N. (2023b). The Relationship between Awareness and Commitment to Participate in the Green Tourism Model of Local Communities: Evidence from the Hmong People Community in Lao Cai Province-Vietnam. International Journal of Professional Business Review, 8(6), e02540-e02540.

27) Thanh, N. N., Trung, N. S., Chien, T. T., Ha, T. T. N., Hien, N. L. T., & Thuy, N. T. (2021). A study on work motivation of commune level civil servants in Vietnam. Pt. 2 J. Legal Ethical & Regul. Isses, 24, 1

28) Thanh, N. N., Tung, P. H., Thu, N. H., Kien, P. D., & Nguyet, N. A. (2021). Factors affecting the share of fake news about the COVID-19 outbreak on social networks in Vietnam. Journal of Liberty and International Affairs, 7(3), 179-195.

29) Tuoi, N. T., & Thanh, N. N. (2023). The Impact of Digital Capabilities on the Work Performance of Provincial Civil Servants in Vietnam. Journal of Law and Sustainable Development, 11(4), e560-e560.

30) Veenstra, G. (2013). The gendered nature of discriminatory experiences by race, class, and sexuality: A comparison of intersectionality theory and the subordinate male target hypothesis. Sex roles, 68, 646-659.

Cultural Influences on Students' Information Technology Skills Development

Nguyen Thị Quynh Trang[1], Phan Thị Thu[2]
[1,2] National Academy of Public Administration, Vietnam

ABSTRACT: This qualitative study examines the cultural influences on developing information technology (IT) skills among secondary school students in Vietnam. The research uncovers how cultural values, educational practices, and socio-economic conditions influence IT education by conducting in-depth interviews, focus groups, and classroom observations across urban and rural settings. Key findings reveal significant disparities in the perception of IT's importance between urban and rural areas, with cultural norms and economic realities influencing these attitudes. Traditional Confucian values inhibit active and exploratory learning methods in IT education. Additionally, English language barriers limit the effective use of global IT resources, while gender norms and socioeconomic status create uneven student opportunities. The study suggests policy interventions aimed at enhancing IT infrastructure, promoting gender inclusivity, and adjusting curricula to accommodate language and cultural nuances. Recommendations include the development of more inclusive, culturally sensitive educational practices to ensure equitable IT skill development. This research contributes to understanding the multifaceted impact of cultural factors on IT education and proposes strategies for crafting more effective and inclusive IT educational policies.

KEYWORDS: Information Technology Education; Cultural Influences; Educational Inequality; Digital Literacy Skills

INTRODUCTION

In an increasingly interconnected world where technology permeates every aspect of life, information technology (IT) competencies are no longer just advantageous—they are indispensable. IT skills' significance spans educational, professional, and personal realms, emphasizing the need for a proficient, tech-savvy generation. However, developing these crucial skills is not solely a function of access and education but is deeply influenced by cultural factors that vary dramatically across different regions and communities (Leidner & Kayworth, 2006).

Vietnam presents a particularly compelling case for this investigation. As the country strides forward in integrating technology across all sectors, its education system must wrestle with the dual challenge of advancing technological integration while remaining true to its cultural heritage. Despite the rapid adoption of digital tools in Vietnamese schools, there is a notable lack of research exploring how Vietnam's distinct cultural values influence the development and dissemination of IT skills among students (Straub et al., 2001). This gap is significant because it overlooks the potential for enhancing educational strategies and outcomes through a deeper understanding of cultural influences, offering a hopeful and optimistic path forward (Leidner & Kayworth, 2006).

This study employs qualitative research methods, such as in-depth interviews, participant observations, and focus groups, to delve into the nuanced cultural impacts on IT skill development among Vietnamese students. By focusing on qualitative insights, this research offers a unique depth and context that quantitative data alone cannot provide. It aims to uncover how cultural values and norms shape students' engagement with and mastery of IT, enriching our understanding of the complex interplay between culture and IT education.

The implications of this research extend far beyond academic interest, offering practical applications that can directly impact educational practices. By identifying how cultural factors affect IT education, this study can help tailor educational practices that foster IT competencies and resonate with the students' cultural contexts, enhancing both learning outcomes and student engagement. This research fills a critical and urgent gap in the existing literature. It contributes to the broader effort of preparing students in Vietnam and similar cultural settings to thrive in a digital future, making it a crucial resource for educators, policymakers, and curriculum developers.

Cultural Influences on Students' Information Technology Skills Development

LITERATURE REVIEWS

Cultural Values and IT Learning Outcomes

A pivotal study by Vu et al.(2003) examined the intersection of cultural values and IT education across multiple countries. Their research highlighted how countries with strong long-term orientation cultures, such as many in Asia, tend to implement IT education in ways that emphasize future benefits and disciplined study. However, the study notes that such approaches can sometimes overlook immediate and practical applications, crucial for engaging students in more individualistic cultures (Thanh et al., 2021).

Technological Access and Educational Equity

In a related vein, Tan and Lim's (2018) work focused on the digital divide within Asian countries, including Vietnam. They reported significant disparities in access to technology between urban and rural areas and how underlying cultural and economic structures influence these disparities (Tuoi & Thanh, 2023). Their findings suggest that even within a single country, varying levels of technology adoption can create uneven educational outcomes influenced by geographic and cultural factors (Dede, 2000).

Language Barriers to Technology Use

Another critical aspect is the role of language in technology use in education, as explored by Lubis and Fithriani (2023). Their study on Vietnamese students highlighted that English proficiency is a significant barrier to effectively utilizing IT resources, many of which are primarily available in English. This technical and cultural barrier affects students' confidence and willingness to engage with IT tools.

Parental and Societal Expectations

Exploring another dimension, Pham (2023) delved into how parental and societal expectations affect students' engagement with IT education in Vietnam. Their qualitative study found that while parents recognize the importance of IT skills for future career prospects, traditional expectations about careers and education often limit encouraging explorative and creative use of technology in learning. This tension reflects broader cultural attitudes towards education and technology.

Impact of Pedagogical Approaches on IT Competency

Finally, Pham's work (2023) investigates the impact of pedagogical approaches on IT competency, emphasizing the need for active and student-centered learning environments to improve IT skills. The study critiques the rote-learning methods in some cultures, suggesting that such methods are less effective for developing advanced IT skills, which require critical thinking and problem-solving abilities.

Synthesis and Gaps

While the reviewed literature provides substantial insights into the factors influencing IT education from a cultural perspective, there remains a gap in comprehensive studies that directly link these cultural elements with specific IT learning strategies and outcomes in Vietnam (Asher et al., 2019). Most research provides regional or global overviews without sufficient granularity to inform specific educational practices in different cultural settings within Vietnam. This gap underscores the need for localized research that can bridge cultural understanding with practical IT education strategies.

RESEARCH METHODS

Participant Selection

The research targeted diverse participants to capture various experiences and perspectives. We selected students, teachers, and IT coordinators from urban and rural secondary schools across Vietnam. A total of 40 participants were chosen using purposive sampling to ensure a representation of various socioeconomic backgrounds and educational settings. This selection aimed to understand the differences and similarities in IT skill development across different cultural and environmental contexts.

Data Collection Methods

Three primary data collection methods were employed to ensure a comprehensive understanding of the cultural factors influencing IT skill development:

In-depth Interviews: Each participant was interviewed semi-structured to allow for flexibility in responses and to explore specific topics in detail. These interviews focused on personal experiences with IT education, perceptions of the importance of IT skills, and the influence of cultural values on IT learning.

Focus Groups: Several focus group discussions were organized, grouping participants by their roles (e.g., students and teachers) to foster dynamic interactions and elicit diverse perspectives. These discussions were instrumental in uncovering collective insights and shared experiences regarding the cultural dynamics within IT education.

Observations: Observational visits were made to classrooms and IT labs to directly witness and record interactions and practices related to IT education. These observations helped to contextualize the interview and focus group data, providing a real-time glimpse into the teaching methods and student engagement with technology.

Cultural Influences on Students' Information Technology Skills Development

Data Analysis

Qualitative data analysis was performed using thematic analysis to identify, analyze, and report themes and patterns within the data. The process began with transcribing all recorded interviews and focus group discussions, followed by a rigorous coding process. Initial codes were generated by examining the data for recurring ideas and concepts, which were then collated into potential themes. These themes were reviewed and refined to ensure they accurately represented the dataset. The NVivo software was utilized to assist with the organization and categorization of data, enhancing the reliability and efficiency of the analysis.

Ethical Considerations

Ethical approval for the study was obtained from an institutional review board. All participants were provided with detailed information about the study's purpose and their expected involvement. Informed consent was obtained from all participants, with assurances of anonymity and confidentiality. Special attention was given to ethical considerations involving minors, including obtaining parental consent.

Validity and Reliability

Several strategies were implemented to ensure the validity and reliability of the research findings. Data sources (interviews, focus groups, observations) were triangulated to cross-verify information and insights. Member checking was also conducted, wherein participants were given a chance to review and comment on the findings to confirm the accuracy and resonance of the interpretation of their responses. This process enriched the data and bolstered the study's credibility. This methodology section outlines the rigorous and ethical approach adopted to explore the complex influence of cultural factors on IT education in Vietnam, ensuring a rich and insightful exploration of this significant area of study.

RESEARCH RESULTS

Cultural Perceptions of Technology's Role in Education

One of the most prominent themes from the data was the varied perception of technology's role in education. Participants, especially from urban areas, perceived IT skills as crucial for future employment and societal progress (Ertmer & Ottenbreit-Leftwich, 2010). However, participants from rural settings often viewed technology as less critical compared to traditional academic subjects such as mathematics and literature. This distinction underscores a cultural divide influencing how IT education is prioritized and implemented across different regions.

Influence of Confucian Values

Confucian values, deeply embedded in Vietnamese culture, significantly impacted attitudes towards IT education. Respect for authority and a focus on rote learning were frequently cited as barriers to more interactive and exploratory approaches to learning IT (Chuang & Wang, 2018). Students often felt restricted from following traditional learning methods, which they believed were less effective in developing practical IT skills than more hands-on approaches.

Language Barriers to Accessing Technology

Language emerged as a critical barrier to accessing and utilizing IT resources effectively. Many students and teachers reported that many software and online resources available primarily in English limited their usability (Chang et al., 2014). This barrier is particularly pronounced in non-urban areas where English proficiency is generally lower, highlighting a significant cultural and linguistic challenge in adopting global IT resources.

Gender Dynamics in IT Education

The data also revealed notable gender dynamics in IT skill development. Male students were generally more encouraged at home and in school to pursue IT-related activities, perceived as aligning with traditional gender roles that associate technological proficiency with masculinity (Fischman, 2000). Female students felt less supported and sometimes actively discouraged from engaging deeply with IT, reflecting broader societal norms about gender roles.

Impact of Socioeconomic Status

Socioeconomic status was identified as a significant factor influencing access to IT education. Students from higher socioeconomic backgrounds often had better access to technology at home and more exposure to IT at an earlier age, giving them a significant advantage in developing IT skills. In contrast, students from lower socioeconomic backgrounds faced substantial disadvantages, including limited access to quality IT education and resources, significantly hindering their ability to develop comparable competencies (Smith, 2007).

Educational Policy and Infrastructure

Participants frequently discussed the impact of educational policies and infrastructure on IT skill development. Urban schools with better funding and infrastructure offered more comprehensive IT curricula and extracurricular activities, leading to more robust IT competencies among their students. Conversely, under-resourced schools, particularly rural areas, struggled to provide primary IT education, illustrating a significant inequality based on geographic location (Smith, 2007). These findings

Cultural Influences on Students' Information Technology Skills Development

highlight the multifaceted influence of cultural, linguistic, socioeconomic, and policy factors on Vietnamese students' IT skills development. They underscore the need for culturally sensitive and region-specific strategies in IT education to address the diverse needs and barriers faced by students across Vietnam.

DISCUSSION

Cultural perceptions and educational priorities: The variance in how technology's role is perceived across different regions highlights the profound cultural influences on academic priorities. Urban participants' view of IT as essential contrasts sharply with rural perspectives, where technology is often seen as secondary (Letchumanan et al., 2023). This discrepancy can be partially attributed to the economic and occupational landscapes that differ markedly between urban and rural areas. With their closer ties to global financial networks, metropolitan areas naturally place a higher premium on IT skills, which are critical in the global marketplace (Thanh, 2021).

Impact of traditional values: The influence of Confucian values on learning approaches presents a significant cultural barrier to adopting more interactive and practical IT learning methods. The emphasis on respect for authority and rote learning contradicts the exploratory and often collaborative learning styles that are most effective in IT education (Liang & Matthews, 2023). This clash between traditional educational values and modern educational needs suggests a critical area for educational reform, aiming to integrate more flexible, student-centered teaching approaches while respecting cultural traditions.

Language as a barrier: The language barrier in accessing technological resources underscores a broader issue of global inequality in education. The dominance of English in IT necessitates reevaluating language education within Vietnam, particularly in enhancing English proficiency from early education stages to equip students better to engage with global IT resources (Yen & Van Hoi, 2023). Addressing this barrier is about improving English language instruction and advocating for more multilingual resources in IT.

Gender norms and IT education: The study's gender dynamics reflect broader societal norms influencing educational trajectories. The encouragement of boys over girls in pursuing IT-related activities perpetuates gender disparities in technological fields (Yen & Van Hoi, 2023). Addressing these disparities requires cultural shifts and educational policies promoting gender equality in all subjects, including IT.

Socioeconomic disparities: The impact of socioeconomic status on IT skill acquisition highlights a critical equity issue within the educational system. Students from wealthier backgrounds have disproportionate advantages in accessing technology, which compounds over time and perpetuates social inequalities (Fauziah et al., 2023). This calls for policy interventions providing equitable IT access across all socioeconomic groups.

Policy implications and future research: This study's findings suggest several policy implications, including the need for investment in IT infrastructure across all regions, especially in rural areas, and the implementation of educational reforms that encourage modern pedagogical practices suitable for IT education (Ntorukiri et al., 2022). Future research should focus on longitudinal studies to track the impact of such reforms and explore the long-term outcomes of students' IT competencies.

Limitations: While this study provides valuable insights, it is limited by its focus on secondary education in Vietnam and may not be fully generalizable to other educational levels or contexts. Further studies could expand the scope to include primary and tertiary educational settings and examine other cultural contexts to enrich the global understanding of cultural influences on IT education.

In conclusion, the discussion highlights the complex interplay of cultural, educational, and social factors influencing IT skill development in Vietnam. It underscores the need for culturally informed educational strategies to foster effective IT education that caters to students' diverse needs.

CONCLUSION

Exploring cultural influences on developing IT skills among Vietnamese students has unveiled a complex landscape shaped by diverse cultural, linguistic, and socioeconomic factors. This study, through qualitative methods including interviews, focus groups, and observations, has provided significant insights into how these factors influence IT education in secondary schools across Vietnam.

The findings indicate that perceptions of IT's importance vary significantly between urban and rural areas, influenced by local economic conditions and cultural perspectives (Thang & Thanh, 2023b). Traditional educational values, such as those stemming from Confucian ideals, often hinder the adoption of more interactive and practical IT learning methodologies. Additionally, language barriers, particularly the dominance of English in IT resources, restrict access and utilization among Vietnamese students, highlighting a crucial area for educational policy intervention.

Cultural Influences on Students' Information Technology Skills Development

Gender dynamics and socioeconomic disparities also play a critical role in shaping access to and engagement with IT education. These elements underscore the urgent need for policy changes that promote gender inclusivity and socioeconomic equity in IT education. It is clear that merely providing access to technology is not enough; there must be a concerted effort to address these underlying cultural and social barriers to maximize the effectiveness of IT education.

This study suggests several areas for policy intervention, including enhancing IT infrastructure, particularly in rural areas, integrating more culturally sensitive and inclusive teaching methods and improving language education policies to equip students to better engage with global technological resources. Additionally, there is a call for educational reforms that encourage gender equality and provide equitable opportunities for all students, regardless of their socioeconomic status (Thang & Thanh, 2023a).

Future research should continue to explore these dynamics in other educational contexts and longitudinally assess the impact of these suggested reforms over time (Chien & Thanh, 2022). Moreover, expanding the research to include other regions and comparing the findings can enrich understanding of how cultural contexts influence IT education globally.

In conclusion, this study not only fills a significant gap in the existing literature by providing detailed insights into the cultural influences on IT skill development in Vietnamese schools but also offers practical recommendations for enhancing IT education in a culturally informed and inclusive way. The broader implications of this research highlight the importance of considering cultural factors in the design and implementation of educational policies and practices, ensuring they are tailored to meet the diverse needs of students in a culturally sensitive manner.

REFERENCES

1) Asher, Z. D., Patil, A. A., Wifvat, V. T., Frank, A. A., Samuelsen, S., & Bradley, T. H. (2019). Identification and review of the research gaps preventing a realization of optimal energy management strategies in vehicles. SAE International Journal of Alternative Powertrains, 8(2), 133-150.

2) Chang, D. T., Thyer, I. A., Hayne, D., & Katz, D. J. (2014). Using mobile technology to overcome language barriers in medicine. The Annals of The Royal College of Surgeons of England, 96(6), e23-e25.

3) Chuang, S., & Wang, G. G. (2018). Confucian philosophy and influence on perceived values and behavioural orientations by Taiwan's millennials. Human Resource Development International, 21(4), 362-381.

4) Dede, C. (2000). Emerging influences of information technology on school curriculum. Journal of Curriculum Studies, 32(2), 281-303.

5) Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of research on Technology in Education, 42(3), 255-284.

6) Fauziah, L., Dewi, N. L. Y., Yodiansyah, H., & Lameng, Y. B. V. (2023). Social Development and Gender Gap in Information Technology Perspective. International Journal of Science and Society, 5(1), 353-364.

7) Fischman, G. (2000). Imagining teachers: Rethinking gender dynamics in teacher education. Rowman & Littlefield.

8) Leidner, D. E., & Kayworth, T. (2006). A review of culture in information systems research: Toward a theory of information technology culture conflict. MIS quarterly, 357-399.

9) Letchumanan, M., Husain, S. K. S., & Ayub, A. F. M. (2023). Determining the Influence of Cultural Values on Promotion of Higher Order Thinking Skills in Technology Enhanced Learning Environment. Malaysian Journal of Mathematical Sciences, 17(2).

10) Liang, Y., & Matthews, K. E. (2023). Are Confucian educational values a barrier to engaging students as partners in Chinese universities?. Higher Education Research & Development, 42(6), 1453-1466.

11) Lubis, N. H., & Fithriani, R. (2023). Investigating vocational high school teachers' challenges in integrating Computer Assisted Instruction (CAI) into EFL classes. Jurnal Paedagogy, 10(3), 809-819.

12) Ntorukiri, T. B., Kirugua, J. M., & Kirimi, F. (2022). Policy and infrastructure challenges influencing ICT implementation in universities: a literature review. Discover Education, 1(1), 19.

13) Pham, T. T. (2023, July). Digital Access, Usage, and Educational Outcomes: Evidence from Vietnam. In Proceedings of the Tenth ACM Conference on Learning@ Scale (pp. 267-271).

14) Smith, J. P. (2007). The impact of socioeconomic status on health over the life-course. Journal of Human Resources, 42(4), 739-764.

15) Straub, D., Loch, K. D., & Hill, C. E. (2001). Transfer of information technology to the Arab world: a test of cultural influence modeling. Journal of Global Information Management (JGIM), 9(4), 6-28.

16) Thang, N. D., & Thanh, N. N. (2023a). The Factors Influence the Intention to Invest in Green Tourism in Vietnam: Evidence from Business Survey. International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8(5), 121.

Cultural Influences on Students' Information Technology Skills Development

17) Thang, N. D., & Thanh, N. N. (2023b). The Relationship between Awareness and Commitment to Participate in the Green Tourism Model of Local Communities: Evidence from the Hmong People Community in Lao Cai Province-Vietnam. International Journal of Professional Business Review, 8(6), e02540-e02540.

18) Thanh, N. N., Trung, N. S., Chien, T. T., Ha, T. T. N., Hien, N. L. T., & Thuy, N. T. (2021). A study on work motivation of commune level civil servants in Vietnam. Pt. 2 J. Legal Ethical & Regul. Isses, 24, 1

19) Thanh, N. N., Tung, P. H., Thu, N. H., Kien, P. D., & Nguyet, N. A. (2021). Factors affecting the share of fake news about the COVID-19 outbreak on social networks in Vietnam. Journal of Liberty and International Affairs, 7(3), 179-195.

20) Tuoi, N. T., & Thanh, N. N. (2023). The Impact of Digital Capabilities on the Work Performance of Provincial Civil Servants in Vietnam. Journal of Law and Sustainable Development, 11(4), e560-e560.

21) Vu, H. T. T., Le, N. H., Phan, L. T., & Nguyen, S. T. U. (2023). Effectiveness of building a culture of learning among Vietnamese pedagogical university students. International Journal of Education and Practice, 11(3), 439-449.

22) Yen, N. T. H., & Van Hoi, N. (2023). Ensuring Equality in Education Access: The Dynamics and Challenges for Vietnamese Ethnic Minority Girls. Journal of Contemporary Sociological Issues, 3(1), 89-107.

23) Yen, N. T. H., & Van Hoi, N. (2023). Ensuring Equality in Education Access: The Dynamics and Challenges for Vietnamese Ethnic Minority Girls. Journal of Contemporary Sociological Issues, 3(1), 89-107.

Impact of Psychological Factors on Physical Education Learning Outcomes

Windi Surya Pratama[1], Wilda Welis[2], Ishak Aziz[3], Syahrastani[4]

[1,2,3,4]Faculty of Sports Science, Universitas Negeri Padang, Jl. Prof. Dr. Hamka Air Tawar, Padang, Sumatera Barat, Indonesia

ABSTRACT: This research aims to analyze the impact of students' perceptions and learning motivation as the main factors that influence physical education learning outcomes. Affective learning is reported to be one of the key factors in achieving physical education learning outcomes. A correlation design using the associative causal method has been used to collect information from a sample of 63 public elementary school students. Data collection was carried out through questionnaires and focus group discussions. Next, to examine the impact of this study, we utilized IBM SPSS software. The results show that there is a different correlation between physical education learning outcomes and predictors of student perception and learning motivation. The strength of the direct influence identifies that there is a significant positive influence on students' perceptions and learning motivation on physical education learning outcomes. Therefore, the components of student perception and learning motivation are the main factors in physical education learning outcomes.

KEYWORDS: Learning Environment, Self-Perception and Learning Motivation

I. INTRODUCTION

Education lasts throughout life in every unit of life and is given in various paths, types, levels and educational units that are oriented towards changes in mental attitudes based on personality. Education provided in various fields, both formal and non-formal, is an effort made to strive for equal distribution of education in various circles in society. Higher Education (quoted by Natawidjaya et. al., 2007: 3). Education is developed and managed in an academic pedagogical atmosphere by healthy, autonomous, and accountable institutional organizations.by utilizing self-evaluation as a management tool based on National and International quality standards as a reference for internal and external quality guarantors.

To underlie that, it is hoped that Penjasorkes, can be used as a means of shaping human life, because through Penjasorkes in schools can develop students' potential. The development of students' potential can be achieved through various kinds of sports and games activities which contain several elements, namely cognitive, affective and psychomotor. Sports and game activities are given according to the level of growth and development of students at school, physical activities carried out must be planned in a sequential (systematic) and continuous manner, which can develop in totality the functions of the human body itself. Thus, the learning outcomes of student health workers will be better.

Good learning outcomes in learning Education in particular are expected to be able to play a role in producing quality students, namely as humans who are able to think critically, creatively, logically and take initiative in dealing with the symptoms of life both socially and technologically that develop in the midst of society in the current era of globalization. To express the above description, Penjasorkes aims to develop knowledge, skills, confidence, and personality values related to physical activities, such as aesthetic development, and social development.

In fact, initial observations at State Elementary School 10 Kunangan Parit Rantang, Kamang Baru District, Sijunjung Regency, March 2021 about the midterm learning outcomes of Penjasorkes. The author found that the completeness of students' learning has not met expectations. This means that the results of the Penjasorkes midterm exam have not partially reached the maximum completeness criteria (KKM). The KKM for Penjasorkes learning for the 2021 school year is 75, still using the KKM form of the 2004 Education Unit Level curriculum. Of the 23 students consisting of 17 male and female students with scores below KKM, the average score is 56 (incomplete, and as many as 6 students whose scores pass KKM are with an average of 83 (Complete). So it can be interpreted that the learning outcomes of Penjasorkes owned by class IV are still relatively low with an average score below KKM.

Impact of Psychological Factors on Physical Education Learning Outcomes

From the data in it is clear that, the problem in this study is the low learning outcomes of Penjasorkes, with an average below KKM.

Based on the above facts, it is clear that the learning outcomes of Penjasorkes students of State Elementary School 10 Kunangan Parit Rantang, Kamang Baru District, Sijunjung Regency, have not been as expected. This means that there are still many students who have learning outcomes that are below KKM. This is due to many factors that affect the learning outcomes of students such as; the learning environment, not only provides facilities to go to school, but closeness to children can help him learn and solve problems together. The learning environment can improve problem-solving skills in learning and can be negotiated in an academic environment (Lage, M. J., Platt, G. J., & Treglia, M. 2000; Marwan, D. 2013).

Learning facilities are external factors that can affect student learning outcomes. Learning facilities include facilities and infrastructure. Learning facilities are one of the important factors to help the process of teaching and learning activities. When learning facilities are complete and good and utilized optimally by students, it has a high level of student learning outcomes.

In addition, parental support also contributes to influencing student learning outcomes. Nopiyanto, Y. E., & Raibowo, S. (2020) stated that parental support is one of the effective roles given by parents to children. Parents believe that raising children excessively will certainly produce spoiled children, and if given firmness and punishment will produce independent children. Therefore, in a good parental environment such as the closeness of children in the family should provide motivation and useful information, pay attention to learning, and positive reinforcement.

Reinforcement in terms of learning is also inseparable from students' perceptions of the learners themselves. Student perception can affect student learning outcomes in learning. One type of perception is learned perception, learned perception is a perception formed because individuals learn something from the surrounding environment. Perceptions learned are in the form of thoughts, ideas or ideas and beliefs learned from others. So each individual's reaction is based on perceptions that have been learned, such as children following their parents' behavior and personality. Perception of something will affect the actions that will be taken on it, including students' perception of physical education learning itself which will affect the learning outcomes of their Health Educators (Yazid, T. P., & Ridwan, R. 2018).

Active learning activities will have a positive influence on students. Student learning activities that are driven by learning motivation are a sign that students already have the awareness in themselves to study seriously. One of the real things that can be seen is that children who have high learning motivation and learning activities will get good results as well (Nurmala, D. A., Tripalupi, L. E., & Suharsono, N. 2014; Warti, E. 2016; Saputra, H. D., Ismet, F., & Andrizal, A. 2018). Moving on from these factors, we want to conduct a study related to the influence of self-perception and learning motivation on the learning outcomes of State Elementary School Student Assessment 10 Kunangan Parit Rantang, Kamang Baru District, Sijunjung Regency.

II. METHODOLOGY

Sample and data collection

The population of this study was 285 people from Sekolah Dasar Negeri 10 Kunangan Parit Rantang, Kamang Baru District, Sijunjung Regency. As a method of data collection in this study, using the sampling probabliti technique, which is based on consideration of the goals set by the researcher, so that the data to be taken is only 63 students.

Research instruments

To verify the proposed hypothesis, it is necessary to make measurements related to self-perception, motivation, and learning outcomes (Bui et al., 2019; Fiske, Cuddy, & Glick, 2007). The instrument used in this study was using survey questionnaires with open and closed questions providing perceptions or views and experiences held by students. The instruments used are 1) perception with indicators (1) learning achievement, (2) changing learning experiences, (3) verbal persuasion (feedback), (4) emotional stimuli (Sağırlı, M., & Okur, B. 2017). 2) learning motivation with indicators (1) The existence of desire and desire to succeed, (2) Emotional stimulation, (3) The existence of desire and desire to succeed, (4) The existence of encouragement and need in learning, (5) The existence of hopes and aspirations for the future, (6) The existence of rewards in learning (Hamzah, 2016:31).

Data analysis

First, descriptive statistics are examined to describe general abilities of self-perception, learning motivation, and physical education learning outcomes. To assess the conceptual relationship between the proposed variables, use IBM SPSS software. Significance is determined at the level of $p < 0,05$.

Impact of Psychological Factors on Physical Education Learning Outcomes

III. RESULTS

To test the hypothesis that there is an influence between self-perception and learning motivation to contribute to physical education learning, a simple linear regression analysis uses the SPSS 25 for windows program as proposed in the following table:

Table 1. Analysis of Variance (ANOVA)

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	86,917	7,884		11,024	,000
	X1	-,089	,094	-,120	-,941	,350

a. Dependent Variable: Y

Table 2. R Square

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,320ª	,120	,002	3,604

a. Predictors: (Constant), X1

Tabel di atas menjelaskan besarnya persentase pengaruh variabel bebas terhadap variabel terikat yang disebut koefisien determinasi yang merupakan hasil penguadratan R. Dari output diatas diperoleh R Squere 0,120 yang mengandung pengertian bahwa pengaruh variabel bebas (persepsi diri) terhadap variabel terikat (hasil belajar) adalah sebesar 12%.

Table 3. Analysis of Variance (ANOVA)

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	137,329	19,699		6,971	,000
	Y	-,774	,248	-,372	-3,129	,003

a. Dependent Variable: X2

Table 4. R Square

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,372ª	,138	,124	7,017

a. Predictors: (Constant), Y

The table above explains the percentage of influence of the independent variable on the dependent variable called the coefficient of determination which is the result of the squaring R. From the output above obtained R Squere 0.138 which contains the understanding that the influence of the independent variable (self-perception) on the dependent variable (learning outcomes) is as large as 13,8%.

IV. DISCUSSION

Based on the results of the study, it was found that self-perception and learning motivation affect physical education learning outcomes. The relationship between movement skills (i.e., locomotor skills and object control), physical activity in the form of physical self-perception in learning (i.e., health, coordination, sports ability, strength, fitness, and self-esteem) without having impaired coordination development in children aged 7-10 years, and observed that coordination was the only significant predictor of physical self-concept for object control skills. No variables selected from self-concept versus physique were found to be

significant predictors for locomotor skill. This means that the development of children's coordination is very important to improve self-concept related to physical activity so that when self-perception is good in physical activity in Penjasorkes learning, it will directly affect the learning results of students (Yu J, Sit CHP, Capio CM, et al, 2016).

Self-perception of learning outcomes is an important correlation of their participation in learning with regard to physical activity (Crocker, Eklund, & Kowalski, 2000). The results of this study also reported that, children with a more positive physical self-perception tend to be motivated to participate in a physically active lifestyle, so that in their study they will tend to get good results (Raudsepp, Liblik, & Hannus, 2002). In addition, one's self-perception in the physical domain is a key component of intrinsic motivation (Duda, Chi, Newton, Walling, & Catley, 1995).

In addition, another factor that affects learning outcomes, namely learning motivation. Learning motivation includes internal factors. Motivation is the driving force that arises from within students to carry out an activity and achieve predetermined goals. High learning motivation will increase enthusiasm to carry out the learning process and also improve student learning outcomes. For the smooth learning process, roles from various parties are needed so that the motivation in students can grow (Jamil, H., & Azra, F. I. 2014).

Student learning motivation in the learning process plays an important role in achieving learning outcomes. Because Motivation is a stimulus that arouses one's behavior, provides direction for behavior and maintains strong behavior. In terms of learning, students will succeed if in themselves there is a will, desire, and drive to learn, because with learning motivation, students will be moved, directed attitudes and behaviors in learning. In relation to Mulyasa's motivation, (2010:174) said "motivation is one of the factors that can improve the quality of learning, because students will learn seriously if they have high motivation". With motivation will grow the urge to do something in relation to the achievement of the goals of the learning. In line with Ting, L & Min, J (2013, p.157), increasing student learning motivation is important for the teaching and learning process of new knowledge or skills because motivation will affect how teachers and students interact with learning material so as to achieve good learning outcomes.

According to this theory, competence motivation increases when a person manages to fully master the task. This suggests that individuals who consider themselves physically competent, tend to exert greater effort in motor skills and mastery efforts, than those with poor self-perception physical competence, thereby indirectly affecting student learning outcomes (Yu J, Sit CHP, Capio CM, et al, 2016).

Based on the results of the study, it turns out that learning motivation has an influence. In this case, learning motivation is identical to how a student can focus and encourage in learning PJOK, in terms of getting good learning results. The low ability of student learning motivation as impris will have a negative impact on the learning outcomes of the students themselves. Therefore, it is necessary for a physical education teacher to create a conducive and interesting learning atmosphere so that it can cause student motivation in learning.

This study supports the process model of Ryan, R. M., & Deci, E. L. (2000) wherein, participation and performance in physical education. As hypothesized, the influence of autonomy support to needs satisfaction and from needs satisfaction to learning motivation and perceived competence is significant. The influence of learning motivation and perceived competence with learning strategies, and of learning strategies with performance and participation in physical education is significant. All indirect links in the structural model are also significant. Learning motivation support is defined as behavior to nurture and develop the source of a student's desire to learn (Reeve, J. 2009). The satisfaction of these three needs is a central resource and, as hypothesized, motivational learning support influences student learning outcomes.

The findings suggest that satisfaction needs are important for understanding learning motivation in exploring learning outcomes. In line with previous research (Ntoumanis, N. 2005) learning motivation as one of the variables in the analysis to simplify these findings. Where motivation is closely related to learning outcomes. This means that increasing student motivation in learning will have an impact on the learning outcomes of the students themselves (Bagøien, Halvari, & Nesheim, 2010).

So it can be concluded that learning motivation is one of the predictors in educational literacy to achieve good learning outcomes. Openness of the desire to follow an action in learning, encourages students to increase their understanding of learning itself. Directly increasing learning motivation itself has a positive impact on improving PJOK learning outcomes owned by students at State Elementary School 10 Kunangan Parit Rantang, Kamang Baru District, Sijunjung Regency.

V. CONCLUSIONS

The research aimed to analyze the influence of students' perceptions and learning motivation on physical education learning outcomes, with affective learning being highlighted as a key factor. Employing a correlation design using the associative causal method, data was collected from a sample of 63 public elementary school students through questionnaires and focus group discussions. The impact of the study was examined using IBM SPSS software. The results revealed varying correlations between

Impact of Psychological Factors on Physical Education Learning Outcomes

physical education learning outcomes and predictors such as student perception and learning motivation. Importantly, the direct influence analysis indicated a significant positive impact of students' perceptions and learning motivation on physical education learning outcomes. Consequently, it was concluded that components of student perception and learning motivation are pivotal in determining the success of physical education learning outcomes. The findings underscored the critical role of affective learning in achieving desired outcomes in physical education.

This conclusion emphasizes the importance of understanding and addressing students' perceptions and motivations in physical education contexts. By recognizing and nurturing these aspects, educators can better facilitate meaningful learning experiences and enhance overall outcomes in physical education. Additionally, the use of correlation designs and statistical analysis tools like IBM SPSS proved effective in exploring these relationships and deriving meaningful insights. Overall, the research contributes valuable insights into the factors influencing physical education learning outcomes, emphasizing the significance of affective learning, student perception, and learning motivation. These findings provide a foundation for further research and offer practical implications for educators aiming to optimize teaching strategies and enhance student achievement in physical education

VI. REFERENCES

1) Balconi, M., & Vanutelli, M. E. (2018). *Alpha brain oscillations, approach attitude, and locus of control affect self-perception of social efficacy in cooperative joint-action. Frontiers in Life Science, 11(1), 11–25.* doi:10.1080/21553769.2018.1465858

2) Bui, K. L., Maia, N., Saey, D., Dechman, G., Maltais, F., Camp, P. G., & Mathur, S. (2019). Reliability of quadriceps muscle power and explosive force, and relationship to physical function in people with chronic obstructive pulmonary disease: an observational prospective multicenter study. *Physiotherapy Theory and Practice*. https://doi.org/10.1080/09593985.2019.1669233

3) Crocker, P. R. E., Eklund, R. C., & Kowalski, K. C. (2000). Children's physical activity and physical self-perceptions.Journal of SportsScience, 18, 383–394.http://dx.doi.org/10.1080/02640410050074313.

4) Duda, J. L., Chi, L., Newton, M. L., & Walling, M. D. (1995). Task and ego orientation and intrinsic motivation in sport. *International journal of sport psychology*.

5) Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: warmth and competence. *Trends in Cognitive Sciences*.

6) Hamzah B. Uno, (2006). *Teori Motivasi dan Pengukurannya*. Jakarta: PT. Bumi Aksara.

7) Jamil, H., & Azra, F. I. (2014). Pengaruh Lingkungan Keluarga dan Motivasi Belajar Siswa terhadap Hasil Belajar Akuntansi Siswa Kelas X SMK Negeri 1 Solok Selatan. *Journal of Economic and Economic Education Vol*, *2*(2), 85-98.

8) Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *The journal of economic education*, *31*(1), 30-43.

9) Marwan, D. (2013). Pengaruh Lingkungan Belajar Terhadap Hasil Belajar Siswa Kelas X Mata Pelajaran IPS di SMK. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa*, *3*(1).

10) Mulyasa, E. (2012). Standar Kompetensi dan Sertifikasi Guru. Bandung: PT. Remaja Rosdakarya.

11) Nopiyanto, Y. E., & Raibowo, S. (2020). Penerapan model pembelajaran Jigsaw untuk meningkatkan motivasi dan hasil belajar mahasiswa penjas pada mata kuliah filsafat penjas dan olahraga. *Journal Of Sport Education (JOPE)*, *2*(2), 61-69.

12) Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of educational psychology*, *97*(3), 444.

13) Nurmala, D. A., Tripalupi, L. E., & Suharsono, N. (2014). Pengaruh motivasi belajar dan aktivitas belajar terhadap hasil belajar akuntansi. *Jurnal Pendidikan Ekonomi Undiksha*, *4*(1).

14) Raudsepp, L., & Liblik, R. (2002). Relationship of perceived and actual motor competence in children.Perceptual & Motor Skills, 94(3), 1059–1070.

15) Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educational psychologist*, *44*(3), 159-175.

16) Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, *25*(1), 54-67.

17) Sağırlı, M., & Okur, B. (2017). The analysis of fourth grade primary students' reader self-perceptions in terms of gender and preschool educational background. *Journal of Education and Training Studies*, *5*(2), 71-78.

18) Saputra, H. D., Ismet, F., & Andrizal, A. (2018). Pengaruh motivasi terhadap hasil belajar siswa SMK. *Invotek: Jurnal Inovasi Vokasional dan Teknologi*, *18*(1), 25-30.

Impact of Psychological Factors on Physical Education Learning Outcomes

19) Ting Lin, Yen. & Min Jou. (2013). Integrating Popular Web Applications In Classroom Learning Environments And Its Effects On Teaching, Student Learning Motivation And Performance. The Turkish Online Journal of Educational Technology, April 2013, volume 12 Issue 2.

20) Wahyuni, D. S. (2016). Pengaruh efikasi diri, Cara belajar, persepsi siswa tentang komunikasi guru dan persepsi siswa tentang perhatian orangtua terhadap hasil belajar siswa kelas XI MAN di Kota Palu. *Matematika dan Pembelajaran*, *4*(2), 21-42.

21) Warti, E. (2016). Pengaruh motivasi belajar siswa terhadap hasil belajar matematika siswa di SD Angkasa 10 Halim Perdana Kusuma Jakarta Timur. *Mosharafa: Jurnal Pendidikan Matematika*, *5*(2), 177-185.

22) Yazid, T. P., & RIDWAN, R. (2018). Proses Persepsi Diri Mahasiswi Dalam Berbusana Muslimah. *An-Nida'*, *41*(2), 193-201.

23) Yu J, Sit CHP, Capio CM, et al. (2016). Fundamental movementskills proficiency in children with developmental coordination disorder: does physical self-concept matter? DisabilRehabil; 38:45–51.

AI Based Chatbot: A Case Study Afghanistan Healthcare Services Mental Health Disorder

Esmatullah Sabet[1], Sayed Shafiullah Sadat [2], Hasib Ahmad Khaliqi[3]

[1,3]Lecturer at Parwan University, Parwan, Afghanistan

[2]Lecturer at Polytechnic University, Kabul, Afghanistan

ABSTRACT: Artificial intelligence increasingly integrates our daily lives with the creation and analysis of intelligent software and hardware, called intelligent agents. Intelligent agents can do a variety of tasks ranging from labor work to sophisticated operations. A Chatbot is a typical example of an artificial intelligence system. For developing artificial intelligence Chatbot, we have implemented encoder-decoder attention mechanism architecture memory cells, TFIDF (term frequency-inverse document frequency) algorithm and LLM (Large Language Module).

To conduct this research, mixed methods research could involve combining both qualitative and quantitative methods to provide a more comprehensive understanding of the research topic. Survey utilized as the main methods for collecting the primary data and reviewed the existing literature for collecting the secondary data in this research. The data was collected from 18 participants, including medical doctors, patients, lecturers and university students in Afghanistan. Additionally, secondary data was obtained through a review of literature from other countries that have faced similar situations.

Moreover, the analysis reveals a widespread belief among respondents that the implementation of AI based Chatbot for Afghanistan healthcare service in mental health disorder will contribute to reduce illness in Afghanistan.

KEYWORDS: Artificial Intelligence (AI), Chatbot, TFIDF (term frequency-inverse document frequency), Afghanistan.

I. INTRODUCTION

Chatbot are Artificial Intelligence (AI) based systems or computer software through which we can human interaction with it using various techniques which include Neural Network (NN) and Natural Language Processing (NLP). AI technology which is used for building machines to process information and gives a response, which is very close to real. We can use some text and get a response from the system as real person by text and speech. It can be simple as answering a single line or it can reply too many sentences based on collecting most important words from it (Kumar & Ali, 2020).

This chatbot is planned to help the healthcare system to give answer to people without any doctor or healthcare employ. This system will save much time of people compare to consulting and meeting the doctor. The query will be answered by a trained system, if the answer is not available in the data set it will response negative.

II. PROBLEM STATEMENT

In 2022, the Ministry of Public Health reported that one out of two people in Afghanistan suffered from mental disorders, including depression and anxiety. The increasing awareness of mental health has made it a primary concern of development. Nearly 16 million people in Afghanistan needed cure, where the low and middle class faced more burden than the well-off people. This project is an attempt to make mental health more accessible. This conversational agent can be complemented with clinicians to make it more effective and fruitful (moph.gov.af/en/node/3173, 2022).

III. RESEARCH GOAL

It will give you a clear picture that healthcare today need to adopt this technology to drive more treatment, this Chatbot helps the healthcare system to give answer to many people without any doctor or healthcare employ. This system also save much time of people compare to consulting and meeting the doctor in section of mental health disorder.

AI Based Chatbot: A Case Study Afghanistan Healthcare Services Mental Health Disorder

IV. LITERATURE REVIEW

This research is intended to cover the literature review of the study where in this research studied about chatbot in the area of mental health. Chatbots represents a potential shift in the interaction of people with data and services online (Brandtzaeg & Følstad, Why people use chatbots, 2017). With the increase rise of interest in chatbot design and development, we lack the knowledge to know about why humans use chatbots.

They are simulations which can understand human language, can process it and response to human while performing specific tasks, for example, a chatbot can be employed as a helpdesk executive. Chatbots are not considered as a recent development. The first chatbot was created by Joseph Wiesenbaum in 1966 named as Eliza (Weizenbaum & ELIZA, 1966). It first started when Alan Turing published an article named "Computer Machinery and Intelligence" and this raised an intriguing question, "Can machine think?" Since then we have seen multiple chatbots that are outstanding to their predecessors to become more naturally conversant and technologically advanced. These advancements made an era where conversations with chatbots have become more normal and natural as with another human.

Brief Timeline of Chatbots

1950

The Turing test was created by Alan Turing (Turing, 1950). It was a test of a machine's ability to exhibit intelligent behavior equivalent to, or indistinguishable from, that of a human.

1966

Eliza, the first chatbot, was created by Joseph Weizenbaum, designed to be a therapist (Gentner, Neitzel, Schulze, & Buettner, 2020). It used a method called "pattern matching" and "substitution" to create the illusion the bot was understanding what the user was saying.

1972

Parry, created chatbot by Kenneth Mark Colby, a psychiatrist and computer scientist from Stanford's Psychiatry Department in 1972 (ZEMČÍK, 2019). Unlike Eliza, Parry tried to make people pay attention to something else instead of itself.

1981

The Jabberwocky chatbot was created by British computer programmer Rollo Carpenter in 1981. It was launched on the internet in 1997. The goal of this chatbot was to make people feel like they were talking to another person in a natural, fun, and entertaining way. (Raj, 2019).

1992

In 1991, there was a significant advancement in the development of chatbots with the creation of Dr. Sbaitso happened. This chatbot utilized the Sound Blaster sound card, a groundbreaking technology developed by 16 Creative Labs. Dr. Sbaitso was able to synthesize speech, allowing it to communicate verbally and appear more human-like than its predecessors. However, despite this advancement, chatbots still struggle with communicating in a complex and sophisticated manner, a challenge that persists to this day (ZEMČÍK, 2019).

1995

A.L.I.C.E. (Artificial Linguistic Internet Computer Entity) chatbot based on natural language artificial intelligence. A.L.I.C.E. sometimes called Alicebot it is available as free and open source software. Alicebot is a chatbot that uses a special computer language called AIML (Artificial Intelligence Markup Language) to give responses to your query (Bani & Singh, 2017).

2001

SmarterChild is a chatbot that can help you find information quickly. It was made by a company called ActiveBuddy and was first released in 2001. You can use it to get news, weather, stock information, movie listings, and information on how to get around. But it is no longer used (Singh & Thakur, 2020).

2010

Siri is a smart assistant that you can use on your iPhone. It can help you with things like making phone calls, sending messages, and setting reminders. It's made by a company called the International Artificial Intelligence Center, and it uses speech recognition technology from a company called Nuance Communications. Siri also uses advanced computer learning to work its magic. In 2012 Google launched the Google Now chatbot. It was originally codenamed "Majel" after Majel Barrett, the wife of Gene Roddenberry and the voice of computer systems in the Star Trek franchise; it was also codenamed as "assistant" (Raj, 2019).

2014

Alexa is a popular virtual voice assistant application developed by Amazon. Alexa provides multiple functionalities like real-time data extraction, voice interaction, weather forecast, broadcasting, smart audio-video streaming, tasks list management, home, automation control and others (Sadavarte & Bodanese, 2019).

AI Based Chatbot: A Case Study Afghanistan Healthcare Services Mental Health Disorder

2016

In 2016, Facebook introduced a new platform for Messenger that allowed chatbots to interact with users. Later on, the chatbots were able to join groups, show a preview of what they could do, and even scan QR (Quick Response) codes through the camera on Messenger. This allowed users to quickly access the chatbot without having to search for it. In May 2016, Google unveiled its Amazon Echo competitor voice-enabled bot called Google Home at the company's developer conference. It enables users to speak voice commands to interact with various services (Raj, 2019).

2017

Woebot is a chatbot that is easy to use for several reasons. It is also user-friendly, and it has a policy that keeps your personal information. Woebot is a chatbot that can give you quizzes and videos to help you learn about your thoughts and mental health (Brandtzaeg, Skjuve, Dysthe, & Følstad, 2021).

V. RESEARCH METHODOLOGY

Research methodology is very important in any research and I want to mention Case study and Systematic Literature Review is used in this research. And data collection for this step addressing research questions may involve quantitative methods such as surveys and data collection, sampling the appropriate sample population for the study this may include medical doctors that worked in section of mental health and patients who have experienced.

Furthermore, in this section, the methodology for this research is explained. It dialogs about the methods used for gathering data from different groups of the people that worked and are experienced in section of mental health disorder. As this is a qualitative research and requires explanation of the answers given by the respondents, therefore, I have talked with many doctors about my topic, according of the instruction prepared the questionnaire form in Persian language after finishing the survey, the questions were changed to English and set to a dataset for analyzing and manipulating.

A. DATA COLLECTION

We have collected data using the chosen research design. This involved conducting surveys and analyzing data from relevant sources such as government reports, databases, and academic literature. For the surveys we will design questioner in Google forms according to our research question, the questioners were designed in two categories: the first part put personal information for responders, second parts include question for professional's doctor and who have experienced or have information about this issue.

In overall our data collection performed in two ways, one was primary data collection and the other was secondary data collection methods. Both the primary and the secondary data collection is presented here:

Primary Data Collection

Primary data is the data that has been collected from the Kabul hospital doctors at and citizens who had experience in mental disorder. Conducting surveys is a popular method of primary data collection. We create a questionnaire and distributed it to people who have experience in mental disorder in Afghanistan.

Secondary Data Collection

Secondary data collection refers to the process of collecting data from existing sources rather than directly from a primary source. In the context of the AI chatbot for Afghanistan health care services especially in mental health chatbot, secondary data collection involved gathering information from a variety of sources, such as academic journals and research papers.

B. THE DATA ANALYSIS AND RESULTS

The implementation of AI based chatbot for Afghanistan healthcare service in mental health disorder, presents a range of challenges that must be carefully analyzed and addressed to ensure the success of the project. As a system analyst, it is important to conduct a thorough analysis of these challenges in order to identify potential solutions and ensure that the system is designed and implemented in a way that is both effective and usable for public. This questionnaire is designed to guide the analysis of challenges in the implementation of AI based chatbot for Afghanistan healthcare service in mental health disorder, with a particular focus on data set. The questionnaire aims to provide a comprehensive overview of the chatbot that must be addressed in order to ensure we have a successes project. The analysis generated by this questionnaire can help to inform the development and implementation of the project in Afghanistan and beyond.

The majority of respondents expressed that the implementation of this chatbot will decrease the concern of Afghan people about mental health disorders and 83.3% agree and 11.1% are not, illustrate in the figure 5.3.

VI. CONCLUSIONS

This research explains a medical chatbot which can be used to replace the conventional method of disease diagnosis and treatment recommendation. The chatbot can acts as a user application. The users of this application can specify their symptoms

to the chatbot and in turn, chatbot will specify the health measures to be taken. General information about symptom and diseases are available in the dataset and thus the chatbot instance can provide information about disease and treatment of a user. After analyzing the symptoms of different users, it finally predicts the disease to the user and details about the treatment become visible.

A smart medical chatbot can be useful to patients by identifying the symptoms as described by them, giving proper diagnosis and providing with suitable treatment for the disease. In the busy life, it is rare for people to frequently visit hospitals for check-ups. Chatbot is great importance in such situations as they provide diagnostic assistance with a single click of button. Chatbot doesn't require the help of any physician to give proper health measures to the users and this is one of the major advantages of chatbot. Moreover, the cost effectiveness in using chatbot is a major attractiveness to users. The chat with users is completely personal and this helps users to be more open with their health matters and paves way for chatbot to efficiently identify the disease.

Furthermore, the role played by chatbot can sometimes be beyond the scope and user may require consulting a doctor for taking health related tests. In such situations, chatbot can be helpful if it can be made to set up an appointment with an efficient doctor based on their schedule. Also it will be beneficial if the symptoms and disease identified by the chatbot can be made into a report and automatically forwarded to an available doctor where he can further assist the user with more advices and future measures to maintain their health.

REFERENCES

1) R. Kumar and M. M. Ali, "A Review on Chatbot Design and Implementation Techniques," *International Research Journal of Engineering and Technology (IRJET),* 2020.

2) P. B. Brandtzaeg and A. Følstad, "Why people use chatbots," *Thessaloniki, Greece,* 2017.

3) J. Weizenbaum and ELIZA, " a computer program for the study of natural language communication between man and machine. Commun," *ACM,* pp. p. 36-45, 1966.

4) A. M. Turing, "Computing machinery and intelligence," 1950.

5) T. Gentner, T. Neitzel, J. Schulze and R. Buettner, "A Systematic Literature Review of Medical Chatbot Research from a Behavior Change Perspective," *IEEE,* p. 735, 2020.

6) M. T. ZEMČÍK, "A Brief History of Chatbots," 2019.

7) B. S. Bani and P. A. Singh, "College Enquiry Chatbot Using A.L.I.C.E," *International Journal of New Technology and Research (IJNTR) ,* 2017.

8) S. Singh and H. K. Thakur, "Survey of Various AI Chatbots Based on Technology Used," *International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO) Amity University, Noida, India,* 2020.

9) S. S. Sadavarte and E. Bodanese, "Pregnancy Companion Chatbot Using Alexa and Amazon Web Services," *IEEE,* 2019.

10) P. B. Brandtzaeg, M. Skjuve, K. K. Dysthe and A. Følstad, "When the Social Becomes Non-Human: Young People's Perception of Social Support in Chatbots," 2021.

The Role of School Sports in Shaping Student Identity and Social Relationships

Le Phuoc Quang

National Academy of Public Administration, Vietnam

ABSTRACT: This qualitative study explores the impact of school sports on student identity and social relationships in Vietnamese secondary schools. Employing in-depth interviews, focus groups, and observational methods, the research examines the experiences of students, coaches, and administrators across three distinct school settings. Findings indicate that participation in school sports significantly enhances students' self-perception and identity, facilitates robust social connections, and fosters community. Additionally, the study reveals that school sports programs are effectively integrated with Vietnamese cultural values, particularly emphasizing collectivism and community orientation. However, gender differences in sports participation highlight the need for more inclusive and gender-sensitive program designs. The study also identifies challenges related to resource limitations and balancing academic and sports commitments, suggesting areas for policy enhancement. This research contributes to the broader understanding of the educational value of extracurricular activities. It underscores the potential of school sports as a tool for personal and social development in academic settings. Importantly, the findings offer practical and actionable insights for educators and policymakers, providing a roadmap to optimize the benefits of school sports programs.

KEYWORDS: School Sports; Student Identity; Social Relationships; Cultural Values; Education

INTRODUCTION

The role of school sports extends beyond physical development and athletic achievement, influencing various aspects of young people's lives. In educational settings, sports programs are often celebrated for their potential to foster teamwork, discipline, and resilience. However, the impact of these programs on student identity and social relationships remains a nuanced field worthy of detailed exploration. This research seeks to illuminate how participation in school sports shapes students' identities and social dynamics, providing insights that could enhance educational policies and practices (Hwang et al., 2016).

In Vietnam, school sports are integral to the educational curriculum, reflecting the nation's cultural emphasis on collective activities and community participation. Despite the widespread implementation of sports programs, there remains a significant gap in localized research addressing how these activities influence Vietnamese students' social interactions and identity formation. This gap is particularly noticeable in Vietnam's rapidly changing social fabric, where traditional values increasingly intersect with global influences. Understanding the role of school sports within this unique cultural setting is essential for developing programs that support positive student social and identity outcomes (Lizzio et al., 2021).

Globally, much of the existing research on school sports focuses on physical health outcomes or generic skill development, such as leadership and teamwork. Less attention has been paid to these programs' more profound social and identity-related impacts, particularly in non-Western contexts. In Vietnam, the lack of specific studies exploring the intersection of sports participation with aspects of social identity and peer relationships is particularly striking in the country's rapidly changing social fabric. This study aims to fill this gap by explicitly focusing on the qualitative aspects of how school sports influence student life within the Vietnamese cultural milieu (Higginbotham, 2021).

This study employs a rigorous qualitative research approach to deeply understand the experiences and perceptions of students involved in school sports. Methods such as in-depth interviews, participant observations, and focus groups will be utilized to gather rich, descriptive data that provides insights into sports participation's personal and social dimensions. These approaches are particularly suited to exploring the complex, nuanced interactions and meanings that sports activities engender among youth, allowing for a comprehensive understanding of their impact on student identity and social relations.

The Role of School Sports in Shaping Student Identity and Social Relationships

The findings of this research are expected to have significant implications for educational policy, school management, and the broader field of youth sports development. By providing a detailed examination of how school sports influence social relationships and identity among Vietnamese students, this study will offer valuable insights for educators, policymakers, and sports program designers aiming to enhance the effectiveness and inclusiveness of school sports programs. Moreover, the insights gained could guide interventions that promote positive social integration and identity reinforcement, thereby supporting the holistic development of students.

LITERATURE REVIEW

Impact of School Sports on Student Identity

A study by Pot et al. (2024) examined the impact of school sports on the development of student identity among high school athletes in the United States. The researchers found that participation in sports significantly contributed to a sense of self and community among students. Their qualitative analysis highlighted that sports provided a platform for students to express themselves, gain confidence, and establish a social identity within their peer group. This study is foundational in understanding the broader implications of sports on identity, suggesting that similar dynamics may be observed in other cultural contexts, including Vietnam.

School Sports and Social Relationships

Jacks et al. (2022) explored the role of school sports in fostering social relationships among students in Australian secondary schools. Through focus groups and interviews, they discovered that sports activities facilitated bonding and reduced social barriers between diverse student groups. The findings underscore the importance of school sports as a social bridge, enhancing communication and understanding among students from different backgrounds. This research supports the premise that sports can be a critical tool for social integration, particularly relevant in Vietnam's culturally diverse setting.

Cultural Context and Sports Participation

Straub et al. (2001) conducted a study specifically focused on Vietnamese school settings, investigating how cultural factors influence participation in school sports. They found that cultural values such as collectivism and community orientation significantly affected students' engagement in sports. The study revealed that students who felt a strong alignment between their cultural values and the ethos of their sports teams were more likely to report positive identity and relationship outcomes. This research highlights the necessity of considering cultural elements when assessing the impact of school sports.

Gender Differences in Sports Participation

A gender-focused analysis by MPEd (2022) on participation in school sports across several Asian countries, including Vietnam, found that boys and girls experienced and interacted with school sports differently. While boys often reported sports as a means for social status and competition, girls viewed sports more as a channel for fitness and socialization. This distinction is crucial for understanding how school sports contribute to identity formation differently based on gender, which could inform more gender-inclusive sports programs.

Long-term Effects of School Sports

In a longitudinal study, Kramer (2021) investigated the long-term effects of school sports participation on personal and professional identity development. Following participants from their school years into early adulthood, Kramer found that those who participated in sports were likelier to demonstrate leadership qualities, have higher self-esteem, and maintain more robust social networks. This study suggests the enduring impact of school sports on personal and social aspects of life, which may be especially significant in a collectivist culture like Vietnam's (Troutman & Dufur, 2007).

RESEARCH METHODS

Research Design

This study employs a qualitative research design to explore the role of school sports in shaping student identity and social relationships in Vietnamese schools. The qualitative approach was chosen because it is strong in understanding complex social phenomena from the participants' perspectives. This method allows for in-depth exploration of personal experiences, cultural contexts, and the nuanced ways school sports impact students.

Participants

The participants for this study will be selected from three high schools in Vietnam, representing a mix of urban and rural settings to encompass a diverse range of experiences and backgrounds. Approximately 30 students aged between 13 and 18 years will be recruited, along with ten coaches and five school administrators, to gain multiple perspectives on the impact of school sports. Inclusion criteria for students will require active participation in school sports programs for at least one academic year.

The Role of School Sports in Shaping Student Identity and Social Relationships

Data Collection Methods

In-depth Interviews: Semi-structured interviews will be conducted with all participants to explore their experiences and perceptions regarding school sports. Each interview will last approximately 45-60 minutes and will be conducted in Vietnamese. Questions will probe into how sports participation has influenced their identity, social interactions, and perceived social cohesion within their school environment.

Focus Groups: Two focus groups, one comprising only students and another with coaches and administrators, will be held to discuss collective views and experiences related to school sports. These sessions aim to generate more dynamic discussions about sports participation's cultural and social impacts.

Observational Studies: Observational visits will be made during sports practices and matches to note interactions, behaviors, and the environment of sports activities. Observations will help contextualize the interview and focus group data, providing a more comprehensive understanding of the sports culture within schools.

Data Analysis: Data from interviews and focus groups will be transcribed and translated into English for analysis. Thematic analysis will identify, analyze, and report patterns within the data. This approach will involve coding the data in phases, beginning with initial codes generated as data is collected and refined into broader themes as more data is analyzed.

Ethical Considerations: Ethical approval will be obtained from the participating schools and a university ethics committee. All participants will be secured with informed consent, with additional parental consent for minors. Participants will be assured of confidentiality and the right to withdraw from the study at any point without consequence. All data will be anonymized to protect the participants' identities.

Validity and Reliability

To ensure validity and reliability, the study will employ triangulation, involving multiple data sources (interviews, focus groups, and observations). Member checking will also be utilized, where participants are given a chance to review and comment on the findings to ensure the accuracy and authenticity of the reported data.

RESEARCH RESULTS

Emergence of Identity and Self-Perception: The interview and focus group data analysis revealed that participation in school sports significantly influences students' self-perception and identity formation. Students frequently described feeling more confident and self-assured due to their involvement in sports (Davies & O'Neill, 2022). They noted that the recognition and encouragement from peers and coaches during sports activities contributed to a stronger sense of self and a positive identity. Many students expressed that sports allowed them to find a "niche" within the school community where they felt valued and accepted (Pfingsthorn et al., 2021).

Social Relationships and Community Building: School sports emerged as a critical platform for building social relationships and fostering community among students. Participants highlighted how sports activities facilitated interactions across different social and academic groups, helping to break down barriers between students. Coaches and administrators observed that sports teams function as small communities where students learn to support one another, which often translates into improved social cohesion in the broader school environment (Umalihayati, 2023).

Cultural Integration and Value Alignment: The study found that school sports programs in Vietnam often align with local cultural values, such as community spirit and collective well-being, enhancing their impact on students. Students reported that the emphasis on teamwork and group success in sports resonates with Vietnamese cultural norms, prioritizing communal harmony over individual achievement. This cultural integration helps reinforce students' cultural identities and promotes inclusive social interactions (Vu et al., 2023).

Gender Dynamics in Sports Participation: Data indicated significant gender differences in school sports experiences. Male students often perceived sports as a domain for showcasing strength and competitiveness, whereas female students appreciated social interaction and physical fitness opportunities. Despite these differences, both genders acknowledged the benefits of sports in developing personal identity and social networks (Alcaraz-Muñoz et al., 2023).

Challenges and Limitations: While the overall impact of school sports on student identity and social relationships was positive, some challenges were noted. Access to resources, such as sports facilities and equipment, was a concern, especially in rural schools. Some students also mentioned the pressure of balancing academic responsibilities with sports, which could sometimes lead to stress and anxiety (Sukmadewi, 2022).

Comparative Insights: Observational data supported the interview and focus group findings, showing active engagement and positive student interactions during sports activities. Observations also highlighted the role of coaches and school administrations in facilitating a supportive sports environment, which is crucial for the benefits observed (Woolley et al.,2018).

The Role of School Sports in Shaping Student Identity and Social Relationships

DISCUSSION

The findings from this study significantly contribute to understanding how school sports impact student identity and social relationships in Vietnam. As demonstrated, sports serve as a form of physical activity and a vital component of social and personal development. Enhancing self-perception and identity among students through sports participation underscores the role of athletic activities in fostering a sense of achievement and belonging. This aligns with existing literature that suggests sports are a medium through which students can explore and solidify their identities within a supportive community setting.

Integration of Cultural Values: The alignment of sports programs with Vietnamese cultural values such as collectivism and community orientation is particularly noteworthy. This cultural unity may enhance the effectiveness of sports in promoting social cohesion and integration, supporting findings from Ting-Toomey (2020) regarding the importance of cultural considerations in sports participation. This aspect of the study highlights the potential of tailored sports programs to reinforce national and cultural identities, suggesting that policymakers and educators should consider cultural values when designing or implementing school sports programs.

Gender Differences and Inclusivity: The observed gender differences in sports participation and benefits indicate areas for further development in school sports programs. The distinct values that sports hold for male and female students suggest initiatives that specifically address these differences, potentially by promoting sports that emphasize inclusivity and equality (Guerrero et al., 2023). Ensuring that sports programs cater effectively to all students regardless of gender could further enhance their impact on student identity and social relationships.

Challenges in Implementation: The challenges identified, such as resource limitations and the pressure of balancing academic and sports commitments, are critical for understanding the constraints within school sports programs. These findings suggest that more comprehensive support systems may be necessary to maximize the benefits of sports participation. This could involve investments in sports facilities, especially under-resourced areas, and developing programs that integrate sports more seamlessly with academic schedules.

Implications for Future Research: This study opens several avenues for future research. Longitudinal studies could explore the long-term impacts of sports participation on student development beyond the school years (Tuoi & Thanh, 2023). Comparative studies between different regions within Vietnam could further elucidate how regional variations in cultural and economic conditions affect the outcomes of sports programs (Hoa & Thanh, 2023). Additionally, research focusing on the perspectives of parents and non-participating students could provide a more rounded view of the community impact of school sports.

Limitations: The study's limitations include the reliance on self-reported data, which can be subject to biases such as memory recall and social desirability (Thang & Thanh, 2023b). Although efforts were made to ensure reliability and validity through methodological triangulation and member checking, future studies might benefit from incorporating more objective social and personal development measures (Thanh et al., 2021).

CONCLUSION

This qualitative study delved into the transformative role of school sports in shaping student identity and fostering social relationships within Vietnamese secondary schools. Through in-depth interviews, focus groups, and observations, we uncovered compelling evidence that school sports significantly boost students' self-esteem and foster a robust sense of belonging (Verónica et al. 2023). These athletic programs provide more than just physical benefits; they are a crucial platform for personal growth and social integration.

Our findings revealed that school sports are intricately woven with the fabric of Vietnamese cultural values, particularly collectivism. This alignment dramatically enhances the social impact of these programs, promoting a strong sense of community and cooperation among students (Verónica et al., 2023). Such integration is crucial, considering the distinct ways male and female students engage with sports, highlighting the need for gender-sensitive approaches to maximize inclusivity and effectiveness (Thang & Thanh, 2023a).

The implications of this research are profound for educational policymakers and school administrators. There is a clear call to amplify support for sports programs, especially in under-resourced areas, and to tailor these programs to reflect and reinforce cultural values. This approach promises to deepen the impact of sports on students' development and prepare them for broader societal engagement.

Looking ahead, the scope for further research is vast. Longitudinal studies could shed light on the long-term effects of sports participation, while comparative studies across different regions could unveil how local conditions influence sports outcomes. Such efforts would provide a richer understanding of how best to harness the potential of school sports for student development.

The Role of School Sports in Shaping Student Identity and Social Relationships

In conclusion, the power of school sports extends far beyond the playing fields. They are a vital tool in the educational landscape, significantly enhancing students' personal and social experiences. By strategically leveraging this tool, schools can profoundly enrich students' lives, indelibly impacting their journey through education and into society. This study contributes to our understanding of the role of extracurricular activities in shaping youth and underscores the unique potential of school sports in the Vietnamese context.

REFERENCES

1) Alcaraz-Muñoz, V., Roque, J. I. A., & Lucas, J. L. Y. (2023). How do Girls and Boys Feel Emotions? Gender Differences in Physical Education in Primary School. Physical Culture and Sport. Studies and Research, 100(1), 25-33.
2) Davies, H., & O'Neill, J. (2022). Adolescents' experiences of identity development in schooling. Journal issue, (3).
3) Guerrero, M. A., & Guerrero Puerta, L. (2023). Advancing gender equality in schools through inclusive physical education and teaching training: a systematic review. Societies, 13(3), 64.
4) Higginbotham, G. D. (2021). Can I belong in school and sports?: The intersectional value of athletic identity in high school and across the college transition. Cultural Diversity and Ethnic Minority Psychology, 27(4), 613.
5) Hoa, N. T. T., & Thanh, N. N. (2023). Factors Affecting Corruption Control in Public Administration: Evidence from Vietnam. Journal of Law and Sustainable Development, 11(12), e1636-e1636.
6) Hwang, S., Feltz, D. L., Kietzmann, L. A., & Diemer, M. A. (2016). Sport involvement and educational outcomes of high school students: A longitudinal study. Youth & Society, 48(6), 763-785.
7) Jacks, T., Palvia, P., Serenko, A., & Ghosh, J. (2022). Global perspectives on IT occupational culture: A three-way cultural analysis. Communications of the Association for Information Systems, 51(1), 27.
8) Kramer, T., Valente-Dos-Santos, J., Visscher, C., Coelho-e-Silva, M., Huijgen, B. C., & Elferink-Gemser, M. T. (2021). Longitudinal development of 5m sprint performance in young female tennis players. Journal of sports sciences, 39(3), 296-303.
9) Lizzio, A., Dempster, N., & Neumann, R. (2011). Pathways to formal and informal student leadership: The influence of peer and teacher–student relationships and level of school identification on students' motivations. International journal of leadership in education, 14(1), 85-102.
10) MPEd, D. N. E. (2012). Motivational gender differences in sport and exercise participation among university sport science students. Journal of Physical Education and Sport, 12(2), 180.
11) Pfingsthorn, J., Czura, A., Kramer, C., & Štefl, M. (2021). Interculturality and professional identity: Exploring the potential of telecollaboration in foreign language teacher education. Interculturality and the English Language Classroom, 83-115.
12) Pot, N., Schenk, N., & Van Hilvoorde, I. (2014). School sports and identity formation: Socialisation or selection?. European Journal of sport science, 14(5), 484-491.
13) Straub, D., Loch, K. D., & Hill, C. E. (2001). Transfer of information technology to the Arab world: a test of cultural influence modeling. Journal of Global Information Management (JGIM), 9(4), 6-28.
14) Sukmadewi, N. K. D. (2022). Peran Kepala Sekolah Dalam Meningkatkan Mutu Pendidikan Sekolah. Metta: Jurnal Ilmu Multidisiplin, 2(4), 355-364.
15) Thang, N. D., & Thanh, N. N. (2023a). The Factors Influence the Intention to Invest in Green Tourism in Vietnam: Evidence from Business Survey. International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8(5), 121.
16) Thang, N. D., & Thanh, N. N. (2023b). The Relationship Between Awareness and Commitment to Participate in the Green Tourism Model of Local Communities: Evidence from the Hmong People Community in Lao Cai Province-Vietnam. International Journal of Professional Business Review, 8(6), e02540-e02540.
17) Thanh, N. N., Trung, N. S., Chien, T. T., Ha, T. T. N., Hien, N. L. T., & Thuy, N. T. (2021). A study on work motivation of commune level civil servants in Vietnam. Pt. 2 J. Legal Ethical & Regul. Isses, 24, 1
18) Thanh, N. N., Tung, P. H., Thu, N. H., Kien, P. D., & Nguyet, N. A. (2021). Factors affecting the share of fake news about the COVID-19 outbreak on social networks in Vietnam. Journal of Liberty and International Affairs, 7(3), 179-195.
19) Ting-Toomey, S. (2009). Intercultural conflict competence as a facet of intercultural competence development: Multiple conceptual approaches. The Sage handbook of intercultural competence, 100-120.
20) Troutman, K. P., & Dufur, M. J. (2007). From high school jocks to college grads: Assessing the long-term effects of high school sport participation on females' educational attainment. Youth & society, 38(4), 443-462.
21) Tuoi, N. T., & Thanh, N. N. (2023). The Impact of Digital Capabilities on the Work Performance of Provincial Civil Servants in Vietnam. Journal of Law and Sustainable Development, 11(4), e560-e560.

22) Umalihayati, U. (2023). School-Community Relationships as a Key Factor in the 21st-Century Learning. Tarbawi: Jurnal Keilmuan Manajemen Pendidikan, 9(01), 133-140.

23) Verónica, A. M., José Ignacio, A. R., & Juan Luis, Y. L. (2023). How do Girls and Boys Feel Emotions? Gender Differences in Physical Education in Primary School.

24) Vu, H. T. T., Le, N. H., Phan, L. T., & Nguyen, S. T. U. (2023). Effectiveness of building a culture of learning among Vietnamese pedagogical university students. International Journal of Education and Practice, 11(3), 439-449.

25) Woolley, K., Edwards, K. L., & Glazebrook, C. (2018). Focus group or individual interviews for exploring children's health behaviour: the example of physical activity. Adv Pediatr Res, 5(02), 1-10.

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

Le Hai Ha
Thuong Mai University, Vietnam

ABSTRACT: In recent years, mixed-frequency data analysis models have received much attention and application in the fields of economics and finance, especially in forecasting national macroeconomic indicators. However, in Vietnam, there are almost no studies applying these models. Vietnam is a country with a long-standing agricultural production background and the workforce mainly makes a living from farming. There are many types of Vietnamese agricultural products with high export value, bringing a significant source of foreign currency to the country. Coffee is Vietnam's main export product, a product that earns a lot of foreign currency, contributing to the country's socio-economic development. Therefore, applying models with mixed frequency data such as MIDAS to forecast coffee export growth is a promising new research direction.

KEYWORDS: forecast, export growth, coffee

1. INTRODUCTION

In the context of the world economy in general and the Vietnamese economy in particular appearing more and more frequently unstable factors, accurately analyzing and forecasting the movements of economic indicators is essential. Macroeconomics is extremely important in policy management and macroeconomic stability. A good analysis and forecast result will help the economy avoid disruptions, limit risks, and take advantage of development opportunities. Analyzing and forecasting macroeconomic indicators in general and forecasting export turnover in particular is always an urgent requirement, especially for a developing country like Vietnam, an open economy. Due to its small scale, it is vulnerable to adverse external fluctuations. Therefore, researching and finding appropriate forecasting methods for Vietnam's export turnover is important.

Over the past several decades, Vietnamese coffee production has developed as an export-oriented industry. Although coffee has gone through many ups and downs, fluctuations in output, turnover and export prices, it is always a key industrial crop, strategically linked to the lives of tens of thousands of producers, contributing to improve living standards and income for thousands of workers.

As the world's second largest coffee producer and exporter, our country's coffee products have been exported to more than 80 countries and territories, especially markets such as the United States and the EU. , Japan, Korea, with the signing of free trade agreements, Vietnam's coffee export industry in recent years has increasingly improved in quality and output, enhancing competitiveness. Compete with other countries.

However, deep international integration will cause Vietnam's economy to suffer strong fluctuations due to shocks in the international market, typically the Covid-19 pandemic. When global supply chains break down, it will significantly affect the connection points of the chain (including Vietnam), thereby, there will be certain impacts and risks on export activities in general. General and coffee export activities in particular. Therefore, forecasting coffee export growth in the coming period is a concern not only for researchers but also for policymakers in each country in the world.

This reality creates an urgent need to build new layers of models to better forecast unusual fluctuations in the short term, promptly meeting the requirements of macroeconomic management. The mixed-frequency data analysis model has the great advantage of making the most of high-frequency data collected (day, week, month) to make predictions for the dependent variable with low-frequency data. (Year quarter). According to Kuzin's (2011) research, the mixed frequency data analysis method shows effectiveness in short-term forecasting of macroeconomic indicators; According to Yu Jiang and research team (2017), forecasting methods using mixed frequency data have better accuracy than traditional forecasting methods. Therefore, in this study, the mixed-frequency data analysis model is applied to best exploit data collected with different frequencies (daily, monthly, and

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

quarterly) and from many activities. Different economic sectors/regions to instantly forecast the growth rate of Vietnam's coffee exports. The experimental results are expected to create a premise to further promote the application of mixed-frequency data analysis models for forecasting other important macroeconomic indicators that government agencies need. The government needs to monitor for policy planning, and at the same time serve as a basis for integrating mixed-frequency data regression techniques into the quantitative analysis model system of policy-making agencies to meet the needs of the government. The goal of manage macroeconomic policies in general and coffee export policies in particular in the new period of Vietnam.

2. OVERVIEW OF MIXED FREQUENCY DATA ANALYSIS MODELS

The mixed frequency data analysis model (MIDAS) was proposed by the author group Eric Ghysels, Arthur Sinko & Rossen Valkanov in 2002. The mixed frequency data analysis model is the regressions. The reduced-form parameterization involves sampling processes at different frequencies. In which, the explanatory variables have different frequencies, equal to or higher than the frequency of the dependent variable, and for explanatory variables with higher frequencies, lagged distribution polynomials are used to prevent the increase in frequency. Increase in the number of parameters as well as problems related to the choice of delay order.

Basic mixed frequency data analysis model for one explanatory variable and the next step with $h_q = h_m/m$ is defined as follows:

$$y_{t_q + mh_q} = y_{t_m + h_m} = \beta_0 + \beta_1 b(L_m; \theta) x^{(m)}_{t_m + w} + \varepsilon_{t_m + h_m}$$

In there:

- y is the dependent variable with low frequency; x is an explanatory variable with high frequency.

- t_q is the time at which low-frequency data is available, t_m is the time when y has high frequency data available and h_q is the low frequency forecast time; H_m is the time of high frequency forecasting.

- m is an index that determines the higher frequency of the independent variable compared to the dependent variable. For example, if y has a quarterly frequency and x has a monthly frequency, then m = 3, and if y has a quarterly frequency and x has a weekly frequency, then m = 12.

- $b(L_m; \theta) = \sum_{k=0}^{K} c(k; \theta) L_m^k$ is the lag polynomial with L_m is the delay operator defined by:

$L_m^k x^{(m)}_{t_m} = x^{(m)}_{t_m - x} \cdot x^{(m)}_{t_m + w}$ sampled from high-frequency variables x_{t_m}

- $c(k; \theta)$ are the parameters of the model's lag coefficients that need to be estimated.

One of the main problems of the MIDAS method is to find a suitable parameterization for the lag coefficients $c(k; \theta)$. Because x_{t_m} has a higher frequency y_{t_q}, full modeling often requires multiple lags in the regression equation, which can lead to over-parameterization. Some popular weighting schemes for parameterization such as Almon are also called "Exponential Almon Delay" corresponding to the Almon delay function. Specifically, the Almon diagram is represented as follows:

$$c(k; \theta) = \frac{\exp(\theta_1 k + \cdots + \theta_Q k^Q)}{\sum_{k=1}^{K} \exp(\theta_1 k + \cdots + \theta_Q k^Q)}$$

Where Q is the number of parameters of θ, or θ = (θ1,θ2,…,θQ) are the parameters that need to be estimated. This function is quite flexible and can take many different shapes with just a few parameters. They can be ascending, descending or concave patterns. Ghysel, Santa-Clara, and Valkanov (2005) used this functional form with two parameters, which allows great flexibility and determines how many lags are included in the regression. Because the Almon lag scheme is the most commonly used and highly flexible, in this study the authors used the Almon lag scheme to determine appropriate parameterizations for the lag coefficients of the model.

Mixed frequency data analysis models are widely used in the financial sector; macroeconomics and was developed by Ghysels and a number of authors to produce extended models of unrestricted mixed frequency data analysis or U-MIDAS (a model for analyzing data with mixed frequency The mixture is supplemented with various restrictions on the influence of high-frequency variables by having each higher-frequency factor identified as an explanatory variable in a low-frequency regression, analyzing high-frequency data. STEP weighted mixed probability or STEP-MIDAS (which is a U-MIDAS model where the coefficients for high-frequency data are constrained using the STEP function, augmented polynomial lag MIDAS model or ADL-MIDAS (where, for each high frequency up to k, the regression coefficients of the high-frequency components are modeled as a p-dimensional lag polynomial), the exponential Almon weighted MIDAS model or EAW-MIDAS (which is a MIDAS model using exponential weights

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

and second-order lag polynomials), β-weighted MIDAS model or BW-MIDAS (which is a MIDAS model using β-weighting function) (Andreou, Ghysels, and Kourtellos 2010; Ghysels, Kvedaras, and Zemlys 2016; Kvedaras et al. 2021). In particular, the U-MIDAS, STEP-MIDAS, and ADL-MIDAS models are estimated using the least squares (OLS) linear regression method, while the EAW-MIDAS and BW-MIDAS models are estimated. using the least squares nonlinear regression method. The advantage of the mixed frequency data analysis (MIDAS) model is that, in addition to overcoming the problem of mixed frequency data, it also reduces the number of estimated parameters and simplifies the regression model. simpler. The weighting function is used to reduce the number of parameters in MIDAS regression. According to published research results, mixed-frequency data analysis models are often effective for immediate forecasting and short-term forecasting.

3. RESEARCH DATA

3.1. Data source

The research was conducted on a data set of macroeconomic indicators, collected with different frequencies (quarterly, monthly, weekly) from websites such as the General Statistics Office, the General Department of Customs, and the IMF. , WB,... in the period from 2019 to 2023. The reason for the authors to choose the period 2019 - 2023 is because the COVID-19 pandemic broke out strongly in 2020, the entire economy, economic indicators The macroeconomic economy has strong fluctuations, which contributes to increasing the testability of the model.

In this study, the authors forecast Vietnam's coffee export growth rate quarterly using the basic MIDAS model in which independent variables are selected at different frequencies. Analyzes were performed on Excel and Eviews 12 software.

3.2. Variables included in the model

To forecast export growth rate by quarter, the research team based on a data set of 22 variables corresponding to 19 economic indicators (of which: 5 quarterly frequency variables, 14 monthly frequency variables) and 3 inverters. weekly rate, described in detail in Table 1, Table 2, Table 3.

Table 1: Quarterly frequency economic indicators

Variable	Unit	Economic Index
TTXK_Q	(%)	Export growth
TTGDP	(%)	GDP growth
CCTT	(%)	Balance of payments
DTTR	(%)	Net direct investment
TKV	(%)	Capital account

Table 2: Monthly frequency indicators

Variable	Unit	Economic Index	Variable	Unit	Economic Index
TTDSBL	(%)	Retail sales growth	TDTQT	(%)	Total international reserves (excluding gold)
TTSXCN	(%)	Industrial production growth rate	TTNK	(%)	Growth of goods imports
TTCT_M	(%)	Money supply growth	CCTM	(%)	Balance of trade
TLDT_M	(%)	Reserve ratio	LP	(%)	Inflation rate
CSGCP	Index	Composite stock price index	USD_M	USD/VND	USD/VND exchange rate (1 month average)
LS	(%)	Interest rate	V_M	USD/OUNCE	Gold futures contract
CSTGHD	Index	Exchange rate index	DT_M	USD/barrel	Crude oil futures contracts

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

Table 3: Weekly frequency economic indicators

Variable	Unit	Economic Index
USD_W	USD/VND	USD/VND exchange rate (1 week average)
V_W	USD/OUNCE	Gold futures contract
DT_W	USD/barrel	Crude oil futures contracts

4. FORECAST RESULTS OF VIETNAM'S QUARTERLY COFFEE EXPORT GROWTH

4.1. Vietnam's coffee export growth situation in the period from 2019 - 2023

For many years, Vietnam has always been the second-largest coffee exporting country in the world, and the world leader in robusta coffee exports, present in more than 80 countries and territories, accounting for 14.2%. Global green coffee export market share (ranked 2nd, after Brazil). In particular, exported roasted, ground, and instant coffee has accounted for 9.1% of the market share (ranked 5th, after Brazil, Indonesia, Malaysia, and India). The EU is the largest consumer market for Vietnamese coffee, accounting for 40% of the total volume and 38% of the country's total export turnover; followed by Southeast Asia, accounting for 13% of total volume and total turnover. Coffee exports have grown strongly in the period 2019-2023, a period of crisis due to the Covid-19 pandemic and geopolitical conflicts.

Figure 1: Vietnam coffee export turnover in the period 2019 - 2023

Unit: US Dollar Billion

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
2019	297,862	249,898	234,626	283,049	254,661	240,809	280,683	231,527	215,145	223,529	183,889	174,635
2020	259,475	218,093	270,987	273,654	263,786	265,115	239,113	200,381	208,31	206,434	200,73	163,657
2021	196,179	177,244	218,526	238,32	223,475	238,337	222,952	239,488	234,51	260,131	256,381	245,78
2022	292,218	223,995	291,186	304,85	386,551	358,278	305,363	324,622	315,934	286,767	293,533	249,087
2023	280,922	283,512	327,047	341,916	375,704	342,937	346,652	307,76	296,164	255,804	218,293	182,219

Vietnam coffee export turnover in the period 2019 - 2023

M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 M11 M12

2019 2020 2021 2022 2023
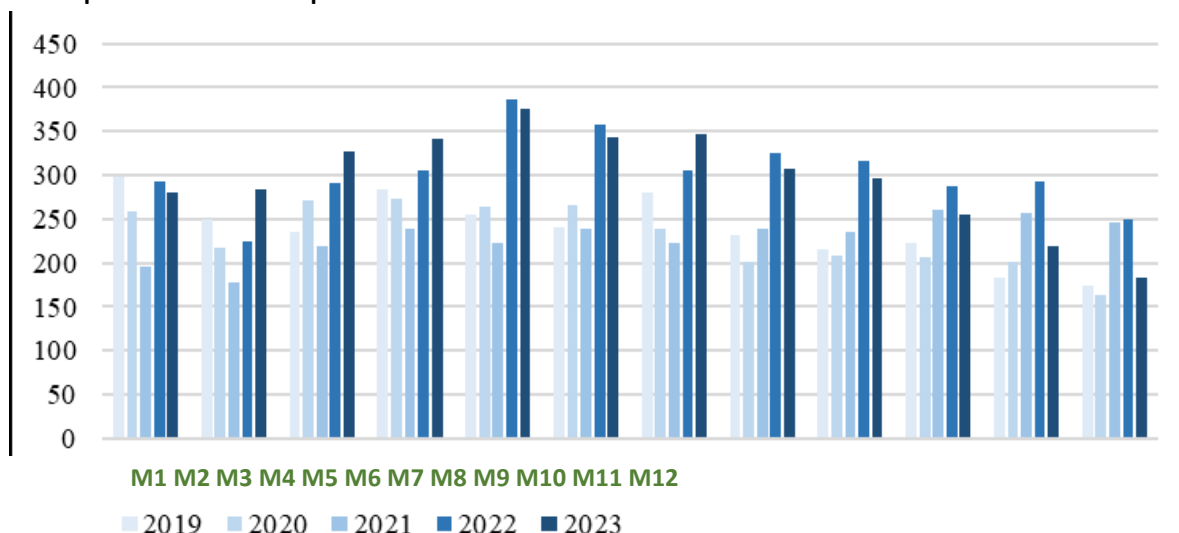
Source: Results of the data analysis by the Author

For the whole year 2019, coffee exports reached a total of 1,653,265 tons (about 27.55 million bags), a decrease of 223,702 tons, or a decrease of 11.92% compared to the export volume of 2018, accounting mainly for Robusta coffee. Germany and the US continue to be Vietnam's two largest coffee consumption markets. Vietnamese coffee products are exported to more than 80 countries and territories, accounting for 14.2% of the global coffee export market, ranking second after Brazil. In general, coffee export turnover tends to decrease quite significantly in 2019, the reason is said to be reduced coffee output due to bad weather and reduced cultivation area.

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

In 2020, the volume and value of coffee exports for the whole year 2020 reached 1.51 million tons and 2.66 billion USD, down 8.8% in volume and 7.2% in value compared to 2019. Germany, the US, and Italy continue to be Vietnam's three largest coffee consumption markets in the first 11 months of 2020 with market shares of 12.8%, 9.3%, and 8.4% respectively. In particular, robusta coffee exports to many main markets decreased, such as Germany, the US, Spain, Russia, Belgium, and Thailand. On the contrary, robusta coffee exports to other main markets increased, such as Italy, Japan, Algeria, and the Philippines. The reason is that large markets such as the EU, the US, and Russia increasingly prefer Arabica coffee varieties with a more delicious and delicate flavor.

According to the Import-Export Department (Ministry of Industry and Trade), for the whole year 2021, Vietnam's coffee exports reached 1.52 million tons, worth approximately 3 billion USD, down 2.7% in volume, but increased 9.4% in value compared to 2020. Notably, in December 2021, export coffee prices reached their highest level since June 2017. According to the Import-Export Department (Ministry of Industry and Trade), easing social distancing, more favorable customs clearance activities, and increased world demand are factors helping Vietnam's coffee exports recover at the end of 2021. According to estimates, Vietnam's coffee exports in December 2021 reached 130 thousand tons, worth 305 million USD, an increase of 21% in volume and an increase of 26.2% in value compared to November 2021, compared to January 2021. December 2020 decreased by 6.5% in volume but increased by 20.3% in value. By 2022, the global coffee market will face many difficulties when global inflation increases rapidly and consumers tend to "tighten their belts", causing demand for coffee to decrease. Despite this, Vietnam's coffee industry still achieved remarkable results when exports grew at double digits compared to 2021. In 2022, Vietnam's coffee exports reached 1.72 million tons, reached 3.94 billion USD, an increase of 10.1% in volume and an increase of 28.3% in value compared to 2021. In the first months of 2022, Vietnam's coffee exports grew strongly thanks to recovering demand. returned after the COVID-19 pandemic and rising coffee prices in the context of tight global supply due to crop failures and supply chain congestion in some major producing countries. In addition, the increase in exports was also supported by improved container and ship supply.

According to the Report at the conference "Summary of the 2022-2023 coffee crop year, and mission directions for 2023-2024", at the end of the 2022-2023 crop year (from October 2022 to September 2023), coffee exports coffee reached 1.66 million tons, down 4.5% compared to the 2021-2022 crop year, but turnover reached 4.08 billion USD, up 3.4% thanks to high selling prices. This is the highest turnover level in any crop year to date. The average coffee export price reached 2,451 USD/ton, an increase of 5.5% compared to the previous crop year.

Although coffee exports decreased in the first half of 2023, over the past several months, world Robusta coffee prices have recorded a continuous upward trend, contributing to Vietnam's coffee export turnover still growing positively. In particular, in June 2023 alone, Vietnam exported 150,00 tons of coffee with a value of 342.94 million USD, an increase of 9.1% in volume and 24.3% in value compared to the same period in 2022.

Accumulated in the first 9 months of 2023, Vietnam's coffee exports reached 1.27 million tons, down 7.3% over the same period last year; Turnover reached 3.16 billion USD, up 1.9%. Citing data from the General Department of Customs, in October 2023, the whole country exported over 43,000 tons, down 14.2% over the previous month and down 48.8% over the same period last year. This is the lowest export volume every month in the past 12 years. Coffee export turnover in October 2023 reached 157.55 million USD, down 6.6% compared to September 2023 and down 28.0% compared to January 2022. Specify the reason why the amount of coffee exported decreased sharply, accordingly, there were no more goods left for export in the country. Overall, in 2023, Vietnam's coffee exports will reach 1.62 million tons, down 8.7% compared to 2022; but turnover reached a record high of more than 4.24 billion USD, an increase of 4.6% compared to 2022. Output decreased but turnover increased because export prices in 12 consecutive months increased sharply, on average reaching 2,613, 8 USD/ton, up to 14.5% over the same period in 2022.

4.2. Results of forecasting growth of Vietnamese coffee exports using the MIDAS model

In the forecast study on Vietnam's coffee export growth, the team applied the basic MIDAS model with the parameters in the model selected as presented. The team reviewed and selected a model with 17 variables, including 16 independent variables.

MIDAS model: The 16 independent variables include 8 quarterly frequency variables and 8 monthly frequency variables

The peculiarity of the MIDAS model is to quickly forecast export growth in the period when the data has not been published based on the information collected up to the most recent time. Therefore, the research team applied to forecast Vietnam's coffee export growth in the first quarter of 2024 and the second quarter of 2024 with high-frequency data collected until December 2023. The way the forecast is conducted is as follows: The authors will forecast the next quarter based on the previous quarter's data and compare it with the actual data value of that quarter when announced.

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

For example, the results of the fourth quarter of 2020 will be used to forecast the results of the first quarter of 2021 and compare the results with the actual published data of the first quarter of 2021; Then continue to use the announced results of the first quarter of 2021 to forecast the second quarter of 2021 and compare the results with the actual published data of the second quarter of 2021, the forecasting process continues similarly. same for the following quarters.

*Regression results:
Figure 2: Results of quarterly coffee export growth forecast of the MIDAS model
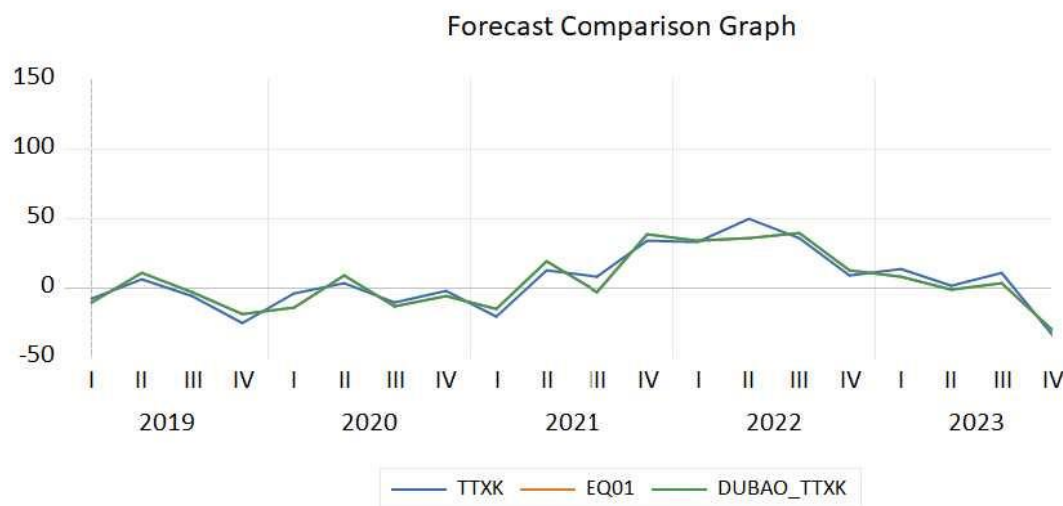
Source: Results of the research team

Through the process of building a model on Eviews, 12 groups have produced a model to test the quarterly growth forecast of Vietnamese coffee exports. With test data for the period 2019-2023, the chart is represented by two growth lines including the forecast growth line for Vietnamese coffee exports through the MIDAS model (DUBAO_TTXK) and the growth line for Vietnamese coffee exports South reality (TTXK). The team provided a comparison chart between the two growth paths to test the reliability and accuracy of the model compared to reality.

The results in the chart show that the two growth lines have almost the same development trends at each stage and are almost asymptotic to each other. Thereby, it partly shows that the model has relative accuracy, reflecting the actual situation of Vietnam's coffee export growth in the period 2019-2023 despite many objective fluctuations in the economy. To test in more detail the reliability and accuracy of the forecast model, the research team continues to evaluate the indicators of the forecast model.

Evaluate forecast error
Evaluate the forecast error of the MIDAS model

Time	TTXK (Actual)	MIDAS (Forecast)	|and|
2019Q1	-8,2900	-10,5229	2,2329
2019Q2	6,3800	10,8310	4,4510
2019Q3	-6,1800	-3,5095	2,6705
2019Q4	-25,0700	-18,9890	6,0810
2020Q1	-4,3200	-14,4955	10,1755
2020Q2	3,0900	8,6381	5,5481
2020Q3	-10,9400	-13,3115	2,3715

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

2020Q4	-1,9300	-6,3790	4,4490
2021Q1	-20,9000	-14,8937	6,0063
2021Q2	13,0000	19,3000	6,3000
2021Q3	7,5900	-2,0040	9,5940
2021Q4	33,5400	38,2200	4,6800
2022Q1	33,2100	34,1846	0,9746
2022Q2	49,8800	35,3966	14,4834
2022Q3	35,7200	38,9932	3,2732
2022Q4	8,7400	12,5101	3,7701
2023Q1	13,0100	7,9505	5,0595
2023Q2	1,0200	-1,5871	2,6071
2023Q3	0,3600	3,68	3,3200
2023Q4	-34,8800	-31,14	3,7400
R2		**0,915228**	
RMSE		**1,349254688**	
THERE IS		**0,3373136719**	

Graph of the forecast line obtained from the MIDAS model in the chart and measurement indicators such as R-squared index, average error measurement index (RMSE), average absolute value measurement index of error (MAE) of the regression model in the table shows that in general, the basic MIDAS model gives quite good forecasting results for Vietnam's quarterly coffee export growth with high indexes close to 1 (The closer the value is to 1, the better the model). The authors chose a large sample size from the first quarter of 2019 to the fourth quarter of 2023 to provide the smallest standard error. The smaller the standard error, the more accurately the model shows the ability to predict and explain secondary variables. belongs well.

The chart shows that the model can almost predict periods of major changes in Vietnam's coffee export growth rate, specifically in the period 2020-2021 when the COVID-19 pandemic caused export growth to increase. Vietnam's coffee exports fluctuate abnormally or in 2023 export growth will decrease sharply, mainly due to the decline in aggregate demand, supply chain disruption, and tightening monetary policy. This method proves to be superior to traditional models that are limited by using balanced data (for example, models that only use monthly data or models that only use quarterly data). The flexibility will not be as high as the MIDAS model.

This result proves that the development of these forecasting models is on the right track and the input data are selected appropriately. Furthermore, adding high-frequency financial data to the MIDAS regression model also improves prediction accuracy, demonstrating that financial data plays an important role in predicting commodity export growth. chemistry. This finding implies that to fully utilize the predictive power of financial indicators, they must be combined with macroeconomic data.

5. CONCLUSION

The study uses the MIDAS model to predict Vietnam's coffee export growth based on a data set of macroeconomic indicators collected in the period 2019 - 2023. Analysis results show that, with the same independent variables, and data taken at

Application of Composite Frequency Data Analysis Model to Forecast the Growth of Vietnam's Coffee Exports

a higher frequency, the MIDAS model will give better forecasting results. Like some previously published research results, the forecast results show that the MIDAS model is effective for short-term forecasting. The research results also show that high-frequency financial variables can be used to forecast Vietnam's coffee export growth. This may be related to the recent development of Vietnam's financial market.

From a policy perspective, our findings imply that financial variables need to be closely monitored to predict fluctuations in the commodity export cycle. On the model side, the results point to the importance of linking financial sectors and economic reality in macroeconomic models. The role of financial variables in predicting export growth is due not only to their forward-looking nature but also to the close linkage between financial markets and a country's import and export activities. .

Short-term forecasts of macroeconomic indicators will have important implications in policy planning and devising each country's economic development strategy. Therefore, with the goal of providing timely and appropriate forecasts in the future, the research team will continue to build and deploy models with different frequency data to forecast economic indicators. Macroeconomics of Vietnam.

REFERENCES

1) Başer, U., Bozoğlu, M., Eroğlu, N. A., & Topuz, B. K. (2018). Forecasting chestnut production and export of Turkey using ARIMA model. Turkish Journal of Forecasting, 2(2), 27-33.
2) Bin, J., & Tianli, X. (2020). Forecast of export demand based on artificial neural network and fuzzy system theory. Journal of Intelligent & Fuzzy Systems, (Preprint), 1 - 9.
3) Bui, T. M. N., Nguyen, T. Q. N., & Nguyen, T. Q. C. (2019). Using Arima model in forecasting the value of Vietnam's exports. Journal of finance & accounting research, Vol. 186, No. 1, p. 58.
4) Bussière, M., Fidrmuc, J., Schnatz, B. (2005), Trade integration of Central and Eastern European countries: Lessons from a gravity model. ECB Working Article, No. 545;
5) Dung, T. T. M., Tuan, V. T., Huong, D. T. M., & Luan, N. M. (2014). Applying quantitative methods in forecasting pangasius exports. Scientific Journal of Can Tho University, p. 123 - 132
6) Eckert, F., Hyndman, R. J., & Panagiotelis, A. (2019). Forecasting Swiss exports using Bayesian forecast reconciliation (No. 457). KOF Working Papers.
7) Feenstra, R. C. (2015). Advanced international trade: theory and evidence. Princeton university press.
8) Foroni, C., & Marcellino, M. G. (2013). A survey of econometric methods for mixed-frequency data. Available at SSRN 2268912.
9) Ghysels, Eric, Pedro Santa-Clara, and Rossen Valkanov (2004). "The MIDAS Touch: Mixed Data Sampling Regression Models". Powered by the California Digital Library University of California, 34p. https://escholarship.org/uc/item/9mf223rs.
10) Hai, N. M., Dung, N. D., Thanh, D. V., & Lam, P. N (2020). Building Export Value Forecast Model Using Dimensional Reduction Method Based on Kernel Technique. The XXIII National Conference: Some Selected Issues of Information and Communication Technology.
11) IMF, "IMF Country Report No. 21/42," 2021.
12) Kuzin, V., Marcellino, M., & Schumacher, C. (2011). MIDAS vs. mixed-frequency VAR: Nowcasting GDP in the euro area. International Journal of Forecasting, 27(2), 529-542.
13) Le, N. B. N., T. A., & Le, L. Q. T. (2018). Forecast model for shrimp export prices of Vietnam. Scientific Journal of Can Tho University, p. 188-195
14) Lehmann, R. (2015). Survey-based indicators vs. hard data: What improves export forecasts in Europe? (No. 196). ifo Working Paper.
15) Mariano, R., and Y. Murasawa (2010): "A coincident index, common factors, and monthly real GDP", Oxford Bulletin of Economics and Statistics, 72(1), 27 - 46.
16) Pyo, H. K., & Oh, S. H. (2016). A Short-term Export Forecasting Model using Input-Output Tables.
17) Qu, Q., Li, Z., Tang, J., Wu, S., & Wang, R. (2019). A Trend Forecast of Import and Export Trade Total Volume based on LSTM. In IOP Conference Series: Materials Science and Engineering (Vol. 646, No. 1, p. 012002). IOP Publishing.
18) Schorfheide, F., and D. Song (2011): "Real-time forecasting with a mixed frequency VAR", mimeo.
19) Siggel, E. (2006). International competitiveness and comparative advantage: a survey and a proposal for measurement. Journal of Industry, competition and trade, 6(2), 137-159.
20) Stoevsky, G. (2009). Econometric Forecasting of Bulgaria's Export and Import Flows. Bulgarian National Bank Discussion Articles DP/77/2009.

21) T. N. A. Nguyen, T. H. H. Pham, and T. Vallée, "Trade Volatility in the Association of Southeast Asian Nations Plus Three: Impacts and Determinants," Asian Dev. Rev., vol. 37, no. 2, pp. 167 – 200, 2020.

22) Urrutia, J. D., Abdul, A. M., & Atienza, J. B. E. (2019). Forecasting Philippines imports and exports using Bayesian artificial neural network and autoregressive integrated moving average. In AIP Conference Proceedings (Vol. 2192, No. 1, p. 090015). AIP Publishing LLC

23) World Bank (2020) World Development Indicator.

24) Xie, Q., & Xie, Y. (2009). Forecast of the total volume of import-export trade based on grey modelling optimized by genetic algorithm. In 2009 Third International Symposium on Intelligent Information Technology Application (Vol. 1, pp. 545-547). IEEE.

Analytics Integration in Performance Management: A Bibliometric Analysis

Lekshmi Chithra R[1], Dr Prakash Pillai R[2]

[1]Research Scholar, Department of Personnel Management, Loyola College of Social Sciences, University of Kerala, Thiruvananthapuram, Kerala

[2]Assistant Professor, Department of Personnel Management, Loyola College of Social Sciences, University of Kerala, Thiruvananthapuram, Kerala

ABSTRACT: Performance management enables measurement, identification, prediction and retention of resources which are critical to the success of the organization. Literature shows that traditional performance management systems suffer from subjectivity, lack of continuity and ineffective use of data. Application of analytics in performance management function is one variation which has been receiving increased interest in the recent years due to this. This paper explores the integration of HR Analytics (HRA) in performance management function. The study relies on bibliometric analysis to understand the publication pattern, dominating themes and upcoming research trends in this area. Bibliometric data from SCOPUS database is subjected to analysis using VOSviewer. Findings reveal an increase in research activity in this area over the years. Application of analytics in performance management, employee engagement, evaluating training needs and predicting attrition are observed to be the significant topics in the recent years.

KEYWORDS: HR Analytics; HRA; performance management; bibliometrics.

I. INTRODUCTION

Performance management is a core HR function which aids in improving organizational performance by developing the performance of individuals and teams. Still literature shows that traditional approaches to manage performance face challenges like subjectivity, lack of continuity and ineffective use of data. In order to alleviate the shortcomings of traditional performance management systems, a growing number of organizations integrate analytics in this function these days. Along with providing an evidence-based approach to decision making, analytics also helps to make the best use of HR data. This paper adopts a bibliometric approach to explore the works in this area. The data extracted from SCOPUS database is subjected to analysis using VOSviewer to answer the research questions.

II. RESEARCH QUESTIONS

This study aims for an overview of research works in the area of integration of analytics in performance management. The following research questions are attempted to be answered.

RQ1: What is the publication pattern in the research area: analytics in performance management?
RQ2: Which are the prominent themes in this area (areas with maximum research activity)?
RQ3: What are the future areas of research in this theme?

III. METHODOLOGY

Integration of analytics in performance management has been receiving growing interest in research in recent years. This study adopts a bibliometric approach to explore the research works in this field.

According to Pritchard (1969) bibliometric analysis is the quantitative analysis of bibliographic data. It is the statistical analysis of a set of connected documents using several bibliometric indicators which provides a general informative overview of any research area and demonstrates summaries of the trends (Rialp et al., 2017). According to Mariani et al(2022) a growing

number of literature review articles employ bibliometric analysis to measure and map (multidisciplinary) research, to identify leading authors and seminal work (Donthu et al., 2021), and to map novel research trends (Mariani and Borghi, 2019). Recently, this technique has been passed down to diverse disciplines such as management, finance, economics, operations, marketing and psychology, among others. (Merig_o and Yang, 2017; Cheng, 2016; Podsakoff et al., 2008; Tur-Porcar et al., 2018; Laengle et al., 2017; Mart_ınez-L_opez et al., 2018).

The bibliographic data used in this study were collected from the Scopus database. This is because Scopus is the largest abstract and citation database of peer-reviewed academic research literature in the world (Kataria et al., 2020; Norris and Oppenheim, 2007; Zhao and Strotmann, 2015). Scopus is also accepted as an effective database dealing with academic documents worldwide (Kataria et al., 2020; Valenzuela-Fernandez et al., 2019).

IV. SEARCH TERMS AND ANALYTICS SOFTWARE

The SCOPUS database was searched using the terms below as title, abstract and keyword for the period 2011-2023. The language was limited to English. Document types selected were articles, review, book chapter, conference papers, notes.

Table I. Search Terms in SCOPUS

Search term	No. of results
"HR" AND "analytics" AND "performance" AND "management"	127
"HR Analytics" AND "performance AND "management"	67
"HR Analytics" AND "performance management"	9
"HR" AND "analytics" AND "performance management"	16
"Performance" AND "HR Analytics"	105
"Performance analytics" AND "HR"	4

The results were exported as .csv files to MS Excel. After manual cleaning, it was ensured there were no duplicates. The final result had 218 documents. This metadata has been subjected to analysis using VOSviewer software. VOSviewer is an open free software that enables researchers to conduct bibliometric data analysis easily. The use of free software contributes to the transparency, reliability and replicability of the research (Mariani et al.,2022; Antons et al., 2020).

V. RESULTS

A. Publication Trend

To understand the research activity in this area an analysis of publication trend has been done. The following depicts the details of publications, citations, leading authors and contributing countries over the period of analysis.

1).Publications and citations

A total of 218 articles has been published in SCOPUS from the time period 2011 to 2023. Figure 1 shows an increasing trend indicating the growing research activity in this area over the years. A steady increase can be observed from 2020 to 2023. 150 articles are published in this 4-year period. This makes 68% of the total publications. Maximum number of publications (48) is in 2023 making it 22% of the total number of publications. The lowest productivity is in 2014 (0 publications).
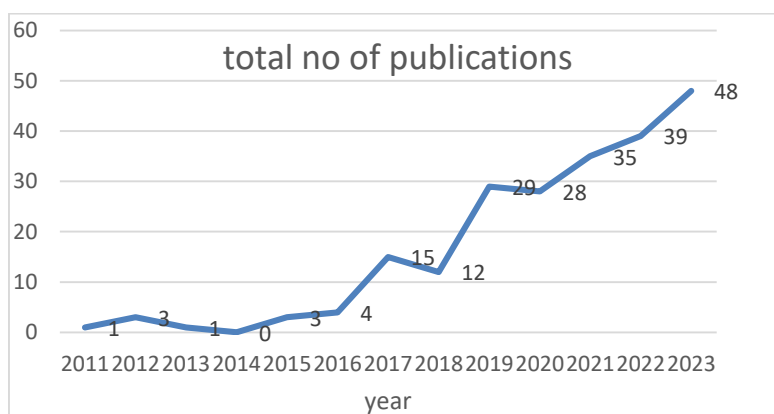
Figure 1. Number of Publications by Year

Analytics Integration in Performance Management: A Bibliometric Analysis

Table II. Number of Publications and Citations by Year

Year	No. of publications	Percentage	Number of citations	Percentage
2011	1	0.46%	68	2.91%
2012	3	1.38%	181	7.75%
2013	1	0.46%	0	0.00%
2014	0	0.00%	0	0.00%
2015	3	1.38%	10	0.43%
2016	4	1.83%	276	11.82%
2017	15	6.88%	490	20.98%
2018	12	5.50%	140	5.99%
2019	29	13.30%	236	10.10%
2020	28	12.84%	490	20.98%
2021	35	16.06%	309	13.23%
2022	39	17.89%	104	4.45%
2023	48	22.02%	32	1.37%
Total	218	100.00%	2336	100.00%

Table 2 shows 2017 and 2020 report maximum number of citations (490). This is 20.98% of the total citations in the overall period analysed. 2021 has the second highest citation (309) which is 13.23% of the total. 2013 and 2014 have the lowest number of citations (0).

Table III. Information Related to Publications and Citations by Year

Year	No. of publications	No. of citations	No. of publications	Avg citation per publication	Avg citation per cited publication
2011	1	68	1	68	68
2012	3	181	2	60.33	90.5
2013	1	0	0	0	0
2014	0	0	0	0	0
2015	3	10	1	3.33	10
2016	4	276	3	69	92
2017	15	490	12	32.67	40.83
2018	12	140	11	11.67	12.73
2019	29	236	28	8.14	8.43
2020	28	490	27	17.5	18.15
2021	35	309	30	8.83	10.3
2022	39	104	25	2.67	4.16
2023	48	32	12	0.67	2.67

2).Top 10 authors and citations

Table 4 shows the leading authors in this field. Angrave et al (2016) is the most cited author backed by Marler and Boudreau (2016). These two articles contribute to 44.29% of the total citations in the top 10 list.

Table IV. Top 10 Authors and Citations

Sl No.	Title	Authors	Citedby
1	HR and analytics: why HR is set to fail the big data challenge	Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence,M. & Stuart M.(2016)	266
2	An evidence-based review of HR Analytics	Marler, J. H., & Boudreau, J. W. (2016)	250

3	Three-Way Complementarities: Performance Pay, Human Resource Analytics, and Information Technology	Aral, S., Brynjolfsson, E., & Wu, L. (2012)	177
4	When eliminating bias isn't fair: Algorithmic reductionism and procedural justice in human resource decisions.	Newman, D. T., Fast, N. J., & Harmon, D. J. (2020).	122
5	The questions we ask: Opportunities and challenges for using big data analytics to strategically manage human capital resources	Hamilton, R.H. & Sodeman, W. A. (2020)	83
6	Talent and analytics: new approaches, higher ROI	Harris, J.G. , Craig, E. & Light,D.A. (2011)	68
7	Learning pulse: a machine learning approach for predicting performance in self-regulated learning using multimodal data	Di Mitri,D.,Scheffel, M.,Drachsler,H.,Börner,D.,Ternier,S. & Specht,M. (2017)	61
8	Leveraging technology for talent management: Foresight for organizational performance	Sivathanu B. & Pillai R .(2019)	47
9	Analytical abilities and the performance of HR professionals	Kryscynski, D., Reeves, C., Stice-Lusvardi, R., Ulrich, M. & Russell, G. (2017).	46
10	Organizational capabilities that enable big data and predictive analytics diffusion and organizational performance: A resource-based perspective	Mishra, D., Luo, Z., Hazen, B., Hassini, E. & Foropon, C. (2019)	45

3).Top countries contributing to this field

Table 5 shows top 10 countries contributing to this field of research. India tops the list with 79 publications which accounts to 37% of the total publication. Indian articles also have the third highest number of citations (278). This is 11% of the total citations. United States seconds the list in number of publications (35, 16%) and contributes to the maximum number of citations (972, 38%).

Figure 2 is the map visualization of the top countries contributing to this field. There are eight groups of countries that collaborate. Clusters represent the group of nations that generally collaborate among each other. The size of the node for any country indicates the number of research papers it has produced.
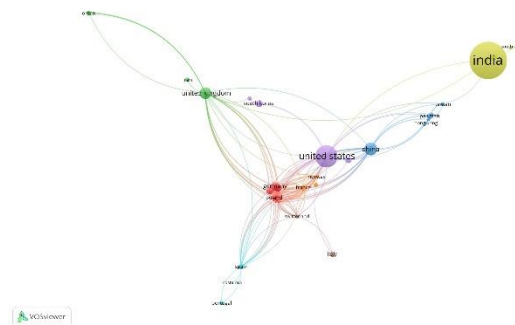
Figure 2. Map Visualization of Top Countries Contributing to This Area

Table V. Top 10 Countries Contributing to this Area

B. Keyword Co-Occurrence Analysis

Sl No	Country	Number of publications	Percentage	Number of citations	Percentage
1	India	79	43.65%	278	13.18%
2	United States	35	19.34%	972	46.09%
3	China	15	8.29%	118	5.60%
4	United Kingdom	13	7.18%	443	21.01%
5	Germany	8	4.42%	29	1.38%
6	Japan	7	3.87%	42	1.99%

7	Australia	6	3.31%	51	2.42%
8	Netherlands	6	3.31%	132	6.26%
9	South Korea	6	3.31%	24	1.14%
10	UAE	6	3.31%	20	0.95%

This analysis was done to understand the existing relationship between topics in the area. Keyword co-occurrence analysis is based on the assumption that the words appearing together are linked to each other by a thematic relationship (Mariani et al., 2022). Co-occurrence analysis including all keywords on VOSviewer produced the visualization in Figure 3. The map visualization helps to understand how keywords and concepts evolved over time. Five groups of research activity were found. Cluster blue has the biggest impact in the map. As the map shows research is most active in the areas of application of analytics in performance, and talent management. Cluster red has the second highest impact. This area is rich with studies that focus on the application of analytics in predicting attrition, training needs and employee performance. Followed by cluster green which deals with studies keen on the application of analytics to understand job satisfaction, employee engagement and retention.
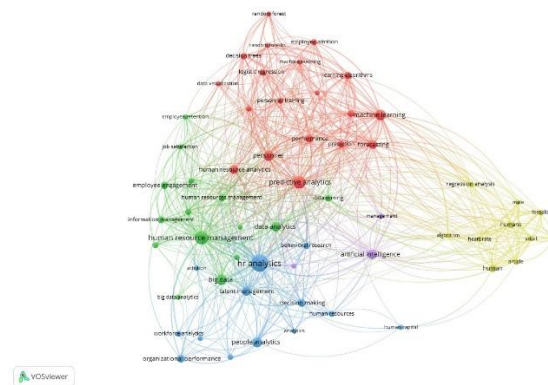
Figure 3. Clusters Identified Through Co-Occurrence Analysis

Cluster 1 (Blue) – HR Analytics, talent management, people analytics, organizational performance, human resources, decision making
Cluster 2 (Red) – human resource analytics, professionals training, employee attrition, performance, predictive analytics, prediction, forecasting, data visualization, learning algorithms
Cluster 3 (Green) – human resource analytics, big data, data analytics, attrition, data mining, employee engagement, job satisfaction, employee retention, information management
Cluster 4 (Purple) – artificial intelligence, management
Cluster 5 (Yellow) – regression analysis, algorithms.
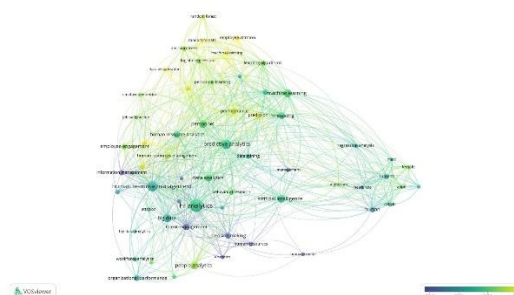
Figure 4. Overlay Visualization of Co-Oocurence Analysis

Figure 4 shows the overlay visualization of the co-occurrence analysis. It can be observed that in the beginning of the period of analysis, more generic studies dominated the research in this area. The research in this period had a focus on HR Analytics as an approach, its benefits to talent management. Other topics include human capital and information management. Later on, studies concentrated on predictive capabilities of analytics especially in organizational performance, employee engagement, training and retention. The transition of nodes from green to yellow demonstrate this very clearly. Recent years show research activity with a focus on predictive analytics and its application in employee performance and attrition.

Analytics Integration in Performance Management: A Bibliometric Analysis

C .Bibliographic Coupling Network Analysis

To observe the thematic structure of documents, Bibliometric coupling analysis was carried out. A bibliographic couple is a set of two documents sharing one or more common references (Kessler, 1963). Documents forming a bibliographic couple exhibit similar intellectual content (Weinberg, 1974). By bibliographic coupling analysis we can assume thematic similarity, allowing to illustrate the intellectual structure of a research field (Donthu et al., 2021). This analysis also helps to identify the leading researchers and most influential publications. VOSviewer visualized six clusters as shown in Figure 5 which included a total of 76 documents which met the threshold of authors having minimum 5 citations.
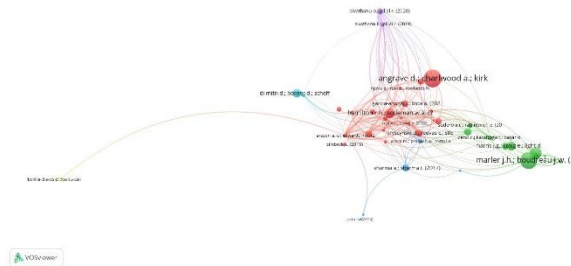
Figure 5. Clusters Identified Through Bibliographic Coupling Analysis

Table 6 describes each cluster and core theme of each. Cluster red consists of 22 articles which constitutes 717 citations, 48% of total citations. The leading themes in this cluster are challenges in integration of analytics, analytics and its impact in HR functions. Cluster green has 11 constituting 588 of citations which is 39% of the total. The main themes include HR Analytics and its impact in HR functions like employee performance management, performance monitoring and talent management. Cluster blue has 5 articles. In this cluster constituting 72 of citations, key themes include application of HR Analytics in performance appraisal, application of HRA in Indian organizations and AI in HR. Cluster yellow has 2 articles constituting 12 citations. Clusters purple and cyan consist of 2 documents each with 31 and 73 citations. The clusters yellow, purple and cyan include works that focus on predicting performance using analytics, machine learning and talent management. The most cited works over the period of analysis revolve around challenges to integration of analytics and the impact of analytics in performance management, performance monitoring and performance appraisal.

Table VI. Clusters and Dominating Themes

Cluster	Core themes	Author	Total citations
1	HR analytics and impact in HR functions, HRanalytics in predicting turnover.	Angrave et al (2016)	266
		Billot and King (2017)	22
		Cayrat and Boxall (2022)	6
		Dahlbom et al (2020)	38
		Garcia and Osca (2021)	37
2	HR analytics and impact in organizational performance, employee performance monitoring, procedural justice and talent analytics	Marler and Boudreau (2017)	250
		Newman et al (2020)	122
		Harris and Light (2011)	68
		Levenson and Fink (2017)	43

		Nocker and Sena (2019)	35
3	HR analytics and performance appraisal, application of HRA in Indian organizations, AI in HR	Sharma and Sharma (2017)	41
		Arora et al (2021)	14
		Patre (2016)	7
		Saraswathy et al (2017)	5
		Rana et al (2018)	5
4		Bonilla and Palos (2023)	6
		Palácios et al (2021)	6
5		Di mitri et al (2017)	61
		Sivathanu and Pillai (2020)	31
6		Yuan et al (2021)	12

D. Co-Citation Analysis

 This analysis was done to identify the relationships among cited publications to understand the evolution of fundamental themes. Co-citation analysis is a reliable technique to make sense of the connections among documents in the reference lists across publications in a literature base (Zupic and Cater, 2015). As Figure 6 shows VOSviewer visualized five clusters.
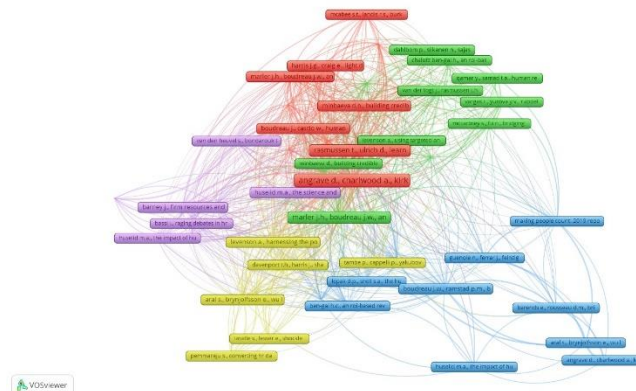
Figure 6. Clusters Identified Through Co-Citation Analysis

Cluster 1 – (Red) This cluster has 14 articles. The core themes revolve around how HR Analytics can be implemented to enhance decision making and the challenges in its implementation. It can be observed that research focus here is a general understanding of what HR Analytics is, the benefits of its implementation and challenges in its integration.

Cluster 2 – (Green) This cluster has 12 articles. The core theme in this cluster is practical implementation/adoption of analytics. This extends to application of analytics in areas like organizational performance, performance management, performance appraisal and talent management.

Cluster 3 - (Blue) This group has 11 articles. The focus here is impact of analytical implementation in HR, in areas like turnover, productivity, performance and pay.

Cluster 4 – (Yellow) This group has 8 articles. Predictive analytics, talent analytics and application of AI to enhance decision making are the key themes here.

Analytics Integration in Performance Management: A Bibliometric Analysis

Cluster 5 – (Purple) Includes 8 articles mostly into futuristic perspectives on HR Analytics.

The thematic evolution in this area started from defining what analytics is and what are the benefits of using analytics. Over time the focus moved to integration of analytics, challenges to integration, application of analytics in performance management and performance appraisal. Emerging themes in this area is found to be application of predictive analytics and AI to maximize the benefits of analytics-based decision making.

VI. MAJOR FINDINGS AND DISCUSSION

An increasing trend can be observed in the area of integration of analytics in performance management over the period 2011 – 2023. A total of 218 publications were published in this period. 68% of the publications were published in the year range 2020 to 2023. Co-occurrence analysis of keywords and their overlay reveals an evolution of topics from generic HRA studies to the application of analytics in specific HR functions including its predictive capabilities. At the beginning of the period of analysis, more generic studies dominated the research in this area. Later on, studies concentrated on the predictive capabilities of analytics especially in organizational performance, employee engagement, training, and retention. Recent research activity has a focus on predictive analytics and its application in employee performance, and attrition. Bibliographic coupling analysis shows the most influential works over the period analysed. The leading themes addressed in these papers include the impact of analytics in specific HR functions, challenges to the integration of analytics, application of analytics in performance management, performance monitoring, performance appraisal, and talent management. A co-citation analysis was also conducted which reveals the evolution of themes in the area of analytics integration in performance management. The various themes evolved from defining what analytics is and what are the benefits of using analytics. Subsequently, the focus moved to the integration of analytics, integration challenges, and application of analytics in performance management and performance appraisal. Emerging themes in this area are found to be the application of predictive analytics and AI to maximize the benefits of analytics-based decision-making.

Even though the period analysed marks an increasing research activity in the area of integration of analytics in performance management, various challenges to this integration have also been pointed out by studies. Lack of skillset in HR professionals has been one challenging factor emphasized throughout the period of analysis (Cayrat and Boxall,2022; Visier, 2021; Angrave et al, 2016; CIPD,2013). This includes poor statistical and technical skills. A frequently studied variable in analytics adoption is 'fear appeals' and many times it was found to be a challenging factor. The fear of losing their jobs due to less analytical competence negatively affects the attitude of HR professionals in integrating analytics in the first place. The dearth of business acumen of HR professionals (Marler and Boudreau, 2016) also leads to a low understanding of pragmatic nuances of analytics. These factors contribute to a decreased trust in analytics-based findings and drive managers to rely on their intuitions for decision-making. Also, low proficiency in analytics creates a handicap in asking the right questions even when there is a lot of data at the disposal of the HR team.

The unavailability of centralized data is the second most prominent challenge that came up from the studies (Ramachandran et al, 2023; Hamilton and Sodeman, 2019; McIver et al., 2018; Roberts, 2016; Angrave et al, 2016). Silos mentality, insufficient support from top management, and lack of collaboration from line managers are found to be the key reasons for this. Employee data is not just what is captured by the HR department. It is also captured by other departments like marketing, sales, operations, and customer feedback. HR Analytics by itself is cross-functional in nature. The inability to collate data from various departments limits proper analytical integration. In recent years, the absence of a data-driven culture in organizations has been a significant challenge emphasized by studies (Ramachandran et al, 2023; Ekka and Singh,2022). A strong data-driven culture is characterized by data sharing, adoption of technology, and having more change champions (Ramachandran et al, 2023). An organizational culture that is weak in the data-driven context negatively affects the integration of analytics.

A. Practical Implications

Since lack of analytics-related competencies among HR professionals are found to be the prominent challenge, upskilling and training programmes in statistics, technology and analytics have to be designed and delivered as a priority. The need and significance for analytical integration have to be conveyed to HR professionals in such a way that it doesn't trigger job insecurities. To nurture a data-driven culture in the organization, stakeholder collaboration has to be made possible. All stakeholders – top management, middle-level management, line management, employees and HR professionals must be convinced of the value of analytics in enhancing their respective jobs. One of the options in this regard is ensuring better access to data by these stakeholders. Though many organizations use data management platforms, it is realized that the access and integration of data remain to be improved. Finally, for smooth integration of analytics, HR has to be able to design and implement change strategies and manage resistance to change. Another option is encouraging organizations to document their analytics-related practices more rigorously.

B.Recommendations for Future Research

It was found that studies that empirically measure the impact of analytics in performance management function are limited in number. Future research can address this gap. There is also a need for studies that design and recommend change strategies for the effective implementation of analytics. This will help make analytical integration agreeable to a larger number of stakeholders. The application of predictive capability of analytics is a topic which is receiving growing interest in recent years. Future research can also explore the impact of predictive and prescriptive analytics in various HR functions including performance management.

VII. CONCLUSION

This study explored the application of HR Analytics in performance management. It was found that research activity in this area is increasing. The focus of the studies has evolved from exploring the benefits and impact of analytics to the application of the same in performance management. Recent studies are keen on the application of predictive analytics in employee performance, attrition, training and retention. Undoubtedly analytics as a domain continues to expand in terms of stakeholders, methods, and outcomes. However, various challenging factors have also been present which have been slowing down its integration to the expected levels. As Oracle (2021) reports only 15% of the firms are analytically mature (uses predictive and prescriptive analytics) while 68% of organizations are still using descriptive analytics. For a strategic function like performance management to be effective, descriptive, predictive and prescriptive analytics should be utilized. Overcoming these challenges will help more organizations to address this 'capability gap' (Deloitte, 2014) and pave the way for HR to be ultimately strategic.

REFERENCES

1) Afzal, M. (2019). HR Analytics: challenges and prospects of Indian IT sector. *International Journal of Management*, 9(7), 404-415.https://www.ijmra.us/project%20doc/2019/IJMIE_JULY2019/IJMRA-15913.pdf

2) Aguinis, H., Joo, H., & Gottfredson, R. K. (2011). Why we hate performance management-And why we should love it. *Business Horizons*, 54(6), 503–507. https://doi.org/10.1016/j.bushor.2011.06.001

3) Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence,M. and Stuart M. (2016). HR and analytics: why HR is set to fail the big data challenge. *Human Resource Management Journal* ,26(1), 1–11.

4) Antons, D., Grunwald, E., Cichy, P., & Salge, T.O. (2020). The application of text mining methods in innovation research: current state, evolution patterns, and development priorities. R D Management, 50, 329–351.

5) Apostolatou, P. (2018). *HR Analytics: How does a data-driven approach affect fairness perceptions of the performance appraisal system?* [Master thesis, University of Groningen]. University of Groningen

6) Barbar, K., Choughri, R., & Soubjaki, M. (2019). The impact of HR Analytics on the training and development strategy - Private sector case study in Lebanon. *Journal of Management and Strategy*, *10*(3), 27. https://doi.org/10.5430/jms.v10n3p27

7) Bassi, B. L. (2011). Raging debates in HR Analytics. *Human Resource Management International Digest*, *20*(2), 74–80. https://doi.org/10.1108/hrmid.2012.04420baa.010

8) Buck, B., & Morrow, J. (2018). AI, performance management and engagement: Keeping your best their best. *Strategic HR Review*, *17*(5), 261–262. https://doi.org/10.1108/shr-10-2018-145

9) Cayrat, C., and Boxall, P., Exploring the phenomenon of HR analytics: a study of challenges, risks and impacts in 40 large companies. (2022). *Journal of Organizational Effectiveness: People and Performance*, 9 (4), 572-590. DOI: 10.1108/JOEPP-08-2021-0238.

10) Cheng, M. (2016). Sharing economy: a review and agenda for future research. International Journal of Hospitality Management, 57, 60-70.

11) CIPD. (2013). *Talent analytics and big data – The challenge for HR*. https://www.cipd.co.uk/Images/talent-analytics-and-big-data_2013-challenge-for-hr_tcm18-9289.pdf

12) Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W.M. (2021). How to conduct a bibliometric analysis: an overview and guidelines. *Journal of Business Review*. 133, 285–296.

13) Ekka,S., Singh,P.(2022).Predicting HR Professionals' Adoption of HR Analytics: An Extension of UTAUT Model. *Organizacija*,55(1),77-93.

14) Fernandez, V., & Gallardo-Gallardo, E. (2021). Tackling the HR digitalization challenge: Key factors and barriers to HR Analytics adoption. *Competitiveness Review*, *31*(1), 162–187. https://doi.org/10.1108/CR-12-2019-0163

15) Fitz-enz, J. (2009). Predicting people: From metrics to analytics. *Employment Relations Today*, *36*(3), 1–11. https://doi.org/10.1002/ert.20255

16) Frioux, R., (2013). *How data analytics can support succession planning*. Dataclear Online Publication

17) Hamilton, R.H. & Sodeman, W, A. (2020). The questions we ask: Opportunities and challenges for using big data analytics to strategically manage human capital resources. *Business Horizons*, 63(1),85-95.

18) Hangal, A. (2019). Role of HR Analytics on employee performance improvement. *Gavesana Journal of Management*. 12(2), 1-6. https://vjim.edu.in/gavesana/assets/images/downloads/Gavesana-July-December-2019-issue1.pdf

19) HR Research Institute. (2021). *The state of HR Analytics 2021*. https://www.hr.com/en/resources/free_research_white_papers/the-state-of-hr-analytics-2021 report_kttr6trx.html

20) Huselid, M. A. (2018). The science and practice of workforce analytics: Introduction to the HRM special issue. *Human Resource Management*, 57(3), 679–684. https://doi.org/10.1002/hrm.21916

21) Institute powered by HRcom, HR. (2021). *The State of HR Analytics 2021*. https://www.hr.com/en/resources/free_research_white_papers/the-state-of-hr-analytics-2021-report_kttr6trx.html

22) Kapoor, B., & Kabra, Y. (2014). Current and future trends in human resources analytics adoption. *Journal of Cases on Information Technology*, *16*(1), 50–59. https://doi.org/10.4018/jcit.2014010105

23) Kataria, A., Kumar, S., Sureka, R. and Gupta, B. (2020). Forty years of Employee Relations – The International Journal: a bibliometric overview. *Employee Relations*, 42(6), 1205-1230.

24) Kaufman, B.E. (2007). The development of HRM in historical and international perspective. In P. Boxall, J. Purcell, & P. Wright (Eds.). *The Oxford Handbook of Human Resource Management*. Oxford University Press.

25) Kessler, M.M. (1963).Bibliographic coupling between scientific papers. *American Documentation*, 14(1),10-25.

26) King, K. G. (2016). Data analytics in human Resources: A case study and critical review. *Human Resource Development Review*, *15*(4), 487–495. https://doi.org/10.1177/1534484316675818

27) Lunsford, D. L., & Phillips, P. P. (2018). Tools used by organizations to support human capital analytics. *Performance Improvement*, *57*(3), 6–15. https://doi.org/10.1002/pfi.21767

28) Madsen, D., & Slåtten, K. (2019). An examination of the current status and popularity of HR Analytics. *International Journal of Strategic Management*, *19*(2), 17–38. https://doi.org/10.18374/ijsm-19-2.2

29) Margherita, A. (2021). Human resources analytics: A systematization of research topics and directions for future research. *Human Resource Management Review*, *32*(2). https://doi.org/10.1016/j.hrmr.2020.100795

30) Mariani, M., & Borghi, M. (2020). Environmental discourse in hotel online reviews: a big data analysis. *Sustain Tourism*, 29 (5), 829–848.

31) Mariani, M., Machado, I., Magrelli, V., Yogesh K. Dwivedi. (2022). Artificial intelligence in innovation research: A systematic review, conceptual framework, and future research directions. Technovation, Vol 122. https://doi.org/10.1016/j.technovation.2022.102623

32) Marler, J. H., & Boudreau, J. W. (2016). An evidence-based review of HR Analytics. *International Journal of Human Resource Management*, *28*(1), 3–26. https://doi.org/10.1080/09585192.2016.1244699

33) Marler, J. H., Cronemberger, F., Tao, C. (2017). HR Analytics: Here to stay or short lived management fashion?. *Electronic HRM in the Smart Era*, 59–85. Emerald Publishing Limited. https://doi.org/10.1108/978-1-78714-315-920161003

34) Mart_inez-L_opez, F.J., Merig_o, J.M., Valenzuela, L. and Nicol_as, C. (2018). Fifty years of the European journal of marketing: a bibliometric analysis. *European Journal of Marketing*, 52,439-68.

35) McIver, D., Lengnick-Hall, M. A., & Lengnick-Hall, C. A. (2018). A strategic approach to workforce analytics. *Business Horizons*, 61(3).

36) Merig_o, J.M. and Yang, J.B. (2017). Accounting research: a bibliometric analysis. *Australian Accounting Review*, 27(1), 71-100.

37) Minbaeva, D. (2017). Human capital analytics: why aren't we there? Introduction to the special issue. *Journal of Organizational Effectiveness*, *4*(2), 110–118. https://doi.org/10.1108/JOEPP-04-2017-0035

38) Mishra, S. N., Lama, R., & Pal, Y. (2016). Human resource predictive analytics (HRPA) for HR management in organizations. *International Journal of Scientific & Technology Research*, 5,5. www.ijstr.org

39) Mohammed, A. Q. (2019). HR Analytics: a modern tool in HR for predictive decision making. *Journal Of Management*, *10*(3). https://doi.org/10.34218/jom.6.3.2019.007

40) Norris, M. and Oppenheim, C. (2007). Comparing alternatives to the Web of Science for coverage of the social sciences' literature. *Journal of Informetrics*, 1(2),161-169.

41) Pritchard, A. (1969). Statistical bibliography or bibliometrics?. *Journal of Documentation*, 25, 348-349.

42) Pulakos, E. D., & O'Leary, R. S. (2011). Why is performance management broken? *Industrial and Organizational Psychology*, *4*(2), 146–164. https://doi.org/10.1111/j.1754-9434.2011.01315.x

43) Ramachandran, R., Babu, V. and Murugesan, V.P. (2023). The role of blockchain technology in the process of decision-making in human resource management: a review and future research agenda. *Business Process Management Journal*, 29 (1), 116-139. https://doi.org/10.1108/BPMJ-07-2022-0351

44) Rasmussen, T., & Ulrich, D. (2015). Learning from practice: How HR Analytics avoids being a management fad. *Organizational Dynamics*, *44*(3), 236–242. https://doi.org/10.1016/j.orgdyn.2015.05.008

45) Rialp, A., Merig_o, J.M., Cancino, C.A. and Urbano, D. (2019). Twenty-five years (1992-2016) of the international business review: a bibliometric overview. *International Business Review*, 28(6).

46) Roberts, G. (2016). Navigating political and ethical issues of using big data in HR. *Talent Analytics.*

47) Saxena, M., Bagga, T., & Gupta, S. (2021). Fearless path for human resource professionals's through analytics: A study of recent tools and techniques of human resource analytics and its implication. *International Journal of Information Technology (Singapore)*, *13*(4), 1649–1657. https://doi.org/10.1007/s41870-021-00677-z

48) Schläfke, M., Silvi, R., & Möller, K. (2013). A framework for business analytics in performance management. *International Journal of Productivity and Performance Management*, *62*(1), 110–122. https://doi.org/10.1108/17410401311285327

49) Sharma, A., & Sharma, T. (2017). HR Analytics and performance appraisal system: A conceptual framework for employee performance improvement. *Management Research Review*, *40*(6), 684–697. https://doi.org/10.1108/MRR-04-2016-0084

50) Shrivastava, S., Nagdev, K., & Rajesh, A. (2018). Redefining HR using people analytics: The case of Google. *Human Resource Management International Digest*, 26(2), 3–6. https://doi.org/10.1108/HRMID-06-2017-0112

51) Soundararajan, R., & Singh, K. (2017). *Winning on HR Analytics: Leveraging data for competitive advantage*. Sage Publications Pvt Ltd.

52) Sullivan, J. (2013). *How Google is using people analytics to completely reinvent HR*. Talent Management and HR. www.tlnt.com/how-google-is-using-people-analytics-to-completely-reinvent-hr-2/

53) Sureka, R., Kumar, S., Kumar Mangla, S. and Hourneaux Junior, F. (2021), "Fifteen years of international journal of productivity and performance management (2004–2018)", *International Journal of Productivity and Performance Management*, Vol. 70(5), 1092-1117. https://doi.org/10.1108/IJPPM-11-2019-0530

54) Tur-Porcar, A., Mas-Tur, A., Merig_o, J.M., Roig-Tierno, N. and Watt, J. (2018). A bibliometric history of the Journal of Psychology between 1936 and 2015. *Journal of Psychology*, 152(4), 1-27.

55) Valenzuela-Fernandez, L., Merig_o, J.M., Lichtenthal, J.D. and Nicolas, C. (2019). A bibliometric analysis of the first 25 Years of the journal of business-to-business marketing. *Journal of Business-To-Business Marketing*, 26 (1), 75-94.

56) Van den Heuvel, S., & Bondarouk, T. (2017). The rise (and fall?) of HR Analytics. *Journal of Organizational Effectiveness: People and Performance*, *4*(2), 157–178. https://doi.org/10.1108/joepp-03-2017-0022

57) Van der Togt, J., & Rasmussen, T.H. (2017), "Toward evidence-based HR", *Journal of Organizational Effectiveness: People and Performance*, Vol. 4 No. 2, pp. 127-132. https://doi.org/10.1108/JOEPP-02-2017-0013

58) Van Eck, N.J., & Waltman, L. (2014). Visualizing bibliometric networks. In Y. Ding, R. Rousseau, & D. Wolfram (Eds.), *Measuring scholarly impact: Methods and practice* ,285–320. Springer.

59) Visier. (2021).*The age of people analytics: Survey on characteristics, value achieved, and leading practices of advanced organizations*. https://www.sierra-cedar.com/wp-content/uploads/

60) Weinberg, B. H. (1974). Bibliographic coupling: a review. *Information Storage and Retrieval*, 10, 189-196.

61) Weisbeck, D. (2015). Fact or hype: Do predictive workforce analytics actually work?. Visier Publication, September Edition.

62) Witte,L.(2016).*We have HR Analytics! so what? - An exploratory study into the impact of HR Analytics on strategic HRM.* [Master Thesis, University of Twente] https://purl.utwente.nl/essays/70301

63) Yancey Momin, W. M., Mishra, K. (2015). HR Analytics as a strategic workforce planning. *International Journal of Applied Research*, 1(4), 258-260. http://dx.doi.org/10.13140/RG.2.2.26305.51040

64) Yang Zhang, & Stephen J. J. McGuire. (2023). A bibliometric analysis of hrm systems and firm innovation. *International Journal of Business and Society*, *24*(1), 82-99. https://doi.org/10.33736/ijbs.5604.2023

65) Zhao, D. and Strotmann, A. (2015). Analysis and visualization of citation networks. *Synthesis Lectures on Visualization*, 3(2), 1-127.

66) Zupic, I., ˇCater, T. (2015). Bibliometric methods in management and organization. Organ. Res. Methods 18, 429–72.

Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics

Ahmad Zamzami Nur[1], Sri Harti Widyastuti[2]

[1,2]Java Language Education Study Program Graduate Program Faculty of Languages, Arts and Culture Yogyakarta State University Jl. Colombo Yogyakarta No. 1, Sleman, Daerah Istimewa Yogyakarta 55281, Indonesia.

ABSTRACT: The aims of this study is to describe the heuristic and hermeunitic interpretations, matrices and models, hypograms, and indirectness of expression contained in the lyrics of "Teary Eyed Tears" by Rubah Di Selatan, which is the original soundtrack of the independent film Portrait Canal Yoshiro. This investigation employs a descriptive method. Using Riffaterre's semiotic theory, the results demonstrate a) heuristic and hermeunitic readings, b) matrices and models, c) actual and potential hypograms, and 4) the indirectness of expression in the lyrics of the song "Teary Eyed Tears" by Rubah Di Selatan, which is the original soundtrack in the independent film Yushiro Canal Portrait.

KEYWORDS: Riffaterre Semiotic, Song Lyrics, Rubah Di Selatan

I. INTRODUCTION

Not only poetry but also short stories, novels, films, songs, and plays are included in literature. Literary works have meaning as creative products and function as a medium for the dissemination of ideas or entertainment. Both meanings have been able to reflect the understanding of literary studies so far. It is a good thing when a literary work can have a positive impact on readers and transfer knowledge. Thus, literary works have ideas in the empirical world, that is, ideas about culture. Wellek and Waren (1987:135) stated that literary works can be seen as a form of documentation that encompasses the history of ideas and philosophy because they are a mirror of the history of ideas.

In literature, language style and trick play are things that are innovated in order to convey the ideas contained in them as a whole so that future readers can easily understand them. The language in the works is full of ciphers, metaphors, and expressions with indirect meaning. Wellek and Heren (1987:16) express these symptoms. Symptoms in literature suggest that we are dealing with poetic language, mediating and concentrating the resources of everyday language and sometimes giving it an element of intentionality that forces the reader to notice what is there and recognize what is there. in literature.

The views represented by Wellek and Heren are consistent with those of Michael Riffaterre. Riffaterre (1987) in his book Semiotics of Poetry argues that there are four things to consider when understanding and interpreting a poem, namely: 1) poetry is an indirect expression expressed in terms of other things; 2) heuristics and Explanatory reading; 3) matrix, model and variance; finally 4) hypogram. Poetry can also be realized in lyrics as they share the same characteristics that poetry can be conveyed through song. This is confirmed by Damono (2005:106-7), argues that literature can also be created in the form of song and painting, or even vice versa.

In Indonesia, the term "musicization of poetry" is often used, which can be interpreted as the process or effort of translating poetry into musical form. This happens all the time, and it's nothing new in the world of literature or even entertainment. Similar to something classic, so it tends to turn into something romantic in the modern day. In the song itself, the notes are one of the most important things that grab the listener's attention. The packaging used to cover the text must be good enough so that the idea can be conveyed to the audience later.

Yogyakarta is one of the cities that has become a very broad forum for the music world. It is said that this is the capital of education, because since ancient times there have been many schools and celebrities. Rubah Di Selatan is a music group from Yogyakarta formed in 2015 to perform culture-centric folk songs. Folk music can be explained as two things in different musical

Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics

entities, or as traditional music that exists in various regions. Rubah Di Selatan uses several national instruments such as West Sumatra Saruan and West Java Kalindin. Central Javanese music is Kalindin. Rubah Di Selatan consists of Malinda (vocals), Gilang (guitar), Adnan (keyboards) and Ronnie (ethnic percussion) who already have an album Anthera. One of the most famous songs is "Teary Eyed Tears". Although the song was inspired by an event or past tragedy, when Indonesia was colonized by the Japanese, there was Romusha, so Sultan Hamengku Buwono IX decided to order people to build a Mataram Trench development called Yushiro Canal.

Roem (2011) describes the biography of a Yogyakarta leader in his book entitled "Throne of the People: The Gaps in the Life of Sultan Hamengku Buwono". Sultan Hamongubwono, who was in power in Yogyakarta and also served as the governor, was subordinate to the regional government of the central government in Jakarta. With a unique and strong personality, he acts as King and Sultan on the one hand, and an official of the Unified State of the Republic of Indonesia on the other.

The researchers chose the song "Teary Eyed Tears", which has a special function of reflecting on history and reminiscing about the tragedy in it. For songs that are just aesthetically enjoyable, there is a correlation between the lyrics of the creator and the listener, but in this song it has a different function than the voiced form. Full of folk style, so it has more impact than other songs.

II. METHOD

This study uses a descriptive method that falls under the category of qualitative research. Data analysis of qualitative data examines hidden or hidden meanings in depth through data interpretation (Ratna, 2010: 94 and 306). This study has primary data sources, the lyrics of Rubah Di Selatan song "Teary Eyed Tears", and secondary data from semiotics-related articles, books, journals, theses, and dissertations. Collect data using listening and note-taking techniques. Get it by listening to Rubah Di Selatan song "Teary Eyed Tears". The recording technique involves recording the characters in song lyrics and then analyzing the data by categorizing it. After the data are finalized in the category stage, they are further examined using Riffaterre's theory of semiotics.

III. RESULT AND DISSCUSION

An ethnic band with a folk genre formed in 2015, better known as Rubah Di Selatan, which is concerned with culture. The group name, inspired by the nature of the fox, is simple but has a very strong character. Formed in the Bantul area, which is geographically located to the south on the map of the Special Region of Yogyakarta, the four personnel who come from the south of Yogyakarta are expected to have strong and simple characteristics. There is already one album that officially came out in early February 2019 with the title Antera. There are 10 songs in which Antera itself has the meaning of anthers taken from modern Latin. With the philosophy that in the future Rubah Di Selatan can make a flower or flowers that can continue to rotate.

The song "Teary Eyed Tears" talks about the Yushiro Canal or Mataram Trench during the Japanese occupation, where Romusha was at that time. The song became the soundtrack to a documentary about Yushiro Canal. The lyrics of the song are as follows:

Murky moon
A house without a room
As the wind sweep, seep, stun

A silent whisper by the ear, smarting What is there to see and hear?
Roaring roar! A silent witness
To our fading soul

So long, remembrance and oblivion
Buried indifference amongst embers
Can't you see the bare stream
Of tears left behind
So long, remembrance and oblivion
Buried indifference amongst embers
Don't you remember the bare stream
"Only when the Progo and Opak rivers embrace may the Mataram land be fertile and men prosper"

Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics

So long, remembrance and oblivion
Buried indifference amongst embers
Can't you see the bare stream
Of tears left behind

So long, remembrance and oblivion
Buried indifference amongst embers
Can't you see the bare stream
Of taers left behind

The song lyrics above can be analyzed using Reffaterre's semiotic theory, which includes heuristic and hermeneutic readings, matrices and models, actual and potential hypograms, and indirectness of expression.

Heuristic and Hermenutic Heuristic Reading

The results of the study show that the heuristic reading of the lyrics of the song **"Teary Eyed Tears"** by Rubah Di Selatan shows deep sadness. This song can help listeners imagine the situation when Indonesia was colonized by the Japanese and Romusha's enactment made all the people, especially the people in Yogyakarta, tormented. On the lyrics,

Excerpt 1

(1)   A silent whisper by the ear, smarting

(2)   What is there to see and hear?

(3)   Roaring roar! A silent witness

(4)   To our fading soul

shows the relationship between excerpts. Excerpt (1) and (2) describe something that hurts so that only the victim in the incident can feel pain. Continuing on lyrics (3) and (4), in the end, the pain that hit resulted in death due to coercion given by the invaders.

Excerpt 2

(1)   So long, remembrance and oblivion

(2)   Buried indifference amongst embers

(3)   Can't you see the bare stream

(4)   Of tears left behind

(5)   So long, remembrance and oblivion

(6)   Buried indifference amongst embers

(7)   Don't you remember the bare stream

In the next part of the excerpt, the correlation from lines (1) to (7) shows something missing. Leaving a cry written with the remaining tears shows that sadness can really be felt. Tears are a form of human sadness. Sadness for a loss that ultimately makes you forget the **Hermeneutic Reading**

Understanding the lyrics of the song **"Teary Eyed Tears"** can not only be done at the lexical level but also at the semiotic stage. Specifically, by hermeneutic reading, which involves codes outside the language so that meaning in a text or lyrics can be found, As stated by Riffaterre (1978: 5–6), the function of hermeneutic reading is a very significant originator.

The title of the song composed by Rubah Di Selatan, namely **"Teary Eyed Tears",** has a symbolic meaning so that it can be correlated with the creator, which is interpreted in a song. This shows that the folk genre in the music group Rubah Di Selatan makes the atmosphere clearly described. Conceived with an ironic tone, the meaning of the lyrics is conveyed to the listeners.

Excerpt 3

"Only when the Progo and Opak rivers embrace may the Mataram land be fertile and men prosper"

Packaged in Javanese, symbolizing the geographical existence of history contained in the lyrics of the song from Yogyakarta. This means that Mataram Earth will be fertile and the people can prosper if the Progo and Opak rivers can become one. It is impossible if you just think about it, but Sultan Hemengku Buwono IX made a way so that Romusha could be eliminated by the

Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics

people being asked to build the Yashiro Canal or the Mataram Ditch, which, from the view of the Japanese colonialists, said that Yogyakarta was less prosperous, and then given assistance to make the Mataram Ditch so that life in the city of Yogyakarta is more prosperous.

The Matrix and The Model

An abstract concept that is never actualized and does not appear is the meaning of the matrix. The matrix can be manifested in the form of words, phrases, clauses, or even simple sentences. Lantowa (2017: 18) emphasizes making a matrix analogy like a donut, in which there are two parts, namely, the donut meat and the empty circle in the middle of the donut. Which is an integral component, so they complement each other. The matrix found in the song **"Teary Eyed Tears"** is related to feeling very sad. This is shown in the song lyrics with sentence models.

Roaring roar! A silent witness, To our fading soul, So long, remembrance and oblivion, Buried indifference amongst embers, Can't you see the bare stream, Of tears left behind. **Actual and Potential Hypograms**

There are two types of hypograms in the song **"Teary Eyed Tears"** by Rubah Di Selatan, namely actual and potential. The hyopogram is divided into two parts, namely actual and potential. Actual can be real text, words, sentences, or the entire text. Potential can be in the form of words, phrases, or simple sentences, according to Ratih (2016: 8). The lyrics of the song, as well as the advice of a friend of the Prophet, namely Umar Bin Khattab, which reads "Don't be sad for what has passed, unless it can make you work harder for what will come," show that it is related to the actual hypogram. While the potential hypogram is that all events have a certain purpose.

Unsustainability of Expression Change of Meaning

The change of meaning found in the lyrics of the song **"Teary Eyed Tears"** by Rubah di Selatan is in the form of a metaphor. On the lyrics, Boisterous Rumble!" Part of the silent witness" refers to inanimate objects that were witnesses to the incident at that time. Therefore, the lyrics of the song describe the sadness that there are no witnesses who actually see it because everyone is affected. Then, in the lyrics, forgot to be Buried in the Coals" becomes an analogy in which all events will disappear into dust due to the incident at that time.

Deviance of Meaning

In the song **"Teary Eyed Tears"** by Rubah di Selatan, the distortion of meaning takes the form of a contradiction that mocks the listener. To feel the sadness that was experienced during that event. All things that contain sadness in the end will only cause tears and then become something that is destroyed. Must immediately rise above all the events experienced by doing something in a positive direction away from a very painful sadness.

Creation of Meaning

The meaning of the lyrics of the song **"Teary Eyed Tears"** by Rubah Di Selatan is enjambenent.

Excerpt 2

(1) So long, remembrance and oblivion
(2) Buried indifference amongst embers
(3) Can't you see the bare stream
(4) Of tears left behind
(5) So long, remembrance and oblivion
(6) Buried indifference amongst embers
(7) Don't you remember the bare stream

From sentences 1 to 2, 2 to 3, 3 to 4, 4 to 5, 5 to 6, and 6 to 7, form one sentence. This sentence emphasizes that all sorrow will be buried and vanished, even though tears continue to flow from the eyes of those who witnessed what happened at that time.

IV. CONCLUTION

From the study above, researchers can draw a conclusion, namely as follows: the heuristic and hermeneutic reading of the lyrics of the song **"Teary Eyed Tears"** describes a deep sadness over the events that happened at that time in the city of Yogyakarta, which in the end the people, with the envoy of Sri Sultan Hamengku Buwono IX, made the Yushiro Canal to stabilize the prosperity of its people, shown in the verse song lyrics 1 and 2. The matrix of the song lyrics **"Teary Eyed Tears"** is the feeling of sadness with the events shown in the song lyrics with sentence *Roaring roar! A silent witness, To our fading soul, So long, remembrance and oblivion, Buried indifference amongst embers, Can't you see the bare stream, Of tears left behind.*

Interpretation of the Lyrics of Teary Eyed Tears by Rubah Di Selatan (OST. PORTRAIT OF CANAL YUSHIRO): A Study of Riffaterre's Semiotics

The actual hypogram in the lyrics of the song **"Teary Eyed Tears"** is in the form of advice from the Prophet's friend, Umar Bin Khattab, which reads "Don't grieve over what has passed unless it will make you work harder for what is to come" indicates that it is related to the actual hypogram. While the potential hypogram is that all events have a certain purpose, there is an indirect expression in the form of a change of meaning, namely, in the form of a metaphor. In the lyrics *Roaring roar*! *A silent witness*, refers to inanimate objects that bear witness to what happened at that time. Then, in the form of distortion of meaning in the form of contradictions that provide satire to the listener, to feel the sadness that was experienced during that event. All things that contain sadness in the end will only cause tears and then become something that is destroyed. And the last in the form of creating meaning is found in stanza 2, where sentences 1 to 2, 2 to 3, 3 to 4, 4 to 5, 5 to 6, and 6 to 7 form one sentence. This sentence emphasizes that all sorrow will be buried and vanished, even though tears continue to flow from the eyes of those who witnessed what happened at that time.

REFERENCES

1) Damono, Sapardi Djoko. 2005. Pegangan Penelitian Sastra Bandingan. Jakarta: Pusat Bahasa.
2) Endaraswara, Suwardi. 2003. Metodologi Penelitian sastra; Epistemologi, Model, Teori dan Aplikasi. Yogyakarta: Pustaka Widyatama.
3) Endraswara, Suwardi. 2013. Metodologi Penelitian sastra; Epistemologi, Model, Teori dan Aplikasi. Yogyakarta: CAPS.
4) Endraswara, Suwardi. 2013. Teori Kritik Sastra. Yogyakarta: CAPS.
5) Endraswara, Suwardi. 2020. Metodologi Penelitian Fenomenologi Sastra. Yogyakarta: Fakultas Bahasa dan Seni UNY.
6) Lantowa, Jafar., et al, (2017), Semiotika - Teori, Metode, dan Penerapannya dalam Penelitian Sastra, Yogyakarta: CV Budi Utama
7) Moleong, Lexi J. 2005. Metode Penelitian Kualitatif. Bandung: Remaja Rosdakarya.
8) Pamungkas, O.Y dkk. 2021. Javanese Cosmology: Symbolic Transformation Of Names In Javanese Novels. HTS Teologiese Studies/Theological Studies
9) Pamungkas, O.Y dkk. 2020. Metaphor as a Strategy of Language Politeness: A Study of the Novel Tetralogy by Ki Padmasusastra. Atlantis Press, Advances in Sosial Sciense, Education and Humanities Research. Vol. 533.
10) Ratna, N. K. (2010). Metodologi Penelitian Kajian Budaya dan Ilmu Sosial Humaniora pada Umumnya. Yogyakarta: Pustaka Pelajar.
11) Retnowati, Intan Tri dkk. 2022. Interpretasi Lirik Lagu "Pilu Membiru", "Rehat", "Sulung", dan "Saudade" Karya Kunto Aji dalam Album Mantra-Mantra: Sebuah Kajian Semiotika Riffaterre. Jurnal Wicara, Vol. 1, No. 1.
12) Riffaterre, Michael. 1978. Semiotic of Poetry. London: Indiana of University Press
13) Roem, M. D. (2011). Takhta untuk rakyat: Celah-Celah Kehidupan Sultan Hamengku Buwono IX. Jakarta: Gramedia Pustaka Utama.
14) Wellek, Rene dan W arren. 1987. Teori Kesusastraan. Diindonesiakan oleh Melani Budianta. Jakarta: PT. Gramedia Pustaka Utama.

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

Muhammad Adam Fatihurrahman[1], Duwi Kurnianto Pambudi[2], Enggista Hendriko Delano[3]

[1,2,3] Department of Sports Science, Faculty of Sports and Health Sciences, Yogyakarta State University.

ABSTRACT: Evaluation of Bhayangkara Presisi Football Club Achievement Development Management. Thesis. Yogyakarta: Masters Program, Faculty of Sports and Health Sciences, Yogyakarta State University, 2024.

The aim of this research is to find out the evaluation of the Bhayangkara Presisi Football Club's achievement development program, examining it from the context, input, Process and Product (CIPP) aspects as well as finding out whether the achievement development program that has been running at the Bhayangkara Presisi Football Club has been managed optimally.

This research is a type of quantitative and qualitative research with the CIPP evaluation model. The sampling technique used purposive sampling technique to obtain a sample of three program administrators, three coaches and six players. Evaluation uses quantitative and qualitative approaches. Data collection uses research instruments in the form of observation, questionnaires, interviews and documentation.

The results of the research, namely, Context evaluation of Bhayangkara Presisi FC's achievement coaching management, amounted to 2.91, which is in the good category. Based on the background indicators of the coaching program, it is 3.09 in the good category, the coaching program objectives are 2.60 in the good category, and the coaching program is 3.03 in the good category. The evaluation input for Bhayangkara Presisi FC's achievement coaching management, amounting to 2.75, is in the good category. Based on the human resources indicator, it is 3.07 in the good category, the trainer program is 3.05 in the good category, funding is 2.66 in the good category, facilities and infrastructure is 2.66 in the good category, and parental support is 2.29 in the poor category. Bhayangkara Presisi FC's achievement management evaluation process, amounting to 2.83, is in the good category. Based on the program implementation indicator, it is 3.06 in the good category, and coordination is 2.83 in the good category. Bhayangkara Presisi FC's performance management management evaluation product, amounting to 3.27, is in the good category. Based on the achievement indicator of 3.33 in the good category and welfare of 3.20 in the good category.

KEYWORDS: Evaluation, Achievement Development Program, Bhayangkara Presisi FC

I. INTRODUCTION

Sport is part of daily human activities which is useful for forming a healthy body and mind. Achieving peak performance in sports can only be achieved through a systematic, planned, regular and continuous coaching process. Athlete development is the responsibility of all citizens and cannot be done in sections or individually. In order to achieve high and maximum performance, continuous, tiered and sustainable development of athletes is needed. Serious attention from the government is the main requirement for advancing sports in Indonesia.

The government must be the driving force so that all components of the nation are called to make their contribution to the country. Abrar & Fitroni (2021: 1) state that the main objective of the achievement development program is to develop athletes from an early age, to search for athletes' talents in each sport and to be able to achieve maximum performance. Tiered, systematic and planned development is one of the important activities in improving sports performance. Efforts to develop sports achievements by the government through the Ministry of Education and Culture, Ministry of Youth and Sports, Provincial KONI, and parent sports organizations. This is in accordance with Law of the Republic of Indonesia Number 11 of 2002 concerning Sports.

Development of sports achievements cannot happen instantly, especially with random management, but requires totality and commitment to develop sports in a systemic and supportive (sustainable) manner. Sports achievement is something that is observable and measurable, meaning that sports coaching is carried out with a scientific approach starting from talent scouting to the coaching process. When viewed from a systemic perspective, the quality of the output is determined by the input and the

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

quality of the coaching process that occurs (Aji & Supriyono, 2021: 95). The achievements that have been obtained so far are a real consequence of sub-systems that are less than optimal, namely input and processes. Coaching sports performance requires a process to be able to achieve peak performance and coaching athletes cannot be done alone, but must be systemic, integrated, directed and programmed with clear.

The success of achievement coaching is largely determined by various elements, one of the elements that influences the achievement of achievement coaching goals is the application of good management. In connection with management in fostering sports achievements, there are five management resources that must be managed well, namely (1) human resources, (2) financial capabilities, (3) internal cooperation, (4) facilities and infrastructure, (5) methods applied. The five management resources above are a unit that cannot be separated one by one, because each other supports and determines each other (Wani, 2018: 35).

One sport that is of concern is football. The sport of football is one of the most popular sports among Indonesian people of all ages. is a team sport, where each player generally plays a special ball (called a soccer ball) with their feet on a soccer field. This sport is played by two teams, each consisting of 11 (eleven) core players and several reserve players. Entering the 21st century, this sport has been played by more than 250 million people in 200 countries. Football aims to score as many goals as possible by putting the ball into the opponent's goal. Football is played in an open, rectangular field, on grass or synthetic turf. (Maulana, et al., 2021: 96; Putri, et al., 2017: 2; Choi, et al., 2021: 516; Chang & Lee, 2017: 21).

Modern football originated from the efforts of people in the mid-nineteenth century between local football clubs who began to apply various rules, and ended with the formation of the Football Association in London, England in 1863. The rules created by the association allowed clubs to play each other without dispute, and specifically prohibits handling the ball (except the goalkeeper) and cheating during open field play. After a meeting of the five associations, a split began to emerge between association football and the rules created by the Rugby schools, which became known as rugby football. Football has been an Olympic sport since the Summer Olympics were held in 1900. During the first half of the nineteenth century, various football rules began to be created in schools, universities and clubs. The first set of rules published was that of Rugby School in 1845, followed by Eton College in 1847.

In the 1850s, several clubs not connected to schools or universities began to form throughout the world to play various types of soccer games. Several clubs emerged with their own rules, most notably the Sheffield Football Club which was formed in 1857, which led to the formation of the Sheffield Football Association in 1867. Bhayangkara Presisi Indonesia Football Club is an Indonesian football team owned by the National Police. This club plays in League 1. This club also holds the record as the club with the most name changes in Indonesia, all because of the dualism that occurred between this club and the Persebaya Surabaya club between 2010 and 2016. Currently, this club is the squad holder. U-20 National Team Due to the Cancelation of the U-20 World Cup. The origins of this club began with the Dualisme Persebaya Surabaya which switched to the Indonesian Premier League and changed its name to Persebaya 1927 under PT Persebaya Indonesia. At that time, the team formerly known as Persikubar Kutai Barat was brought to Surabaya and changed its name to Persebaya Surabaya by Wisnu Wardhana under PT Mitra Muda Inti Berlian e (MMIB) so that Surabaya would have representatives in the official PSSI league. In 2015 they were not allowed to take part in the Mahaka Sports & Entertainment tournament entitled 2015 President's Cup. Because they wanted to take part, they added the word United to this team. Since qualifying for the top 8 round, BOPI has indicated that it will abandon the name Persebaya, because the patent rights for the logo and name are in the hands of Persebaya 1927, a subordinate of PT Persebaya Indonesia. Therefore, they changed their name to Bonek FC. The club, which is under the auspices of the Indonesian National Police or National Police, has changed its name three times in the League 1 competition. When this club was founded on September 8 2016, this team was called Bhayangkara Surabaya, then changed to Bhayangkara Solo FC, and finally used Bhayangkara Presisi FC as the club name.

During the first observation by the researcher, data was obtained regarding the achievements of Bhayangkara Presisi FC. From the Bhayangkara FC achievement list table, it can be concluded that in 2010 - 2011 the main division was in 5th position in group 3, in 2011 - 2012 the main division was in the top 8, in 2013 the main division was in 1st place, in 2014 the LSI league was in the top 8, in 2015 the league discontinued, in 2016 position 7 in the ISC A league, in 2017 league 1 won 1st place, in 2018 league 1 fell to position 3, in 2019 it fell to position 4, in 2020 it fell to position 11, in 2021 – 2022 it rose to position in the top 3 , in 2022-2023 it will drop to 7th position and in the 2023 – 2024 league while being the caretaker of league 1. As time goes by, the position of Bhayangkara Presisi FC's Football achievements, which are less consistent at the top of the standings, Bhayangkara Presisi FC this season has transformed into a top club. lower. How could it not be, they are still stuck at the bottom of the board, even in the relegation zone, until they have played seven BRI Liga 1 2023/2024 matches. The club nicknamed The Guardian is now in 17th position with four points from one wins, one draw and five losses. They are only ahead of Arema FC who are in the bottom position with only two points. The situation faced by Bhayangkara Presisi FC is increasingly difficult because it is difficult to win. However, Coach Emral Abus admitted that there had been no ultimatum directed at him regarding this bad result. The transition from

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

changing coaches should require a process for team improvement. Apart from that, efforts to increase achievement cannot be separated from sustainable or long-term coaching. With this decline in performance, the frequency and quality of training should be increased, such as training core players and generational seeds every week. Complete types of training include; physical training, skills training, mental strength training, etc. In 2013 and 2017, Bhayangkara Presisi FC was able to top the standings or be champions of the League, which is different from today, if you look at the achievements of that year, at that time the players were very stable in spirit and showed their performance even though they went through many ups and downs, which is different from this year's league which has many experience defeat. If there is no improvement in the performance of Bhayangkara Presisi FC, it will be a serious threat with a position in the relegation zone by occupying 18th position or also at the bottom of the standings. Apart from being the team that has never won, Bhayangkara Presisi FC is also the team that has conceded the most goals. A number of problems that are still the main task are the home base which has not been settled or moved around, so that the infrastructure during training is less than optimal. The observations above provide an illustration that there are problems that need to be resolved in order to find a solution. This proves that excellence in achievement cannot be separated from an implicit threat that can quickly undermine high achievements. The problems with the Bhayangkara Presisi FC team are of course closely related to the management system in the team is not good. In connection with these problems, researchers are trying to explore more deeply the problems and management that need to be evaluated in the Bhayangkara FC team. Based on the results of initial observations carried out by researchers during training and visits to home base, the main problems found at Bhayangkara Presisi FC include: 1. there are almost 80% of administrators and players who have double jobs, namely being members of the National Police, so motivation and focus are still lacking. 2. Many young players are new and are still adapting to Bhayangkara Presisi FC's training programs. 3. Management of athletes who have passed peak performance and designing training programs for regeneration who are currently unable to become second tier players due to the lack of playing time in competitions so there is a big difference with seniors. 4. The management's limitations in embracing, approaching psychologically and materially so that athletes continue to provide the best performance. 5. Change of trainer, so it takes time for the training improvement process. Achievement is used to measure the level of knowledge, intelligence and skills of a person, community group, nation and country. Sports achievement is the result obtained from the effort and hard work of an athlete to obtain a medal in a championship/match. Achieving maximum athlete performance requires programmed, directed and continuous coaching and development and is supported by adequate supporting facilities.

II. METHODS

This type of research is evaluation research which uses a mixture of quantitative and qualitative methods. The evaluation model that will be used in this research is the CIPP model because the CIPP model is a complex evaluation that includes Context, Input, Process, and Product Research Population.

A large group of individuals who have the same characteristics is called a population. A population can be a group of elements or cases, either individuals, objects, or events related to specific criteria. Population as the entire research object consisting of humans, objects, animals, plants, symptoms, test scores, or events as a data source that has certain characteristics in a study (Subakti, et al., 2021: 56). The subjects of this evaluation are daily administrators, player coaches and goalkeeper coaches, and Bhayangkara Presisi Football Club players who are willing to be samples and fill out questionnaires from researchers with the criteria for players joining League 1. The sample criteria are: daily administrators, player coaches and goalkeeper coaches, and Bhayangkara Presisi Football Club players who are willing to be samples and fill out questionnaires from researchers with the criteria for players joining League 1. Data collection techniques are carried out by observation, interviews, questionnaires and a combination of the three. Apart from these three things, documentation can be used as supporting secondary data. The validity used in this research is content and construct validity. A questionnaire is said to be reliable or reliable if a person's answers to statements are consistent or stable over time. If an instrument can be declared reliable if it has a Cronbach Alpha Coefficient > 60%, or more than 0.06 (Ghozali, 2016: 47). This reliability test uses the SPSS version 23.0 program.

III. RESULTS

Data Analysis Techniques analyze data, so that a conclusion can be drawn from the data by calculating categories. The data obtained was then processed with the help of the SPSS version 23.0 computer program. In accordance with the research objectives, the data analysis technique used to analyze the data in this research is interactive model qualitative analysis as proposed by Miles and Huberman.

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

Table 1. Average indicators of the background of the construction program, the purpose of the construction program, and the construction program

Component Context	Mean	Kategori
Construction Program Background	3,09	Good
Purpose of the Construction	2,60	Good
Program Construction	3,03	Good
Program Context Components	2,91	Good

Shows that the Contexs evaluation of Bhayangkara FC Achievement Development management is 2.91 in the good category.

Table 2. Average Bhayangkara Presisi FC Input Evaluation Results

Component Input	Mean	Kategori
Human Resources	3,07	Good
Trainer program	3,05	Good
Funding	2,66	Good
Facilities and infrastructure	2,66	Good
Family support	2,29	Not good
Input Components	2,75	Good

Shows that the management evaluation input for Bhayangkara FC Achievement Development is 2.75 in the good category.

Table 3. Average Bhayangkara Presisi FC Input Evaluation Results

Component Process	Mean	Kategori
Program Implementation	3,06	Good
Coordination	2,60	Good
Process Components	2,83	Good

Shows that the Bhayangkara Presisi FC management evaluation process is 2.83 in the good category

Table 4. Average Bhayangkara Presisi FC Product Evaluation Results

Product Components	Mean	Kategori
Performance	3,33	Good
Well-being	3,20	Good
Product Components	3,27	Good

Shows that Bhayangkara Presisi FC's sports management product evaluation is 3.27 in the good category.

IV. DISCUSSION

Context Component, Based on the results of the context analysis and evaluation above, it shows that the background of the coaching program, the objectives of the coaching program and the existing coaching program at Bhayangkara Presisi FC with categories are good. However, a good coaching program must have clear implementation so that each indicator in a coaching program can run according to predetermined procedures. In context evaluation, the evaluator assesses goals, needs, problems, assets, and opportunities, plus relevant contextual conditions and dynamics (Stufflebeam & Zhang, 2017: 311). Another opinion says that context evaluation is related to specifications regarding the program environment, unmet needs, the character of the evaluation subject and the program objectives to be achieved (Meivawati, etal., 2018: 63; Areli, et al., 2020: 180).

Based on the context component indicators in the background of the coaching program with an average value of 3.09 in the good category. The background of the coaching program contains indicators of management and athlete development strategies, both of which show good results. The results of observations and interviews also show that there is tiered athlete development. And progressive as evidenced by the existence of early age training for Bhayangkara Presisi FC players, and recruiting many young players, the aim is for the long term, even though they have experienced a decline in results this season. However, for sports coaching such as the quality of athletes being coached, trainer qualifications, intensive trainers (training programs, training

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

schedules, try-ins, try-outs and competitions, infrastructure and sports science and technology support have been carried out well. Because, coaching activities have been programmed, directed, planned through tiered activities over a relatively long period of time which are based on the concept of periodization and training principles and implementation methodology in Field. Based on the research results, it shows that the program background is good, the goals of the coaching program are good, and the coaching program is running well.

Input evaluation is the initial ability of a situation to support a program. Input evaluation here explains aspects relating to coaches, athletes, facilities and infrastructure, funding and parental support. Based on the research results, it shows that the input evaluation for the Bhayangkara Presisi FC sports management implementation program is good. However, parental support is still lacking, because they are far from their parents and communication with their families is limited to focus on training. However, other components show good results. Facilities and infrastructure show good results, but they need to be improved again because almost every year the home base always moves. Currently the home base is at the PTIK stadium.

Input evaluation assesses alternative approaches, activity plans, staffing plans, and budgets for feasibility and potential cost-effectiveness for meeting needs and achieving targeted objectives. In relation to this research, Input evaluation is an activity to analyze resources, in this case athletes, coaches and other supporters such as funding, financial resources, facilities and infrastructure.

Based on the funding indicator of 2.66, the good category. Funding is the most important supporting factor in efforts to make the sports performance development program a success. Funding at Bhayangkara Presisi FC is good because apart from funding from Korlantas there is also a main sponsor from the bank, so there are no problems with funding. Because, the achievement development program requires a lot of funding to support activities so that they can run well. Supporting achievement development activities requires support from both facilities and infrastructure and funds, in this case as a form of the process of carrying out development activities. Thus, without financial support, coaching will not be achieved. This support is closely related so that an integrated program can be created to support all sporting activities, so that maximum performance can be achieved. For sports coaching, quite a bit of funding is needed because this coaching system will cover and involve all systems and ranks in Indonesia (Assega & Akhiruyanto, 2021: 40).

Process evaluation is a material for implementing a decision that will be taken, in this case it will be seen whether the implementation of a program that has been determined is appropriate or not, the process evaluation here explains how the training program is implemented, the implementation of the coaching and monev (monitoring and evaluation) program at Bhayangkara Presisi F.C. Based on the research results, it shows that the evaluation process for the Bhayangkara Presisi FC achievement management implementation program is good. Process evaluation is related to activities to implement the program plan with the input that has been provided. Sugiyono (2017: 750) explains that the evaluation process is used to answer program implementation, procedures for implementing the performance of the people involved in implementation, implementation according to schedule, input to support the program implementation process, and weaknesses in program implementation. Process evaluation is carried out to learn whether program implementation is in accordance with plan.

The process components in research at Bhayangkara Presisi FC include program implementation and coordination, both of which show good results. Before the match, maximum training is carried out and mutual coordination between all parties. The physical and mental condition of the players must be fit before the match, they also have to stay in the mess to avoid negative things. Coordination of all parties before the match starts, all parties will replay the opposing side to set the match strategy. Because an athlete's performance is determined by a system of various interrelated parties, coordination, synchronization and synergy between various stakeholders is required.

Product evaluation in this research explains the results that have been achieved from a coaching program, namely achievement. Bhayangkara Presisi FC has had good achievements in recent times or in the last season, it can be seen from the results they have achieved, however, during interviews and documentation obtained by researchers, this season Bhayangkara Presisi FC has experienced a significant decline in performance. Bhayangkara Presisi FC experienced several changes in main coach. The decline in performance was due to several factors, because they wanted to focus on developing young players, so many professional players were replaced with young players, the hope was that future results would be better, there were several players who passed the national team selection. Achievements cannot be achieved just like that, but must be done with hard work from each athlete and under the guidance of quality coaches and support from various groups to advance football at Bhayangkara Presisi FC. The purpose of product evaluation is to measure and help further decisions, what has been achieved and what has been done after the program runs. Feedback on achievements is essential, both during the program cycle and at its conclusion. Product evaluation is also often expanded to assess long-term effects.

Evaluation of Achievement Development Management of Bhayangkara Precision Football Club

V. CONCLUSIONS

Based on the results of research and the results of data analysis that has been carried out, it is concluded that the achievement management evaluation of Bhayangkara Presisi FC is 2.94 in the good category. Conclusions based on each evaluation component are as follows.

1. Context of the management evaluation for the achievement of Bhayangkara Presisi FC, amounting to 2.91 is in the good category. Based on the background indicators of the coaching program, it is 3.09 in the good category, the coaching program objectives are 2.60 in the good category, and the coaching program is 3.03 in the good category.

2. Input evaluation of Bhayangkara Presisi FC's achievement coaching management, amounting to 2.75, is in the good category. Based on the human resources indicator, it is 3.07 in the good category, the trainer program is 3.05 in the good category, funding is 2.66 in the good category, facilities and infrastructure is 2.66 in the good category, and parental support is 2.29 in the poor category.

3. Bhayangkara Presisi FC achievement management evaluation process, amounting to 2.83, is in the good category. Based on the program implementation indicator, it is 3.06 in the good category and coordination is 2.83 in the good category.

4. Product evaluation of Bhayangkara Presisi FC's achievement management management, amounting to 3.27, is in the good category. Based on the achievement indicator of 3.33 in the good category and welfare of 3.20 in the good category.

REFERENCES

1) Abas, R., Sugiharto, S., & Sulaiman, S. (2019). The regional government policy towards the development of sports facilities and infrastructure in Ternate City, North Maluku Province. *Journal of Physical Education and Sports*, *8*(6), 186-191.

2) Abidin, K. Z., & Yuwono, C. (2021). Pembinaan prestasi atlet Paracycling National Paralympic Committee of Indonesia di Surakarta tahun 2020. *Indonesian Journal for Physical* Education *and Sport*, *2*(1), 130- 136.

3) Abrar, I. I., & Fitroni, H. (2021). Pembinaan cabang olahraga bola basket pada usia dibawa 20 tahun di Jawa Timur. *Jurnal Kesehatan Olahraga*, *9*(04).

4) Aji, S. W., & Supriyono, S. (2021). Survei pembinaan prestasi atlet dayung pada PODSI Kabupaten Pati Tahun 2020. *Indonesian Journal for Physical Education and Sport*, *2*, 94-99.

5) Akamigbo, I. S., & Eneja, R. U. (2020). Evaluation of financial accounting curriculum in senior secondary schools in Nigeria. *Nnadiebube Journal of Education*, *5*(3).

6) Aldapit, E., & Suharjana, S. (2019). CIPP evaluation model for the coaching program of running athletes. *Psychology, Evaluation, and Technology in Educational Research*, *1*(2), 104-116.

7) Al-Shanawani, H. M. (2019). Evaluation of self-learning curriculum for kindergarten using Stufflebeam's CIPP model. *SAGE Open*, *9*(1), 2158244018822380.

8) Amin, A. K., Doewes, M., & Purnama, S. K. (2017). Development of prototype: a swinging training aid tool —Swing Trainer‖ on woodball male athletes. *European Journal of Physical Education and Sport Science*, *3*(4).

9) Ananda, R., & Rafida, T. (2017). *Pengantar evaluasi program pendidikan*. Medan: Perdana Publishing.

10) Areli, A. J., Lian, B., & Kristiawan, M. (2020). An Evaluation of implementation industrial work practice programs in vocational school. *International Journal of Progressive Sciences and Technologies*, *20*(2), 179-186.

11) Arikunto, S. (2019). *Prosedur penelitian suatu pendekatan praktek*. Jakarta: PT Bukit, A. V.,

12) Bastari, A., & Putra, G. E. (2019). Evaluation of learning programs in Indonesian Naval Technology College with the context, input, process, and product (CIPP) model. *International Journal of Applied Engineering Research*, *14*(20), 3823-3827.

13) Cahya, A. C. A., Yazida, I. Y. P. I., Saniyah, R. S. R., & Sucipto, S. (2021, September). Peran penting penyusunan desain evaluasi bagi pelaksanaan program pelatihan. In *Seminar Nasional Peta Jalan Pendidikan dan Rancangan Undang-Undang Sistem Pendidikan Nasional* (Vol. 1, No. 1).

14) Danardono (2012). Program Pembinaan Prestasi Atlet Kota Yogyakarta Pemusatan Latihan Kota Yogyakarta. Tersedia pada http://staff.uny.ac.id Diakses pada 26 Januari 2024.

15) Damayanti, E. S. (2019). Evaluasi program pembinaan cabang olahraga karate Satlak Prima tahun 2011-2017. *Jurnal Penjaskesrek*, *6*(1), 11-20.

16) Darmawati, I., & Susilo, P. (2019). Analisa koordinasi, komunikasi dan budaya organisasi terhadap kinerja pegawai sekretariat DPRD Kota Tangerang. *JMB: Jurnal Manajemen* dan *Bisnis*, *8*(2).

17) De Bosscher, V., Brockett, C., & Westerbeek, H. (2016). *Elite youth sport policy and dual career support services in fifteen countries*. Routledge Handbook of Youth Sport.

18) Dehghansai, N., Spedale, D., Wilson, M. J., & Baker, J. (2020). Comparing developmental trajectories of elite able-bodied and wheelchair basketball players. *Adapted Physical* Activity *Quarterly*, *37*(3), 338-348.

19) Dewi, P. C. P., & Vanagosi, K. D. (2019). Evaluasi program pembinaan prestasi panahan pengkab perpani Karangasem. *Jurnal Pendidikan Kesehatan Rekreasi*, *5*(2), 101-111.

20) Diatmika, I. P. W., Yoda, I. K., & Tisna, G. D. (2021). Evaluasi program pembinaan prestasi cabang olahraga bulutangkis di persatuan bulutangkis (pb) Anugerah Denpasar dengan metode contex, input, procces, product (CIPP). *Indonesian Journal of Sport & Tourism*, *1*(1).

21) D'Isanto, T., D'Elia, F., Raiola, G., & Altavilla, G. (2019). Assessment of sportperformance: Theoretical aspects and practical indications. *Sport Mont*, *17*(1), 79-82.

22) Djatmiko. (2011). *Pelatihan Instruktur Kebugaran.* Surabaya: Dapartemen Faal Fakultas Kedokteran Universitas Airlangga.Djoko pekik irianto. (2002). Dasar Kepelatihan. Yogyakarta: Andi

23) Dohsten, J., Barker-Ruchti, N., & Lindgren, E. C. (2020). Caring as sustainable coaching in elite athletics: benefits and challenges. *Sports Coaching Review, 9*(1), 48–70.

24) Doncaster, G., Medina, D., Drobnic, F., Gómez-Díaz, A. J., & Unnithan, V. (2020). Appreciating factors beyond the physical in talent identification and development: insights from the FC Barcelona sporting model. *Frontiers in Sports and Active Living*, *2*, 91.

25) Doufexi, T., & Pampouri, A. (2020). Evaluation of employees'vocational training programmes and professional development: A case study in Greece. *Journal of Adult and Continuing Education*, 1477971420979724.

26) Febriana, R. (2021). *Evaluasi pembelajaran*. Jakarta: Bumi Aksara.

27) Fitriyani, F., & Robiasih, R. H. (2021). An evaluation of Muhadatsah Program at Pondok Modern Daarul Abror using CIPP Model. *Journal of Applied Linguistics, Translation, and Literature*, *1*(1), 7-16.

28) Fukuda, D. H. (2018). *Assessments for sport and athletic performance*. Human Kinetics.

29) Ghozali, I. (2016). *Aplikasi analisis multivariate dengan program IBM SPSS*, Semarang: Universitas Diponegoro.

30) Gordon, Dan. (2009). *Coaching science*. Britain: Learning Matters Ltd.

31) Gullickson, A. M. (2020). The whole elephant: Defining evaluation. *Evaluation and program planning*, *79*, 101787.

32) Gunung, I. N., & Darma, I. K. (2019). Implementing the context, input, process, product (CIPP) evaluation model to measure the effectiveness of the implementation of teaching at

33) Politeknik Negeri Bali (PNB). *International Journal of Environmental and Science Education*, *14*(1), 33-39.

34) Hardani, Auliya, N. H., Andriani, H., Fardani, R. A., Ustiwaty, J., Utami, E. F.,

35) Harsuki. (2012). Pengantar manajemen olahraga. Jakarta: PT Raja Grafindo Persada.

36) Irmansyah, J. (2017). Evaluasi program pembinaan prestasi cabang olahraga bola voli pantai. *Jurnal Keolahragaan, 5*(1), 24-38. Doi: http://dx.doi.org/10.21831/jk.v5i1.12759.

37) Istofian, R. S., & Amiq, F. (2016). Metode drill untuk meningkatkan teknik menendang bola (shooting) dalam permainan sepakbola usia 13-14 tahun. *Jurnal Kepelatihan Olahraga*, *1*(1).

38) Nugroho, W. A. (2017). Pembinaan Prestasi Olahraga Sepakbola Di Pusat Pendidikan Dan Latihan Putra Batang. *Juara: Jurnal Olahraga*, *2*(2), 162–173.

39) Putra, Gerry*. "Stadion PTIK Jadi Kandang Bhayangkara FC Musim 2018". Bolalob - Situsnya Anak Futsal!. Diakses tanggal* 28 Januari 2024

40) Rekyan Woro Mulaksito Mulyadi. (2015). Pembinaan Prestasi Cabang Olahraga Basket Lapangan di Kabupaten Sleman. Skripsi.. Program Studi PJKR Universitas Negeri Yogyakarta

41) Sukmana, D. J., & Istiqomah, R. R. (2020). *Metode penelitian kualitatif & kuantitatif*. Wonosari: CV. Pustaka Ilmu. Harsono. (2015). *Kepelatihan olahraga. (teori dan metodologi*

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

Mifta Arifin[1], Mismiwati[2], Deky Anwar[3]

[1,2,3] Universitas Islam Negeri Raden Fatah Palembang, South Sumatera, Indonesia

ABSTRACT: this research departs from the problem that whether fomo (fear of missing out) and price discount on impluse buying with religiousity as a moderating variable on palembang city communities shopping at shopee e-commerce. The purpose of this study was to know and analyze how much influence fomo (fear of missing out) and price discount on impluse buying with religiousness as a moderating variable on palembang city communities shopping at shopee e-commerce. This research uses quantitative research. The population in this study were consumers who decided to buy or use shopee in Palembang city, without distinguishing gender, the number of which was unknown. The sampling technique used in this study was purposive sampling. There were 100 samples of Palembang City residents. Data collection was carried out online via WhatsApp social media. While the data analysis used in this research is SEM (Structural Equation Modeling) through SmartPLS 4.0 with a moderating analysis model. The results of the analysis show FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.029 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Impulse Buying in Palembang City People who shop at Shopee E-Commerce. FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Religiosity (Z) with a P value of 0.014 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Religiosity in Palembang City People who Shop at Shopee E-Commerce. Price Discount (X2) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.045 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Impulse Buying in Palembang City People Shopping at E-Commerce Shopee. Price Discount (X2) has a positive and significant effect on Religiosity (Z) with a P value of 0.000 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Religiosity in Palembang City People who Shop at Shopee E-Commerce. Religiosity (Z) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.034 or <0.05, so it can be concluded that there is a significant effect of Religiosity on Impulse Buying in Palembang City People Shopping at E-Commerce Shopee. The effect of FoMO (Fear of Missing Out) on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee ECommerce, indicated by a T-statistic value of 1.435 < 1.96 and a p-value of 0.151> 0.05. this means that hypothesis 6 is not accepted. The effect of Price Discount on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee ECommerce, indicated by a T-statistic value of 2.015> 1.96 and a p-value of 0.044 <0.05. this means that hypothesis 7 is accepted.that FoMO (Fear of Missing Out) and Price Discount on Impulse Buying. Then the results of the moderating variable in the form of religiosity have a role in moderating (strengthening and weakening) FoMO (Fear of Missing Out) and Price Discount on Impluse Buying at Shopee.

KEYWORDS: FoMO *(Fear of Missing Out), Price Discount*, *Impluse Buying,* Religiusitas

I. INTRODUCTION

The development of the digital economy has brought many changes in the field of trade. Buying and selling activities that are usually done face-to-face can now be done online. This activity is known as e-commerce which stands for electronic commerce. E-commerce is a shopping application that provides convenience for buyers to be able to buy goods based on their needs. The emergence of various e-commerce makes companies in the same field compete with each other to create innovative strategies to serve consumers' shopping desires (Tondang, G. A., & Silalahi, 2022).

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

Graphics 1. Number of E-Commerce Visitors in Indonesia in 2023

	Shopee	Tokopedia	Lazada	BliBli	Bukalapak
Kuartal I	157.966.666,	117.033.333,	83.233.333,3	25.433.333,3	18.066.666,7
Kuartal II	166.966.666,	107.200.000	74.533.333,3	27.100.000	15.566.666,7
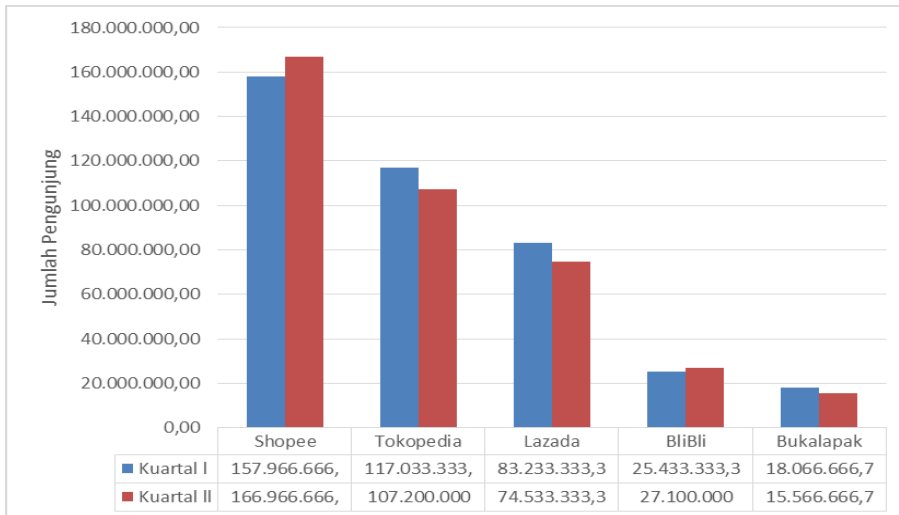
 Based on the data above, Shopee currently dominates the e-commerce market in Indonesia by ranking first in the number of monthly visits and outperforming its competitors such as Tokopedia, Lazada, BliBli and Bukalapak. This is also a benchmark that interest in e-commerce in Indonesia is very high. Shopee is one type of e-commerce that is based on mobile applications and currently in Indonesia itself Shopee is experiencing significant development, this can also be seen that among the public there are also many who talk about e-commerce, including Shopee.

Table 1. Shopee User Data in Indonesia by Age Range

Usia	Presentase
15-19 tahun	7%
20-24 tahun	24%
25-29 tahun	23%
30-34 tahun	19%
35-39 tahun	17%
40-44 tahun	10%

 Table 1 Shopee users aged 20-24 years dominate by (24%), followed by the age range 25-29 years by (23%). While the age of 15-19 years gets the smallest percentage, namely (7%). From this data, it can be seen that Shopee users are dominated by the millennial generation. This generation makes technology a partner of life, which is not only looking for information or working but all activities can be carried out by millennials through the use of technology (Putri, A. E. N., & Handayani, 2021). People make purchases not based on needs alone, but because they want to fulfill the desires that arise within themselves. This shopping activity is called impulse buying, or the process of buying an item, where the buyer has no intention of buying beforehand, it can be associated with unplanned purchases or instant purchases (Lisda Rahmasari, 2019). Impulse buying is a purchase made without prior planning. The desire to buy often arises due to various factors, for example, lower prices in social media advertisements and not thinking about the priority benefits of the item (Widiawati Susanti, 2023). Apart from the influence of FoMO which can influence consumers to make spontaneous purchases is the price discount made by the company. With the ease of reaching consumers in this internet network era, companies are competing to attract consumers to visit their online store pages, today's

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

fierce competition makes companies must have a price strategy that can really attract the attention of many consumers not only once or twice but how companies can make consumers loyal to their online stores. It can be concluded that there is still inconsistency between the FoMO (Fear of Missing Out) variable, and price discounts on impulse buying and raises that these variables have an indirect effect on impulse buying so that moderating variables need to be presented in this study. One of the factors that influence impulse buying is religiosity. Religiosity is one way to minimize the formation of impulsive spending attitudes. The existence of high religious values will function as self-control in behavior (Djudiyah dan Suryana Sumantri, 2015).

II. LITERATURE REVIEW

a. *Locus of Control*

The grand theory used is Locus of Control Theory. Locus of control is one of the personality variables defined as an individual's belief in whether or not he is able to control his own destiny. every individual who has confidence in himself or his fate is under his control, and can be said to have an internal locus of control, while individuals who have the belief that the environment has control over the fate that occurs in their lives are said to have an external locus of control (Rotter, 2010). Locus of Control theory is a person's personality variable which is whether or not the person is able to control their own destiny. So, this theory is able to explain each dependent variable of impulse buying where unplanned purchases occur due to lack of control over themselves where there is no previous plan to buy these items and locus of control is able to explain the variables studied. Locus of Control is one of several variables related to the emergence of impulse buying behavior. With the characteristics of the Internal and External Locus of Control, individuals have a certain tendency to behave and respond to a stimulus. On that basis, Locus of Control is the variable that will be tested for its closeness in relation to impulse buying behavior.

b. Impulse Buying

Impulse buying is an irrational purchase and a quick and unplanned purchase, followed by a conflict of thought and emotional impulse. The emotional impulse is related to the deep feelings shown by making a purchase because of the urge to buy a product immediately, ignore negative consequences, feel satisfaction and experience conflict in thinking (Mar'atul Mukaromah, 2021). Solomon and Rabolt state that impulse buying is a condition that occurs when individuals experience a sudden feeling of urgency that cannot be resisted. This tendency to buy spontaneously can generally result in purchases when consumers believe that such actions are natural.

c. FoMO (Fear of Missing Out)

FoMO is the behavior of someone who does not want to miss the trend, so someone must continue to follow every what is happening, there is anxiety that arises if you do not follow the trend. The urge to always be connected to anyone, especially friends and other people in any case characterizes this FoMO (Fear of Missing Out). The desire to feel, follow, and always be updated with various things that social media makes a person can be indicated to experience Fear of Missing Out (Gaiska Meindieta Muharam, 2023). The factor that causes someone to experience Fear of Missing Out is the openness of information on social media. In general, people who suffer from FoMO (Fear of Missing Out) have an excessive interest in accessing the internet, therefore it can cause this individual to be addicted to social media (Al-menayes, 2016). FoMO (Fear of Missing Out) sufferers will be depressed if they see beautiful and beautiful photos uploaded on social media belonging to anyone they see. FoMO (Fear of Missing Out) sufferers also think that everyone seen on social media lives a much more interesting, exciting and successful life compared to themselves (McGinnis, 2020).

d. Price Discount

Kotler defines discounts as savings offered to consumers from the normal price of a product listed on the label or package (Philip Kotler and keller, 2016). The majority of consumers like lower prices for goods, especially if discounts apply to goods with relatively expensive prices (A. Mishra, 2011). Price discounts are a price-based promotional strategy where customers are offered the same product at a lower price, whereas bonus packages represent a quantity-based sales promotion strategy where customers are offered more products at the same price. Price discounts can be offered as a reduction in terms of a percentage of the original price or in terms of dollars (H. A. Chen, H. Marmorstein, M. Tsiros, 2012). The widespread use of bonus packages for various product categories such as clothing, e.g. promotions in the form of buy one get one free. Price is an important instrument in buying and selling, if the price offered is reasonable and in accordance with market mechanisms and applicable rules, there will be justice in pricing. However, if the price is set in a false manner by including a political element, which has elements of seeking as much profit as possible then what will happen is price injustice (D. P. Ndari, 2015).

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

e. Religiusitas

Religiosity according to Jaludin Rahmat is diversity, which is a condition that exists in a person that encourages him to act in accordance with the level of his obedience to religion. Meanwhile, according to Zakiah Daradjat, religiosity is a complex system of beliefs, convictions, attitudes and utterances that connect individuals from one existence to something religious (Zakiah Daradjat, 2007). Religiosity according to Delener is one of the important driving factors and can influence consumer behavior. This can happen because it is based on consumer decisions to buy products depending on their level of faith. According to Rokeach and Banks, religiosity is an attitude or awareness that arises based on a person's belief or belief in a religion. Broadly speaking, religiosity can be interpreted as an instinctual urge to believe and carry out his beliefs in the form of his obedience so that a norm is formed that regulates human relations with God. Religiosity can also be intended as a person's sense of trust in believing in the teachings of his religion and can implement it in everyday life (Ira Yanti, 2018).

III. RESEARCH METHODS

The type of research used is using the quantitative method. Quantitative method is researching whose data is expressed in numbers and analyzed with statistical techniques. in numbers and analyzed with statistical techniques (Suryani & Hendryadi., 2015). In this research data source used is primary data. Primary data is data obtained or collected directly in the field by the person conducting the research or the person concerned who needs it (Bagas sunu pratama, 2017). Doing research or concerned who need it. Primary data in this study are consumers who shop at shopee. To measure respondents' attitudes to this research question using a Likert scale. Population is the sum of all units or individuals whose characteristics are to be studied (Suharsimi Arikunto, 2006). The population in this study are those who decide to buy or use Shopee, without distinguishing gender with the target consumer, namely the Palembang City Community, whose number is unknown. The sample is part of the population whose characteristics are to be investigated, and is considered to represent the entire population (Sasmita, 2021). The sample in the study used purposive sampling method, which is a sampling technique based on certain considerations. The sample selection is taken based on certain characteristics that are considered to have a close relationship with the matter to be studied. In other words, the sample unit that is linked is adjusted to the criteria that have been determined based on the research objectives or research problems. The criteria for respondents needed in this study are as follows:

a. Palembang City people who have shopped online at Shopee e-commerce.

b. At least three times in 6 months shop online at Shopee e-commerce.

According to Hair, if the sample is too large, it will be difficult to get a suitable model, so it is more advisable to take a sample of between 100-200 respondents to interpret using SEM. based on the criteria and calculations that have been carried out and based on expert opinion, a sample of 100 respondents is obtained.

IV. RESULT

The number of respondents collected was 100 respondents who came from their consumers who decided to buy or use Shopee. Measurements are carried out through processing and analyzing questionnaire data using the SmartPLS 4.0 application. The PLS algorithm is used to process data as follows.

1. Uji Outer Model

a. Convergent Validity

The value of convergence effectiveness (Convergent Validity) is the outer loading value of the latent variable with its indicators. The expected value is >0.70.

Table 2. Convergent Validity

Variabel	Indikator	*Outer Loading*	Keterangan
FoMO *(Fear of Missing Out)* (X1)	X1.1	0.850	Valid
	X1.2	0.820	Valid
	X1.3	0.885	Valid

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

Price Discount (X2)	X2.1	**0.838**	**Valid**
	X2.2	**0.902**	**Valid**
	X2.3	**0.889**	**Valid**
Impulse Buying (Y)	Y.1	**0.788**	**Valid**
	Y.2	**0.838**	**Valid**
	Y.3	**0.784**	**Valid**
	Y.4	**0.888**	**Valid**
Religiusitas (Z)	Z.1	**0.894**	**Valid**
	Z.2	**0.900**	**Valid**
	Z.3	**0.837**	**Valid**

Based on table 2 shows that all indicators on FoMO *(Fear of Missing Out)* (X1), *Price Discount* (X2), *Impulse Buying* (Y) and Religiusitas (Z) are declared valid. In the table there are evidence of meeting the requirements, namely there is an external load value> 0.6

   b.   Discriminant Validity

   The discriminant validity value is the cross loading factor value used to determine if the variable has adequate discriminant which can be determined by comparing the loading value on the intended variable must be greater than the loading value of other variables.

Table 3. Cross Loading

	FoMO (Fear Of Missing Out) (X1)	Price Discount (X2)	Impulse Buying (Y)	Religiusitas (Z)
X1.1	0.850	0.685	0.677	0.662
X1.2	0.820	0.704	0.598	0.613
X1.3	0.885	0.791	0.604	0.655
X2.1	0.747	0.838	0.609	0.699
X2.2	0.765	0.902	0.654	0.710
X2.3	0.729	0.889	0.697	0.673
Y.1	0.522	0.546	0.788	0.481
Y.2	0.626	0.704	0.838	0.641
Y.3	0.607	0.544	0.784	0.481
Y.4	0.668	0.651	0.888	0.694
Z.1	0.647	0.645	0.583	0.894
Z.2	0.650	0.648	0.622	0.900
Z.3	0.685	0.777	0.643	0.837

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

Based on the table above, all indicators that go through the Cross Loadings (Discriminant Validity) test are valid because they exceed 0.70 and are greater than the value of other variables.

c.   Composite Reliability

Variables are said to meet the Composite Reliability requirements if the Composite Reliability value is> 0.70, for Explanatory Research> 0.60 - 0.70 is still acceptable.

Table 4. Composite Reliability

Variabel		*Composite Reliability*	Kriteria	Keterangan
FoMO (Fear Of Missing Out) (X1)		**0.888**	> 0,60	**Reliabel**
Price Discount (X2)		**0.909**	> 0,60	**Reliabel**
Impulse Buying (Y)		**0.895**	> 0,60	**Reliabel**
Religiusitas (Z)		**0.909**	> 0,60	**Reliabel**

Based on table 4 above, all latent variables have a composite reliability value> 0.60. These results indicate that each Variable has met the composite reliability so that it can be concluded that the overall variable has a high level of reliability.

2. Uji Inner Model
a. Koefisien Determinasi (R-square)
Table 5. R-Square

	R- square
Impulse Buying	**0.614**
Religiusitas	**0.651**

Based on the information in table 5, it is known that the R-square value of Religiosity (Z) 0.651> 0.33 means that the
Model has a moderate coefficient of determination. The R-square value of Impulse Buying (Y) 0.614> 0.33 means that the model has a moderate coefficient of determination.

3. Hypothesis Testing

Hypothesis testing is done by testing the structural model by estimating the path coefficient which is the estimated relationship in the structural model obtained by the bootstraping procedure with a value that is considered significant If the t statistical value < 1.96 or P> $\square$ = 0.05 means Ho is accepted and H1 is rejected. if the t statistical value > 1.96 or P < $\square$ = 0.05   means Ho is rejected and H1 is accepted.

a. Direct Effect Test
Table 6. Bootsrapping Results of direct Effect Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistic (|O/STDEV|)	P Values	Ket
X1 -> Y	0.297	0.292	0.136	2.187	0.029	Diterima
X1 -> Z	0.297	0.290	0.121	2.461	0.014	Diterima

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

X2 -> Y	0.302	0.305	0.150	2.010	0.045	Diterima
X2 -> Z	0.538	0.538	0.116	4.659	0.000	Diterima
Z -> Y	0.242	0.236	0.114	2.119	0.034	Diterima

Based on the data above, hypothesis testing can be carried out as follows:

1. First hypothesis: FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.029 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Impulse Buying in Palembang City People who shop at Shopee E-Commerce. The results of this study are in line with research conducted by (Meidiana Fairuz Salsabila, 2023) showing that FoMO (Fear of Missing Out) has a positive and significant effect on Impulse Buying. Meanwhile, (Santoso, 2021) research shows the results that FoMO (Fear of Missing Out) has no positive and significant effect on Impulse Buying.

2. Second Hypothesis: FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Religiosity (Z) with a P value of 0.014 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Religiosity in Palembang City People who Shop at Shopee E-Commerce. The results of this study are in line with research conducted by Siti (Siti Nurjannah, 2023) showing that FoMO (Fear of Missing Out) has a positive and significant effect on Religiosity. Meanwhile, Santoso et al's research shows the results that FoMO (Fear of Missing Out) has no positive and significant effect on Religiosity.

3. Third Hypothesis: Price Discount (X2) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.045 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Impulse Buying in Palembang City People Shopping at E-Commerce Shopee. The results of this study support the results of previous research conducted by (Y. Xu, 2014) showing a positive influence between discounts on impulse purchases. Price discounts generate greater impulse purchase intentions than bonus packages. The more discounts given, the more consumers will buy in large quantities at the store. Meanwhile, (Sri Wilujeng, 2017) research shows the results that Price Discount does not have a positive and significant effect on Impulse Buying.

4. Fourth Hypothesis: Price Discount (X2) has a positive and significant effect on Religiosity (Z) with a P value of 0.000 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Religiosity in Palembang City People who Shop at Shopee E-Commerce. This is in accordance with (Kasimin, P. Dian, 2013) research that providing discounts can stimulate consumers to make purchases and allow impulsive buying behavior to occur. Meanwhile, research by (Aurel Salsabilah, 2023) et al shows the results that Price Discount does not have a positive and significant effect on Religiosity.

5. Fifth Hypothesis: Religiosity (Z) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.034 or
<0.05, so it can be concluded that there is a significant effect of Religiosity on Impulse Buying in Palembang City People Shopping at E-Commerce Shopee. This is in accordance with Rahma Syahira's research (2021), that Religiosity has a positive and significant effect on Impulse Buying.

b. Indirect Effect Test

Table 7. Bootsrapping Results of Indirect Effect Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistic (OSTDEV)	P Values
FoMO (Fear of Missing Out) -> Impulse Buying->Religiusit as	0.072	0.071	0.050	1.435	0.151
Price Discount-> Impulse Buying-> Religiusita s	0.130	0.124	0.065	2.015	0.044

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

6. Sixth Hypothesis: The effect of FoMO (Fear of Missing Out) on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee E-Commerce, indicated by a T-statistic value of 1.435 < 1.96 and a p-value of 0.151> 0.05. this means that hypothesis 6 is not accepted. This means that indirectly FoMO (Fear of Missing Out) through Religiosity does not have a positive and significant effect on Impulse Buying in Palembang City People who Shop at ECommerce Shopee. The results of this study support the results of previous research conducted by (Serdivio, 2021) which states that Religiosity is negatively correlated with FoMO (Fear of Missing Out on Impulse Buying).

7. Seventh Hypothesis: The effect of Price Discount on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee E-Commerce, indicated by a T-statistic value of 2.015> 1.96 and a p-value of 0.044 <0.05. this means that hypothesis 7 is accepted. This means that indirectly Price Discount through Religiosity has a positive and significant effect on Impulse Buying in Palembang City People who shop at E-Commerce Shopee. This is in accordance with the research of Teguh Purwanto (2022), that religiosity influences a person to make impulse purchases. Meanwhile, religiosity is known to neither weaken nor strengthen price discounts on impulse buying.

V. CONCLUSION

Based on the results of the research and discussion of the results of the tests that have been carried out, it can be concluded that Religiosity (Z) is able to mediate FoMO (Fear of Missing Out) and Price Discount on Impulse Buying in Palembang City People Who Shop at Shopee E-Commerce. The results of the analysis show FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.029 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Impulse Buying in Palembang City People who shop at Shopee E-Commerce. FoMO (Fear of Missing Out) (X1) has a positive and significant effect on Religiosity (Z) with a P value of 0.014 or <0.05, so it can be concluded that there is a significant effect of FoMO (Fear of Missing Out) on Religiosity in Palembang City People who Shop at Shopee ECommerce. Price Discount (X2) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.045 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Impulse Buying in Palembang City People Shopping at ECommerce Shopee. Price Discount (X2) has a positive and significant effect on Religiosity (Z) with a P value of 0.000 or <0.05, so it can be concluded that there is a significant effect of Price Discount on Religiosity in Palembang City People who Shop at Shopee E-Commerce. Religiosity (Z) has a positive and significant effect on Impulse Buying (Y) with a P value of 0.034 or <0.05, so it can be concluded that there is a significant effect of Religiosity on Impulse Buying in Palembang City People Shopping at ECommerce Shopee. The effect of FoMO (Fear of Missing Out) on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee E-Commerce, indicated by a T-statistic value of 1.435 < 1.96 and a p-value of 0.151> 0.05. this means that hypothesis 6 is not accepted. The effect of Price Discount on Impulse Buying through Religiosity in Palembang City People Shopping at Shopee E-Commerce, indicated by a T-statistic value of 2.015> 1.96 and a p-value of 0.044 <0.05. this means that hypothesis 7 is accepted.that FoMO (Fear of Missing Out) and Price Discount on Impluse Buying. Title must be in 24 pt Regular font. Author name must be in 11 pt Regular font. Author affiliation must be in 10 pt Italic. Email address must be in 9 pt Courier Regular font.

REFERENCES

1) A. Mishra, & H. M. (2011). *The Influence of Price Discount Versus Bonus Pack on the Preference for Virtue and Vice Foods*. *196–206*.

2) Al-menayes. (2016). The Fear of Missing out Scale : Validation of the Arabic Version and Correlation with Social Media Addiction. *International Journal of Applied Psychology*, *6*(2), 41–46.

3) Aurel Salsabilah. (2023). Pengaruh Price Discount, Kemudahan Pembayaran, Dan Religiusitas Terhadap Perilaku Impulse Buying Pada Pengguna Aplikasi Shopeefood Di Kota Surabaya Dengan Pendapatan Sebagai Variabel Moderasi. *Management Studies and Entrepreneurship*, *4*(4), 3717–3725.

4) Bagas sunu pratama. (2017). Analisis pengaruh brand image, kualitas produk dan harga terhadap keputusan pembelian produk kartu perdana telkomsel. *Jurnal Manajemen*, *3*(3), 529–534. https://doi.org/10.1109/ICME.2017.8019456

5) D. P. Ndari. (2015). Pengaruh Potongan Harga Terhadap Pengambilan Keputusan Pembelian Pada Ud Upindo Raya Cabang Tanah Grogot. *EJournal Administrasi Bisnis*, 89.

6) Djudiyah dan Suryana Sumantri. (2015). Religiusitas Sebagai Kendali Nilai Materialitik Dan Belanja Pada Mahasiswa. *Seminar Psikologi & Kemanusiaan, Psychology Forum UMM*, 82.

7) Gaiska Meindieta Muharam. (2023). *Pengaruh Fear of Missing Out (FoMO) dan Konformitas Teman Sebaya Terhadap Impulsive Buying Pada Mahasiswa Kota Semarang (Studi Pada Konsumen TikTok Shop)*. *1*(8).

The Effect of Fomo (Fear of Missing Out) and Price Discount on Impulse Buying with Religiosity as a Moderating Variable in Palembang City People Who Shop at E-Commerce Shopee

8) H. A. Chen, H. Marmorstein, M. Tsiros, & A. R. R. (2012). *When More Is Less : The Impact of Base Value Neglect on Consumer Price Discounts*. *76*, 64–77.

9) Ira Yanti. (2018). Analisis Pengaruh Faktor Psikologi Dan Religiusitas Perilaku Muslimah Kota Medan Terhadap Konsumsi Kosmetik Halal Dan Baik. *Jurnal At Tawassuth*, *8*(2), 302.

10) Kasimin, P. Dian, & M. W. (2013). *Effect of Discounts, Sales Promotion and Merchandising on Impulsive Buying at Toko Intan*. 1–19.

11) Lisda Rahmasari. (2019). Menciptakan Impulse Buying. *Majalah Ilmiah Informatika*, *3*(1), 56–68.

12) Mar'atul Mukaromah. (2021). Analisis Psikopatologi Kecenderungan Impulsive Buying pada Salah Satu Mahasiswa Universitas Negeri Semarang. *Jurnal Ilmiah Psikologi Mind Set*, 2.

13) McGinnis. (2020). *Fear of missing out: Tepat mengambil keputusan di dunia yang menyajikan terlalu banyak pilihan*. 14) Meidiana Fairuz Salsabila. (2023). *Pengaruh Fear Of Missing Out Terhadap Impulsive Buying Pengguna E-Commerce*.

15) Philip Kotler and keller. (2016). *Marketing Management*.

16) Putri, A. E. N., & Handayani, T. (2021). Keputusan Pembelian E-Commerce Shopee Pada Generasi Milenial Di Kecamatan Johar Baru. *Jurnal Studi Manajemen Dan Bisnis*, *8*(1), 35–43.

17) Rotter. (2010). *Generalized Expectancies for Internal Versus External Control of Reinforcement. Pshycologycal Monograps*. *80*, 1–28.

18) Santoso. (2021). Fomsumerism : Mengembangkan Perilaku Conformity Consumption Dengan Memanfaatkan Fear Of Missing Out Konsumen. *Jurnal Ilmiah Bisnis Dan Ekonomi Asia*, *15*(2), 159–171.

19) Sasmita, S. A. (2021). *PERPUSTAKAAN PERGURUAN TINGGI NEGERI DI JAKARTA*. *8*(3), 297–302.

20) Serdivio. (2021). The Mediating Role Of The Fear Of The Fear Of Missing Out. *Education*.

21) Siti Nurjannah. (2023). Pengaruh Literasi Ekonomi, Kontrol Diri, dan "FOMO", terhadap Pembelian Impulsif pada Generasi Milenial. *Jurnal Global Education*.

22) Sri Wilujeng. (2017). *Pengaruh Price Discount dan Bonus Pack Terhadap Impulse Buying Konsumen Indomart di Kecamatan Sukun Kota Malang*.

23) Suharsimi Arikunto. (2006). *Prosedur Penelitian Suatu Pendekatan Praktik*.

24) Suryani & Hendryadi. (2015). *Metode Riset Kuantitatif : Teori dan Aplikasi Pada Penelitian Bidang Manajemen dan Ekonomi Islam.*

25) Tondang, G. A., & Silalahi, P. R. (2022). *Pengaruh Brand Awareness Dan Brand Image Terhadap Keputusan Pembelian Smartphone Android*. *20*(1), 105–123.

26) Widiawati Susanti. (2023). Pengaruh Impulse Buying, Harga Dan Penggunaan Shopee Paylater Terhadap Keputusan Pembelian. *E-Jurnal Riset Manajemen*, *12*(2), 1401.

27) Y. Xu, & J. H. (2014). *Effects Of Price Discounts And Bonus Packs On Online Impulse Buying*. *42*(8), 1293–1302.

28) Zakiah Daradjat. (2007). *Ilmu Jiwa Agama*.

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

Abd Azis[1], Sagaf S. Pettalongi[2], Saude Saude[3], Nurdin Nurdin[4]

[1,2,3,4] Faculty of Teacher Training and Education, Universitas Islam Negeri Datokarama Palu, Indonesia

ABSTRACT: This study aims to discuss the zakat management optimization in improving education quality at National Zakat Charity Agency (BAZNAS) of Palu. This study used a qualitative approach and the data was gathered through field observation, in-depth interviews, and written document analysis. The data analysis, then, was analysed through data reduction, data presentation, and conclusion drawing. The results of this study show that the process of optimizing zakat to improve education quality at Baznas Palu city was conducted according to Islamic zakat management principles which includes planning, implementation, reporting, and monitoring process in the program of collection, distribution, and utilization at National Zakat Charity Agency Palu. The agency also follows professional administration principles such as transparency, accountability, responsibility, independence, fairness, and Islamic shariah compliance. This study also found that the agency has focused zakat distribution for specific educational institutions, both formal and informal. The agency also provide scholarships for academic achievement, and educational cost assistance for underprivileged children. Furthermore, the agency provides capital support for productive businesses runned by disadvantaged families or communities to improve their incomes.

KEYWORDS: zakat management, zakat distribution, education quality, charity, Islamic wealth distribution

I. INTRODUCTION

Indonesia is a country with a majority Muslim population that has significant zakat potential. The zakat can be utilized to reduce poverty rates (Herianingrum et al., 2024). In the modern era, zakat is well recognized among the Muslim community because it can act as a facilitator that carries out economic functions closely related to the equitable distribution of welfare among the community (Aziz, Mansor, Waqar, & Haji Abdullah, 2020). Zakat is also a teaching that can encourage the development of economic strength among Muslims. Generally, the Muslim community expects that the collection of zakat is carried out in the best possible manner according to Islamic Sharia. Various efforts have been made by the government, including scholars and scientists, to ensure the implementation of zakat. Therefore, the operational concept of zakat application can be used as a model, continuously developed in the present day, and actualized according to the growth and demands of society.

Effective implementation of zakat through zakat management organizations. Chapter III of Law No. 38 of 1999 states that there are two types of zakat management organizations: the Zakat Amil Agency, established by the government, and the Zakat Amil Institution, established by the community. Zakat management has entered a new era following the enactment of Law No. 23 of 2011 on Zakat Management. According to this law, all zakat affairs can only be managed by the official Zakat Amil Agency owned by the government. Considering the extensive reach and distribution of the Muslim population across all regions of Indonesia, as well as the significant duties and responsibilities of the National Zakat Agency in managing zakat, the government has also established Provincial National Zakat Agency and District/City National Zakat Agency, based on National Zakat Agency Regulation R.I. No. 2 of 2016 regarding the establishment of zakat collection unit operations.

Zakat is a part of the wealth that every Muslim individual who meets specific criteria must give. The values embodied in zakat should be understood as a strong motivation to ensure that zakat creates economic growth and spiritual value for the poor and cultivates and develops the spirit of generosity among the wealthy. This aligns with Allah SWT's principles and decree in Q.S. At-Taubah/9:103. Translation:

> "Take zakat from their wealth to purify, cleanse, and pray for them. Indeed, your prayers bring tranquility to their souls. Allah is All-Hearing, All-Knowing."

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

Zakat is one of the pillars of Islam that every Muslim must fulfil (Al-Bawwab, 2023). The duty to distribute and pay zakat in the context of religious life for Muslims in Indonesia must be understood not only to support the poor consumptively but also with the more permanent goal of eradicating poverty. Zakat is a way for people to bring joy and prosperity to each other, both the rich and the poor because each of us strives to put things in their proper place, which is the meaning of justice.

However, the collection and distribution of zakat to assist people experiencing poverty have yet to be conducted well and professionally (Owoyemi, 2020). This issue arises because zakat management needs to be handled professionally by governmental or community zakat organizations. Research related to zakat management needs to be improved, leading to a low understanding of zakat management among the public and government. Therefore, this study will examine zakat management in Palu to maximize the amount of zakat and improve the quality of education. This research will focus more on collecting and distributing zakat to assist people experiencing poverty in education. Thus, this study will benefit the government and community in maximizing the amount of zakat and its utilization in education.

II. LITERATURE REVIEW

A. Definition of Zakat

Zakat is an act of worship that constitutes the third pillar of Islam (Retsikas, 2014). In terms of its implementation, zakat is a social obligation for the wealthy (aghniya) once they meet the minimum threshold (nisab) and the period (haul). Among the wisdom of zakat's prescription is realizing economic justice distribution (Mohammed, El Amri, & Shabani, 2021). As one of the assets of Islamic financial institutions, zakat is a potential strategic funding source for efforts to build community welfare (Abdullah, Mat Derus, & Al-Malkawi, 2015). Therefore, the Qur'an warns that zakat collected from those obligated to pay (muzakki) should be distributed to those entitled to receive it (mustahik).

In linguistics, zakat originates from the Arabic zaka-yazku-zakaan, which means blessing, growth, cleanliness, and goodness (Ali & Hatta, 2014). In the Qur'an and Al-sunnah, sadaqah also means zakat. Therefore, Imam al-Mawardi states that the term sadaqah sometimes refers to zakat, and zakat is referred to as sadaqah, which are two different words but with the same substance. According to Sharia, zakat is a specified amount of wealth and its kinds, which Sharia mandates to be distributed to those entitled to receive it under certain conditions.

In a terminological sense, zakat is the granting of ownership rights over a particular portion of wealth to specific individuals designated by Sharia solely for the sake of Allah. According to Syalthut, zakat is a portion of wealth distributed by the wealthy to their impoverished brethren and for public interests, which are vital community needs. Wealth distributed according to Sharia is called zakat because it will increase the wealth given and protect it from disasters. The connection between zakat's linguistic and terminological meanings is evident and robust: the wealth from which zakat is given will become blessed, grow, develop, and increase, becoming pure and enhancing goodness.

Zakat can purify the sins of the person who disburses it, enhancing both the rewards and wealth. According to Wahbah Zuhaili, zakat in Sharia is a mandatory right on property. Yusuf al-Qardawi explains that the term 'wealth' (al-amwaal) is the plural form of the word 'maal.' In Arabic, 'maal' refers to anything people highly desire to save and possess. Ibnu Asyr, as cited by Yusuf al-Qardawi, mentioned that initially, wealth meant gold and silver, but its meaning later expanded to include all goods that are stored and owned.

B. Zakat Regulation

As is universal, Islam not only discusses matters of faith, worship, and Sharia law. Rather, Islam encompasses all aspects of life. In fundraising, for example, Islam teaches sharing, commonly referred to as zakat, infaq, sadaqah, waqf, grants, and so forth. This is what is known as Islamic philanthropy. Therefore, the term fundraising has long existed and has been taught in Islam.

As assets of the Muslim community, zakat, infaq, sadaqah, and waqf should continuously be promoted among those who have surplus wealth (aghniya) so that they are willing to share with those in need. If this can be effectively implemented, the author believes that it is possible to finance education and alleviate poverty through Islamic philanthropy. However, trust in the management and distribution of these funds still needs to be improved. According to Ramayulis, steady and adequate funding for Islamic education can be obtained through Waqf (Q.S. Ali-Imran: 92), Zakat (Q.S. At-Taubah: 6, and At-Taubah: 103), Sadaqah (Q.S. Al-Baqarah: 261), and Grants (Q.S. Al-Baqarah: 177).

Zakat is one component of Islamic philanthropy that significantly contributes to the economy of the Muslim community (Obaidullah & Manap, 2017). According to Yusuf Qardhawi, a zakat is a form of 'amaliyah ijtima'iyah' worship, meaning it is worship related to wealth that holds a strategic, important, and decisive function in the development of community welfare. Zakat is one of the instruments in Islamic economics that enhances the socio-economic status of the Muslim community (Zauro, Saad, & Sawandi, 2020). In general and the Asnaf groups in particular. This socio-economic improvement includes basic needs for the

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

Asnaf, especially the poor and needy groups. Among the most critical needs besides food, shelter, and clothing, education is also crucial because it can enhance the capabilities of the poor asnaf and the wider Muslim community in improving their production factors, enabling them to transition from being Mustahiq (recipients of zakat) to becoming Muzzaki (contributors of zakat).

Besides being a means of worship and a sign of devotion to Allah SWT, zakat, as the third pillar of Islam, also serves as a significant social institution and a foundation of Islamic economics. If zakat, infaq, and sadaqah are well-managed, including their collection, acquisition, and distribution, they will be capable of addressing the issue of poverty or at least reducing it.

Zakat management consists of collection and distribution. Indonesia regulation explains that the payment of zakat originates from the term "Take." Allah SWT commands, "Take it." When a muzakki (zakat payers) has given zakat to someone, it is said that he has taken zakat. The eight asnaf, or groups entitled to receive zakat, indicate that the distribution in this situation is quite clear. Tithing yields more incredible goodness and a broad, clear, peaceful mood, positively impacting the community and the general economy. On the other hand, those who refuse to pay zakat will endure torturous punishment in the hereafter.

C. Digitalization of zakat

Digital zakat, or online zakat, is a mechanism for zakat payment that involves online-based media such as Electronic Banking and Financial Technology (Beik, Swandaru, & Rizkiningsih, 2021). According to Khadijah, online zakat is a process of paying and receiving zakat and collecting and distributing zakat through a digital system or via the Internet.

From the definition above, digital zakat is the process of collecting and distributing zakat by the Amil Zakat Institution using the internet. According to Tantriana & Rahmawati, there are several advantages that digital zakat has, namely that it can increase zakat payments by muzakki to National Zakat Agency, make it easier for National Zakat Agency to collect zakat and provide updates on the zakat collection that has been carried out and its distribution, making it easy for muzakki to pay their zakat at any time and wherever they are, muzakki can easily monitor how they distribute zakat and muzakki can easily access National Zakat Agency's financial reports. Digital-based zakat transactions generally use electronic payment tools like electronic money (e-money).

To date, at least Bank Indonesia (BI), the institution regulating monetary activities in Indonesia, has recognized 32 types of legal electronic money for conducting financial transactions. Several National Zakat agencies have partnered with various electronic money providers in Indonesia. In this modern era, many National Zakat Agencies have begun implementing digital zakat systems because digital zakat offers numerous conveniences for both muzakki and Zakat Management Organizations in paying and collecting zakat. According to Oktavendi & Mu'ammal (2022),, there are several advantages of digital zakat:

1) It can increase zakat payments by muzakki to Zakat Management Organizations.
2) It facilitates Zakat Management Organizations in collecting zakat and providing updates on the zakat collected and its distribution.
3) Digital zakat allows muzakki to pay their zakat anytime and anywhere.
4) Muzakki can easily monitor how their zakat is being distributed.
5) Muzakki can easily access the financial reports of the Zakat Management Organizations.

According to scholars digital zakat is an innovation for Zakat Management (Widiastuti, Cahyono, Zulaikha, Mawardi, & Al Mustofa, 2021). Organizations in performing their duties. This is because digital zakat aligns better with the current era, where society has embraced numerous digital platforms. Their research also mentions that Zakat Management Organizations can utilize digital zakat innovation in various ways. Digital zakat innovation includes collection and distribution, which extend to ease of transparency and zakat disbursement. Zakat is a Muslim's obligation to disburse a specified net value of their wealth, which does not exceed one nisab, given to mustahik under certain predetermined conditions.

Zakat is the third pillar of Islam, which was mandated in Madinah during the month of Shawwal in the second year of Hijrah following the mandate of Ramadan fasting. Zakat consists of two types: zakat al-fitr and zakat on wealth, serving as a cleaner for the soul and wealth. Zakat is a financial worship with social-economic dimensions and functions or the distribution of Allah's grace. It also represents social solidarity, an expression of humanity and justice, a proof of Islamic brotherhood, a binder of unity among the nation and community, a connection between the rich and the poor, and a means to bridge the gap between the strong and the weak.

Digitalization is defined as the exploitation of digital opportunities (Nurdin, 2022). Digital transformation is then defined as the process of reshaping the economy, institutions, and society at a systemic level (Nurdin, 2023). While the latter involves changes at all levels of society, digitalization by integrating various technologies (such as cloud technology, sensors, big data, and 3D printing) opens up unexpected possibilities (Nurdin, Agam, & Adawiyah, 2023; Nurdin, Pettalongi, Ahsan, & Febrianti, 2023). It offers the potential to create new products and services radically. The process of converting various information, news, or announcements from analog to digital format, making it easier to produce, manage, store, and distribute, is known as information digitalization. This can be presented in digital information through text, numbers, visuals, and audio that contain ideas about

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

ideology, social issues, health, and business. Digital technology is a system where manual labor or methods are no longer used. The transition from an analog to a digital system is called digitalization, leading to an automated operating system using formats that computers can read.

The management of digital zakat and the digitalization of zakat payments at the National Zakat Agency is carried out with a marketing strategy and follows the rules of Islamic law. To accelerate socialization, partnerships are formed with digital partners such as virtual stores and companies that use other online features like Muslim Travel, Gopay, and Cimb Niaga Syariah to facilitate muzzaki to pay zakat anytime and anywhere. Thus, the reflection of digital zakat payments will increase the potential for zakat receipt and provide welfare to its beneficiaries.

III. METHODOLOGY

This study uses qualitative methods. In qualitative research, the theory is only a guide, so the research focuses on the facts in the field (Nurdin & Pettalongi, 2022; Nurdin, Stockdale, & Scheepers, 2016). The data was collected through direct observation, in-depth interviews, and written document analysis at the research site (Rusli, Hasyim, & Nurdin, 2021; Rusli & Nurdin, 2022). The research location is the National Zakat Agency of Palu City. As a Zakat management institution, the National Zakat Agency assists the underprivileged, especially children of elementary and middle school age. The approach used in this research is ethnography. Ethnographic studies describe and interpret cultures, social groups, or systems. Although the meaning of culture is comprehensive, ethnographic studies usually focus on patterns of activities, language, beliefs, rituals, and ways of life in society.

The interviews involved ten local customary leaders, citizens, and three local government staff. The interviews were recorded and transcribed. The results of the transcripts were consulted with the participants to obtain their consent (Nurdin, Scheepers, & Stockdale, 2022; Nurdin, Stockdale, & Scheepers, 2014). The data analysis used a deductive thinking technique, interpreted as a research procedure that produces deductive data from the interviews and field notes. Data analysis was conducted using thematic analysis from Strauss and Corbin (1998). The analysis started with open, axial, and selective coding. The final result of the data analysis is themes found from the data.

IV. RESULTS AND DISCUSSION

A. History of BAZNAS Palu City

On May 14, 1992, the administrators began their activities by issuing a Circular Letter about the Establishment of BAZIS (zakat, infaq, and alms amil agency) from the city to the village, with letter No. 02/Bazis/ST/1992 dated July 21, 1992. Based on this circular, the zakat, infaq, and alms amil agency was established down to its lower levels in the Palu City area. The institutional management of zakat follows the structure of district/city governments and has been officially recognized as the National Zakat Agency based on the Director General's Decree No. DJ.II/37 Year 2015 Regarding the Amendment to the Decision of the Director General of Islamic Community Guidance No. BJ.II/568 Year 2014 on establishing the National Zakat Agency at the district-city level across Indonesia.

As the name suggests, the Provincial and Regency/City National Zakat Agency has been officially formed by the central government with Presidential Decree Number 8/2001, dated 17 January 2001, concerning the name of the Zakat Management Organization. It is called the Regional Zakat Amil Agency at the central level. The change in the paradigm of zakat management was marked by the birth of Law Number 23 of 2011 concerning zakat management, so it is no longer known as Regional Zakat Amil Agency but as a whole is called the National Zakat Agency at both the central, provincial and district/city levels, while in the sub-district level, there is no Regional Zakat Amil Agency.

The Palu City National Zakat Agency is located at Gajah Mada Street, No. 130 Palu. The Palu City Regional Zakat Agency was established on January 2, 2002, based on the Palu Mayor's Decree Number 47 of 2002. The composition of the Palu City Zakat agency management for the 2009-2013 period is based on the Decree of the Mayor of Palu Number 451.7/142/Kesra/2008 dated March 4, 2008. The Regional Government of Palu City established the Zakat management institution based on the Decree of the Minister of Religion of the Republic of Indonesia Number 373 of 2003 concerning the implementation of Law Number 38 of 1999 concerning Zakat Management.

B. Zakat Management in Improving the Quality of Education in Palu City

This section will explain that the optimization of zakat management in improving the quality of education at the Palu City National Zakat Agency has been implemented well and maximally, including that the Palu City National Zakat Agency has taken several optimal steps to maximize collection, distribution, utilization, and reporting with the productive zakat program and the Smart National Zakat Agency program which have become routinely implemented programs. However, the Palu City National Zakat Agency faces several problems, and appropriate and accurate solutions must be found. Some issues or obstacles that require solutions are:

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

C. Optimizing Zakat Collection

Law Number 23 of 2011 concerning Zakat Management, Instruction of the President of the Republic of Indonesia Number 3 of 2014 concerning Optimization of Zakat Collection, and Mayor Circular No.100.2.4.3/1349/Kesra/2023 concerning Optimization of Zakat collection on income, infaq, and sadaqah. With three legal guidelines for the National Zakat Agency of Palu City, it has yet to be able to increase the collection of zakat to a greater extent or tends to stagnate.

The solution carried out by the National Zakat Agency of Palu City is to make improvements and strategies to increase the potential for Zakat so that it can collect a significant amount. The solution that can be implemented concretely by the Palu City National Zakat Agency is to maximize the Palu Mayor's Circular Letter to the Departments and agencies within the Palu City government. It can also coordinate and collaborate with agencies at the Palu City level. Collecting more significant amounts of zakat funds to become the proper, effective, and efficient solution can improve the quality of education, such as educational institutions, including schools, madrasas, and underprivileged children.

Efforts to maximize Muslims' zakat obligations can also be rationalized as taxpayers. Muslims are obliged to pay taxes in the name of public accountability to the state and for the benefit of the population. From the benefit aspect, taxes and zakat can provide income and economic growth evenly. Zakat obligations are very different from tax obligations. It can be distinguished that when Muslims do not pay taxes, there is a penalty (punishment) that has been regulated in law and government regulations. Meanwhile, when Muslims do not pay zakat, there are no penalties regulated by the government.

D. Organizing a System in Zakat Management

The Palu City National Zakat Agency needs a proper, effective, and efficient Zakat management mechanism or system. Currently, the National Zakat Agency does not yet have an appropriate system for zakat management services. A better solution is to carry out an in-depth study of what kind of system can be used for the National Zakat Agency in Palu City.

Obstacles regarding the service system in zakat management, especially in distributing aid for education, no longer need to be manual and straightforward. Still, the Palu City National Zakat Agency already has a solution. It will create a digitalization system, making it easier for the public to get good information about educational aid applications in academic institutions and underprivileged communities in Palu City. Finally, it can be the correct, effective, and efficient solution that can have an impact on improving the quality of education such as educational institutions, including schools, madrasas, underprivileged children, and parents of students who cannot afford to be given productive business capital for the community so that they will be empowered to increase economic needs and to finance their children's education. Apart from that, people given productive business capital assistance are expected to become muzaki (zakat givers) who were previously mustahik (zakat recipients).

E. Socialization of the National Zakat Agency to the Community

The National Zakat Agency of Palu City must realize the potential for zakat not to receive maximum revenue if efforts are made to socialize the obligation of zakat to civil servants, employees, the Indonesian national army, the police and the broader community as Muzaki (givers) of zakat to the National Zakat Agency of Palu City. So, the solution that must be implemented is related to the socialization of zakat obligations for Muslims in Palu City.

The National Zakat Agency of Palu City can do as much as possible to optimize zakat collection by conducting outreach to agencies, bodies, the Indonesian National Army, the Indonesian National Police, entrepreneurs, especially Muslims, so that it becomes the proper, effective, and efficient solution that can impact the quality of education, including educational institutions, schools, madrasas, and underprivileged children.

F. Growing Public Awareness in Paying Zakat

The awareness of Muslims in paying zakat is fundamental to providing motivation and raising this awareness to become the proper, effective, and efficient solution—awareness of Muslims in paying or completing zakat at the National Zakat Agency in Palu City. The solution is to increase Muslims' understanding of paying zakat, such as matching the budget capacity of the National Zakat Agency and motivating and raising awareness of Muslims by providing religious enlightenment through lectures on activities of an Islamic nature.

The awareness that Muslims should pay zakat will have a significant impact on Muslims themselves. So that it becomes the proper, effective, and efficient solution that can affect improving the quality of education in educational institutions that need help and support in improving physical facilities and infrastructure, both schools and madrasas, which are very limited in terms of costs, children who have achievements need support and rewards to motivate them to continue to excel, especially for underprivileged children whose ability to pay for their education is minimal, including children in schools, madrasas and universities, which are the people of Palu City.

G. Community Trust

If zakat governance is weak, it can lead to disappointment and loss of trust in zakat institutions, even resulting in public doubts about the role of zakat itself. Therefore, as public funds that have the potential to overcome the problems of the poor, zakat must be managed transparently and accountable. Implementing transparency and accountability in every zakat management activity can maintain and increase muzakki's trust in zakat management institutions. Meanwhile, muzakki's trust in zakat institutions determines muzakki's interest in paying zakat.

Apart from influencing muzakki's trust, transparency and accountability in Zakat management also correlate with Zakat recipients' performance. Zakat management institutions implementing transparency and accountability experience increasing zakat receipts yearly. However, to ensure the level of transparency and accountability of a zakat institution, currently, there are no relevant standard measuring tools. So it must be done immediately by the National Zakat Agency of Palu City, as follows:

1. Transparency of reports through the National Zakat Agency information management system (SIMBA), an integrated application belonging to the Central National Zakat Agency.
2. Transparency of reports through preparing written reports, which are given to muzakki, the Palu City Government, and the Palu City Ministry of Religion Office.
3. Transparency of reports by making written reports which are posted on the National Zakat Agency information board in Palu City

Efforts to build and increase public trust, especially Muslims, in paying their zakat. The National Zakat Agency of Palu City has carried out three aspects as mentioned above, which is very urgent to do and easy to develop is the development of a more independent digitalization system owned by the National Zakat Agency of Palu City because it can easily be monitored by both civil servants of the city government and the ministry of religion Palu City and the wider community.

V. CONCLUSION

Optimizing zakat management in improving the quality of education at the National Zakat Agency in Palu City refers to management functions, namely planning, organizing, actuating and controlling and following Law no. 23 of 2011 concerning zakat management which includes collection, distribution, utilization, and reporting. The steps taken to optimize zakat management are: First, optimizing zakat collection starts from collecting data on muzakkik, especially among civil servants, carrying out efforts to explore zakat sources such as establishing a Zakat Management Organization in schools, mosques, and local government institutions within the scope of the Palu City Government, and vertical agencies, publicizing zakat via social media, print media and electronic media, collaborating with banks to digitize zakat, outreach activities in government institutions and elements of society. Second, Optimization in the distribution of zakat, still referring to the Al-Qur'an surah At-Taubah/ 9:60 regarding the eight groups with the right to receive zakat and the ijtihad of the ulama. In this research, the author only focuses on distributing zakat funds for educational institutions, assistance for productive businesses, and scholarship assistance. Third, the use of zakat for community empowerment in Palu City, especially assistance to academic institutions and productive business assistance to the community, aims to improve their standard of living, which will ultimately be able to pay for their children's education costs. Likewise, scholarships and educational assistance for underprivileged students. Fourth, transparency of reporting in zakat management with the principles of 1) openness, 2) accountability, 3) responsibility, 4) independence, 5) fairness and justice, and 6) sharia propriety.

REFERENCES

1) Abdullah, N., Mat Derus, A., & Al-Malkawi, H.-A. N. (2015). The effectiveness of zakat in alleviating poverty and inequalities. Humanomics, 31(3), 314-329. doi:10.1108/H-02-2014-0016
2) Al-Bawwab, R. A. (2023). Zakat: changing the framework of giving. Islamic Economic Studies, 30(2), 86-103. doi:10.1108/IES-08-2021-0026
3) Ali, I., & Hatta, Z. A. (2014). Zakat as a Poverty Reduction Mechanism Among the Muslim Community: Case Study of Bangladesh, Malaysia, and Indonesia. Asian Social Work and Policy Review, 8(1), 59-70. doi:https://doi.org/10.1111/aswp.12025
4) Aziz, Y., Mansor, F., Waqar, S., & Haji Abdullah, L. (2020). The nexus between zakat and poverty reduction, is the effective utilization of zakat necessary for achieving SDGs: A multidimensional poverty index approach. Asian Social Work and Policy Review, 14(3), 235-247. doi:https://doi.org/10.1111/aswp.12212
5) Beik, I. S., Swandaru, R., & Rizkiningsih, P. (2021). Utilization of Digital Technology for Zakat Development. In M. M. S. Billah (Ed.), Islamic FinTech: Insights and Solutions (pp. 231-248). Cham: Springer International Publishing.

Optimizing Zakat Management to Improve Education Quality in Palu City, Central Sulawesi, Indonesia

6) Herianingrum, S., Supriani, I., Sukmana, R., Effendie, E., Widiastuti, T., Fauzi, Q., & Shofawati, A. (2024). Zakat as an instrument of poverty reduction in Indonesia. Journal of Islamic Accounting and Business Research, 15(4), 643-660. doi:10.1108/JIABR-11-2021-0307

7) Mohammed, M. O., El Amri, M. C., & Shabani, R. M. (2021). Zakat on Wealth and Asset: Lessons for SDGs. In M. M. S. Billah (Ed.), Islamic Wealth and the SDGs: Global Strategies for Socio-economic Impact (pp. 375-392). Cham: Springer International Publishing.

8) Nurdin, N. (2022). Impact of Internet Development on Muslim Interaction with Islam. Paper presented at the Proceeding of International Conference on Islamic and Interdisciplinary Studies, Palu.

9) Nurdin, N. (2023). Implementation of Blended Learning And E-Learning In Indonesia. Paper presented at the International Conference on Islamic and Interdisciplinary Studies (ICIIS) 2023, Palu.

10) Nurdin, N., Agam, M., & Adawiyah, A. (2023). Geographic Information System Continuance Adoption and Use to Determine Bidikmisi Scholarship Recipients Distribution. Paper presented at the Proceedings of the 2022 International Conference on Computer, Control, Informatics and Its Applications, Virtual Event, Indonesia. https://doi.org/10.1145/3575882.3575953

11) Nurdin, N., & Pettalongi, S. S. (2022). Menggunakan Paradigma Studi Kasus Kualitatif Interpretatif Online dan Offline Untuk Memahami Efektivitas Penerapan E-Procurement. Coopetition: Jurnal Ilmiah Manajemen, 13(2), 155-168.

12) Nurdin, N., Pettalongi, S. S., Ahsan, M. N., & Febrianti, V. (2023). Factors affecting students' continuance intention to use teaching performance assessment application from technology continuance theory. International Journal of Electrical and Computer Engineering (IJECE), 13(5), 5342-5353.

13) Nurdin, N., Scheepers, H., & Stockdale, R. (2022). A social system for sustainable local e-government. Journal of Systems and Information Technology, 24(1), 1-31. doi:10.1108/JSIT-10-2019-0214

14) Nurdin, N., Stockdale, R., & Scheepers, H. (2014). Coordination and Cooperation in E-Government: An Indonesian Local E-Government Case The Electronic Journal of Information Systems in developing Countries, 61(3), 1-21.

15) Nurdin, N., Stockdale, R., & Scheepers, H. (2016). Influence of Organizational Factors in the Sustainability of E-Government: A Case Study of Local E-Government in Indonesia. In I. S. Sodhi (Ed.), Trends, Prospects, and Challenges in Asian E-Governance (pp. 281-323). Hershey, PA, USA: IGI Global.

16) Obaidullah, M., & Manap, T. A. A. (2017). Behavioral Dimensions of Islamic Philanthropy: The Case of Zakat. In M. Zulkhibri & A. G. Ismail (Eds.), Financial Inclusion and Poverty Alleviation: Perspectives from Islamic Institutions and Instruments (pp. 219-243). Cham: Springer International Publishing.

17) Oktavendi, T. W., & Mu'ammal, I. (2022). Acceptance model for predicting adoption of Zakat, Infaq, and Sodaqoh (ZIS) digital payments in Generation Z. Journal of Islamic Accounting and Business Research, 13(4), 684-700. doi:10.1108/JIABR-09-2021-0267

18) Owoyemi, M. Y. (2020). Zakat management. Journal of Islamic Accounting and Business Research, 11(2), 498-510. doi:10.1108/JIABR-07-2017-0097

19) Retsikas, K. (2014). RECONCEPTUALISING ZAKAT IN INDONESIA. Indonesia and the Malay World, 42(124), 337-357. doi:10.1080/13639811.2014.951519

20) Rusli, R., Hasyim, M. S., & Nurdin, N. (2021). A New Islamic Knowledge Production And Fatwa Rulings: How Indonesia's Young Muslim Scholars Interact With Online Sources. Journal of Indonesian Islam, 14(2), 499-518.

21) Rusli, R., & Nurdin, N. (2022). Understanding Indonesia millennia Ulama online knowledge acquisition and use in daily fatwa making habits. Education and Information Technologies, 27(3), 4117-4140. doi:10.1007/s10639-021-10779-7

22) Strauss, A., & Corbin, J. M. (1998). Basics of Qualitative Research: Grounded Theory Procedures and Techniques (2 ed.). California, USA: Sage Publications, Inc.

23) Widiastuti, T., Cahyono, E. F., Zulaikha, S., Mawardi, I., & Al Mustofa, M. U. (2021). Optimizing zakat governance in East Java using analytical network process (ANP): the role of zakat technology (ZakaTech). Journal of Islamic Accounting and Business Research, 12(3), 301-319. doi:10.1108/JIABR-09-2020-0307

24) Zauro, N. A., Saad, R. A. J., & Sawandi, N. (2020). Enhancing socio-economic justice and financial inclusion in Nigeria. Journal of Islamic Accounting and Business Research, 11(3), 555-572. doi:10.1108/JIABR-11-2016-013

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

Shristi Karmacharya[1], Rupa Devi Thapa[2]

[1]Manmohan Cardiothoracic Vascular and Transplant Center, Kathmandu, Nepal

[2]Yeti Health Science Academy, Kathmandu, Nepal

ABSTRACT: Grief is feelings and emotions to loss that individuals might experience as they attempt to accept the loss. Like general people, nurses also experience such grief as they have to face the situations of many patients' loss at hospital. Prolonged grief can cause a decline in productivity, increase absenteeism, job turnover, and pose physical and mental health risks among nurses. Hence, the study aimed to explore the experience of grief and the use of coping strategies among the nurses following patients' deaths. A descriptive study design was carried out among 111 registered nurses working in different departments of Manmohan Cardiothoracic Vascular and Transplant Center (MCVTC), Maharajgunj, Kathmandu, Nepal using a non-probability enumerative sampling technique. A structured, self-administered questionnaire was used to collect the data. The respondents obtained the highest percentage of mean score on experience of grief on feeling (45.55%). Among the respondents, 40.9% use social support, 76.53% engage in the care of other patients, 74.55% form personal goals, 45.08% use self-help method, and 70.76% use the self-assessment method to cope with the death of a patient. The conclusion of the study emphasized how critical it is to comprehend nurses' grieving processes when patients pass away in order to help them identify and manage psychological stress.

I. INTRODUCTION

Grief is a natural emotional reaction to the loss of a significant thing or person and the value we pay for our loved ones and commitment to one another.[1]The National North American Nursing Diagnosis Association International defines grief as a normal but complicated process that includes emotional, physical, spiritual, social, and intellectual responses and behaviors by which individuals, families, and communities integrate a loss into their daily lives.[2]Feelings related to grief include rage, frustration, loneliness, sadness, guilt, regret, and peace, depending on the sort of loss. Resolutions in typical mourning might take months or even years, and there may be behavioral, cognitive, emotional, or bodily repercussions.[3]

Grief coping refers to the use of potentially adaptive cognitive, behavioral, emotional, spiritual, and social methods for addressing the obstacles that come up during the internal and/or outward stages of a person's mourning process.[4]

Not only do families grieve when a patient passes away at a hospital, but nurses who care for patients around-the-clock also experience grief.[5] As professional health caregivers build both therapeutic-client relationships and personal bonds with their patients, patient deaths can trigger grief experiences among physicians and nurses, also known as professional bereavement.[6] Due to frequent interactions and the closeness of their care providers, nurses are frequently the medical professionals who develop closer ties with their patients. Nursing connections are said to be incredibly gratifying, yet when a patient passes away, this connection can lead to emotional and psychological distress. When dealing with patients' end-of-life situations, nurses experience feelings of apprehension, discomfort, and anxiety.[7]

Grief is a multifaceted experience, mainly caused by altruism, compassion, and empathy. Some nurses view their patients as their own families, and as a result, they experience pain and grief when their patients' lives end. In addition, grief can result from long-term suffering, limited time to take rest during work shifts, emotional exhaustion, andaself-perceived inability to deliver quality care to patients.Grief causes psychological stress for nurses, which is linked to several physical, mental, cognitive, behavioral,and emotional problems, such as despair, anger, anxiety, irritability, social isolation, and somatization. Prolonged grief can cause a decline in productivity, increase absenteeism, job turnover, and pose physical and mental health risks.[8]

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

A number of patient fatalities were observed to have an adverse physical and psychological impact on nurses. However, due to professional stigma, the experience of grief following patients' death among nurses is not commonly acknowledged. Nurses who suffer from professional stigma are expected to provide professional care to patients and families even when they are grieving, but they are unable to acknowledge their own and their colleagues' grief.[9] Nurses may not be able to articulate their grief and, therefore, hide it within themselves or choose to ignore their feelings. As a result, burnout, cumulative stress, and ineffective coping may result if nurses do not express their grief following patient deaths.[10]

II. METHODOLOGY

A descriptive study design was adopted to assess the experience of grief and the use of coping strategies following patients' deaths among nurses working in the Manmohan Cardiothoracic Vascular and Transplant Center, Maharajgunj, Kathmandu. The study population consisted ofthe nurses working in the intensive care unit, critical care unit, emergency department, and general ward of the hospital. The nurses who had passed the minimum qualification to work as staff nursesand had encountered at least one patient death in the last three monthswere included in the study.

An enumerative sampling technique was used in the study for data collection. The total respondents were 111 nurses in the study. Ethical approval was obtained from the Institution Research Committee (IRC) of the Yeti Health Science Academy (YHSA). In addition, approval for data collection was obtained from Manmohan Cardiothoracic Vascular and Transplant Center. The data was collected from 17th November to 1st December, 2022.

A self-administered questionnaire technique was used to assess the experience of grief and the use of coping strategies following patients' deaths among the nurses.The experience of grief following patients' death is categorized by the respondents' feelings and emotions. The study tools consisted of questions related to socio-demographic and profession-related characteristics of the respondents, five-point Likert scales to assess grief i. e. feelings and emotions after patient death, and the use of strategies to cope with patients' deaths.

III. RESULTS

Table 1: Socio-Demographic Characteristics of the Respondents

N=111

Variables	Frequency	Percentage
Age (in years)		
≤ 28	68	61.3
>28	43	38.7
Mean age± SD: 27.86 ± 3.83		
Marital status		
Married	54	48.6
Unmarried	57	51.4
Ethnicity		
Janajati	49	44.1
Brahmin/ Chhetri	59	53.2
Others*	3	2.7
Family types		
Nuclear family	85	76.6
Joint family	26	23.4
Religion		
Hindu	100	90.1
Buddhist	9	8.1
Others**	2	1.8

*Madhesi, Dalit   **Kirat, Christian*

Table 1 represents that 61.3 % respondents were ≤28 years of age, 51.4% were unmarried, 53.2% were Brahmin/Chhetri, 76.6% lived in nuclear family and 90.1% were Hindus.

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

Table 2: Profession Related Characteristics of the Respondents

N=111

Profession related Variables	Frequency	Percentage
Education status		
Proficiency Certificate Level in Nursing	14	12.6
Bachelor of Science in Nursing	97	87.4
Current working area		
Intensive Care Unit	44	39.6
Coronary Care Unit	22	20.6
General ward	33	29.6
Emergency department	12	10.2
Experience in nursingprofession (Years)		
≤ 5	71	64.0
6-10	29	26.1
≥ 10	11	9.9
Number of encountered deaths in last 3 months		
≤4	80	72.1
> 4	31	27.9

Table 2 shows that 87.4% of the respondents had completed their bachelor degree in nursing, 39.6% were working in intensive care unit, 64% had ≤ 5 years of experience in nursing profession and 72.1% had encountered at least four patient's death in last 3 months.

Table 3: Respondents Feelings Regarding Experience of Grief Following Patient Death

N=111

Statements	Responses					Mean ± SD
	N	R	S	M	A	
Feelings	No (%)	No (%)	No (%)	No (%)	No (%)	
Life has no meaning following a patient's death.	25 (22.5)	23 (20.7)	51 (45.9)	9 (8.1)	3 (2.7)	2.48±1.01
I lost interest in work after the patient's death.	42 (37.8)	38 (34.2)	23 (20.7)	8 (7.2)	0	1.97±0.93
I feel afraid to be alone following the patient's death.	44 (39.6)	28 (25.2)	29 (26.1)	8 (7.2)	2 (1.8)	2.06±1.05
I feel emotionally distant from people.	40 (36.0)	31 (27.9)	31 (27.9)	7 (6.3)	2 (1.8)	2.10±1.02
I think of times that I could have made the patient's life more pleasant before patient's death.	12 (10.8)	20 (18.0)	41 (36.9)	25 (22.5)	13 (11.7)	3.06±1.14
I avoid talking about the deceased person.	21 (18.9)	31 (27.9)	33 (29.7)	21 (18.9)	5 (4.5)	2.62±1.12

I think some people can be responsible for the patient's death.	37 (33.3)	29 (26.1)	43 (38.7)	2 (1.8)	0	2.09±0.89
I didn't provide enough care for the patient before his death.	50 (45.0)	35 (31.5)	21 (18.9)	4 (3.6)	1 (0.9)	1.84±0.92
Total						18.22±4.06

N= Never, R= Rarely, S= Sometimes, M= Most of the time, A= Always

Table 3 depicts the respondents' feelings following patient deaths, where the statement "I think of times that could have made the patient's life more pleasant before patient'sdeath" has the highest Mean ± SD i.e.3.06±1.14, whereas the statement "I didn't provide enough care for the patient before death" has the lowest Mean ± SD i.e.1.84±0.9.

Table 4: Respondents Emotions Regarding Experience of Grief Following Patient Death

N=111

Statements	Responses					Mean ± SD
Emotions	N	R	S	M	A	
	No (%)	No (%)	No (%)	No (%)	No (%)	
I feel I need to be emotionally close to someone after patient's death.	37 (33.3)	34 (30.6)	31 (27.9)	7 (6.3)	2 (1.8)	2.13±1.01
I feel guilty about some things said or done before or after the patient death.	26 (23.4)	41 (36.9)	35 (31.5)	8 (7.2)	1 (0.9)	2.25±0.92
I fear remembering the deceased patient.	41 (36.9)	30 (27.0)	32 (28.8)	6 (5.4)	2 (1.8)	2.08±1.01
I feel anger towardmyself after the patient death.	70 (63.1)	23 (20.7)	12 (10.8)	5 (4.5)	1 (0.9)	1.59±0.91
I feel anger towards the deceased patient.	93 (83.8)	9 (8.1)	7 (6.3)	1 (0.9)	1 (0.9)	1.27±0.70
My mind is occupied with thoughts of a deceased patient.	23 (20.7)	36 (32.4)	44 (39.6)	8 (7.2)	0	2.33±0.88
I lack joy regarding activities that I used to enjoy.	47 (42.3)	27 (24.3)	29 (26.1)	5 (4.5)	3 (2.7)	2.01±1.05
I intentionally try to hurt myself.	104 (93.7)	3 (2.7)	2 (1.8)	1 (0.9)	1 (0.9)	1.13±0.55
Total						14.79±4.46

N= Never, R= Rarely, S= Sometimes, M= Most of the time, A= Always

Table 4 represents the respondent's emotional statements regarding the experience of grief following patient death, wherethe statement "I feel guilty about some things said or done before or after the patient death" has the highest Mean ±SD i.e.2.25±0.92, whereas the statement "I intentionally try to hurt myself" has the lowest Mean ±SD i.e.1.13±0.55.

Table 5: Respondent's Coping Strategies in Social Support and Engagement in Care Following Patient Death

N=111

Statements	Responses					Mean ±SD
Social support	N	R	S	M	A	
	No (%)	No (%)	No (%)	No (%)	No (%)	
I reach out to nurses for comfort and companionship.	24 (21.6)	36 (32.4)	32 (28.8)	17 (15.3)	2 (1.8)	2.43±1.05

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

Statements	N	R	S	M	A	Mean±SD
I turn to family members to express my grief.	22 (19.8)	29 (26.1)	49 (44.1)	8 (7.2)	3 (2.7)	2.47±0.98
I identify supportive individuals to debrief grief.	21 (18.9)	24 (21.6)	42 (37.8)	19 (17.1)	5 (4.5)	2.67±1.10
I talk withthe social worker, other patient, and visitor about how much he used to care for the dead patient.	50 (45.0)	26 (23.4)	19 (17.1)	16 (14.4)	0	2.01±1.10
I consult with a professional counselor to cope with patient death.	98 (88.3)	8 (7.2)	4 (3.6)	1 (0.9)	0	1.17±0.52
I visit websites that focus on the grieving process.	80 (72.1)	8 (7.2)	19 (17.1)	4 (3.6)	0	1.52±0.90
Total						**12.27±3.25**
Engage in care of other patients						
I engage in an act of kindness towards other patients.	11 (9.9)	16 (14.4)	23 (20.7)	41 (36.9)	20 (18.0)	3.39±1.22
I accept the reality of loss and provide care for other patients.	4 (3.6)	2 (1.8)	4 (3.6)	28 (25.2)	73 (65.8)	4.48±0.93
I set boundaries while providing holistic nursing care to the patients.	8 (7.2)	14 (12.6)	20 (18.0)	40 (36.0)	29 (26.1)	3.61±1.20
Total						11.48±3.35

N= Never, R= Rarely, S= Sometimes, M= Most of the time, A= Always

Table 5 reveals the methods of coping strategies in social support and engagement in care used by the nurses following patient death. The statement "I accept the reality of loss and provide care for other patients" has the highest Mean±SD i.e.4.48±0.93, whereas the statement "I consult with a professional counselor to cope with patient death" has the lowest Mean±SD i.e.1.17±0.52.

Table 6: Respondent's Coping Strategies in Set-up of Personal Goals and Self-assessment Following Patient Death

N=111

Statements	Responses					Mean ±SD
Set up personal goals	N	R	S	M	A	
	No (%)	No (%)	No (%)	No (%)	No (%)	
I make new plans for the future.	4 (3.6)	11 (9.9)	32 (28.8)	42 (37.8)	22 (19.8)	3.60±1.02
I seek positive feedback from others.	16 (14.4)	20 (18.0)	38 (34.2)	25 (22.5)	12 (10.8)	2.97±1.19
I focus on things that are going to get better.	4 (3.6)	12 (10.8)	53 (47.7)	42 (37.8)	0	4.20±0.77
I remind myself of my personal strength.	4 (3.6)	3 (2.7)	14 (12.6)	43 (38.7)	47 (42.3)	4.14±0.98
Total						14.91±3.96
Self-assessment						
I blame myself for things that have happened.	75 (67.6)	16 (14.4)	13 (11.7)	5 (4.5)	2 (1.8)	1.59±0.98
I assess how well they are doing.	5 4.5)	10 (9.0)	38 (34.2)	37 (33.3)	21 (18.9)	3.53±1.04
I remember grateful things.	0	8 (7.2)	26 (23.4)	49 (44.1)	28 (25.2)	3.87±0.87
I learned to live well, even handling patient deaths.	1 (0.9)	3 (2.7)	13 (11.7)	51 (45.9)	43 (38.7)	4.19±0.81

I am convinced that the death of an individual is a natural process.	2 (1.8)	2 (1.8)	7 (6.3)	26 (23.4)	74 (66.7)	4.51±0.84
Total						17.69±4.54

N = Never, R = Rarely, S = Sometimes, M = Most of the time, A = Always

Table 6 illustrates the respondents' coping strategies in setting up personal goals and self-assessment following the patient's death.The statement "I am convinced that the death of an individual is a natural process." has the highest Mean±SD i.e.4.51±0.84, whereas the statement "I blame myself for things that have happened" has the lowest Mean±SD i.e. 1.59±0.98.

Table 7: Respondent's Coping Strategies in Self Help Following Patient Death

N=111

Statements	Responses					Mean ±SD
Self help	**N**	**R**	**S**	**M**	**A**	
	No (%)	**No (%)**	**No (%)**	**No (%)**	**No (%)**	
I took leave the following day after the patient's death.	98 (88.3)	6 (5.4)	2 (1.8)	4 (3.6)	1 (0.9)	1.23±0.73
I attend religious place (e.g. temple, church, mosque, etc.).	42 (37.8)	24 (21.6)	31 (27.9)	9 (8.1)	5 (4.5)	2.20±1.16
I perform spiritual activities (e.g. praying, meditation, spending alone time in nature, yoga, etc.).	25 (22.5)	32 (28.8)	35 (31.5)	13 (11.7)	6 (5.4)	2.49±1.12
I take steps to regain a sense of hope, (e.g. creating goals for the future.	15 (13.5)	25 (22.5)	34 (30.6)	26 (23.4)	11 (9.9)	2.94±1.18
I regularly set aside time for myself to express my grief.	29 (26.1)	38 (34.2)	36 (32.4)	6 (5.4)	2 (1.8)	2.23±0.96
I engage in recreational activities to cope with the situation (e.g. exercise, read books, listen to music, watch movies, play games, sleep, go shopping, etc.).	11 (9.9)	21 (18.9)	41 (36.9)	27 (24.3)	11 (9.9)	3.05±1.11
I express feelings in creative ways (e.g. writing journals, makingscrapbooks, etc.).	34 (30.6)	29 (26.1)	29 (26.1)	15 (13.5)	4 (3.6)	2.33±1.15
I distance myself from patient death.	59 (53.2)	21 (18.9)	17 (15.3)	8 (7.2)	6 (5.4)	1.93±1.21
I drink alcohol or use other substances to feel better.	103 (92.8)	2 (1.8)	3 (2.7)	2 (1.8)	1 (0.9)	1.16±0.64
I do not think about the patient unless I am at work.	25 (22.5)	16 (14.4)	21 (18.9)	33 (29.7)	16 (14.4)	2.99±1.39
Total						22.54±5.38

N= Never, R= Rarely, S= Sometimes, M= Most of the time, A= Always

Table 7shows respondents coping strategies for self-help following patient death, where the statement "I engage in recreational activities to cope with the situation (e.g. exercise, read books, listen to music, watch movies, play games, sleep, go shopping, etc.)" has the highest Mean±SD i.e. 3.05±1.11, whereas the statement "I drink alcohol or use other substances to feel better" has the lowest Mean±SD i.e. 1.16±0.64.

Table 8: Respondents' Mean Score regarding Experience of Grief and Coping Strategies Following Patient's Death

N=111

Subscales	Maximum Possible Score	Obtained Score Range	Mean±SD	% of Mean Score
Experience of grief				
Feelings	40	8-38	18.22±4.06	45.55%

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

Emotions	40	8-39	14.79±4.43	36.97%
Total	**80**	**16-77**	**33.01±8.49**	**41.26%**
Coping strategies				
Social support	30	6-27	12.27±3.25	40.9%
Engagement in care of other patients	15	3-15	11.48±3.35	76.53%
Set up personal goals	20	5-20	14.91±3.96	74.55%
Self help	50	10-50	22.54±5.38	45.08%
Self assessment	25	6-25	17.69±4.54	70.76%
Total	**140**	**30-137**	**78.89±20.48**	**56.35%**

Table 8 depicts the respondents'mean score regarding their experience of grief and coping strategies following the patient's death where the total obtained Mean±SDon the experience of grief was33.01±8.49 and total Mean±SD on the coping strategies was 78.89±20.48.

IV. DISCUSSION

In this study, the highest percent mean score found in feeling was 45.55%. The feelings expressed by the respondents included loneliness, losing interest at work, avoidance of conversation, and being disappointed. A similar finding was shown on a study conducted in a public hospital in Indonesia, where the respondents expressed their feelings by responding to the patient's death by crying, being sad, showing pity, empathy, being disappointed, and feeling guilty.[9]

To cope with the patient's death, 40.9% of the respondents used social support, 76.53% engaged in the care of other patients, 74.55% formed personal goals, 45.08% used the self-help method, and 70.76% used the self-assessment method to cope with the death of a patient. A similar results were found on a study conducted among Canadian oncologists who responded to an online survey and described several coping mechanisms to deal with the patient's death. Peer support from coworkers, especially nurses and other oncologists was the most common. Other strategies were38% performed their hobbies, 38% exercised, 47% spent time outdoors, 24% focused on research, 21% turned to their faith, 6% took vacation, 5% used alcohol and 31% avoided thinking about patients unless at work.[11]

V. CONCLUSION

The study highlights the importance of understanding nurses' experiences of grief following patients' deaths. It is more likely that nurses from other nations who encounter grief have suffered similar feelings and emotions. Nonetheless, more research is advised to explore these issues. Understanding nurses' grief from a holistic perspective provides important insights for nursing practice, research, leadership, administration, and education.

ACKNOWLEDGEMENT

REFERENCES

1) Hooyman N.R., Kramer B.J., Living through loss. New York ; Chichester: Columbia University Press; 2006 [cited 2022 Aug]. Available from: https://books.google.nr/books?id=uL43BAAAQBAJ&printsec=copyright#v=onepage&q&f=false
2) Carpenito L. J, Handbook of nursing diagnosis. 15th ed. Philadelphia, Pa: Wolters Kluwer Health; 2016-263.
3) Silvestri L.A, Saunders Comprehensive Review For The NCLEX-RN Examination. 2nd South Asia Edition. DLF Cyber CIty, Phase II, Gurgaon-122 002, Haryana, India: ELSEVIER A division of RELX India Private Limited,; 2018-1030-1031.
4) Crunk A. E, Burke L. A, Neimeyer R. A, Robinson EHM, Bai H. The Coping Assessment for Bereavement and Loss Experiences (CABLE): Development and initial validation. Death studies. 2019;45(9):1–15. DOI: 10.1080/07481187.2019.1676323
5) Shimoinaba K, McKenna L, Copnell B, Nurses' experiences, coping and support in the death of a child in the emergency department: A qualitative descriptive study. International Emergency Nursing. 2021 Nov;59:101102. DOI: 10.1016/j.ienj.2021.101102

Experience of Grief and Coping Strategies Following Patients' Death among Nurses Working in a Tertiary Level Hospital, Kathmandu, Nepal

6) Wenzel J, Shaha M, Klimmek R, Krumm S. Working Through Grief and Loss: Oncology Nurses' Perspectives on Professional Bereavement. Oncology Nursing Forum. 2011 Jun 27;38(4):E272–82. DOI: 10.1188/11.ONF.E272-E282

7) Cooper J, Barnett M. Aspects of caring for dying patients which cause anxiety to first year student nurses. International Journal of Palliative Nursing. 2005 Aug 1;11(8):423–30. DOI: 10.12968/ijpn.2005.11.8.19611

8) Erami E, Taghadosi M. Factors Contributing to Grief Experience Among Oncology Nurses: A Qualitative Study. Seminars in Oncology Nursing. 2023 Oct;39(5):151472. DOI: 10.1016/j.soncn.2023.151472.

9) Betriana F, Kongsuwan W. Lived experiences of grief of Muslim nurses caring for patients who died in an intensive care unit: A phenomenological study. Intensive and Critical Care Nursing. 2019 Jun;52:9–16. DOI: 10.1016/j.iccn.2018.09.003

10) GerowL, Conejo P, Alonzo A, Davis N, Rodgers S, Domian EW. Creating a Curtain of Protection: Nurses' Experiences of Grief Following Patient Death. Journal of Nursing Scholarship. 2010 Feb 24;42(2):122–9. DOI: 10.1111/j.1547-5069.2010.01343.x

11) Granek L, Barbera L, Nakash O, Cohen M, Krzyzanowska MK. Experiences of Canadian oncologists with difficult patient deaths and coping strategies used. Current Oncology. 2017 Aug 31;24(4):277-284. DOI: 10.3747/co.24.3527

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

Joshua Odion[1], Andikan Kenneth Ekpa[2]

[1]Department of Instrumentation and Control, Total Energies Limited, Port Harcourt, Nigeria

[2]Department of Electrical/Electronic Engineering, Akwa Ibom State Polytechnic, Ikot Osurua, Nigeria

ABSTRACT: The effect of the occurrence of high impedance fault (HIF) in power system networks results to low current signal which cannot be detected by the electrical equipment which results to fire outbreaks. Nigerian power system network has witnessed the occurrence of HIF which has led to fire outbreak in buildings and in minor cases grid collapse. In this paper, the performance of ANN in the detection and location of HIF was studied and determined. The transmission network located in south-south region of the Nigerian 330kV power system network was obtained and modeled in SIMULINK. The line distance was split into six points and implemented in the SIMULINK to obtain the current signals at each point of the lines. The current signals were used as the input data with the split distance utilized as the target to the ANN model. The ANN had three input neurons (each neuron represented the phase current signal), the hidden layer had five neurons with each neuron incorporating log sigmoid curve and the output layer having one neuron which was the split distance. The outcome had the least error deviation value of 0.0118 making the performance of ANN effective in the point location of HIF occurrence on the transmission line.

KEYWORDS: Artificial Neural Network, Fault detection, Fault location, high impedance fault, Transmission system

I. INTRODUCTION

The electrical power system network comprises of generation stations, transmission stations and distribution systems [1, 2, 3]. The generation plants generate electricity at voltage of between 16kV to 25kV with the voltage stepped up to high voltage transmittable power (330kV for the Nigerian power system network and 735kV for the United States power system network) [4, 5, 6, 7]. The essence of voltage rating step up was to minimize losses on the lines. The transmission system has transmission station and substations where the transmission power voltage rating was stepped down on reaching the required load demand location. The occurrence of faults has limited the effectiveness of the operation of power system network. The occurrence of fault can yield high current or low current signal [8, 9, 10]. The type of fault occurrence that results of high current signal is known as low impedance fault which the introduction of relays has aided in the identification, classification and location of the fault in power system network [11, 12, 13]. The same cannot be said to the occurrence of high impedance fault (HIF) which is characterized with low current signal because there is no existing material or power system equipment that can identify, classify nor locate the occurrence of the fault. The occurrence of HIF is known to be the contact between the transmission line and a semiconductor and the case of the transmission line energized when there is a cut and falls on the ground was considered [14, 15, 16, 17]. In this paper, artificial neural network was deployed in the fault detection and location on the Nigerian 330kV transmission line in south-south region was considered. The data utilized was obtained from the transmission center in Osogbo and modeled in SIMULINK. A three phase HIF was introduced into the power system model with current signal obtained and at various transmission line distances for each location and sent to the ANN model. While the current signals at each distance was used as the input data, the transmission line distances were used as the target variable leading to the generation of the output variable by the ANN model. The ANN model was carried out in the neural network toolbox located in MatLab toolboxes. The configured ANN model was inserted into the power system network modeled in SIMULINK model to determine the point location of the HIF 3-phase occurrence and the outcome was compared with the target to determine if the proposed model was effective for the detection and location of 3-phase HIF in the Nigerian power system network.

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

II. REVIEW OF RELATED LITERATURE

The authors in [18, 19, 20], the author proposed the use of three phase voltage and currents angles of certain specific points on the transmission line and the use of transfer matrix of the current signals of the transmission line. The three-phase current and voltage angles were calculated form the ends of the transmission lines and the finite differences between the outcome of the calculated angles from the transmission line ends were computed at infinitesimal points of the line to obtain the occurrence of the HIF and to identify the location of the faults. The obtained results showed that the proposed method was effective in the determination of the HIF and location of the occurrence of the fault. The author emphasized that despite the efficiency of the model in the determination and location of HIF, the model is complex and can be very difficult in implementation which was the gap of the research. In [21, 22, 23], the author suggested the use of power line communication device for the detection and location of HIF in transmission line power system network. the power communication line was installed at the start point of the transmission line where the occurrence of HIF was monitored. The frequencies at the narrow heads of the transmission line and the power line were determined and the impedance values of the transmission. The current flow on the power line was monitored and the occurrence of HIF was determined to be the difference in metrics between the original frequency, impedance and current signals and the response of these parameters to responses when the transmission line was introduced to HIF. Different case test was carried out and it was found that the proposed method is effective in the detection and location of HIF on the transmission system. The system of connection of high voltage transmission line and power line communication cable could result to constant occurrence of faults due to interference and the fault location accuracy was low. Utilization of a zero sequence current signal values from the transmission line terminals that are connected to earth for HIF detection and location was carried out in [24, 25, 26] where the authors compared the outcome to negative sequence current signal. In each case, the HIF was obtained at the maximum time of several cycles. The use of zero sequence and negative sequence current signals were found to be insensitive to the variations in HIF class, HIF pattern and transmission line parameter variations. The outcome of the result obtained showed that the proposed methods were effective in detection and location of HIF with Negative sequence current signals being more effective than the use of zero sequence signals. The gap in this research was the models were the large of HIF location which was considered too wide of onsite power engineers to track the faults. In [27, 28, 29, 30], the author utilized power line system cable as seen in [31, 32, 33, 34] but this time, the author embarked on several test signals injections and installed HIF occurrence alarm. The identification of HIF occurrence was based on impulses recorded by the power lines on the transmission lines on Greek rural electrification scheme and it was found that the use of power lines was effective in fault detection and location. The use of power lines on the transmission line has been described as dangerous due to fault occurrence as a result of signal and magnetic interference and hence should be avoided. The authors in [35, 36, 37, 38] proposed the use of electromagnetic time reversal (EMTR) voltage method for the determination of the occurrence of HIF and location of the fault on the transmission line. The use of EMTR involves the determination of the frequency of the traveling wave of the different on the current signal from the point of HIF occurrence. Also, the author performed a reduced scale experiment and modeled the system with the method on PSCAD. The outcome showed that the system was effective in detection and location of HIF. The HIF location accuracy of the model was low and the proposed method is complex to implement. In [39, 40, 41, 42], the author utilized analyzed the effects of fault from pole to pole, pole to ground and other types of fault contingencies in the detection and location of HIF on the transmission system with equivalent network of multi-terminal MMC-HVDC systems for HIF identification. Furthermore, the author utilized modal transformation for line-mode and zero mode voltages. The proposed method identified the occurrence of HIF but was not efficient in location of the fault and has been described as complex in implementation. The authors in [43, 44, 45, 46] utilized a developed synchronized waveform for the detection and location of HIF in the power system network. The modeling of the power system network was done and simulated in Matlab. The outcome showed that the developed method detected the occurrence of fault but was not adequate in the point location of the HIF because fault location has no relationship with signal waveform which was the gap in the study. In [47, 48, 49, 50], the author proposed the use of synchronized current information for the detection of HIF in the power system network especially in noisy environment.

III. MATERIALS AND METHOD

The data utilized for the power system network model was obtained from the national transmission center in Osogbo in Osun State and the single line diagram for the model was shown in Fig. 1.

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

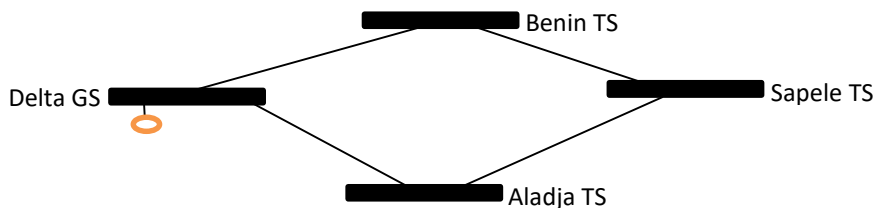**Fig. 1. Power system line diagram of the network**

The Line diagram encompasses of two generation stations and two transmission load station. The generation were in Delta GS and the transmission load stations selected were Aladja TS, Benin TS and Sapele TS. The transmission voltage rating utilized in this study was 330kV. The line transmission distances from the data obtained were shown in Table 1.

Table 1. Transmission line distance

Transmission line number	From bus	To bus	Distance (km)
1	Benin TS	Sapele TS	50
2	Benin TS	Delta GS	107
3	Delta GS	Aladja TS	30
4	Sapele GS	Aladja	93

The power system diagram was subjected to SIMULINK and was simulated. The current signal for each line distance was split into 6 equal distance with the maximum current signals at each phase obtained. The Simulink diagram of the model network was shown in Fig. 2.
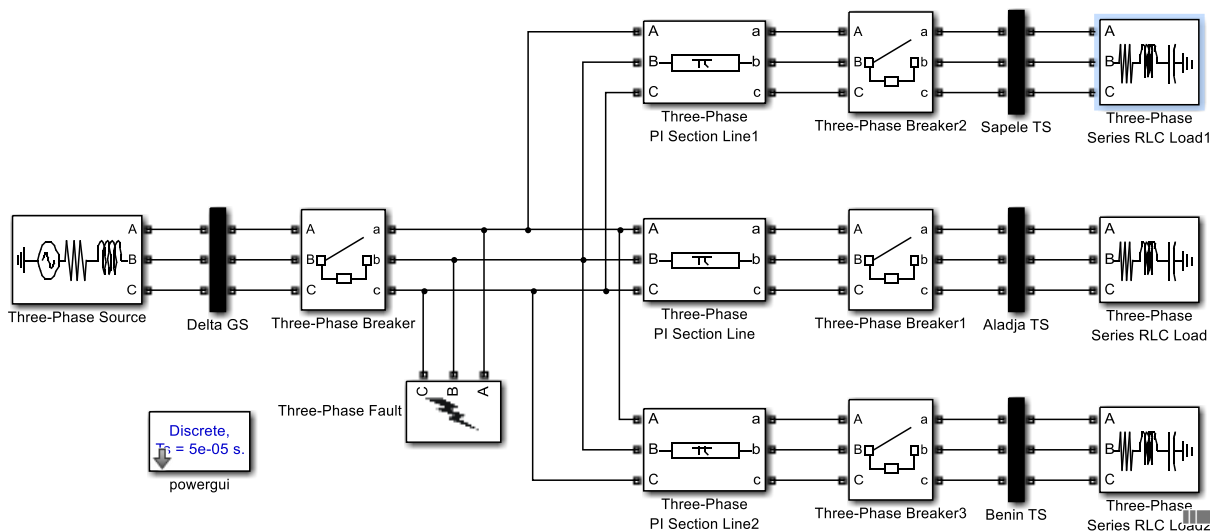
Fig. 2. SIMULINK model of the power system network

The split distance and the current signal for each phase for the transmission line at three phase HIF generated from the SIMULINK model and sent to the MatLab editor for the ANN model was shown in Table 2.

Table 3. Split distance with three phase HIF current signal data

	Split distance (kM)	Phase A	Phase B	Phase C
Line 1	8.3300	3.4882	4.8602	4.4175
	16.6700	4.3114	3.7836	3.5308
	25.0000	5.3126	4.3279	3.5540
	33.3300	3.9686	4.7470	3.7888

		41.6700	4.5000	5.1633	5.0544
		50.0000	3.7157	5.3117	3.7818
Line 2		17.8300	6.9491	6.7029	6.7621
		35.6700	7.3121	6.8743	5.2991
		53.5000	6.6530	6.8426	5.8309
		71.3300	5.3075	6.0811	5.3302
		89.1700	7.0726	6.6524	5.4408
		107.0000	7.2568	5.6015	7.0169
Line 3		5	9.4421	6.6698	10.1786
		10	9.9129	8.0574	7.7394
		15	5.8865	10.1803	9.3675
		20	9.9522	10.2185	5.9636
		25	8.4993	6.0449	7.4105
		30	5.7343	10.2480	9.9644
Line 4		15.5000	6.7378	6.8912	6.7693
		31.0000	5.9181	6.9556	6.8677
		46.5000	7.2920	5.6355	5.8290
		62.0000	5.3047	6.2928	6.7050
		77.5000	6.1821	6.1969	6.6516
		93.0000	6.0580	6.6325	5.5829

ANN model was formulated for each of the transmission line with the current signal at different phases being the input data and the split distance used as the target variable. The ANN structure that was implemented was shown in Fig. 3.
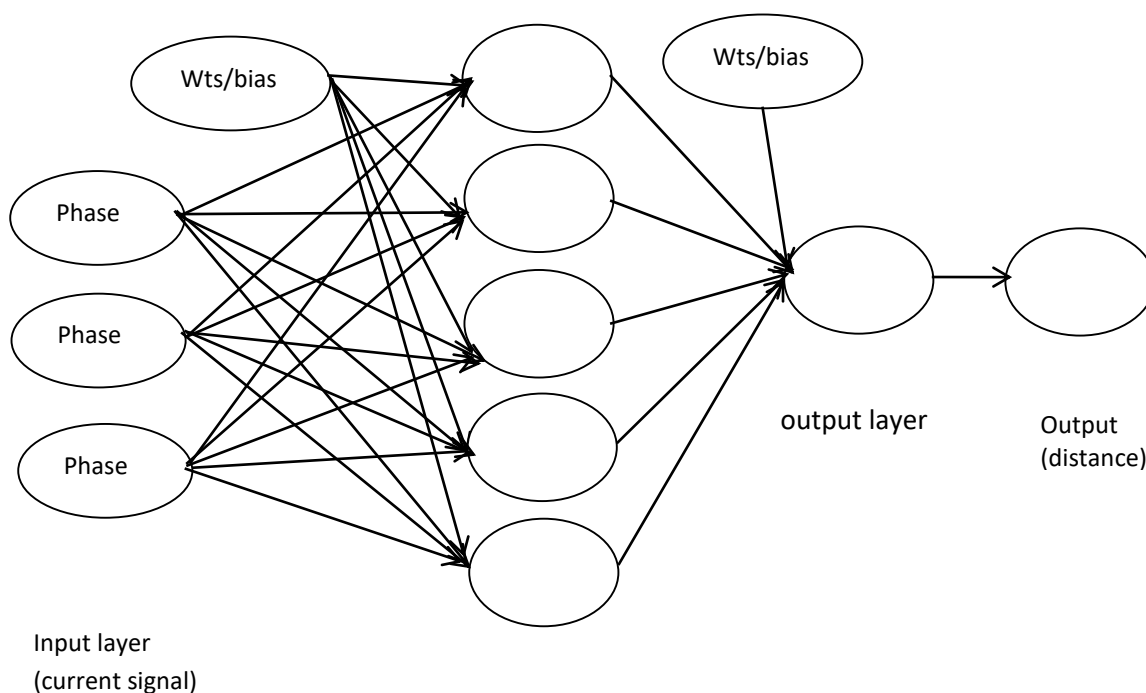
Fig. 3. ANN structure

Form the model structure in Fig. 3, the input has three input neurons which indicated the HIF current phases, the hidden neurons has five hidden neurons with each neuron using log sigmoid curve model shown in quation 1.

$$\log(input) = \frac{1}{1 + e^{input}}$$

(1)

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

The output layer has one neuron which represents the split distance. The target variable was compared with the predicted distance and outcome presented in the result section. The Simulink model with the ANN HIF locator was shown in Fig. 4. The ANN model was configured for each of the transmission lines as shown in Fig. 4.
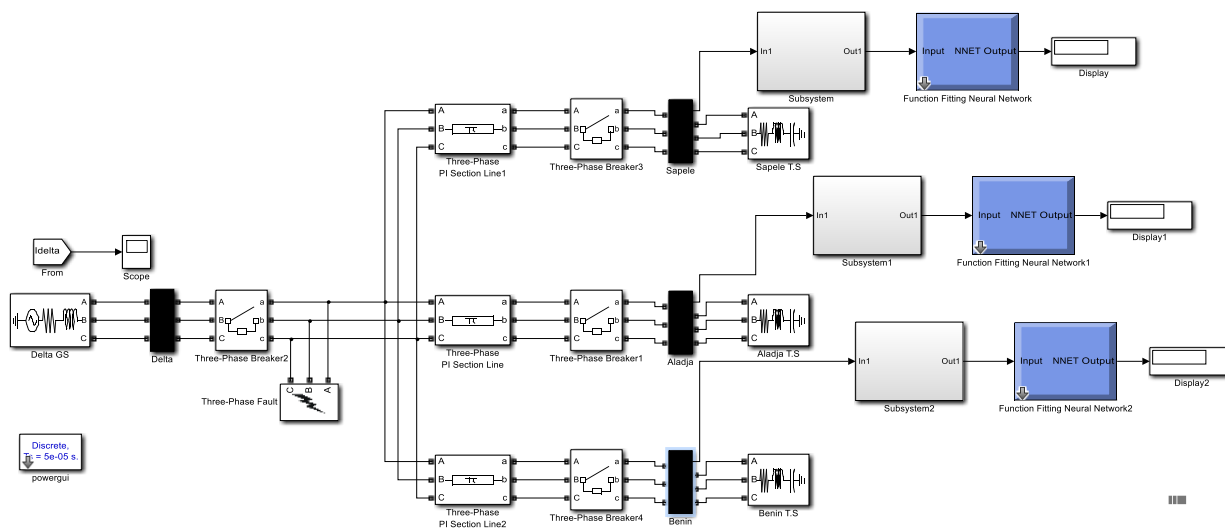
Fig. 1. Methods of HIF detection and location model

IV. RESULTS AND DISCUSSION

The HIF location prediction with ANN model for the three phase HIF occurrence in along Line 1 is shown in Table 3.

Table 3. HIF location with ANN along Line 1

Actual HIF location (km)	ANN location prediction (km)	Error
Line (1)		
8.3300	8.4200	0.09
16.6700	15.3100	1.36
25.0000	24.7000	0.30
33.3300	31.9300	1.10
41.6700	42.1300	0.36
50.0000	48.8800	1.12
Line(2)		
17.8300	17.0100	0.8200
35.6700	35.6000	0.0700
53.5000	52.9000	0.6000
71.3300	70.9920	0.338
89.1700	90.3100	0.1400
107.0000	106.1400	0.8600
Line (3)		
5	5.0200	0.0200
10	10.3312	0.3312
15	14.5331	0.4669
20	21.0121	1.0121
25	24.5220	0.4780
30	29.9299	0.0701

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

Line(4)		
15.5000	15.1000	0.4000
31.0000	30.1001	0.1001
46.5000	46.1000	0.4000
62.0000	62.2000	0.2000
77.5000	77.5116	0.0116
93.0000	93.2100	0.2100

The barchart representing the location of HIF in line1 to line 4 are shown the Figs. 5-8.
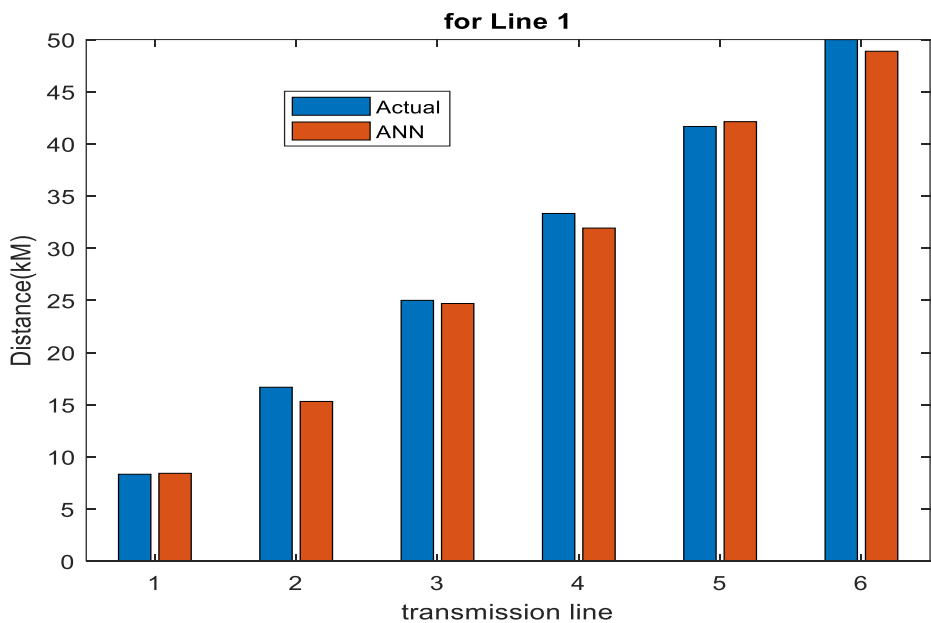
Fig. 5. HIF location with ANN for line 1
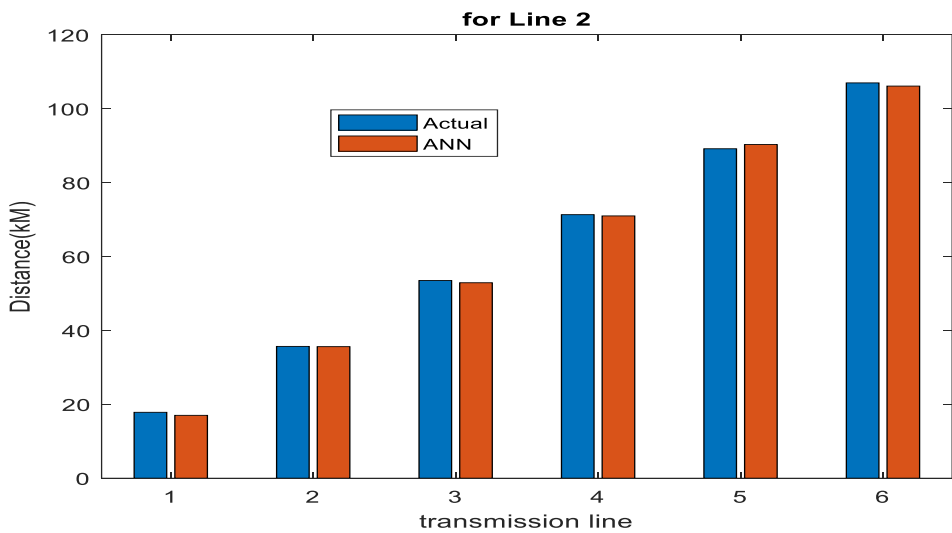
Fig. 6. HIF location with ANN for line 2
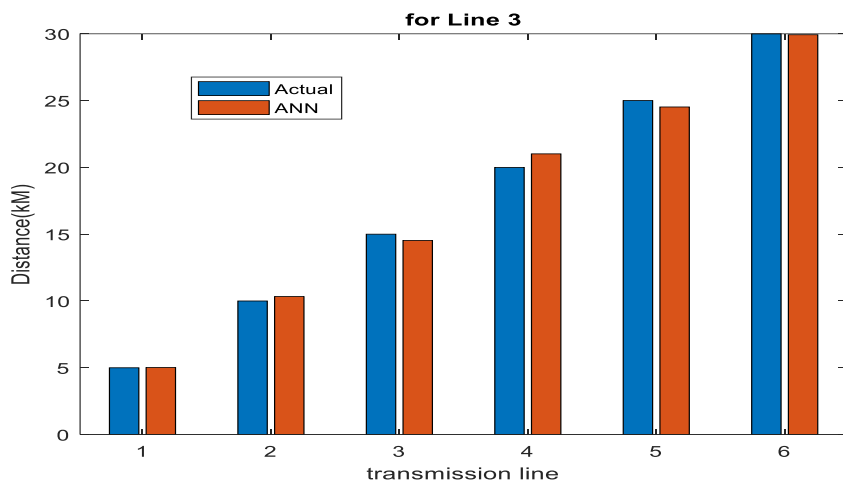
Fig. 7. HIF location with ANN for line 3
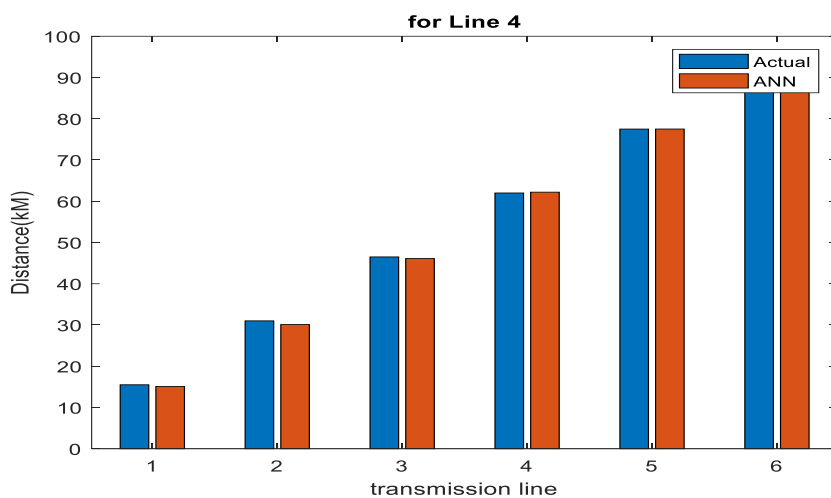
Fig. 8. HIF location with ANN for line 4

It is observed that the location accuracy is high. However, the performance of ANN in detecting and locating the occurrence of HIF on the transmission line is presented in the error barchart of Fig. 9.
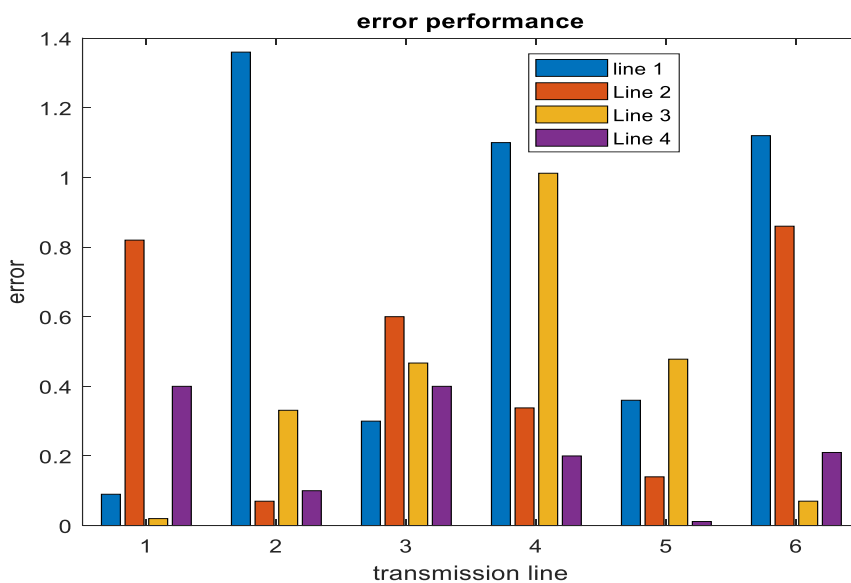
Fig. 9. Error analysis of performance of ANN model in locating HIF on transmission line

Detection and Location of High Impedance Fault on the Nigerian 330kV Transmission System Using Artificial Neural Network

It is observed in Fig. 9 that the highest error deviation with ANN prediction occurred in transmission line 1 split 2 with error value of 1.36. This implies that cite engineers would have to obtain the fault location 1.3km from the point of HIF occurrence which was excessive. However, in critical study of figure showed that the use of ANN can be utilized for fault detection and location due to the least error being 0.116.

V. CONCLUSIONS

The paper was centered on the detection and location of the occurrence of HIF on the Nigerian Power system network in South-south region of Nigeria. The network encompasses the transmission line connecting Benin TS, Delta GS, Aladja TS and Sapele TS. The location of HIF was carried out with ANN mode. The line network was modeled in SIMULINK where the line distance was split to six equal points and implemented in the SIMULINK model to obtain the current signals at each point of the four lines. The outcome showed that ANN can be used to determine the HIF occurrence location on the lines except on point 2 of the first transmission.

It is recommended that a comparative analysis of the performance of ANN in point HIF location be compared with other artificial intelligence model such as ANFIS and Fuzzy logic for transmission line HIF point location.

REFERENCES

1) A. N. Milioudis, G. T. Andreou and D. P. Labridis, "Detection and Location of High Impedance Faults in Multiconductor Overhead Distribution Lines Using Power Line Communication Devices," IEEE Transactions on Smart Grid, vol. 6, no. 2, pp. 894-902, 2015.

2) J. B. Thomas, S. G. Chaudhari and N. K. Verma, ""CNN-Based Transformer Model for Fault Detection in Power System Networks," IEEE Transactions on Instrumentation and Measurement, vol. 72, pp. 1-10, 2023.

3) X. Liu and H. Li, "Data-Driven Hyperphysical Anomaly Detection for Microgrids with GFM Inverters," IEEE Open Journal of Power Electronics, vol. 4, pp. 498-511, 2023.

4) X. Wang, "High Impedance Fault Detection Method Based on Variational Mode Decomposition and Teager – Kaiser Energy Operators for Distribution Network," IEEE Transactions on Smart Grid, vol. 10, no. 6, pp. 6041-6054, 2019.

5) V. Veerasamy, "LSTM Recurrent Neural Network Classifier for High Impedance Fault Detection in Solar PV Integrated Power System," IEEE Access, vol. 9, pp. 32672-32687, 2021.

6) H. Natala, I. E. Nkan, O. I. Okoro and P. I. Obi, "Investigation of the Transfer Capability of the Nigerian 330kV, 58Bus Power System Network Using FACTS Devices," ELEKTRIKA-Journal of Electrical Engineering, vol. 22, no. 1, pp. 53-62, 2023.

7) C. S. Ezeonye, E. E. Okpo, I. E. Nkan and O. I. Okoro, "Effects of Saliency and Core Losses on the Dynamic Behaviour of Permanent Magnet Synchronous Motor," Bayero Journal of Engineering and Technology (BJET), vol. 15, no. 3, pp. 124-133, 2020.

8) D. K. Ibrahim, E. S. T. Eldin, E. El-Din Abou El-Zahab and S. M. Saleh, "Unsynchronized Fault-Location Scheme for Nonlinear HIF in Transmission Lines," IEEE Transactions on Power Delivery, vol. 25, no. 2, pp. 631-637, 2010.

9) Y. S. Ko, "A Self-Isolation Method for the HIF Zone Under the Network-Based Distribution System," IEEE Transactions on Power Delivery, vol. 24, no. 2, pp. 884-891, 2009.

10) I. E. Nkan, O. I. Okoro, C. C. Awah and U. B. Akuru, " Investigating the Steady State Stability of the Nigerian 48-Bus Systems using FACTS Devices," Nigerian Journal of Technology (NIJOTECH), vol. 38, no. 3, pp. 732-743, 2019.

11) A. N. Milioudis, G. T. Andreou and D. P. Labridis, "Detection and Location of High Impedance Faults in Multiconductor Overhead Distribution Lines Using Power Line Communication Devices," IEEE Transactions on Smart Grid, vol. 6, no. 2, pp. 894-902, 2015.

12) H. G. Yeh, S. Sim and R. J. Bravo, "Wavelet and Denoising Techniques for Real-Time HIF Detection in 12-kV Distribution Circuits," IEEE Systems Journal, vol. 13, no. 4, pp. 4365-4373, 2019.

13) N. Peng, "Single-Phase-to-Earth Faulty Feeder Detection in Power Distribution Network Based on Amplitude Ratio of Zero-Mode Transients," IEEE Access, vol. 7, pp. 117678-117691, 2019.

14) Y. Liu, Y. Zhao, L. Wang, C. Fang, B. Xie and L. Cui, "High-impedance Fault Detection Method Based on Feature Extraction and Synchronous Data Divergence Discrimination in Distribution Networks," Journal of Modern Power Systems and Clean Energy, vol. 11, no. 4, pp. 1235-1246, 2023.

15) F. B. Costa, B. A. Souza, N. S. D. Brito, J. A. C. B. Silva and W. C. Santos, "Real-Time Detection of Transients Induced by High-Impedance Faults Based on the Boundary Wavelet Transform," IEEE Transactions on Industry Applications, vol. 51, no. 6, pp. 5312-5323, 2015.

16) M. Wei, W. Liu, H. Zhang, F. Shi and W. Chen, "Distortion-Based Detection of High Impedance Fault in Distribution Systems," IEEE Transactions on Power Delivery, vol. 36, no. 3, pp. 1603-1618, 2021.

17) I. E. Nkan, O. I. Okoro, P. I. Obi, C. C. Awah and U. B. Akuru, " Application of FACTS Devices in a MultiMachine Power System for Transient Stability Enhancement: A Case Study of the Nigerian 330kV 48-Bus System," in IEEE AFRICON, Accra Ghana, 2019.

18) S. AsghariGovar and H. Seyedi, "A Novel Transfer Matrix-Based Approach for Pilot Protection of Hybrid Transmission Lines Considering HIF Location," IEEE Transactions on Power Delivery, vol. 35, no. 4, pp. 1749-1757, 2020.

19) I. E. Nkan, O. I. Okoro, C. C. Awah and U. B. Akuru, "Investigating the Dynamic Stability of the Nigerian 48-Bus Systems for Improved System Performance using FACTS," in 27th Domestic use of Energy Conference, South Africa, 2019.

20) F. P. Jameson, I. E. Nkan and E. E. Okpo, "Improvement of power transfer capability of Nigeria national grid with TCSC FACTS controller," American Journal of Engineering Research (AJER), vol. 13, no. 1, pp. 37-43, 2024.

21) E. C. Abunike, G. D. Umoh, I. E. Nkan and O. I. Okoro, " Investigating the Magnetic Characteristics of 12/8 Switched Reluctance Motor for Enhanced Starting Torque," Nigerian Journal of Technological Development, vol. 18, no. 1, pp. 70-75, 2021.

22) A. I. Edifon, I. E. Nkan and I. A. Ben, " Estimation and ranking of the photovoltaic energy potential for local government areas in Akwa Ibom State, Nigeria," Science Journal of Energy Engineering, vol. 4, no. 6, pp. 68-77, 2016.

23) D. Olatunbosun, B. E. Uguru-Okorie and D. D. Ekpo, "A Comparison of Medical Waste Generated in Selective Private and Public Hospitals in Abeokuta Metropolis, Nigeria," International Journal of Scientific & Engineering Research, vol. 5, no. 7, pp. 1441-1449, 2014.

24) I. E. Nkan, E. E. Okpo and A. B. Inyang, " Enhancement of Power System Transient Stability with TCSC: A Case Study of The Nigerian 330kV, 48-Bus Network," International Journal of Multidisciplinary Research and Analysis, vol. 6, no. 10, pp. 4828-4841, 2023.

25) I. E. Nkan, E. E. Okpo and N. I. Okpura, " Optimum Location of Shunt FACTS Devices for Enhancement of Power System Loadability Using Continuation Power Flow," International Multilingual Journal of Science and Technology (IMJST), vol. 8, no. 9, pp. 6666-6674, 2023.

26) A. E. Oduleye, I. E. Nkan and E. E. Okpo, " High impedance fault detection and location in the Nigerian 330 kV transmission network using adaptive neuro-fuzzy inference system," International Journal of Multidisciplinary Research and Analysis, vol. 6, no. 11, pp. 5390-5398, 2023.

27) A. N. Milioudis, G. T. Andreou and D. P. Labridis, "Enhanced Protection Scheme for Smart Grids Using Power Line Communications Techniques—Part II: Location of High Impedance Fault Position," IEEE Transactions on Smart Grid, vol. 3, no. 4, pp. 1631-1640, 2012.

28) O. I. Okoro, C. E. Abunike, U. B. Akuru, C. C. Awah, E. E. Okpo, I. E. Nkan, P. I. Udenze, U. O. Innocent and M. J. Mbunwe, "A Review on the State-of-the-Art Optimization Strategies and Future Trends of WoundField Flux Switching Motors," in IEEE PES/IAS PowerAfrica, Kigali, Rwanda, 2022.

29) C. J. Diji, D. D. Ekpo and C. A. Adadu, "Design of a Biomass Power Plant for a Major Commercial Cluster in Ibadan-Nigeria," The International Journal of Engineering and Science, vol. 2, no. 3, pp. 23-29, 2013.

30) C. J. Diji, D. D. Ekpo and C. A. Adadu, "Exergoenvioronmental Evaluation of a Cement Manufacturing process in Nigeria," International Journal of Engineering research and Development, vol. 7, pp. 25-32, 2013.

31) C. C. Awah, O. I. Okoro, I. E. Nkan and E. E. Okpo, " Impact of structural dimensions and poles on the torque performance of dual-stator permanent magnet machines," Nigerian Journal of Technological Development, vol. 19, no. 1, pp. 68-79, 2022.

32) I. E. Nkan and E. E. Okpo, " Electric power forecasting by the year 2020 using the least square method," International Journal of Research and Advancement in Engineering Science, vol. 6, no. 1, pp. 205-215, 2016.

33) D. D. Ekpo, "Electricity Generation Potential from Municipal Solid Waste in Uyo Metropolis, Nigeria," Doctoral Dissertation, Ibadan, Nigeria, 2019.

34) J. Odion, C. F. Nelson, A. B. Inyang and A. K. Ekpa, "A Comprehensive Review of FACTS Controllers in Nigeria Power System Network for Enhanced Performance on Variable Loads," International Journal of Multidisciplinary Research and Analysis, vol. 6, no. 12, pp. 5886-5899, 2023.

35) H. Cui, Q. Yang, J. Sun, T. Zhou and Y. He, "Electromagnetic Time Reversal Fault Location Method Based on Characteristic Frequency of Traveling Waves," IEEE Transactions on Power Delivery, vol. 38, no. 5, pp. 3033-3044, 2023.

36) E. E. Okpo and I. E. Nkan, "Constructional Features and Performance Analysis of 3-Phase Linear Induction Motor," International Journal of Scientific Innovations and Sustainable Development, vol. 6, no. 1, pp. 176-185, 2016.

37) C. S. Ezeonye, I. E. Nkan, E. E. Okpo and O. I. Okoro, "Dynamic Analysis and Computer Simulation of Interior Permanent Magnet Synchronous Motor with Intermittent Loading," Nigerian Journal of Technology (NIJOTECH), vol. 41, no. 1, pp. 148-157, 2022.

38) U. J. Essien, J. Odion and A. K. Ekpa, "Application of SSSC for Voltage Stability Improvement in the Nigerian 330 kV Transmission System using Particle Swarm Optimization Technique," International Journal of Multidisciplinary Research and Analysis, vol. 7, no. 2, pp. 813-820, 2024.

39) A. N. Milioudis, G. T. Andreou and D. P. Labridis, "Enhanced Protection Scheme for Smart Grids Using Power Line Communications Techniques—Part I: Detection of High Impedance Fault Occurrence," IEEE Transactions on Smart Grid, vol. 3, no. 4, pp. 1621-1630, 2012.

40) E. E. Okpo, I. E. Nkan, O. I. Okoro and U. B. Akuru, "Winding Reconfiguration of 5.5 kW Three-Phase Induction Motor for Improved Performance," in IEEE PES/IAS PowerAfrica, Nairobi, Kenya, 2021.

41) D. D. Ekpo, C. Diji and A. Offiong, Environmental Degradation and Municipal Solid Waste Management in Eket-Nigeria, Nigeria: Pan African Book Company, 2012, pp. 164-172.

42) D. D. Ekpo, "Challenges of Municipal, Solid Waste Disposal: A Case Study of Uyo Township," Education & Science Journal of Policy Review & Curriculum Development, vol. 1, no. 2, pp. 110-116, 2012.

43) V. Nougain, S. Mishra, G. S. Misyris and S. Chatzivasileiadis, "Multiterminal DC Fault Identification for MMCHVDC Systems Based on Modal Analysis—A Localized Protection Scheme," IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 9, no. 6, pp. 6650-6661, 2021.

44) U. O. Innocent, I. E. Nkan, E. E. Okpo and O. I. Okoro, "Dynamic Response Evaluation of a Separately Excited DC Motor," Nigeria Journal of Engineering, vol. 28, no. 2, pp. 56-61, 2021.

45) E. A. Williams, E. E. Okpo and I. E. Nkan, "Performance evaluation of induction motor behaviour on conventional and PV system power sources," International Journal of Multidisciplinary Research and Analysis, vol. 6, no. 12, pp. 5500-5511, 2023.

46) A. K. Ekpa, U. J. Essien and N. U. Akpan, "Power Transfer Capability Enhancement of The Nigerian 330 kV Transmission Network with SVC FACTS Controller," International Journal of Multidisciplinary Research and Analysis, vol. 7, no. 2, pp. 504-511, 2024.

47) D. Sun, H. Liu, S. Liu and T. Bi, "Development of Synchronized Waveform Measurement and Its Application on Fault Detection," IEEE Transactions on Instrumentation and Measurement, vol. 72, pp. 1-11, 2023.

48) R. Chandrakar, R. K. Dubey and B. K. Panigrahi, "Synchro-Squeezing Transform for High-Impedance Fault Detection in Power Distribution Systems," IEEE Systems Journal, vol. 17, no. 4, pp. 5920-5930, 2023.

49) [U. O. Innocent, I. E. Nkan, E. E. Okpo and O. I. Okoro, "Predicting the Stability Behaviour of ThreeHorse Power Induction Motor Using Eigenvalue Method," Bayero Journal of Engineering and Techcnology (BJET), vol. 16, no. 2, pp. 66-81, 2021.

50) C. A. Adadu, D. D. Ekpo and D. A. Kogh, "Design and Development of Standard Modern 12 Volts Mobile Electric Battery Charging Machine," Journal of Research and Innovations in Engineering, vol. 5, no. 1, pp. 75-80, 2020.

Bridging the Gap between Criminology and Information Technology

Quimberly Rose P. Estrada[1], Dr. Kristine Soberano[2], Zillah R. Segue[3]
[1,2]State University of Northern Negros, Negros Occidental, Philippines
[3]Central Philippine State University, Negros Occidental, Philippines

ABSTRACT: This study aims to establish an essential connection between the fields of information technology and criminology, acknowledging the changing nature of crime in the digital era. Modern society is becoming increasingly dependent on technology, making it difficult for traditional criminological frameworks to understand and deal with the new types of cybercrime and digital deviance. The objective of this research is to study the relationship between criminology and information technology, with an emphasis on how technological improvements can be used to improve the knowledge of criminology students, prevention, and moderation of present-day criminal behavior. This study looks at the mutually beneficial connection between criminological theories and state-of-the-art information technology to offer a thorough and detailed framework for understanding the complexity of modern-day crime. It seeks to open up fresh possibilities for innovative ideas and remedies that successfully close the knowledge gap between criminology and the quickly changing field of technology-driven crimes.

KEYWORDS: information technology, cybercrime, criminology, innovation, gap

I. INTRODUCTION

The dynamic and significant aspect of the ever-evolving field of criminological studies is its relationship with information technology. The advantageous relationship that exists between these two domains possesses a great capacity to transform our understanding of criminal activity, its trends, and the effectiveness of preventive interventions. To improve knowledge, strengthen investigative techniques, and ultimately aid in the creation of stronger and more flexible tactics in the fields of criminal justice and law enforcement, this research aims to close the gap between criminology and information technology.

We leave digital footprints almost wherever we go because of the rapid advancements in information technologies, as well as the growing usage of mobile devices and sensors. Data are everywhere, mobile, and inexpensive today. They are not limited to spreadsheets that are rectangular anymore. The majority of websites that use data for different reasons have been affected by this. (Ozkan, 2019)

"Society and digital technology have become inseparable. The most developed countries are on the verge of true digitization: the Internet of Things, driverless vehicles, and smart cities, while even in the poorest of societies, mobile technologies are becoming ubiquitous." (Colin, Davies & Murdoch, 2022). Indeed, we are living in a world where technology is evolving fast. Years ago, crimes may only have happened in the real world. Nowadays, crimes are even happening on the internet, also known as cybercrime. Who is authorized to stop or prevent these crimes from happening? They are the Philippine Anti-Cybercrime Group. The ACG is tasked with investigating and combating various forms of cybercrime, such as online fraud, hacking, identity theft, and other offenses related to information and communication technologies. And what related bachelor's degree should one take if he or she wants to be a part of this unit? Mostly those in the criminal justice field. However, the main focus of their program is mostly on the legal and ethical aspects of law enforcement and not information technology. So how can criminology students keep up with the fast evolution of technology in these modern times?

In 2018, according to Jaishankar, cyberspace was exploited by many fields of study; however, criminology was too late to explore this space and address the new form of criminality called cybercrime (p. 4). Cyberspace now has an extensive impact on many academic subjects due to the rapid expansion of technology and the internet in modern life. However, the expansion has surpassed the advancement of criminological and legal frameworks. Criminal justice did not keep up with the changing landscape of

Bridging the Gap between Criminology and Information Technology

cybercrime, whereas fields like cybersecurity, computer science, and information technology quickly arose to meet the difficulties of cyberspace.

"As the social web expanded, so too did the 'dark web' or 'deep web', a shorthand for the content on the Internet that is not indexed (and thus not searchable) by standard search engines and/or protected by layers of encryption and other security mechanisms." (Stratton et al., 2017) However, the fact that these deep networks are hidden creates the perfect setting for illegal content (such as material used to exploit children), criminal organizations (like terrorist or organized crime groups), and underground marketplaces (such as the trade of illegal drugs and viruses). To effectively combat these illegal activities on the internet, criminology students must also learn computer forensic techniques to investigate and analyze digital evidence, stay updated on cybersecurity threats and vulnerabilities, and understand the importance of data privacy laws and regulations. Given the rapid evolution of technology, criminology students must be encouraged to continue learning and staying updated on the latest developments in both criminology and information technology. By combining criminological knowledge with IT skills, students can better contribute to efforts aimed at combating cybercrime, particularly on the dark web.

Encouraging instructors to teach students about cybercrimes, rules and regulations, and investigations is one of the main obstacles to creating cybercriminology programs. The study of cyber criminology has grown significantly due to the advancements in computer science, information technology, and Internet science. The needs of the growing criminological field still need to be met by typical criminologists. They are not studying other subjects like Internet science and information technology, which also fall under the broad heading of cyber criminology. (Jaishankar, 2010)

As we study more thoroughly, it becomes clear that criminals' ways of operations are always being shaped by the rapidly changing technological world, which calls for a flexible and adaptable criminological framework. This research aims to provide insights to criminology students that not only improve their understanding of cybercrime but also inform the development of practical strategies and policies that address these digital dangers by addressing the gaps between criminology and information technology, and also for them to stay up to date with the most recent advancements in technology.

METHODS

Research and Design:

The researcher uses a descriptive quantitative research design to present how knowledgeable criminology students are when it comes to innovation and their gained knowledge about the basics of information technology and cybercrime.

Materials and respondents

45 Criminology students who had completed the cybercrime course assessed the instruments for their usability and it only lasted for a day. To collect information from criminology students, the researcher applies non-probability sampling. Based on the study's population and objective, it is selected. The target respondents can be easily reached in this scenario, which makes the sample useful.

Instrumentation

A modified survey was utilized to find out how much IT knowledge criminology students acquired. Sixteen questions covering the fundamentals of computers and the extent of their knowledge of cybercrime are included. The questions are evaluated from 1 (very unaware) to 5 (very aware).

Data Collection Procedure

Descriptive statistics like the mean are utilized to analyze the data collected. For the IT knowledge and cybercrime assessment, the range of the scale of interpretation for the variables measured was as follows;

4.20-5 – Very High

3.20-4.19 – High

2.60-3.39 – Moderate

1.80-2.59 – Low

1.79 – Very Low

RESULTS AND DISCUSSION

Knowledge of the Computer Basics

This part of the article presents the knowledge of criminology students with the basics of Information Technology. It demonstrates the respondents' perceptions of their level of IT knowledge.

Bridging the Gap between Criminology and Information Technology

To ascertain the respondents' familiarity with computer fundamentals, the students' IT knowledge was displayed, as shown in Table 1. Findings showed that the participants' awareness of computer basics is high (x=3.99, sd=.71). It shows that their awareness of the basic computer hardware is high (x = 4.44, sd =.58). It's interesting to notice that their awareness of fundamental software concepts is also high (x = 3.95, sd = .67), and their confidence in understanding computer security principles and measures is also high (x = 3.91, sd = .70). Moreover, their awareness regarding internet safety practices is very high (x = 4.2, sd =.72). In addition to this, their awareness of basic networking concepts (x = 3.8, sd =.72), familiarity with the basics of programming and coding (x = 3.4, sd =.89), awareness of common cyber threats (x = 4.1, sd =.64), and understanding of the concept of digital forensics (x = 4.73) are also high.

Table 1: Criminology student's knowledge of the basics of computers

Variable	SD	Mean (n=45)	Descriptive Interpretation
awareness of the basic computer hardware components such as CPU, RAM, and storage devices	0.58603	4.4444	HIGH
awareness of fundamental software concepts, including operating systems and common applications.	0.6727	3.9556	HIGH
confidence in the understanding of computer security principles and measures	0.70137	3.9111	HIGH
awareness regarding internet safety practices and precautions to protect personal information online	0.72614	4.2	VERY HIGH
awareness of basic computer networking concepts (e.g., IP addresses, routers, and protocols)	0.72614	3.8	HIGH
familiarity with the basics of programming and coding languages commonly used in cybersecurity	0.8933	3.4444	HIGH
awareness of common cyber threats such as malware, phishing, and ransomware	0.64979	4.1778	HIGH
understanding the concept of digital forensics and its role in investigating cybercrimes	0.73718	4.0444	HIGH
GRAND MEAN:	**0.711581**	**3.9972**	**HIGH**

Legend: Very Aware/Very High (4.20-5.00); Aware/High (3.40-4.19); Neither Unaware or Aware/Moderate (2.60-3.39); Unaware/Low (1.80-2.59); Very Unaware/Very Low (1.00-1.79)

The changing geography of modern society has placed the field of criminology at the center of innovative technical breakthroughs and classic investigative techniques. The study of criminal conduct, societal behaviors, and preventive measures is the main focus

Bridging the Gap between Criminology and Information Technology

of criminology; however, the integration of information technology (IT) has become increasingly vital in the fight for justice. Given the speed at, which technology is developing these days, criminology students cannot afford to disregard the importance of IT fundamentals. The ability of criminologists to solve and prevent crimes is improved by the integration of IT technologies and procedures, which makes data analysis, crime mapping, and digital forensics more effective.

Even though it might not be the main emphasis of criminology degrees, IT is an essential supporting element. To successfully navigate the complicated system of digital evidence, cybercrime, and surveillance technologies, criminology students need to brush up on their fundamentals in information technology. A solid foundation in information technology gives criminologists the ability to use technology ethically and responsibly, which helps them stay competitive in a field that is always changing. Educational programs may generate well-rounded individuals prepared to handle the complicated nature of modern crime by recognizing the close connection between criminology and IT. This will ultimately help to improve justice in our technologically-driven society.

Table 2: Criminology students' learning in the cybercrime course/subject

Variable	SD	Mean	Descriptive Interpretation
understanding of the lessons covered in the cybercrime course/subject	0.63802	4.1556	HIGH
understanding about how cybercrime ideas are used in actual applications	0.68165	4.1111	HIGH
familiarity with the software tools, web resources, and textbooks that are accessible for researching cybercrime	0.69048	3.9778	HIGH
understanding the present cybercrime course that tackles the difficulties and complications involved in the topic	0.68755	3.9333	HIGH
knowledge about resources available in assisting in overcoming obstacles related to studying cybercrime, such as counseling or tutoring services	0.65674	4.0222	HIGH
understanding of the cybercrime course's assessment techniques matches the learning objectives and your comprehension of the material	0.6727	4.0444	HIGH
satisfaction with the current teaching methods employed in the cybercrime course	0.67942	4.2444	VERY HIGH
awareness of technological challenges that can be faced during cybercrime studies, such as software issues, hardware limitations, or internet access problems	0.66058	4.1333	HIGH
GRAND MEAN:	**0.670893**	**4.0778**	**HIGH**

Legend: Very Aware/Very High (4.20-5.00); Aware/High (3.40-4.19); Neither Unaware or Aware/Moderate (2.60-3.39); Unaware/Low (1.80-2.59); Very Unaware/Very Low (1.00-1.79)

Bridging the Gap between Criminology and Information Technology

Table 2 presents the respondents' level of knowledge regarding the cybercrime course (subject).

The data indicates that their understanding of the cybercrime course/subject is high (x = 4.07, sd = .67). In its dimension, the respondents' understanding of the lessons covered in the cybercrime course/subject is high (x = 4.15, sd = .63). The same goes with their understanding about how cybercrime ideas are used in actual applications (x = 4.11, sd = .68); familiarity with the software tools, web resources, and textbooks that are accessible for researching cybercrime (x = 3.97, sd = .69); understanding the present cybercrime course that tackles the difficulties and complications involved in the topic (x = 3.93, sd = .68); knowledge about resources available in assisting in overcoming obstacles related to studying cybercrime, such as counseling or tutoring services (x = 4.02, sd = .65); understanding of the cybercrime course's assessment techniques match the learning objectives and your comprehension of the material (x = 4.04, sd = .67); and, awareness of technological challenges that can be faced during cybercrime studies, such as software issues, hardware limitations, or internet access problems (x = 4.13, sd = .66). While the respondents' satisfaction with the current teaching methods employed in the cybercrime course is very high (x = 4.24, sd = .66).

The digital world has completely changed the way that crime is seen, hence criminology students must learn more about cybercrime. With technology developing at an unprecedented rate, criminals have had to adjust their strategies to find new ways to take advantage of weaknesses in the virtual world. Cybercrime is the umbrella term for a variety of illegal behaviors, such as online fraud, identity theft, hacking, and cyberterrorism. For students studying criminology, understanding these digital risks is essential since it gives them the tools to stop and prevent modern criminal activity.

Cybercrime studies extend beyond the boundaries of traditional criminology, providing students with a broad understanding of the interconnection between the virtual and real worlds. Beyond geographical restrictions and legal borders, the digital environment serves as a refuge for illegal businesses. Students studying criminology need to understand the complexities of cybercrime to create tactics that will be useful in law enforcement, policy-making, and preventing crimes. Furthermore, because technology is used in criminal investigations, criminologists need to be knowledgeable about cybercrime to navigate the complicated world of digital evidence and ensure a complete and accurate understanding of illegal activity. All things considered, criminology students who want to address the changing face of criminal conduct in our more interconnected world need to have a solid understanding of cybercrime.

CONCLUSION

In summary, a promising and encouraging trend has been found in the research on bridging the gap between IT and Criminology at a university in Negros Occidental. The criminology students' impressive knowledge of IT and cybercrime abilities highlights the value of educational efforts that include digital in criminology curricula. In addition to giving students a comprehensive understanding of contemporary crime, the harmonious connection between IT and criminology prepares graduates as skilled professionals prepared to handle the challenges of the digital age.

The substantial level of IT proficiency among the criminology students in a university in Negros Occidental emphasizes how crucial it is for academic institutions to acknowledge and promote multidisciplinary collaboration. These students' combined knowledge of criminology and IT will surely help with more efficient crime prevention, investigation, and policy development when they enter the job. Institutions can expand on this accomplishment going forward by incorporating more IT elements into criminology curricula. This will ensure that upcoming generations of professionals are prepared to handle the dynamic difficulties presented by cybercrime in our rapidly changing technology environment.

REFERENCES

1) Colin, C. (2022, July). Bridging Information Security and Environmental Criminology Research to Better Mitigate Cybercrime.
2) JAISHANKAR. (2018, June). Cyber Criminology as an Academic Discipline: History, Contribution and Impact.
3) Stratton, G., Powell, A., & Cameron, R. (2017). Crime and justice in digital society: Towards a "digital criminology"? International Journal for Crime, Justice and Social Democracy, 6(2), 17–33.
4) Jaishankar, K. (2010). The Future of Cyber Criminology: Challenges and Opportunities1. International Journal of Cyber Criminology, 4(1/2), 26.
5) Ozkan, T. (2019, June). Criminology in the age of data explosion: New directions.

Exploring EU Culture Policy towards Eastern Partnership Countries

Sophio Chantadze

Georgian Technical University, Georgia

ABSTRACT: This article delves into the intricate interplay of culture, soft power, and international relations, with a particular focus on the European Union's (EU) cultural diplomacy efforts within Eastern Partnership countries. It illuminates how culture serves as a potent force in shaping societal development and influencing international perceptions and relationships, drawing on Joseph Nye's conceptualization of soft power. Through a comprehensive historical analysis and examination of case studies, the research unveils the nuanced role of cultural diplomacy within the broader framework of soft power and public diplomacy. Specifically, it scrutinizes the EU's cultural diplomacy initiatives in Eastern Partnership countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine - highlighting their significance in diplomatic relations and regional cooperation, particularly within the European Neighbourhood Policy (ENP) and Eastern Partnership context. The study advocates for strategic enhancements in funding mechanisms, support for local institutions, and alignment with EU values to bolster the effectiveness of cultural diplomacy initiatives. Ultimately, it emphasizes the importance of an adaptive and inclusive approach to cultural policy, underscoring the need for continuous collaboration to foster resilient and mutually beneficial EU-Eastern Partnership relationships.

KEYWORDS: Culture Policy, Diplomacy, International Relations, European Union, Eastern Partnership Countries.

I. INTRODUCTION

In the realm of international relations, the role of culture and soft power has become increasingly significant, particularly in shaping diplomatic ties and fostering cooperation among nations. The European Union (EU), recognizing the potency of cultural diplomacy, has actively engaged in cultivating relationships with its Eastern Partnership (EaP) countries, namely Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine. This introductory section sets the stage for a comprehensive exploration of the EU's cultural policy initiatives within the Eastern Partnership, aiming to decipher their impact on diplomatic relations and regional dynamics.

The research at hand embarks on a journey through the theoretical underpinnings and practical manifestations of EU cultural policy within the Eastern Partnership context. Divided into distinct sections, this study endeavors to unravel the complexities of cultural diplomacy, soft power theory, and the EU's engagement strategies with its Eastern neighbors.

II. THE ROLE OF CULTURE IN EUROPEAN UNION FOREIGN POLICY

In a broad context, the concept of culture highlights the distinction between humans and other biological entities. Culture isn't confined to a singular creative act but is instead viewed as a universal outlook of individuals toward the world, a process through which they shape a "new world" and themselves. Each culture constitutes a distinctive realm embodying a particular perspective of individuals (or people) towards their surroundings and themselves (Chikovani, 2006, p. 116).

Despite the varied interpretations of culture, a synthetic and contemporary understanding of this concept has evolved in recent decades. It encompasses not only "a specific way of life for an individual, era, or group" or "practices and patterns of intellectual and especially creative activity" but also represents "an independent and abstract noun describing a general process of intellectual, spiritual, or aesthetic development" (Williams, 1976, p. 80).

In the modern sense, the term "culture" signifies the state of spiritual development of a society and the existence of a nation as a cohesive cultural phenomenon. It denotes a social unity characterized by a shared language, memory, and idea (Firalishvili et al., 2012, p. 3).

Exploring EU Culture Policy towards Eastern Partnership Countries

Culture is increasingly recognized for its pivotal role in the social and economic development of nations (Harrison &; Huntington, 2000, p. 15). In the contemporary world, culture assumes a special significance not only for its social and economic benefits but also as a crucial resource on the international stage and a significant component of soft power. Nye asserts that soft power is as influential as hard power in international relations, emphasizing that if culture and ideology hold appeal, others will willingly embrace them (Nye, 2004, p. 11).

The term "soft power" was initially introduced by the American political scientist and researcher Joseph Nye in his work "The Changing Nature of American Power." As per his definition, "soft power" denotes a state's capacity to influence other actors in the international system by fostering positive attitudes without resorting to hard power. It operates as a cultural force through which states achieve their foreign policy objectives, relying on three primary sources: culture, political values, and foreign policy. Crucially, soft power is characterized by its cultural nature, as its application results from the mutual consent of involved parties rather than through violent or arbitrary means (Nye, 2006).

Since its introduction, the soft power theory has gained significant traction among scholars and policymakers in international relations, particularly focusing on culture and public diplomacy. Nations increasingly integrate soft power theory into their international relations strategies, recognizing its pivotal role in shaping global perceptions and relationships (Hall, 2010, p. 198).

The utilization of soft power has assumed an expanding role in international relations, becoming an integral aspect of the foreign relations of various countries. In recent decades, the European Union has consistently emphasized that soft power stands as its primary resource in international relations.

Herman Van Rompuy, the Former President of the European Council, highlighted on November 9, 2011: "While the range of our 'hard power' is limited, our 'soft power' should not be underestimated. The implementation of soft power is quite complex and cautious because the effective use of soft power requires a consistent and comprehensive approach that must respond to our goals, means, and ways of using them".

In this context, cultural diplomacy, identified as a key element of soft power, has become a significant term in international relations. The widely cited definition by Milton Cummings characterizes cultural diplomacy as "the exchange of ideas, information, art, and other aspects of culture among nations and their people to foster mutual understanding." Over time, the term has evolved to encompass any intentional cultural cooperation among nations or groups, inherently linked to and often intersecting with the realms of soft power and public diplomacy (Donelli, 2019, p. 114).

Milton Cummings suggested a characterization of cultural diplomacy as the "sharing of ideas, information, art, language, and various elements of culture between nations and populations with the aim of promoting mutual comprehension." (UNESCO, 2023).

Meanwhile, in the latter half of the twentieth century, European countries began delineating the concept of cultural policy as a specific obligation on the part of the states. This did not imply the creation of a universal cultural policy at the European level; rather, it served as a set of guiding principles, administrative procedures, and budgetary practices in the cultural domain. These were intended for the state to use as the foundation for actions to be implemented. In the 1970s, under the auspices of UNESCO, a study of existing cultural practices in various countries commenced. This study aimed to be a valuable resource for information exchange and cooperation in the cultural domain, shedding light on challenges, practices, and achievements in individual countries.

Observing the stages of cultural policy development in various European countries reveals a common emphasis on recognizing the economic value of culture and fostering international relations. This is particularly evident in the concerted efforts to develop international cooperation in the field of culture, both within the European Union and with other countries. Over the years, these countries have established and strengthened mechanisms for international cooperation in culture, facilitated by the acknowledgment of the pivotal role of culture in international relations at the central level of the European Union.

As previously noted, the utilization of soft power in international relations has gained prominence and plays an increasingly significant role in the foreign relations of various countries. In recent decades, the European Union (EU) has consistently underscored soft power as its primary resource in international relations (Nielsen, 2013, p. 724).

The European Union stands out as a prominent example of effective soft power application. The basis of its integration lies in efficient cooperation, underpinned by significant shared values. According to Nye, this cooperation is reflected in common cultural and political values, shared foreign policies among member states, and in the foreign policy of each individual state. Gallarotti (2022, p. 384) also highlights that soft power propels diplomacy, playing a crucial role in the EU's foreign affairs, whether by serving as a positive role model or by earning the admiration and trust of other nations.

The EU, being an international regional organization, determines its success by the willingness of non-member countries to engage in the European integration project, as it has proceeded several enlargement stages, and the EU continues on its path to

Exploring EU Culture Policy towards Eastern Partnership Countries

further expansion. The soft power wielded by the EU determines its attractiveness to become a member for non-member countries, as integration implies a place at the decision-making table (Cooper 2004, pp. 179-180, cited in Wagner, 2014).

Since its inception, soft power has remained a pivotal mechanism driving cooperation, unification, and enlargement policies among EU member states. The primary goal of the EU's foreign policy is to ensure security, stability, democracy, and respect for human rights, not only in its immediate neighborhood (e.g., the Balkans) but also in other global hotspots such as Africa, the Middle East, and the Caucasus. Soft power, involving non-military methods like development assistance, serves as the main tool for this policy (Fontaine, 2014, p. 48).

The creative and cultural sectors in Europe provide employment for approximately 8.7 million individuals and play a crucial role in showcasing the diversity of European culture globally (Gabriel, 2019, p. 2)[1].

The European Union places a significant emphasis on promoting democracy and respect for human rights through its cultural policy toward partner countries. This involves encouraging political pluralism, transparent electoral processes, and the rule of law. The EU actively supports democratic institutions and civil society organizations, fostering inclusive political dialogue. The overarching goal is to contribute to the development of democracy and respect for human rights in partner countries. Culture, as a unifying force of shared cultural and political values, plays a crucial role in this endeavor. Cooperation aims to strengthen democratic governance and human rights through comprehensive reforms, advocating for minority rights, freedom of expression, and the right to assembly. Moreover, EU policy actively promotes the preservation and development of cultural traditions in various countries as a potent mechanism of soft power (European Union, n.d).

Since the 1990s, the EU's use of soft power has aimed at fostering democracy and economic development, peaceful conflict resolution, stability promotion, and the integration of countries into the international community through unified instruments of humanitarian, technical, and financial assistance. The signing of Partnership and Cooperation Agreements (PCAs) since 1994 has encompassed political cooperation, trade relations, and enhanced sectoral cooperation.

Another illustration of using EU soft power, together with its economic and security potential, is the European Neighborhood Policy (ENP), introduced in 2003. Virtually all Eastern European states voluntarily joined the ENP, committing to further their development in alignment with EU principles. In 2009, a new initiative, the Eastern Partnership, expanded this approach to include association agreements with six post-Soviet states, further exemplifying the EU's soft power influence. These nations voluntarily committed to aligning their development with EU standards (Gogolashvili, 2018, p.41).

Since the subject of our research is the analysis of EU policy and implemented activities in the field of culture, specifically in relation to the countries of Eastern cooperation, we will focus on this specific format of cooperation and on the specific countries that are members of this dimension, namely: Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. Our primary objective is to analyze the implementation and impact of EU cultural policy in relation with eastern partners within the European foreign relations formats, such as European Neighborhood policy and Eastern Partnership, assessing its influence and outcomes.

III. CULTURE POLICY TOWARDS EASTERN PARTNERSHIP COUNTRIES
A. *Culture as a Transformative Force in the European Neighborhood Policy*

The multifaceted relationship between culture and the European Neighborhood Policy (ENP) unravels as a compelling narrative, transcending conventional diplomatic frameworks to emerge as a transformative force in international relations (Feridun, 2008, p. 3). Originating in response to the 2004 EU enlargement, the ENP has undergone an evolutionary trajectory, wherein culture ceases to be a mere diplomatic appendage and assumes a central role in shaping the intricate tapestry of diplomatic, political, and economic relations.

The pivotal juncture of 2015 marks more than a bureaucratic shift; it signifies a conscious acknowledgment of the diverse cultural dynamics within partner countries. The departure from generic annual packages to a more nuanced, country-specific approach underscores the ENP's commitment to engaging with the unique cultural contexts of each nation (European Commission, 2015). This shift is not a mere procedural adjustment but a profound recognition of culture as a fundamental influencer in shaping the socio-political landscapes of partner countries.

Zooming into the Eastern Partnership (EaP), a microcosm within the broader ENP, reveals a results-oriented approach that surpasses conventional economic and governance perspectives. Since 2016, the EaP has strategically emphasized culture and education as catalysts for fostering resilience and societal cohesion (Żukrowska et al., 2017). Initiatives like EaP and the Culture

---

[1] Since 2017, Mariya Gabriel has served as European Commissioner for Digital Economy and Society. She was elected a Member of the European Parliament in 2009.

Exploring EU Culture Policy towards Eastern Partnership Countries

and Creativity Programme transcend traditional diplomatic tools, positioning culture as a dynamic force for enhancing understanding, collaboration, and cultural vibrancy.

The signing of Association Agreements with Ukraine, Moldova, and Georgia goes beyond economic cooperation; it signifies a commitment to leveraging culture as a vehicle for stability and modernization. The post-2015 ENP revisions, guided by the ethos of "principled pragmatism," showcase an adaptability that responds to crises, conflicts, and the ever-evolving geopolitical canvas (Blockmans, 2017). Culture, in this context, is not a static element but a dynamic force for resilience and innovation.

Financial commitments through the European Neighborhood Instrument (ENI) are not transactional; they represent an investment in the transformative potential of culture (Hett, Kikic, and Meuer, 2015). The promotion of cross-cutting partnerships through the ENI goes beyond conventional boundaries, envisioning a collaborative space where culture becomes a catalyst for growth, employment, and economic modernization (European Commission, 2017).

The ENP transcends bureaucratic processes in its vitality, finding resonance in consultations, recommendations, and parliamentary endorsements. Structured dialogues, democratic accountability, and societal development, inclusive of cultural promotion, form the essence of these endorsements. They underscore the EU's commitment to shared values and highlight the intrinsic role of culture in shaping the destinies of nations.

In navigating the complex terrain of international relations, the ENP emerges not merely as a diplomatic instrument but as a testament to the transformative potential of cultural collaboration. It envisions a diplomatic landscape where culture is not relegated to the realm of soft power but is acknowledged as a dynamic force driving meaningful connections, fostering mutual understanding, and celebrating the rich tapestry of human diversity. The ENP, at its core, paints a vivid picture of a diplomatic world where culture is not just an instrument but a force shaping the narrative of global relations.

As the ENP unfolds, it becomes evident that culture is a fundamental thread woven into the very fabric of diplomatic engagement. The acknowledgement of culture's transformative potential is not merely rhetorical; it is reflected in the tangible policy shifts and strategic initiatives undertaken by the EU.

The 2015 ENP Review marked a paradigmatic shift by moving away from a one-size-fits-all approach to a more tailored and context-specific strategy. This shift recognizes that culture is not homogeneous across partner countries; it is diverse, dynamic, and deeply rooted in historical contexts. By acknowledging this diversity, the ENP demonstrates a commitment to engaging with the unique cultural landscapes of each nation.

Within the EaP, the emphasis on culture is not a mere symbolic gesture but a strategic move. The results-oriented approach adopted since 2016 underscores the belief that culture and education can be powerful agents of change and resilience. EaP and the Culture and Creativity Programme exemplify initiatives that go beyond traditional diplomatic tools, leveraging culture as a dynamic force for fostering understanding and collaboration.

The Association Agreements with Ukraine, Moldova, and Georgia signify a departure from conventional economic partnerships. They are a testament to the EU's recognition that culture is not just an instrument for economic cooperation but a fundamental driver for stability and modernization.

The financial commitments made through the ENI are strategic investments in the transformative potential of culture. The promotion of cross-cutting partnerships through the ENI envisions a collaborative space where culture becomes a catalyst for growth, employment, and economic modernization. It recognizes that culture is not confined to silos but permeates various sectors, contributing to a holistic and integrated development.

The vitality of the ENP extends beyond bureaucratic processes and institutional frameworks. It finds resonance in consultations, recommendations, and parliamentary endorsements. The structured dialogues, democratic accountability measures, and societal development initiatives, which include cultural promotion, underscore the EU's commitment to shared values. This commitment goes beyond rhetoric; it recognizes that culture is not just a soft power tool but an intrinsic element that shapes the destinies of nations.

The ENP's recognition of the transformative potential of cultural collaboration is not limited to words; it is translated into actions. The policy shifts, strategic initiatives, and financial commitments all point to a diplomatic landscape where culture is not relegated to the periphery but occupies a central role in shaping global relations.

B. The Eastern Partnership: Cultivating Collaboration and Cultural Cooperation

The Eastern Partnership has evolved into a foundational pillar of the European Union's (EU) foreign policy, strategically designed to address shifting geopolitical landscapes and deepen collaborative ties with its Eastern neighbors. Originating in response to the 2008 events in Georgia, notably the Russian invasion and territorial occupation, the European Council mandated the European Commission in June 2008 to formulate a more nuanced proposal tailored to the unique circumstances of the region.

Exploring EU Culture Policy towards Eastern Partnership Countries

Formally endorsed in March 2009, the EaP aimed to intensify cooperation with six Eastern neighbors: Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine. Employing bilateral cooperation mechanisms such as Association Agreements[2], Comprehensive Free Trade Areas, and sectoral collaboration, the EaP sought to fortify relationships, streamline visa procedures, and encourage long- term visa liberalization. The initiative also introduced institution-building programs designed to enhance the administrative capacities of these Eastern partners, facilitating their integration into the broader European framework.

The EaP's multilateral cooperation framework comprises four thematic platforms: Democracy, Good Governance, and Stability; Economic Integration and Convergence with EU Policies; Energy Security; and Contacts between People. From which 'Democracy' and 'Contacts between People' are the most relevant to our discussion. These platforms serve as strategic arenas for discussions and collaborative efforts involving high-ranking officials, representatives of international organizations, and stakeholders from the private sector. This comprehensive and inclusive engagement approach underscores the EaP's commitment to fostering well-rounded partnerships.

Within the overarching context of the ENP, the EaP has emerged as a essential instrument since its establishment in 2009. The renewed emphasis on culture from 2021 within the EaP has elevated its significance, transforming it into a platform for intensified collaboration in sectors such as education, youth, culture, creativity, research, innovation, audiovisual policy, and the development of an informed society.

The thematic platform 'Contacts between People' signifies a commitment to enhancing interactions between EU citizens and their counterparts in partner countries. This platform emphasizes the development of the information society, media support, youth engagement, cultural cooperation, and support for education and research. Initiatives like Creative Europe play an essential role in promoting the role of culture as a driver of reforms, fostering tolerance, and facilitating economic development, social inclusion, conflict resolution, and intercultural dialogue.

Additionally, the EaP Civil Society Forum (CSF) serves as a crucial mechanism fostering collaboration and dialogue between non-governmental organizations and governmental authorities. Playing a important role in monitoring activities, providing insights, and encouraging multilateral thematic platforms, the CSF ensures a more inclusive and participatory approach to EaP initiatives.

The Eastern Partnership Summit in November 2017 ushered in a transformative agenda, "20 deliverables for 2020," aligned with the European Commission's Political Guidelines 2019-2024. This comprehensive agenda underscores resilience, sustainable development, and tangible outcomes across sectors, addressing economic, governance, connectivity, and community empowerment aspects. It also addresses gender issues, civil society involvement, media, and strategic communication.

The subsequent document, "Eastern Partnership policy beyond 2020: Reinforcing Resilience – an Eastern Partnership that delivers for all," stands as evidence of the EU's dedication to maintaining progress. This document aligns seamlessly with relevant Commission strategies, reflecting an inclusive and extensive consultation process involving EU member states, partner countries, the European Parliament, the European Economic and Social Committee, and the Committee of the Regions.

The EU's commitment to optimizing the cultural and creative sectors as drivers for sustainable social and economic progress is evident in its foreign policy. This commitment underscores the critical role of culture in fostering openness, advancing European values, and promoting intercultural dialogue, contributing to harmonious community relations.

The post-2020 agenda, outlined in the Joint Staff Working Document, emphasizes ten main investment directions by 2025. Notably, the direction "Together for resilient, gender-equal, fair, and inclusive societies" underscores cultural cooperation and intercultural dialogue, emphasizing participation in initiatives like Creative Europe and EU4Culture.

ENP and the EaP, with their renewed emphasis on culture, stand as dynamic frameworks within the EU's foreign policy. Through strategic action plans, collaborative initiatives, and financial instruments like ENPI and Creative Europe, the EU fosters cultural cooperation, contributing to stability, prosperity, and mutual understanding.

The commitment to adapting policies, as evident in the post-2020 agenda, underscores the EU's dedication to cultivating a vibrant cultural landscape within the Eastern Partnership. This multifaceted approach not only addresses economic and political dimensions but also recognizes the fundamental role of culture in building resilient and inclusive societies, fostering cooperation, and enhancing global dialogue.

In essence, the EaP represents a flexible and adaptive framework that aligns with the ever-evolving dynamics of EU foreign policy, particularly in the context of its Eastern neighbors. The commitment to culture as a driving force for positive change

---

[2] Following over three years of negotiations, Moldova and Georgia marked the initiation of their respective AAs/DCFTAs with the EU during the EaP summit in Vilnius in November 2013. Preceding the summit, the Armenian and Ukrainian Presidents, facing considerable pressure from Russia, unilaterally withdrew their plans to sign similar agreements. Blockmans - Obsolence of the European Neighbourhood Policy.

Exploring EU Culture Policy towards Eastern Partnership Countries

underscores the EU's recognition of the transformative power of cultural cooperation, ensuring a comprehensive and inclusive approach to partnerships. As the EaP continues to evolve, it stands as a testament to the EU's dedication to building resilient, inclusive, and culturally vibrant societies in collaboration with its Eastern neighbors.

C. Creative Europe and Other Initiatives Fostering Global Cultural Cooperation and Inclusivity in Eastern Partnership Countries

Creative Europe, as the European Union's flagship cultural program, embodies the EU's commitment to fostering global cultural cooperation and inclusivity. Evolving through various cycles, from 2000-2006 to its current phase, Creative Europe has embraced a transformative shift towards inclusivity by extending its reach to non-European countries. Notably, on February 24, 2015, a landmark agreement in Brussels welcomed Georgia as the first Eastern Partnership country to join Creative Europe, followed by subsequent memberships from Moldova, Ukraine, and Armenia, cementing the program's role as a driver for global cultural exchange.

Creative Europe serves as more than just a platform for policy development; it catalyzes creative projects and fosters cultural advancement on a global scale. With each cycle, including the 2021-2027 phase with a budget allocation of 2.44 billion euros, Creative Europe addresses the multifaceted needs of the cultural and creative sectors, positioning itself as a pivotal force in promoting cultural diversity and cooperation. Structured into three key directions—Culture, Media, and Multi-sector—Creative Europe articulates ambitious objectives aimed at protecting, developing, and promoting European cultural heritage while enhancing competitiveness and economic potential, particularly in the audiovisual domain.

Eastern Partnership countries like Georgia, Moldova, Armenia, and Ukraine have access to Creative Europe's Culture sub-programme, with opportunities for participation in specific MEDIA sub-programme schemes contingent upon alignment with EU audiovisual legislation. Azerbaijan and Belarus, while not explicitly mentioned in the Culture sub-programme, may participate in MEDIA sub-programme schemes if their legislation aligns with EU standards. Other Eastern Partnership countries can engage in Culture sub-programme Consortiums, capped at 30% of the project budget.

Beyond Creative Europe, the EU extends its cultural initiatives through programs like EU4Culture and EU4Dialogue, providing additional avenues for Eastern Partnership countries to participate in broader cultural cooperation frameworks. EU4Culture, spanning from 2021-2024, supports cultural and creative sectors at the city level in Eastern Partnership countries, aiming to bolster social and economic development while fostering mutual understanding and cooperation. On the other hand, EU4Dialogue focuses on enhancing mobility through education and culture, promoting dialogue initiatives and people-to-people contacts to strengthen relations and promote projects in education and culture.

These cultural initiatives underscore the EU's commitment to leveraging culture as a driver for positive change and cooperation, fostering meaningful connections and collaborations across borders. By facilitating cultural exchange and dialogue, these programs contribute to building resilient, inclusive, and culturally vibrant societies, aligning with the EU's vision of promoting shared values and cooperation with its Eastern neighbors. Through engagement in cultural exchange initiatives, individuals become active participants in shaping the narrative of international relations, transcending linguistic and geographical barriers to foster mutual understanding and appreciation.

IV. BILATERAL COOPERATION BETWEEN THE EU AND EASTERN PARTNERSHIP COUNTRIES

Bilateral cooperation between the EU and the countries of the Eastern Partnership, as mentioned above, is primarily expressed through the association agreements signed between the EU and these countries. The nature of these arrangements varies between the six EaP countries.

While each Eastern Partnership country more or less shares a common aspiration for closer ties with the EU, the nature and pace of their integration vary. The EU employs association agreements, candidate statuses, and tailored support packages to foster political, economic, and societal collaboration, adapting its approach to the unique circumstances and challenges faced by each partner.

Belarus suspended its Eastern Partnership participation in June 2021 (European Council, n.d.). The EU, responding to Belarus' involvement in Russia's military invasion of Ukraine, imposed sanctions, condemning its actions. Even from the biggening Belarus exhibited minimal responsiveness to the European Union's calls for political reform, leading to a significant stagnation in bilateral cooperation. The recent interest in trade cooperation notwithstanding, the negotiations for further deepening European cooperation with Belarus came to an abrupt halt due to Russia's invasion of Ukraine. The geopolitical developments resulting from the invasion have disrupted diplomatic and economic discussions, casting a shadow over the prospects of enhanced collaboration between Belarus and the European Union.

Azerbaijan's relations with the European Union are founded on the Partnership and Cooperation Agreement, which has been in force since 1999. The Partnership priorities emphasize governance, economic development, environment, and people-to-

Exploring EU Culture Policy towards Eastern Partnership Countries

people contacts. Despite the strengthening of cooperation through the EU-Armenia Comprehensive and Enhanced Partnership Agreement (CEPA) since March 2021, both Azerbaijan and Armenia have been unable to establish deep and comprehensive free trade areas with the EU. Consequently, negotiations on Association Agreements with these countries have not progressed.

In the early 1990s, the European Union engaged in negotiations with all three South Caucasus countries, resulting in the signing of "Partnership and Cooperation Agreements" in 1996 and subsequent ratification in 1999. Each of these agreements established a formal structure known as the Parliamentary Cooperation Committee, providing a forum for members of the partner countries' parliaments and the European Parliament to convene and exchange views.

While all three South Caucasus countries - Armenia, Azerbaijan, and Georgia were initially included in the EU's Eastern Neighbourhood policy alongside Belarus, Moldova, and Ukraine, their trajectories diverged over the years.

In this divergence, Georgia stood out as the sole South Caucasus country to sign its Association Agreement. The EU-Georgia agreement came into force in July 2016, highlighting the distinct paths taken by these nations in their relations with the European Union (European Parliament, n.d.).

Recognized as advanced nations within the Eastern Partnership, Georgia, Moldova, and Ukraine jointly expressed their willingness to sign the Association Agreement in 2015, initiating implementation. The EU-Moldova Association Agreement has been in force since July 2016, while in Ukraine, the association agreement took effect on 1 September 2017.

The Association Agreements with these countries prioritize people-to- people contacts, and culture holds a significant position within the specific articles of the agreements. A comparative analysis of the reports on Association Agreements for Moldova, Ukraine, and Georgia reveals various issues, ranging from legislative alignment and policy document creation in the cultural sector to their active participation in Creative Europe programs.

Evaluations of the implementation of Association Agreements from 2019 underscore both achievements and challenges faced by these countries, offering insights into the ongoing efforts and areas that may require further attention.

In the context of Georgia, efforts are underway to initiate legal changes in the audiovisual sector, enabling the country's full participation in the Creative Europe media program. Georgia actively engages in the program and stands out as one of the leading Eastern Partnership countries with a substantial number of implemented projects. However, administrative changes in the Ministry of Culture have posed challenges to the approval of further plans for implementing the country's cultural strategy, putting its successful implementation at risk.

Meanwhile, Moldova is placing significant emphasis on preserving cultural heritage. The country is currently in the process of revising the Law on the Protection of Historic Monuments to align with minimum standards in Europe. Despite these efforts, the benefits of Moldova's participation in the Creative Europe program are acknowledged to be limited at this point.

In the meantime, the Ukrainian government has implemented several strategies to promote culture, including the development of physical culture and sports until 2028 and an overarching National Economic Strategy until 2030, which encompass strategic measures for the overall development of Ukraine's economy, including the creative industries and services sector. The Ukrainian Cultural Fund has actively pursued reforms for further development, and Ukraine's participation in Creative Europe is commendable. However, the cultural sector has faced new and urgent challenges due to the war unleashed by Russia against Ukraine, leading to shifts in cultural policy priorities of the Ukraine (Compendium of cultural policies, 2024).

Recent developments in Ukraine have had a profound impact, not only on Ukraine but also on the entire region and the European Union's approach to Eastern partner countries. The conflict and its unfolding course have necessitated crucial adjustments in the EU's stance and strategies towards its partner nations, prompting significant geopolitical considerations.

The geopolitical landscape underwent significant changes, particularly impacting Ukraine, Moldova, and Georgia - the East European Trio. The escalation of the Russian war against Ukraine introduced a new reality, posing challenges and uncertainties for these countries.

The current challenges faced by Eastern Partnership (EaP) countries, exacerbated by external pressures and internal tensions, highlight the crucial importance of focusing on fundamental rights and the rule of law (RoL) (Havlicek, 2022), which guarantees the sustainability of any policy in any country. Since 2009, it has been evident that reforms, even in more progressive countries like Ukraine, Moldova, or Georgia, can be reversed and are not linear in development. Each country requires an individual and tailored approach. Despite significant EU investment, the results in the RoL area have been mixed across the region. Lack of accountability, especially in smaller countries.

Amidst emerging geopolitical challenges, the Commission presented the 2023 'Enlargement Package' in November. This proposal advocates the commencement of accession negotiations with Ukraine, Moldova, and Bosnia- Herzegovina. Additionally, it indicates the potential attainment of candidate status for Georgia, subject to specified conditions. Notably, the package incorporates a geopolitical rationale aligned with EU values (Havlicek 2022). The decision represents a historic opportunity for the trio to achieve a goal they have pursued for decades. This aspiration aligns not only with the expressed desires of their

Exploring EU Culture Policy towards Eastern Partnership Countries

governments but also resonates with the longstanding efforts of their population, which have strived to demonstrate their alignment with European values and their readiness to safeguard them. Simultaneously, this decision marks a significant stride in Europeanization, signifying that the European Union must substantiate its commitment to its principles. The declared support for partner countries should transcend mere rhetoric and serve as tangible evidence to counter Euro-skeptic sentiments. It is crucial for the European Union to showcase that its proclaimed partnership is genuinely dedicated to enhancing the well-being of partner countries, particularly when the alternative could entail falling under the influence of Russia.

The European Commission's 2023 enlargement package is a comprehensive review, spanning approximately 1500 pages, evaluating the performance of all 10 accession candidates across 33 chapters of the accession process. The Commission suggests the initiation of accession negotiations with Ukraine and Moldova and recommends advancing Georgia to candidate status, emphasizing their potential to meet the conditions outlined in June 2022.

The 2023 reports on EU enlargement policy shed light on various aspects of the cultural sphere. Assessment's underscore diverse challenges and advancements in education and culture across Moldova, Ukraine, and Georgia. The reports emphasize the necessity for strategic enhancements, augmented funding, and improved dialogue in these areas.

According to the reports, Moldova faces challenges due to inadequate funding and limited public financing affecting opportunities for artists. Georgia, has made progress in policy development, and its 2020-2025 strategy broadly aligns with the new European agenda, however, limited information on implementation and civil dialogue is noted. Despite ongoing war, Ukraine has shown some progress in cultural policy reflecting European priorities, emphasizing internationalization and association with Creative Europe. However, challenges include suspended public funding, reported cuts by cultural entities, and difficulties in monitoring looted objects and preserving cultural heritage in occupied territories.

The Commission's key proposals still come with a significant caveat or an additional layer in the conditionality system (Blockmans, 2023, p. 36). In the case of Ukraine and Moldova, the recommendations for initiating accession negotiations are immediately followed by the suggestion that the Council should adopt the negotiating framework once these countries fulfill certain ostensibly 'technical' conditions. However, these conditions hold substantial political significance, particularly concerning the rule of law and reforms to the electoral code. Consequently, the practical commencement of negotiations is effectively postponed, at least until March 2024 when the Commission is set to report back to the Council.

As for Georgia, the potential attainment of the status of a candidate country is contingent on meeting a set of nine conditions, primarily addressing challenges related to oligarchy and foreign policy, as highlighted earlier. This implies that the conditions outlined in June 2022 have not been sufficiently satisfied, even though the Commission sought to avoid the adverse impact on public opinion that could arise from denying candidate status.

The latest Enlargement Package from the Commission marks a significant milestone, being the most crucial in several years. Notably, it represents the initial integration of the East European trio into the accession process, aligning them with the candidate countries from Southeast Europe. The package suggests substantial progress for the three East European states, outlining the conditional commencement of accession negotiations for Ukraine and Moldova, coupled with the recommendation for candidate status for Georgia. In the case of Ukraine, this aligns with the Commission's earlier proposition for a €50 billion financial support instrument.

The 2019 political guidelines underscore the importance of European leadership through collaboration with neighboring countries and partners, guided by shared values and respect for international law. In response to the Ukrainian crisis, the EU has implemented robust sanctions targeting Russia's financial system (Bassot, 2022, p.10).

Moreover, in 2022, following the Russian invasion of Ukraine, The European Political Community (EPC) emerged as an intergovernmental forum facilitating political and strategic discussions regarding the future of Europe. Functioning as a pivotal platform, it addresses and alleviates challenges stemming from recent circumstances, extending an invitation to all European countries that align with the EU's values. The initiative for the European Political Community was proposed by French President Emmanuel Macron during his speech at the Future Conference's closing event in the European Parliament on May 9, 2022. The aggression in the Russian war underscored the necessity of a values-based, well- coordinated foreign policy for a Europe with geopolitical significance. The primary objective of the European Political Community is to enhance political dialogue and cooperation, tackling shared concerns to fortify the security, stability, and prosperity of the European continent (European Council, n.d.).

Analyzing past and present EU cultural policies towards Eap countries yields valuable insights. Acknowledging the diversity among these countries and their distinct cultural priorities is crucial. Providing ongoing assistance in developing tailored cultural policies that address each country's specific needs is essential. Emphasizing the integration of culture within the broader enlargement agenda and acknowledging its role in fostering understanding and collaboration are key considerations.

Exploring EU Culture Policy towards Eastern Partnership Countries

Strengthening funding mechanisms to ensure sustainable support for cultural programs is vital, including establishing mechanisms to support artists, institutions, and projects contributing to overall development.

Consistent consideration should be given to promoting cultural diversity, including heritage, languages, and artistic expressions. Investing in skills development and capabilities of cultural professionals is necessary for a vibrant and knowledgeable cultural sector. Inclusive and participatory approaches that involve local communities and civil society in shaping cultural policies and encourage active citizen engagement strengthen a sense of belonging and identity. Alignment with European values is crucial, emphasizing shared values of democracy, human rights, and cultural cooperation.

Within the Eastern Partnership, enhancing the effectiveness of EU cultural policy should be farther supported establishing permanent monitoring and evaluation mechanisms, using feedback to adapt and refine policies over time. Acknowledging the dynamic nature of cultural landscapes and being adaptable to changing circumstances is very important. Encouraging collaboration between cultural institutions, government bodies, and other sectors will be essential, recognizing the interconnectedness of culture with education, economy, and social development. Enhancing support of international cross-border collaboration, mobility, and experience-sharing will further contributes to a robust cultural domain.

Various and diverse frameworks to support these initiatives could be developed, not solely by centralized EU bodies but also through initiatives originating from private cultural institutions with the support of EU bodies. Valuable ideas may emerge not only from official channels but also through bottom-up approaches, which can be more concrete and efficient. Member countries have more practice in cross border cooperation, while non-member countries may have limited exposure. In some instances, this limitation may be attributed to the absence of relevant experience in these countries. However, in certain cases, it could be linked to formal meetings and formats where initiatives are predominantly voiced by government representatives. Often, these initiatives come from representatives of member states or international organizations, as non- member states may perceive themselves as unequal participants in similar negotiation formats.

V. CONCLUSIONS

Navigating the intricate relationship between cultural policy and EU-EaP collaboration demands a nuanced and adaptive approach. This comprehensive exploration has illuminated the dynamics, challenges, and potential enhancements in their association, providing valuable insights into the multifaceted aspects of cultural policy influence and EU mechanisms. Cultural collaboration serves as a significant driver shaping the development of EU-EaP relationships, fostering understanding, shared identity, and values.

The EU's flexible approach, reflected in diverse mechanisms such as association agreements and support packages, prioritizes fundamental values like democracy, human rights, and cultural cooperation. However, challenges persist, with some countries facing stagnation and others encountering hurdles in establishing free trade areas.

Opportunities for elevated collaboration lie in strengthening funding mechanisms, supporting artists, and involving local communities, alongside continuous evaluation and adaptability. Lessons from ongoing initiatives underscore the importance of inclusivity and alignment with European values.

For Ukraine, Moldova, and Georgia, aligning cultural policies with EU principles lays the groundwork for sustainable development, fostering stable legal frameworks, freedom of expression, and cultural diversity. Strengthening commitment to these principles can create vibrant cultural sectors that enrich citizens' lives and contribute to overall socio-economic development.

As the EU-EaP relationship evolves, whether within the Eastern Partnership framework or towards membership, interdependence and the will of these countries will be decisive. Expedited decision-making, guided by a commitment to shared values, is essential to protect populations from the destructive impacts of conflicts like the Ukraine-Russia war.

In conclusion, continuous collaboration and strategic enhancements in cultural policy are vital for building a resilient and cooperative relationship with the Eastern Partnership. Embracing cultural diplomacy as a powerful tool can increase understanding between different peoples and cultures, contributing to the success of diplomatic endeavors and advancing mutual goals. As President Charles Michel emphasizes, the Eastern Partnership remains a priority for the EU, aligned with its core values and commitments.

REFERENCES

1) Bassot, E. 2022. The six policy priorities of the von der Leyen Commission. EPRS: European Parliamentary Research Service. https://www.europarl.europa.eu/RegData/etudes/IDAN/2022/729351/EPRS_IDA(2022)729351_EN.pdf
2) Blockmans, S. 2017. The Obsolescence of the European Neighbourhood Policy. London: Rowman and Littlefield International, p. 36.

Exploring EU Culture Policy towards Eastern Partnership Countries

3) Chikovani, N. 2006. Religion and Culture in the South Caucasus. Tbilisi: Center for Social Sciences, p. 116.
4) Donelli, F. 2019. 'Persuading through Culture, Values, and Ideas: The Case of Turkey's Cultural Diplomacy', Insight Turkey, Vol. 21, No. 3, p. 114.
5) Feridun, M.2008.'The Future of the European Neighbourhood Policy',European Research Studies,Volume XI,Issue (1-2), pp. 3-6.
6) Fontaine, P. 2014. How the EU Works: 12 Lessons on Europe. Brussels: European Commission, p. 48.
7) Firalishvili, Z., Ghoghoberidze, L., Kokochashvili, M., Gotsadze, T., Feikrishvili, St., Glurjidze, Sh., Firalishvili, L., Elizbarashvili, E., Chichinadze, G. 2012. The Current State of Georgian Culture and the Concept of its Development. Tbilisi: Ministry of Culture and Monuments Protection of Georgia.
8) Gabriel, M. 2019. Innovation and Youth, COMPENDIUM OF BRIEFINGS EPRS: European Parliamentary Research Service, Members' Research Service.
   https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/642208/EPRS_BRI (2019)642208_EN.pdf
9) Gallarotti, G. M. 2022. 'Esteem and Influence: Soft Power in International Politics', Journal of Political Power, p. 384.
10) Gogolashvili, K. 2018. EU Soft Power and Armenia's (R) evolution. Tbilisi: Georgian Center for Security and Development, p. 41.
11) Hall, T. 2010. 'An Unclear Attraction: A Critical Examination of Soft Power as an Analytical Category', The Chinese Journal of International Politics Vol. 3, p. 198. https://www.jstor.org/stable/48615744?read-now=1#page_scan_tab_contents
12) Harrison, L. E., Huntington, S. P. 2000. Culture Matters. New York: Basic Books New York, p. 15.
13) Havlicek, P. 2022. 'The Future of the EU's Eastern Partnership Policy: "Back to the Basics and Value Origins."', SCEEUS Guest Platform for Eastern Europe Policy No. 3. https://sceeus.se/en/publications/the-future-of-the-eus-eastern-partnership-policy-back-to-the-basics-and-value-origins/
14) Hett, F., Kikić, S., Meuer, S. (eds.) 2015. Reassessing the European Neighbourhood Policy: The Eastern Dimension. Friedrich Ebert Stiftung, p. 5.
15) Nielsen, K. L. 2013. 'EU Soft Power and the Capability-Expectations Gap', Journal of Contemporary European Research, p. 724.
16) Nye, J. S. Jr. 2004. Soft Power: The Means to Success in World Politics. New York: Public Affairs, p. 11.
17) Nye, J. S. Jr. 2006. 'Think Again: Soft Power', Foreign Policy Magazine. https://foreignpolicy.com/2006/02/23/think-again-soft-power/
18) UNESCO. 2023. Cutting Edge | From Standing Out to Reaching Out: Cultural Diplomacy for Sustainable Development. https://www.unesco.org/en/articles/cutting-edge-standing-out-reaching-out-cultural-diplomacy-sustainable-development#:
19) Williams, R. 1976. Keywords: A Vocabulary of Culture and Society. London: Fontara, 1976, p.80.
20) Wagner, J. N. E. 2014. The Effectiveness of Soft & Hard Power in Contemporary International Relations, E-International Relations.
21) Żukrowska, K., Visvizi, A., Stryjek, J., Zajaczkowski, M. 2017. European Neighborhood Policy: (Multi-level) Governance, the Reform Process and Prospect of Enhanced Cooperation in the Region. Warszawa: Poltext Co. Ltd., pp. 10-64.

Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State

Dorothy J. Okoro[1], Usen Essien Inyang[2], Godswill Efiom Etim[3], Uduak. I. Umoh[4]

[1,2]Department of Psychology, University of Uyo, Uyo.
[3]Department of Educational Foundation and Childhood Education, Cross River State University, Calabar.
[4]Women and Community, Livelihood Foundation (WOCLIF), Uyo.

ABSTRACT: The burden of care among caregivers has emerged as a significant public health concern. This study investigated demographic factors and perceived social support as predictors of the burden of care among family caregivers of children living with HIV (CLHIV) in Akwa Ibom State. Fifty-seven participants, comprising 6 males (10.53%) and 51 females (89.47%), were purposively selected from rural family caregivers receiving family support services from selected Non-Governmental Organisations (NGOs) in Akwa Ibom State. A cross-sectional survey design was employed, utilizing the Perceived Social Support Scale and the Burden of Care Scale for data collection. Descriptive statistics and multiple regression were used for data analysis. Results indicated that age significantly predicted the burden of care among family caregivers of CLHIV (β = .322; t = 2.50, P < .05). However, caregivers' education (β = .031; t = .235; P > .05) and relationship with the care recipient (β = -.077; t = -0.58; P > .05) did not predict the burden of care. Notably, perceived social support independently predicted the burden of care (β = .292; t = 2.29; P < .05). Furthermore, a significant joint prediction of demographic factors and perceived social support on the burden of care of family caregivers of CLHIV was found (F = (6,56) = 2.82; P < .05). The findings highlight the need for targeted interventions and support programs that address caregivers' needs, particularly in terms of social support networks, to alleviate the burden associated with caring for children living with HIV.

KEYWORDS: Burden of Care, Demographic Factors, Perceived Social Support, Children, HIV.

INTRODUCTION

Human immunodeficiency virus (HIV) in children necessitates the need for dedicated and appropriate adult care, considering the myriad challenges they face while living with the virus and striving to maintain their development and well-being (Asuquo, et al., 2017). Children living with HIV encounter obstacles in getting an inclusive education, establishing friends, and accessing healthcare (Asuquo, et al, 2013). The primary caregiver needs to make a significant financial, physical, and emotional commitment to caring for a child living with HIV, including providing nourishing food, administering antiretroviral therapy (ART) on time, accompanying the child to doctor appointments, and maintaining a watchful, nurturing home environment.

Daily stress from giving care and support drains family members' physical and mental resources, resulting in depletion and lethargy (Campbell & Foulis, 2004). There is a whole set of issues that create emotional strain, including worry, guilt, anxiety, anger, and uncertainty about the cause of the disease, the future, the needs of other family members, and whether enough assistance is being provided. Grieving over the loss of function of the person with the disease is experienced at the time of onset and often repeatedly at other stages in the person's life. Caregivers play a vital role in supporting family members who are sick, infirm, or disabled (Akintola, 2006).

In Africa, family life is centered on providing care. Parents look out for their children, spouses look out for one another, and family members support each other when disease or infirmity strikes (Asuquo et al., 2013). The family system faces additional pressures from disease, most of which persist for a long time. Many of these difficulties are independent of the person's condition, age, and household type they are part of. However, the burden of care is even more significant when caring for children living with HIV (Asuquo, et al., 2017).

Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State

Infants, children, and teenagers with HIV should be able to live and thrive in communities of care that are based at home rather than in institutions. The difficulties faced by caregivers of children living with HIV are comparable to those faced by those caring for children with other life-threatening conditions. These difficulties include sadness, weariness, and exhaustion (Nath, 2017). Many caregivers lack sufficient time for self-care and therapy due to diminished energy and the physical demands of an HIV-positive child. Furthermore, the stressors associated with HIV, such as social isolation and stigma, may reduce the caregiver's willingness to reveal the virus and seek formal assistance for themselves or their families (Kalomo & Liao, 2018).

Families provide emotional support to children living with HIV in addition to personal care and practical assistance. As a result, the child relies on the caregiver, and their health is directly tied to the type and standard of care they receive (Kalomo & Liao, 2018). The physical, psychological, emotional, and financial effects of caring for a child living with HIV are referred to as the caregiver's burden of care.

Burden of care refers to the impact that care provided in physical, psychological, social, and financial terms has on the life of a caregiver of a sick individual unable to perform activities of daily life (Lora et al., 2012). The term "objective burden" describes demands that can be directly measured, such as the financial toll that an illness takes on families, the disruption of daily routines, and a patient's reliance on family members for both financial and practical care (Lora et al., 2012). The term "subjective burden" describes the caregiver's emotional reaction to the social and behavioral challenges faced by a child living with HIV. These caregivers are mostly family members in Nigeria, and many of them are mothers of the care recipients (Knapp, 2010). The majority of the care recipient's everyday needs are met by their caregivers. The burden of care increases as a result of this, and those who care for children living with HIV are more likely to experience psychological distress (Ilse et al., 2008).

Numerous factors have been identified as impacting the burden of care for family caregivers of CLHIV, but this study will investigate whether demographic factors and perceived social support may also play a role. Gender plays a significant role in the burden of care experienced by family caregivers, as evidenced by research conducted by Gadow et al (2010). Female caregivers, for instance, may encounter varying levels of emotional strain or physical exhaustion compared to male caregivers due to societal expectations and traditional gender roles. Moreover, the relationship type with the child also influences the burden of care. Tapscott (2016) highlighted that the caregiver's relationship with the care recipient significantly impacts the caregiving experience. Particularly, mothers and parents generally carry a heavier burden due to their emotional attachment and the daily responsibilities involved in caring for a child with HIV. Additionally, educational attainment is another factor affecting the burden of care among family caregivers of CLHIV. Joseph and Fineman (2011) established a link between caregivers' education levels and their caregiving burden. Higher educational levels equip caregivers with better access to information, resources, and coping mechanisms, potentially mitigating the burden associated with caregiving responsibilities.

Perceived social support describes how people view their friends, family members, and others as sources of practical, emotional, and all-around help when they are in need. In other words, it describes how individuals perceive the availability of practical, emotional, and overall help from their social network when they are in need. Studies have revealed that perceived social support predicts the burden of care for family caregivers (Skeen et al., 2016). Also, studies, such as those by Brisset (2010) and O'Reilly (2010), have demonstrated a significant relationship between perceived social support and the burden of care. Caregivers who perceive higher levels of support from their social networks tend to experience lower levels of burden and psychological distress. This study aimed to fill the gap in understanding the burden faced by caregivers of children living with HIV, helping healthcare practitioners create tailored programs and interventions to support affected families and address the needs of both the children and their caregivers. It was hypothesized that demographic factors would independently and jointly predict the burden of care of family caregivers of children living with HIV in Akwa Ibom State. It was also hypothesized that perceived social support would significantly predict the burden of care of family caregivers of children living with HIV in Akwa Ibom State

METHOD

Research Design

The study utilized a cross-sectional survey design due to its suitability for making single-time observations encompassing a wide array of naturally occurring variables essential for the study. This design facilitated the collection of data at a specific point in time, offering a snapshot of the variables under investigation without requiring longitudinal tracking. Additionally, the cross-sectional design allowed for the examination of relationships between variables at a particular moment, providing valuable insights into associations and patterns within the studied population.

Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State

The Study Area/ Population of the Study

The research was carried out in Etinan and Ibesikpo Local Government Areas, situated in Akwa Ibom state, Nigeria, in the southeastern part of the country. These areas are positioned between latitudes 40321 and 50331 North and longitudes 70251 and 80251 East. Akwa Ibom State shares borders with Cross River State to the east, Rivers State and Abia State to the west, and the Atlantic Ocean to the south. Beneficiaries of donor-funded HIV intervention programs in selected rural communities of Akwa Ibom State were the target demographics of the study. The population consisted of approximately 100 caregivers of children who had benefited from HIV intervention projects by the Health and Development Foundation and the Women and Community Livelihood Foundation (WOCLIF) in rural communities of Akwa Ibom State.

Criteria for Inclusion and Exclusion

The study included caregivers who actively provided continuous care to children (aged 0–14) for the previous six months, as well as those between the ages of 18 and 80. Caregivers who fell into the following categories were not included: (1) passive secondary caregivers, (2) non-continuous caregivers for six months, (3) caregivers of newly diagnosed CLHIV for less than 6 months, and (4) caregivers under 18 years.

Sample Size/ Sampling Technique

The sample size consisted of fifty-seven (57) caregivers, comprising 6 males and 51 females, who were caring for children living with HIV. They were selected from beneficiaries of donor-funded HIV intervention projects in selected Non-Governmental Organizations (NGOs) in rural communities of Akwa Ibom State. Participants' ages ranged from 19 to 53 years, with a mean age of 37.4 years. A multi-stage sampling technique was adopted for the study. The Non-Governmental Organizations (NGOs) were selected using a convenience sampling technique. Only NGOs implementing projects in rural areas of the state were chosen because they are likely to serve the most vulnerable children living with HIV. The actual participants of the study were drawn using the purposive sampling technique. Since the HIV intervention sampled for this study had other beneficiary groups such as adults, adolescents, and pregnant women, only caregivers of children aged 0-14 living with HIV were purposively selected to participate in the study.

Materials

The major instrument used for data collection in this study was a questionnaire divided into three (3) sections. Section A contained information related to participants' demographic details such as age, gender, caregiver education, and relationship with the care recipient. Section B consisted of the Berlin Social Support Scale by Schulz and Schwarzer (2003), and Section C contained the Burden of Care Scale by Graessel, Berth, Lichte & Grau (2014).

The Berlin Perceived Social Support Scale (BSSS) is a 17-item scale designed to measure the level of support received by adolescents from family, friends, and others. The scale uses a five-point Likert format ranging from 1 to 5 (1= Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree). The scale's norm is 48.25, where scores above 48.25 indicate low social support and scores below 48.25 indicate high social support. The social support scale demonstrated an internal consistency of .87. Okoro and Inyang (2022) reported a Cronbach alpha of .80 for the Nigerian sample.

The Burden of Care Scale is an 11-item scale designed to measure the level of care associated with caregiving as a family member. The scale uses a 4-point Likert format with options: Not So Much, A Little, Much, and Very Much, which are directly scored as 1, 2, 3, and 4, respectively. The scale's norm is 17, where scores of 17 and above indicate a high burden of care, while scores below the norm indicate a low burden of care. Graessel, Berth, Lichte & Grau (2014) reported a Cronbach alpha of .65, while Etim (2018) reported a Cronbach Alpha of .88 for the Nigerian sample.

Procedure

The selected NGOs were contacted, and their respective Executive Directors were met and briefed on the purpose of the study. They permitted for copies of the questionnaire to be administered to the desired participants during their Orphans and Vulnerable Children (OVC) meeting. A staff member of the NGOs was assigned to inform the researcher once the OVC meeting was scheduled. The staff members provided information on OVC and assisted in organizing the desired participants for the study. The participants were then briefed on the purpose and given copies of the questionnaire to complete.

Ethical Considerations

All participants were informed that collecting the research instrument implied consent, therefore only willing participants should collect it. The researcher recognized that participants could only give 'informed consent' to be involved in a study if they had a full understanding of the involvement requested of them. Therefore, adequate and honest information on the goals of the study, including the time commitment and the assurance of anonymity of their responses, was provided. Participation in the study was

Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State

entirely voluntary, and participants were not in any way forced, pressured, deceived, or duped into participating. The nature of the study, affiliations, professional standing of the researcher, and intended use of the study findings were thoroughly and honestly explained to participants, and all questions and objections were satisfactorily addressed. Participants were informed that they had the right to refuse to answer any question they found unpleasant or offensive and that they were at liberty to discontinue participation at any point. Additionally, the questionnaire was designed in a way that makes it impossible to determine a participant's identity, as participants' responses were handled with utmost anonymity since they were not asked for their names or assigned numbers.

Statistics

The demographic data of respondents were analyzed using the simple percentage (%) method. Subsequently, the study's hypotheses were tested using a multiple regression statistical technique.

RESULTS

Descriptive statistics and multiple regressions were employed in the analyses.

Table 1: Summary of Caregivers' Demographic Characteristics

Variables	N	Percentage
Gender		
Male	6	55.5
Female	51	45.5
Relationship with Child		
Direct Parents	43	75.43
Grand Parents	7	12.28
Siblings	7	12.28
Highest Education		
Primary	5	8.77
SSCE	43	75.43
Tertiary	9	15.78
TOTAL	**57**	**100**

Table 1 above presents demographic information of participants. The table shows that 6 males (10.53%) and 51 females (89.47%) participated in the study. Table 1 also shows that 43 participants (75.43%) were direct parents of the children living with HIV, 7 (12.28%) were grandparents, and 7 (12.28%) were siblings. Among the participants, 5 (8.77%) had only primary school education, 43 (75.43%) had SSCE, while 9 (15.78%) had tertiary education.

Table 2: Summary Table of Multiple Regression Showing Relative Contributions of Demographic Variables and Perceived Social Support in Burden of Care among Family Caregivers of Children Living with HIV in Akwa Ibom State.

Predictors	B	t-value	Sig	R	R^2	F	P	df
Sex	.020	.1.56	>.05	.466	2.17	2.82	<.05	5
Age	-.322	-2.50	<.05					
Education	-.031	-.235	>.05					
Relationship with Child	-.077	-.587	>.05					
Perceived Social Support	.292	.2.294	<.05					

The findings in Table 2 above indicate that demographic factors (sex, age, caregiver's education, and relationship with the care recipient) yielded a coefficient of multiple correlations (R) of 4.66 and a multiple correlation square (R2) of 2.17. This demonstrates that the effects of demographic factors and perceived social support together account for 2.17 percent of the variation in the burden of care of family caregivers of CLHIV in Akwa Ibom State.

Specifically, Table 2 above indicates that participants' sex showed no significant independent prediction of the burden of care among family caregivers of CLHIV (β = -.020; t = .150; P>.05). Age had a significant independent prediction of the burden of care

among family caregivers of CLHIV (β = .322; t = 2.50; P<.05). The burden of care for family caregivers of CLHIV was not significantly predicted independently by the caregiver's education (β = .031; t = .235; P>.05). The relationship with the care recipient did not show a significant independent prediction of the burden of care for family caregivers of CLHIV (β = -.077; t = -0.58; P>.05). The burden of care for family caregivers of CLHIV was independently predicted by perceived social support (β = .292; t = 2.29; P<.05). Table 2 further indicates that there was a significant joint prediction of demographic factors and perceived social support on the burden of care of family caregivers of CLHIV (F= (6,56) = 2.82; P<.05). The results presented in Table 2 above demonstrate that only age as a demographic factor independently predicted the burden of care of family caregivers of CLHIV in Akwa Ibom State. The first hypothesis, which stated that demographic factors would independently and jointly predict the burden of care of family caregivers of children living with HIV in Akwa Ibom State, was rejected. However, findings presented in Table 2 confirm the hypothesis that perceived social support would significantly predict the burden of care of family caregivers of children living with HIV in Akwa Ibom State.

DISCUSSION OF FINDINGS

The burden of care affects the quality of care given to care recipients and the quality of life of the caregivers. The study's findings contradicted the hypothesis that demographic factors will independently and jointly predict the burden of care of family caregivers of children living with HIV in Akwa Ibom State. This result was consistent with the findings of Gadow, Chernoff, Williams, Brouwers, Morse, and Heston (2010), which found that family caregivers' burden was influenced by the age of the caregivers. The finding also corroborated that of Ozer (2015), who discovered a strong correlation between the age of carers and the burden of care for children living with HIV. The results further refute Joseph and Fineman's (2010) conclusions that the burden of care and caregivers' education are significantly related. Additionally, the results were in direct opposition to Tapscott's (2016) findings, which indicated that the kind of relationship with care receivers was related to the burden of care experienced by family caregivers.

The findings of the study supported that perceived social support is an independent predictor of the burden of care of family caregivers. The finding corroborated Brisset's (2010) report that there is a significant relationship between quality of life, social support, and the burden of care of family caregivers of CLHIV. The finding also confirmed the findings of O'Reilly (2010), who found that individuals who received a high level of social support and low levels of loneliness experienced high levels of care-related burden. However, the study contradicted Lundberg, Thi, and Doan's (2016) report that social support did not predict the burden of care among family caregivers of children living with HIV.

CONCLUSION

Based on the findings of the study it was concluded that; (a) age is a significant predictor of the burden of care of family caregivers of children with HIV, (b) sex, caregivers' education, and relationship with care recipients do not predict the burden of care of family caregivers of children with HIV, (c) perceived social support is a significant predictor of the burden of care of family caregivers of children with HIV.

RECOMMENDATIONS

The following recommendations are made from the findings of the study;

I. There should be a massive media campaign to inform the public about the importance of assisting family caregivers of children living with HIV. This initiative will increase the degree of support provided to caregivers, reduce their workload, and improve their quality of life.

II. Social workers should be hired by the government and other stakeholders to offer in-home care for CLHIV. This step will ease the strain on family caregivers, encourage the provision of high-quality care for the children, and enhance their overall well-being.

III. As part of HIV healthcare services, healthcare professionals should provide special training to caregivers. This effort will make it easier for caregivers to manage CLHIV with high-quality care and less burden.

REFERENCES

1) Akintola, F. (2006). Gendered home-based care in South Africa: more trouble for the troubled. *African Journal of AIDS Resources,* 5(3), 237–47.

2) Asuquo, E. F., Adejumo, P., Akpan, M. I. & Akpan-Idiok, P. A (2017). Ameliorating the impact of caregiving through supporting family caregivers of people living with HIV/AIDS in Calabar, Nigeria. Available at DOI: 9734/bpi/ctmamr/v4.

Demographic Factors and Perceived Social Support as Predictors of Burden of Care among Family Caregivers of Children Living With HIV in Akwa Ibom State

3) Asuquo, E. F., Etowa, J. B, & Adejumo, P. (2013). Assessing the relationship between caregivers' burden and availability of support for family caregivers of HIV/AIDS patients in Calabar. *South East Niger,* 335–344.

4) Brisset, E., (2010). Parenting stress and coping styles in mothers and fathers of preschool children with autism and Down syndrome. *Journal of Intellectual Disability*, 54 (3): 266–280.

5) Campbell, C., & Foulis, C. (2004). Creating contexts for effective home-based care of people living with HIV/AIDS. *Curationis,* 27(3), 5–14.

6) Etim, P. P. (2018). Influence of burden of care and personal functioning on the quality of life of primary caregivers. Undergraduates Project in the Department of Psychology, University of Uyo.

7) Gadow, K. D., Chernoff, M., Williams, P. L., Brouwers, P., Morse E, & Heston J, (2010). Co-occurring psychiatric symptoms in children perinatally infected with HIV and peer comparison sample. Journal of Developmental Behaviour in Pediatrics, 31(2), 116–28.

8) Graessel, E., Berth, H., Lichte, T. & Grau, H. (2014). Subjective caregiver burden: Validity of the 10-item short version of the Burden Scale for Family Caregivers BSFC-s. BMC Geriatric, 14(1), 23.

9) Ilse, G., Feys, F. F., de Wit, P. J., Putman, K. & de Weerdt, Y. (2008). Subjective well-being among family caregivers of individuals with developmental disabilities: the role of affiliate stigma and psychosocial moderating variables. *Resources Developmental Disabilities*, 34, 4103–4114.

10) Joseph, L. A., & Fineman, M. M., (2011). Quality of life among parents of children with autistic disorder: a sample from the Arab world. *Resources for Developmental Disabilities,* 35, 278–287.

11) Kalomo, E. N. & Liao, M. (2018). Social work in public health burden of care among caregivers of persons living with HIV/AIDS in rural Namibia: correlates and outcomes. *Social Work Public Health,* 33, 70-84.

12) Knapp, L.I. (2010). Role strains and personal stress. In H.B. Kaplan, (ed.), *Psychosocial stress: Trends in Theory and Research* (3-32). New York, London: Zen Publishers.

13) Lora, G. M., Kohn, I. Y., Levav, D., McBain, H., Morris, O. P., & Saxena, J. (2012). Caregiving burden of families looking after persons with intellectual disability and behavioural or psychiatric problems. *Journal of Intellectual Disability Research*, 47(6), 447-455.

14) Lundberg, PC, Thi, T, & Doan, K, (2016). Caregiving to persons living with HIV/AIDS: experiences of Vietnamese family members. *Journal of Clinical Nursing,* 25, 788-798.

15) Nath, A. (2017). Pediatric HIV in India: Current scenario and the way forward. *Indian Journal of Public Health,* 61, 124–130.

16) O'Reilly, D. (2010). Is caring associated with an increased risk of mortality? A longitudinal study. *Social Science and Medicine,* 67: 1282–1290.

17) Okoro, D. J. & Inyang, U. E. (2022). Children's disability milieus and perceived social support as predictors of quality of life of family caregivers in Akwa Ibom State. *Nigerian Psychological Research,* 7(1), 79-85.

18) Ozer, L.Y. (2015). Community attitudes towards stroke: The Results of a National Survey of the Taiwanese Population. *International Journal of Social Psychiatry,* 51 (2), 162–76.

19) Schulz, U. & Schwarzer, R. (2003). Social support in coping with illness: The Berlin Social Support Scales (BSSS). *Diagnostica,* 49, 73-82.

20) Skeen, S, Macedo., A, Tomlinson, M., Hensels, I. S, & Sherr, L. (2016). Exposure to violence and psychological well-being over time in children affected by HIV/AIDS in South Africa and Malawi. *AIDS Care,* 28,16-25.

21) Tapscott, K . (2016). *Caregivers' readiness to disclose HIV status: Experiences and challenges of child disclosure in South Africa*. Master's Thesis. University of Cape Town.
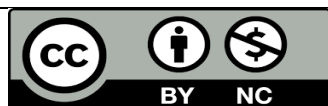
Game Model to Improve the Motor Abilities of Primary School Students

Tuswan[1], Hari Yuliarto[2], Sri Mawarti[3], Anastasia Erlina L.[4], Sb.Pranatahadi[5], Hadwi Prihantanta[6], Margono[7]

[1,2] Faculty of Sport Health, Universitas Negeri Yogyakarta
[3,4,5,6,7] Faculty of Vocational, Universitas Negeri Yogyakarta

ABSTRACT: This research aims to produce a learning model to improve children's motor skills through traditional games which are prepared based on the curriculum and characteristics of elementary school students. Research development procedures use Research and Development. The results of the development research obtained five game models, namely: bicycle wheel racing, rubber band throwing, rubber band unclang, mineral water bottle toss, and bicycle wheel rim target balls which were arranged in the form of a guidebook. The manual for motor skills game models for elementary school students was declared suitable for use based on the assessment of material experts and elementary school teachers. The results of the experts' assessments are as follows: 1) the bicycle wheel racing game is included in the "very good" category with an average rating of 4.8, which means X > 4.2; 2) the mineral water bottle gandon game is included in the "very good" category with an average rating of 4.9, which means X > 4.2; 3) the rubber band throwing game is included in the "very good" criteria with a mean rating of 4.86, which means X > 4.2; 4) the rubber band unclang game is included in the "very good" criteria with a mean rating of 4.9, which means X > 4.2; and 5) the bicycle wheel target ball game is included in the "very good" criteria with an average rating of 4.9, which means X > 4.2

KEYWORDS: game model, motor skills, elementary school students

I. INTRODUCTION

Growth and development is a dynamic process throughout human life that is carried out in stages, where one phase becomes the basis for development in the next phase. Growth can be interpreted as an increase in size, such as height and weight and can be measured quantitatively using kilo grams or centimeters. Human growth is greatly influenced by inherited genetic factors and begins from the conception phase, namely from the moment the egg cell meets sperm. However, the potential for growth depends on the nature and patterns of growth and development which are influenced by the environment, especially during childhood and adolescence. For this reason, parenting styles for children must be implemented appropriately because they can affect the child's growth and development. Therefore, inappropriate parenting patterns can result in malnutrition, physical abuse of children, and exploitation of children. (Rahmatika, 2021; J Suteja, 2019).

Growth and development are two things that cannot be separated and are interrelated biological processes. Growth is a condition for development to occur, because it can stimulate development by increasing the number of cells or tissues. Without growth, changes in the shape, structure, or function of cells or organisms are impossible. On the other hand, development is the result of growth which can result in differentiation, specialization, integration, or regeneration in cells or organisms. Because proper development will improve body functions and complex skills, thereby helping to bring about qualitative changes, namely, in the form of psychosocial, cognitive, moral, and motor function changes. (Bisri, 2015).

In general, motor skills are body movement abilities whose development is influenced by the child's age and overall development. Human motor development is divided into two types, namely fine and gross motor development. The development of gross motor skills involves the large muscles in the arms, legs and trunk. Fine motor skills refer to the ability to coordinate small muscles in hand, finger and eye movements. Gross motor skills generally develop earlier than fine motor skills. However, gross motor skills also form the basis for fine motor skills and are related to body awareness, balance, strength and reaction speed. Thus, gross motor skills and motor skills must be trained, because they really support the child's development process to increase physical maturity and development of the nervous system that supports body movement (U.Hasanah, 2016).

Game Model to Improve the Motor Abilities of Primary School Students

Elementary school age children are called middle childhood and are the mature age for children to learn. Because during middle childhood, children have a high desire to master new skills given by teachers at school. This is also one of the initial signs of a change in the child's attitude towards the family, namely that it is no longer egocentric but objective and empirical (M Limbong, 2020). This means that in middle childhood, children already have an intellectual attitude so that this period is called the intellectual period states that the elementary school age period is also often referred to as the intellectual period or harmony period where children are easier to educate than the previous and subsequent periods. For this reason, learning at the elementary school stage must be carried out appropriately, where the development of children's intelligence is in line with the maturity of their motor skills (Lara Fridani, 2009).

Elementary school students are a period where various changes occur in growth and development which will influence the formation of children's characteristics and personalities. The elementary school age period can be used as a core experience for children who are considered to be able to take responsibility for their own behavior in relationships with peers, parents and others. Apart from that, elementary school age is a time when children gain the basic knowledge in determining success in adapting to adult life and acquiring certain skills (Diyantini, et.al.2015). For this reason, learning in elementary schools must be adapted to the characteristics of students and developments in science and technology. In this way, students always have the opportunity to be creative with their abilities and do not experience boredom during learning (Lara Fridani, 2009).

Education is the process of changing the attitudes and behavior of a person or group of people to mature humans through learning and training efforts (Warniti, 2014). Education has a very important and strategic role in life in a global era full of change, competition and complexity. Education that is implemented from childhood will have a positive impact in efforts to shape character and personality as well as the sustainable development and improvement of human resources. For this reason, education must start from elementary school because success in attending secondary school and college is greatly influenced by success in attending basic education. Apart from that, through basic education, students will be equipped with basic abilities related to the ability to think critically, read, write, count and master basic skills for studying science and technology as well as the ability to communicate which is a minimum ability requirement in social life (Muhammad Ali, 2009).

Technically, elementary school education can be defined as the process of guiding, teaching and training students aged between 6-13 years to have basic abilities in intellectual, social and personal aspects that are integrated and in accordance with their developmental characteristics. Thus, elementary school education can be said to be in the concrete operational phase, where students have demonstrated the ability in the thinking process to operate logical rules, even though they are still tied to concrete objects (Siti, 2017). This means that elementary school students are also able to understand how to combine several groups of objects at varying levels, and are able to think systematically about concrete objects and events(Abidin, 2016).

The development of science and technology does not always have a positive influence on education in Indonesia, especially on physical education subjects in elementary schools. The negative impact of technological developments can be seen by the large number of elementary school students who are lazy about moving and tend to play with cellphones. As a result, the child's tendency to move is minimal, resulting in motor skills not being able to develop in accordance with the child's growth and development. Facing this phenomenon, there is a need for physical education learning innovations that can trigger elementary school students to get opportunities to carry out movement activities. Through physical education, it is hoped that it can help build the development of attitudes, skills, knowledge, creativity and character education so that students can adapt to their surrounding environment (Ritonga & Sutapa, 2020; Kaimuddin, 2018).

Physical education is basically an integral part of the overall education system which aims to develop aspects of health, physical fitness, critical thinking skills, emotional stability, and others. Physical education can also be used as a medium to encourage the development of motor skills, physical abilities and knowledge. Apart from that, through physical education students will acquire various expressions that are closely related to pleasant personal messages. The results of observations show that physical education learning implemented in elementary schools in the Special Region of Yogyakarta has the same tendency at every level of education. Most teachers and coaches prioritize the competitive aspect compared to the development aspect of students' motor perception. Apart from that, the tendency to implement classical and holistic learning is still considered a truth that must always be applied. As a result, learning materials applied to lower class and upper class students always use the same methods and models. Physical education in schools is often seen as a movement activity that only causes fatigue. Apart from that, physical education is often considered a learning process that is only a psychomotor aspect, and is not taken into account by parents. If this situation continues, then one day the Special Region of Yogyakarta will lack potential children who will become outstanding athletes in the future. For this reason, it is necessary to develop learning models that can foster a sense of enjoyment and improve the motor skills of elementary school students, especially in the Special Region of Yogyakarta, because the model is a conceptual framework used as a guide for carrying out activities(Sagala, 2012). Using the right model will make it easier for elementary school students to understand each material provided systematically (Metzler, 2014).

Game Model to Improve the Motor Abilities of Primary School Students

Basically, elementary school students can be said to be playing. This means that every time is filled with activities carried out with inner freedom to gain pleasure so that children can express all forms of behavior that are enjoyable and without coercion in accordance with the statement that playing games that are fun, inclusive and skill-based will help prepare children to participate in a wide variety of physical activities with greater success and enjoyment. Thus fun, inclusive, and skill-based play will help children prepare to participate in a variety of physical activities successfully and happily (Yusuf, 2014; Rohmah, 2016, Louise 2015. Apart from that, playing is a means and medium for children to learn movement, learn about their bodies, and form their personalities (Trianto, 2013; Gallahue & Ozmun, 2013; Pratisti, 2008).

The elementary school curriculum states that physical education is an educational process that utilizes physical activity and is planned systematically with the aim of improving individuals organically, neuromuscular, perceptually, cognitively, socially and emotionally. Meanwhile, the concept of play is a means of socialization which is expected to provide children with opportunities to explore, discover, express feelings, be creative and learn in a fun way (Sujiono, 2012). Thus, the concept of play must be implemented in physical education learning, especially for elementary school children. Through play, it is hoped that it can trigger creativity, smarten the brain, overcome conflict, train empathy, hone the five senses, as a medium for therapy, and make discoveries (Montolalu et.al., 2013).

Traditional games are a culture that contains local wisdom values such as character education values which are important to be transformed to the younger generation. Globalization and advances in science and technology have had a significant impact on the reduced interest of elementary school students in traditional games, because they have been replaced by various digital games such as internet-based or online games on computers or mobile phones. As a result, children's motor development is disrupted and cannot be optimal. For this reason, there is a need for a learning model that can make children interested, feel happy, and of course must involve motor performance (Gallahue & Ozmun, 2013; Lara Fridani, 2009).

The development of a physical education learning model based on local wisdom through traditional games in the Special Region of Yogyakarta is one solution to overcome this problem. Therefore, the potential of traditional children's games in the Special Region of Yogyakarta opens up opportunities for education to look again at local potential, especially to improve the motor skills of elementary school students. Apart from that, the potential that exists in traditional games can be explored in more depth so that local cultural wisdom values can be derived in order to expose children to the onslaught of global culture. The traditional games of the Special Region of Yogyakarta which are expected to improve the motor skills of elementary school students are: a) bicycle wheel racing game; b) gandon game; c) rubber band throwing game; d) rubber band unclang game; and e) bicycle wheel target ball game. Through the game model, it is hoped that it can develop and improve the gross motor and fine motor skills of elementary school students and become a learning reference. The game model is made simply so that it can be practiced in all elementary schools without reducing the goals and objectives of the learning curriculum. Teachers only need to understand and apply the game model in the teaching and learning process (TS Qodr, 2020; M Afandi, 2013).

II. METHODS

This type of research uses research and development with steps adopted from Sugiyono (2010: 298), namely: potential and problems, data collection, product design, data validation, data validation, product trials, product revisions, usage trials, revisions product, and final product. The test subjects in the research were elementary school students in Yogyakarta City, Yogyakarta Special Region. The data collection process was carried out quantitatively and qualitatively. Qualitative data was obtained from: (1) the results of interviews with elementary school teachers; (2) field notes; (3) data on suggestions for improvements to the initial model draft and results of observer observations during product trials (small scale) and use trials (large scale). The quantitative data was obtained from: 1) assessment of the validation value scale, 2) assessment of the observation value scale of game implementation, and 3) assessment of the observation value scale of the feasibility of implementing development in the game. Data Collection Instruments through observation, interviews and questionnaires. The data analysis technique used in this research is quantitative and qualitative descriptive data analysis. Quantitative descriptive data analysis techniques are carried out through: (1) validation assessment results using material experts' rating scales on the game model draft before testing; (2) assessor data resulting from observers' observations of the game model; (3) data from observations regarding the feasibility of designing game facilities for the growth and development of elementary school students in the learning process

III. RESULTS & DISCUSSION

The preliminary study was carried out using observation and interview methods. Observations were carried out on elementary school teachers and students, both directly and indirectly. Based on observations made by researchers, the following data can be obtained: 1) there is no game model guidebook to improve the motor skills of elementary school students, 2) a game model

Game Model to Improve the Motor Abilities of Primary School Students

guidebook to improve the motor skills of elementary school students is needed to make it easier for teachers to implement it in the process learning, and 3) Students are interested in knowing and learning games to improve motor skills.

Based on initial research conducted, there are still many students and teachers who have not utilized traditional games as an alternative physical learning method to improve the motor skills of elementary school students. Difficulty in finding references or sources related to effective and efficient models to apply to the learning process is an obstacle that has been faced by elementary school teachers. For this reason, there is a need for a learning model that is easy to understand and implement in the physical learning process in elementary schools. The steps taken in the process of developing the game model are as follows: 1) analysis of the objectives of developing the game model to improve the motor skills of elementary school students, 2) analysis of the characteristics of elementary school students, 3) reviewing the literature on game models for students elementary school, 4) determine the principles for developing game models to improve the motor skills of elementary school students, 5) determine the objectives, content and activity management strategies, and 6) prepare a draft model for developing game models to improve the motor skills of elementary school students.

The validation model in the research used five validators, namely: three material experts and two media experts. To validate the model using V-Aiken analysis. The results of the analysis show that all the items developed are valid in the medium category (V-Aiken ≤ 0.04 = Low, V-Aiken ≤ 0.08 = Medium, V-Aiken ≤ 0.1 = High). As for the reliability test, Cronbach's Alpha is used with the following analysis results:

Table 1. Reliability Results of Traditional Game Models for Developing Motor Skills in Elementary School Students

Cronbach's Alpha	N of Items
0,691	5

Table 1 shows that the data analysis using Cronbach's Alpha above is the result of the reliability of the game developed by researchers using Cronbach's Alpha, obtaining a value of 0.691, which means $\alpha > 0.60$. In this way, the game model developed by researchers can be said to be reliable.

Results of Small Scale Trials

The implementation of small-scale trials was carried out by elementary school teachers. A small-scale trial was carried out at Muhammadiyah Jogokariyan Elementary School with 15 children to serve as test subjects. Data from small-scale trials can be explained as follows:

1) The bicycle wheel racing game has an average score of 184 (94%) with an average of 4.7. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.7 for the quality of the bicycle wheel racing game. Included in the "very good" criteria because it falls within X > 4.2.

2) The rubber band throwing game has an average score of 184 (94%) with an average of 4.7. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.7 for the quality of the rubber band throwing game. Included in the "very good" criteria because it falls within X > 4.2.

3) The rubber band unclang game has an average score of 181 (92%) with a mean of 4.6. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.6 for the quality of the rubber band unclang game. Included in the "very good" criteria because it falls within X > 4.2.

4) The bicycle wheel target ball game had an average score of 186 (96%) with a mean of 4.8. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating is 4.8 for the quality of the bicycle wheel target ball game. Included in the "very good" criteria because it falls within X > 4.2.

Based on the results of the observer's assessment of model products that have been tested on a small scale, it shows that: the game model for developing motor skills is in accordance with the core competencies and basic competencies of elementary schools, the game model suits the characteristics of students, the game model attracts the attention of elementary school students, the game model can develop the gross and fine motor skills of elementary school students, the instructions in the game model are clear so they are easy to understand and carry out, the equipment used in the game is easy to obtain and safe for use

Game Model to Improve the Motor Abilities of Primary School Students

by elementary school students. Based on the analysis of trials in small groups, it shows that the initial product meets the requirements for trials in large groups.

Results of Large-Scale Trials

The large-scale trial is the result of a follow-up to the game draft which was tested on a small scale and has been revised, to find out the quality of the game model for developing motor skills for elementary school students. Large-scale trials were carried out on 28 students from Muhammadiyah Jogokariyan Elementary School and Minggiran State Elementary School. In large-scale trials, data is obtained in the form of evaluations and recommendations from teaching teachers which will then be used as material for revision.

Table 2. Results of large-scale trials assessing the quality of bicycle wheel racing games

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	1	3
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4
6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	1	3
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	2	2
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	8	44
Number (scale x ∑frequency)					32	220
Total score		252				
Percentage		96%				
Average Score		4,8				
Criteria		Very good				

Table 2 shows that the bicycle wheel racing game has an average score of 252 (96%) with a mean of 4.8. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.8 for the quality of the bicycle wheel racing game is included in the "very good" criteria because it is included in X > 4.2.

Table 3. Results of Large-Scale Trials on Quality Assessment of the Mineral Water Bottle Gandon Game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4

Game Model to Improve the Motor Abilities of Primary School Students

6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	1	3
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	5	47
Number (scale x ∑frequency)					20	235
Total score	255					
Percentage	98%					
Average Score	4,9					
Criteria	Very good					

The mineral water bottle gandon game has an average score of 255 (98%) with an average of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the mineral water bottle gandon game is included in the "very good" criteria because it is included in X > 4.2.

Table 4. Results of large-scale trials assessing the quality of the rubber band throwing game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	1	3
6.	Game instructions are clear and easy for teachers to understand	0	0	0	0	4
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	1	3
8.	The security level of the model complies with security standards	0	0	0	1	3
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	2	2
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	7	45
Number (scale x ∑frequency)					28	225
Total score	253					
Percentage	97%					
Average Score	4,86					
Criteria	Very good					

The rubber band throwing game has an average score of 253 (97%) with a mean of 4.86. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table

Game Model to Improve the Motor Abilities of Primary School Students

to qualitative data on a scale of 5, the average rating of 4.86 for the rubber band throwing game is included in the "very good" criteria because it is included in X > 4.2.

Table 5. Results of Large-Scale Trials on Quality Assessment of the Rubber Band Unclang Game

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	0	4
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	1	3
6.	Game instructions are clear and easy for teachers to understand	0	0	0	1	3
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	0	4
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	1	3
10.	The equipment needed is easy to obtain	0	0	0	1	3
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	5	47
Number (scale x ∑frequency)					20	235
Total score		255				
Percentage		98%				
Average Score		4,9				
Criteria		Very good				

The rubber band unclang game has an average score of 255 (98%) with a mean of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the rubber band unclang game is included in the "very good" criteria because it is included in X > 4.2.

Table 6. Results of large-scale trials assessing the quality of bicycle wheel target ball games

No	Appraised items	Scale				
		1	2	3	4	5
1.	The game model is in accordance with core competencies and basic competencies	0	0	0	0	4
2.	The model is appropriate to the characteristics of elementary school students	0	0	0	0	4
3.	Game models can attract students' attention	0	0	0	1	3
4.	Game models can develop gross motor skills	0	0	0	0	4
5.	Game models can develop fine motor skills	0	0	0	0	4
6.	Game instructions are clear and easy for teachers to understand	0	0	0	0	4
7.	The game instructions are clear and easy for the teacher to put into practice	0	0	0	1	3
8.	The security level of the model complies with security standards	0	0	0	0	4
9.	The security level of the tool complies with security standards	0	0	0	0	4
10.	The equipment needed is easy to obtain	0	0	0	1	4
11.	Equipment settings are clear	0	0	0	0	4
12.	Attractive equipment for students	0	0	0	0	4
13.	Equipment settings are easy for students to understand	0	0	0	1	3
Frequency		0	0	0	4	48

Game Model to Improve the Motor Abilities of Primary School Students

Number (scale x ∑frequency)				16	240
Total score	256				
Percentage	98%				
Average Score	4,9				
Criteria	Very Good				

The bicycle wheel target ball game had an average score of 256 (98%) with an average of 4.9. The average assessment is then converted into a qualitative form on a 5 scale to determine the assessment status. In accordance with the quantitative data conversion table to qualitative data on a scale of 5, the average rating of 4.9 for the bicycle wheel target ball game is included in the "very good" criteria because it is included in X > 4.2.

CONCLUSION

Based on the results of research and development of a book on developing motor skills game models for elementary school students, it can be concluded that the Motor Skills Game Model for Elementary School Students includes 5 types of games, namely: bicycle wheel racing game, mineral water bottle gandon game, rubber band throwing game, game unclanging rubber bands, and a bicycle wheel target ball game based on the results of analysis in large-scale trials shows that the final product can be said to be feasible and can be a reference in learning for elementary school teachers in improving motor skills.

REFERENCES

1) Allen, K.E. & Marotz, L.N. (2013). Profil perkembangan anak pra kelahiran hingga usia 12 tahun. Jakarta: PT Indeks.
2) Altinkok, M. (2016). *The effects of coordination and movement education on preschool children's basic motor skills improvement. Universal Journal of Education Research 4(5): 1050-1058, 2016.*
3) Andrew P. Hills, et.al. (2014) *Physical Activity and obesity in chBritish Journal of sport Medicine. 2014.*
4) Asriansyah. (2014). Model permainan tematik integratif untuk meningkatkan kebugaran jasmani, mengenal huruf dan angka anak TK. *Jurnal Keolahragaan* Universitas Negeri Yogyakarta. Volume 2, Nomor. 2014.
5) Gustian, U. & Tomoliyus. (2015). Pengembangan model pembelajaran integratif berbasis aktivitas jasmani untuk taman kanak-kanak. *Jurnal Keolahragaan* Universitas Negeri Yogyakarta. Volume 3, Nomor 2. 2015.
6) Hidayanti, M. (2013). Peningkatan kemampuan motorik kasar anak melalui permainan bakiak. *Jurnal Pendidikan Anak Usia Dini.* PAUD PPs Universitas Negeri Jakarta. Volume 7. Edisi 1. April 2013.
7) Kurdi. (2014) Pengembangan pembelajaran motorik dengan pendekatan bermain menggunakan agility ladder untuk anak sekolah dasar. *Jurnal Keolahragaan* Universitas Negeri Yogyakarta. Volume 2, Nomor 2. 2014.
8) Muhlisin, M.A. (2017). Permainan bebas anak usia dini. *Jurnal Pendidikan anak.* Taman kanak-kanak Sunan Averros Yogyakarta. 2017.
9) Pradipta, G.D. (2013). Model senam si buyung untuk pembelajaran motorik kasar Pada siswa taman kanak-kanak. *Jurnal Keolahragaan.* Universitas Negeri Yogyakarta. Volume 1, Nomor 2. 2013.
10) Rahyubi, H. (2014) Teori-teori belajar dan aplikasi pembelajaran motorik: deskripsi dan tinjauan kritis. Bandung Nusa Media.
11) Rohmah, N. (2016). Bermain dan pemanfaatannya dalam perkembangan anak usia dini. *Junal Tarhawi.* Universitas Islam Nahdatul Ulama Jepara. Volume 13 13, Nomor 2, Juli-Desember 2016.
12) Sugiyono. (2015). Mertode penelitian kuantitatif kualitatif dan *R&D.* Bandung: Alfabeta.
13) Amisola, R.VB & Jacobson, M.S. (2013) *Physical activity, exercise and sendentary activity: Relationship to the causes and treatment of obesity Adolesencent Medicine Journal Vol. 14 (1): 23-35.*
14) Canty Malley. *National Network for Child Care. Avalaible at:* http://www.ncc.org/Child. *Dev.html.*
15) Dwi Septi Anjas Wulan (2015). Peningkatan kemampuan gerak lokomotor melalui permainan lari estavet modivikasi. Jurnal Pendidikan Usia Dini. 163-180.
16) Eni, Ermawati & Dian, A. Z. (2015). Upaya peningkatan motorik kasar pada anak melalui permainan tradisional balap karung estafet pada kelompok b1 paud supriyadi semarang tahun ajaran 2015/2016. *Jurnal Pendidikan Usia Dini.* 153-168.
17) Gallahue, D.G. & Ozmun, J.H. (2014) *Understanding motor development: Infant, childrent, addolescen, ad ult.(6th ed). New York: Mc Graw-Hill.*

18) Hergenhahn, B, R. & Olson, Matew H. (2016). *Theories of learning* (Terjemahan Tri Wibowo B. S). Jakarta: Kencana Prenada Media Group.

19) Heri Rahyubi. (2014). Teori-teori belajar dan aplikasi pembelajaran motorik Basndung: Nusa Media.

20) Haywood, K.M., Roberton , M., Ann., Getchell, N., et. Al (2014). *Advanced analysis of motor development.* USA. Human Kinetics.

21) Kovar, et. Al. (2014*). Elementary classroom teachers as movement educators.   (4th ed)*. New York: Mc Graw-Hill.

22) Miarso, Yusufhadi, (2014). Menyemai benih teknologi pendidikan. Jakarta: Prenada Media.

23) Monika Rokicka Hebel. (2014*). Crrective gymnastics and motor skills of five and six year old chidrent. Baltic journal of healt and physical activit*. Gdansk University Of Physical Education and Sport and Gdansk, Vol. 6, No. 2, 2014, 114-126.

24) Morrison, T.H. (2017). Evolving polycentric governance of the great barrier reef. Proceedings of the National Academy of Sciences, doi:10.1073/pnas.1620830114.

25) Musfiroh. (2016). Pengembangan karakter anak melalui pendidikan karakte. Jogjakarta: Tiara Wacan.

26) Payne, V.G. & Isaacs, LD. (2016). *Human motors development: A Lifespan Approach,* (8th ed.). New York: MC Graw-Hill.

27) Pica. (2016). Why motor skill matter. Beyond the Journal The Nastional Association for The Education of Young Children.

28) Sean Brotherson. (2014). *Understanding physical education development in young chidrent.*

29) Sugiyono. (2015). Model penelitian dan pengembangan (*research and development)*. Bandung: Alfabeta.

30) Sujiono. Bandung. (2017). Metode pengembangan fisik. Jakarta: Universitas Terbuka.

31) Tal Savion, at all. (2017). *Development contributions to motor sequence learning*. Research article. Exp Brain Res (2017) 195: 293-306.

32) Toho Cholik Mutohir dan Gusril. (2013). Perkembangan motorik pada masa anak-anak. Jakarta: Depdiknas.

33) WHO. (2015). Global recommendations on physical activity for health. Ganeva: WHO Press.

34) Williams, C., et. al. (2013). Physiologi of sport. London: Spon Press.

35) Zawi, K., Lian, D. K.. C. & Abdullah, R.T. (2014). *Gross motor development of Malaysia hearing impaired male preand early school children. International education studies journal:* Vol. 7, No. 13; 2014. Published by Canadian Center of Science and Education.

36) Rasman. (2015). Model-model pembelajaran mengembangkan profesionalisme Guru. Jakarta: PT. Raja Grafindo Persada

37) Upton, P. (2017). Psikologi perkembangan. Jakarta: Erlangga.

38) Sagala, S. (2017). Konsep dan makna pembelajaran. Bandung: Alfabeta.

39) Santrock, John W. (2015). Perkembangan anak (Terjemahan Mila Rachmawati & Anna Kuswanti). Texas: Dallas University.

40) Wasis. (2013). Konsep penelitian dan pengembangan. Malang: Universitas Negeri Malang.

41) Yusuf S. (2015). Psikologi perkembangan anak dan remaja. Bandung: PT. Rosdakarya.

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

Pris Azassih[1], Sumaryanti[2]

[1,2] Universitas Negeri Yogyakarta, Yogyakarta, DIY, 55281, Indonesia

ABSTRACT: This research aims to find out how effective online learning is in the use of online media during the pandemic at SD Tamansiswa Jetis (Tamansiswa Jetis Elementary School), Yogyakarta City. This research was a descriptive quantitative study. The research method was the survey method with data collection techniques used the instruments in the form of questionnaires. The research population was all fifth and sixth grade students of SD Tamansiswa Jetis Yogyakarta, with the total of 40 students. The results of the research on the effectiveness of online learning media in Physical Education lessons at SD Tamansiswa Jetis Yogyakarta show the results with the various categories as follows: in the poor category at 32.5%, in the moderate category at 30%, in the good category at 22.5%, in the very good category at 10 %, and in the very poor category at 2.5%. These results indicate that the online learning using online media During the Covid-19 Pandemic for the fifth and sixth grade students in Physical Education subject at SD Tamansiswa Jetis, Yogyakarta City is not effective.

KEYWORDS: Effectiveness, Online Learning, Online Media and Physical Education.

I. INTRODUCTION

Coronavirus Diseases 2019 is a virus that attacks the human respiratory system and is transmitted through saliva droplets which can cause death (Sari & Sutapa, 2020: 20). World Health Organization (WHO) on 24 April 2020, as many as 213 countries have been infected with Covid-19, 2,631,839 of which were confirmed positive and 182,100 died. The complexity of handling the outbreak, the lack of vaccines and drugs to cure Covid-19 patients and the limited personal protective equipment (PPE) for health workers have made the government implement strict policies to break the chain of Covid-19 spread. One of them is by creating an online learning policy for the process of teaching and learning activities at all levels of education. Minister of Education Nadiem Makarim issued Circular Letter Number 4 of 2020 concerning the implementation of policies and education during the Covid-19 pandemic emergency, therefore in order to break the chain of the spread of the Covid-19 virus, teaching and learning activities in schools were closed and replaced with the implementation of learning at the homes of each student using a networked learning system. Previous research shows that as many as 98% of teachers in primary schools and subject teachers in Bantul Regency Yogyakarta have used online learning during the Covid-19 pandemic (Anugrahana, 2020: 285).

However, field observations show that there are still many Physical Education, Sports and Health teachers who do not utilise learning media. Education has an important role in developing students' talents, potential, and skills to face greater future challenges. Therefore, the planning of the learning process continues to develop in accordance with the times. Physical Health and Sports Education has a relationship with children's feelings, children's personal relationships, group behaviour, children's mental development, social and intellectual aspects, and aesthetics. Student involvement in physical education learning is very important to achieve these goals. However, there is still a lack of teacher knowledge and ability to use online features, as well as barriers and limitations in the implementation of online learning, which causes obstacles in learning Physical Education Sports and Health during the Covid-19 pandemic (Herlina & Suherman, 2020: 3). In online learning situations, teachers must be more creative and innovative in teaching and choosing interesting learning materials so that students are enthusiastic and active during the physical education learning process. Observations and interviews with physical education teachers at Tamansiswa Jetis Elementary School in Yogyakarta City show that some students do not participate in online learning.

The learning media chosen by the PJOK teacher is not known to be effective because there are still many students who do not submit the assignments. To overcome these problems, learning media can be utilised in various ways, such as making learning videos or interesting tasks so that students feel challenged. In addition, the supporting factors needed to create effective teaching

include professional human resources and facilities that motivate students to take part in physical education learning. Based on the above problems, the author is interested in examining the effectiveness of online learning media in Physical Education Sports and Health lessons at SD Tamansiswa Jetis Yogyakarta. This study aims to evaluate the use of online learning media in Physical Education, Sport and Health lessons, as well as to identify factors that influence its effectiveness. By conducting this research, it is expected to provide new insights for Physical Education, Sport and Health teachers in utilising online learning media effectively. In addition, the results of this study are also expected to provide recommendations to related parties, such as schools and governments, in improving the quality of physical learning during the pandemic and distance learning situations.

II. METHOD

Research Design

This research is quantitative descriptive research, namely by collecting quantitative data which is then described. Based on Priyono's opinion (2016: 37) that descriptive research is research conducted to provide a description or describe a phenomenon or symptom on the object under study. The method used in this research is the survey method and data collection techniques using instruments in the form of questionnaires or questionnaires. The data collected is based on the acquisition of the number of scores from the questionnaire given to respondents. This study aims to determine how high the level of effectiveness of online learning media in PJOK subjects at Tamanansiswa Jetis Elementary School, Yogyakarta. Time and Place of Research This research was conducted at SD Tamansiswa Yogyakarta which will be held on 22 May 2022. This research was attended by all students of grade V (five) and VI (six) of SD Tamansiswa Yogyakarta. Research Subjects The population of this research is all students of grade V and VI at SD Tamansiswa Jetis Yogyakarta. Research subjects are sources or parties that provide information that researchers want to obtain. Research subjects can be individuals or entities related to the research topic. The researcher will collect data from the research subjects who are the students to analyse and draw conclusions in accordance with the research objectives.

Table 1. Research Subjects

No	Kelas	Jumlah Siswa
1	Kelas lima (V)	18
2	Kelas enam (VI)	22
Jumlah Siswa		**40**

Instruments, and Data Collection Techniques Based on the opinion of Margono (2010: 157) the instrument grid contains the scope of the question material, the type of question, the abilities measured, the number of questions, the time required. The ability in question is the expected ability of the subject under study. The following instrument lattice is as follows:

Table 2. Instrument Lattice

Variable	Factor	Indicator	Test Item
Implementation media learning media Online by Physical Education, Sport and Health at primary school Tamansiswa Jetis Elementary School Yogyakarta	Media based visual	Photo media	1, 2, 3, 4, 5
	Audio-based media	Recorded media	6,7,8,9,10
	Audio-visual based media visual-based media	Video media	11,12,13,14,15
	Media based computer	Internet media	16,17,18,19, 20

The data collected in the study were used to test hypotheses or answer research questions. The questionnaire statements that originally referred to the use of offline learning media have been modified to the utilisation of online learning media. The questionnaire used has been tested for validity by Bagus Pambudi in 2021. The validity test results showed a correlation between 0.534 to 0.863. After the second retest, the validity correlated between 0.635 to 0.856.

Data Analysis Technique

The data analysis technique used is descriptive percentage data analysis technique, based on the opinion of Sudijono (2009: 40) the formula used is as follows:

P = F N x 100%

Description:

P = Percentage sought (Relative Frequency)

F = Frequency

N = Number of respondents. (Sudijono, 2009: 40)

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

Then in determining the interval using the Norm Reference Assessment (PAN) formula from Azwar (2016: 163) in the table as follows:

Table 3. Assessment Norms

No	Intervals	Category
1	M + 1,5 SD < X	Very High
2	SD < X ≤ M + 1,5 SD	High
3	SD < X ≤ M + 0,5 SD	Smply
4	SD < X ≤ M − 0,5 SD	Low
5	X ≤ M − 1,5 SD	Very Low

Description:
M = average value (mean)
X = score
SD = Standard Deviation

III. RESEARCH RESULT

The results of research on the effectiveness of online learning using online media during the Covid-19 pandemic in PJOK subjects in Grades 5 and 6 at Tamansiswa Jetis Elementary School, Yogyakarta City as a whole are measured by a questionnaire totalling 20 statement items. Based on the results of data research in the field, the following results were obtained:

Table 4. Statistics of Research Data on the Effectiveness of Online Learning Using Online Media During the Covid-19 Pandemic in PJOK Subjects

Description	Value
Mean	60,78
Median	60,50
Mode	55,00
Std. Deviation	7,05
Minimum	50,00
Maximum	80,00

Description of the research results on the effectiveness of online learning using online media during the Covid-19 pandemic in PJOK subjects in Grades 5 and 6 at Tamansiswa Jetis Elementary School, Yogyakarta City in this study can be seen in the table below:

Table 5. Description of the Effectiveness of Online Learning using Online Media During the Covid- 19 Pandemic in PJOK Subjects

Interval	Kategori	Frequency	%
X > 71,35	Very Good	4	10
,31 ≤ x < 71,35	Good	9	22,5
,25 ≤ x < 64,31	Simply	12	30
,21 ≤ x < 57,25	Less	13	32,5
X < 50,21	Very Less	1	2,5
Jumlah		**40**	**100**
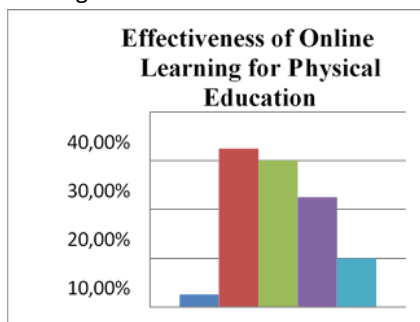
If displayed in diagram form, it can be seen in the figure below :

Effectiveness of Online Learning for Physical Education

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

Figure 1. Diagram of Research Results on the Effectiveness of Online Learning Using Online Media During the Covid-19 Pandemic in PJOK Subjects

Based on the table and figure above, it is known that the effectiveness of online learning using online media during the Covid-19 pandemic in PJOK Subjects in Grades 5 and 6 at Tamansiswa Jetis Elementary School in Yogyakarta City is mostly in the category of less with a percentage of 32.5%, followed by a sufficient category of 30%, a good category of 22.5%, a very good category of 10%, a very poor category of 2.5%. Online Learning using Online Media During the Covid-19 Pandemic in PJOK Subjects in Grades 4 and 5 at Tamansiswa Jetis Elementary School in Yogyakarta City in this study is based on visual, audio, audio-visual and computer media.

1. Visual-based media

The results of research on the effectiveness of online learning using visual-based media in PJOK subjects in this study were measured by 5 statement items. The statistical results of the research data are obtained as follows:

Table 6. Research Data Statistics on the Effectiveness of Online Learning Using Visual-Based Media Visual

Description	Value
Mean	15,05
Median	15,00
Mode	13.00
Std. Deviation	2,54
Minimum	11,00
Maximum	20,00

The description of the research results of online learning effectiveness data using visual-based media can be seen in the table below:

Table 7. Description of Research Results on the Effectiveness of Online Learning Using Visual-Based Media

Intervals	Category	Frequency	%
X > 18,86	Very Good	4	10
16,32 ≤ x < 18,86	Good	8	20
13,78 ≤ x < 16,34	Simply	16	40
11,24 ≤ x < 13,78	Less	7	17,5
X < 11,24	Very Less	5	12,5
Jumlah		**40**	**100**

If displayed in a diagram, it can be seen in the figure below
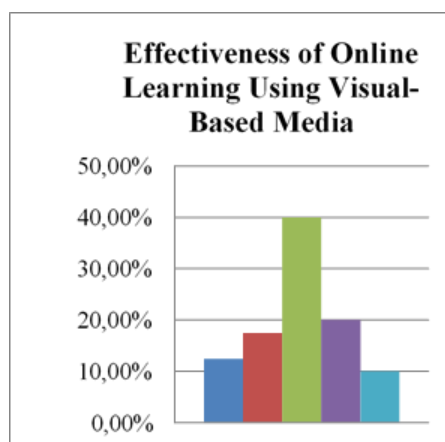
Figure 2. Diagram of Research Results on the Effectiveness of Online Learning Using Visual-Based Media

Based on the table and figure above, it is known that the effectiveness of online learning using visual-based media is mostly in the moderate category with a percentage of 40%, good category of 20%, poor category of 17.5%, very poor category of 12.5%, and excellent category of 10%.

2. Audio-based Media

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

The results of research on the effectiveness of online learning using audio-based media in PJOK subjects in this study were measured by 5 statement items. The statistical results of the research data are obtained as follows: Table 8. Data Statistics on the Effectiveness of Online Learning Using Audio-Based Media in PJOK Subjects

Description	Value
Mean	15,70
Median	15,00
Mode	14.00
Std. Deviation	2,51
Minimum	12,00
Maximum	20,00

Description of the results of research on the effectiveness of online learning using audio-based media in PJOK subjects can be seen in the table below:

Table 9.Description of Research Results on the Effectiveness of Online Learning Using Audio-Based Media in PJOK Subjects

Intervals	Category	Frequency	%
X > 19,46	Very Good	2	5
16,95 ≤ x < 19,46	Good	14	35
14,45 ≤ x < 16,95	Simply	9	22,5
11,93 ≤ x < 14,45	Less	15	37,5
X < 11,93	Very Less	1	2,5
Jumlah		**40**	**100**

If displayed in a diagram, it can be seen in the figure below:
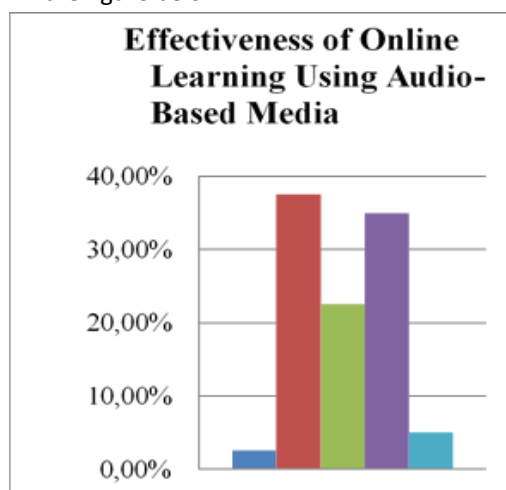
Figure 3.Diagram of Research Results on the Effectiveness of Online Learning Using Audio-Based Media in PJOK Subjects

Based on the table and figure above, it is known that the effectiveness of Online Learning using audio-based media in PJOK subjects is mostly in the category of less with a percentage of 37.5%, a good category of 35%, a sufficient category of 22.5%, a very good category of 5%, and a very poor category of 2.5%. From these results it can be seen that audio-based media is felt to have less of a good impact in helping to convey material.

3. Audio-visual based media

The results of research on the effectiveness of Online Learning using audio-visual based media in PJOK subjects in this study were measured by 5 statement items. The statistical results of the research data are obtained as follows:

Table 10. Data Statistics on the Effectiveness of Online Learning Using Audio-Visual Based Media

Description	Value
Mean	15,43
Median	15,00
Mode	14,00
Std. Deviation	2,18

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

Minimum	12,00
Maximum	20,00

Description of the results of research on the effectiveness of online learning using audio-visual based media can be seen in the table below:

Table 11. Description of Research Results on the Effectiveness of Online Learning Using Audio- Visual Based Media

Intervals	Category	Frequency	%
X > 18,69	Very Good	6	15
16,51 ≤ x < 18,69	Good	4	10
14,45 ≤ x < 16,51	Simply	28	70
11,94 ≤ x < 14,45	Less	2	5
X < 11,94	Very Less	0	0
Jumlah		**40**	**100**

If displayed in a diagram, it can be seen in the figure below:
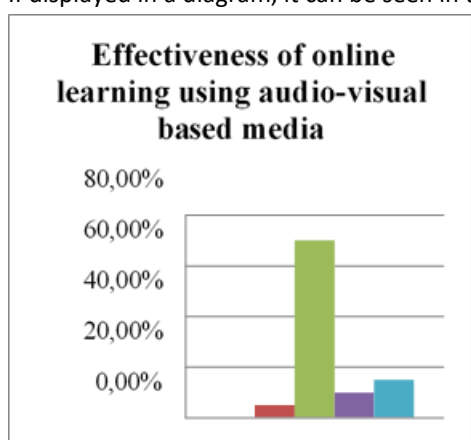
Figure 4. Diagram of Research Results on the Effectiveness of Online Learning Using Audio-Visual Based Media

Based on the table and figure above, it is known that the effectiveness of online learning using audio-visual-based media is mostly in the moderate category with a percentage of 70%, a very good category of 15%, a good category of 10%, a poor category of 5%, and a very poor category of 0%. This shows that audio-visual-based media can be an effective alternative in online learning, but other factors need to be considered such as the quality of the media and the ability of teachers to manage online learning. By paying attention to other factors, audio-visual media can be more effectively used.

4.   Computer-based Media

The results of research on the effectiveness of Online Learning using computer-based media in PJOK subjects in this study were measured by 5 statement items. The statistical results of the research data are obtained as follows:

Table 12.Data Statistics on the Effectiveness of Online Learning Using Computer-Based Media

| Description	Value
Mean	14,60
Median	14,00
Mode	13,00
St. Deviation	2,52
Minimum	10,00
Maximum	20,00

Description of the results of research on the effectiveness of Online Learning using computer-based media can be seen in the table below:

Table 13.Description of Research Results on the Effectiveness of Online Learning Using Computer-Based Media

Intervals	Category	Frequency	%

Effectiveness of Online Media Learning For Physical Education In SD Tamansiswa Jetis, Yogyakarta

X > 18,36	Very Good	5	12,5
86 ≤ x < 18,36	Good	8	20
34 ≤ x < 15,86	Simply	13	32,5
83 ≤ x < 13,34	Less	12	30
X < 10,83	Very Less	2	5
Jumlah		**40**	**100**

If displayed in diagram form, it can be seen in the figure below:
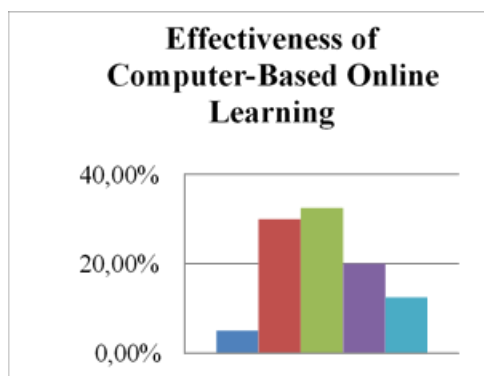
Figure 5: Diagram of Research Results on the Effectiveness of Online Learning Using Computer-Based Media

DISCUSSION

Research conducted by Marjan et al. (2020: 193) shows that during online learning in Indonesia, there are nine types of applications used, including Zoom Meeting, Google Classroom, WhatsApp, email, Edmodo, Skype, Webex, Camstudio, and Google Meet. This shows the variation in the use of technology in the online learning process in Indonesia. In addition, research conducted by Pambudi (2021) focused on the utilization of online learning media by physical education, sports and health teachers in Kapanewon Kasihan. The results showed that the utilization of online learning media in this context was categorized as "sufficient". This shows that the use of online learning media in physical education and health learning can make an adequate contribution to the learning process. Online learning uses the internet network as a means of distance learning (Isman, 2016: 587). It allows learners to learn without having to physically interact directly with teachers and classmates. This approach has proven to be effective especially in situations such as the Covid-19 pandemic, where face-to-face learning is limited or not possible. However, there are challenges in online learning, such as lack of direct social interaction, difficulty in understanding the material, and technical constraints. Therefore, it is important to overcome this barrier and ensure good internet access to optimize the online learning process. In addition, evaluation and supervision of students is also a challenge in online learning, where teachers have to find effective ways to assess students' attitude and progress in online learning.

IV. CONCLUSIONS

Conclusion

Based on the results of the analysis and discussion in the previous chapters, it can be concluded that the results of research on the effectiveness of online learning using online media during the Covid-19 pandemic in PJOK Subjects in Grades 5 and 6 at Tamansiswa Jetis Elementary School, Yogyakarta City are mostly in the less category at 32.5%, followed by the sufficient category at 30%, the good category at 22.5%, the excellent category at 10%, the category is very poor at 2.5%. These results can be concluded that Online Learning using Online Media during the Covid-19 Pandemic in PJOK Subjects in Grades 5 and 6 at Tamansiswa Jetis Elementary School in Yogyakarta City is less effective.

Suggestion

Online learning in PJOK subjects requires teacher creativity and innovation in effective learning methods. Students need to have high motivation and discipline in learning PJOK materials online. Future researchers are advised to conduct a broader study with a larger sample and additional variables to identify factors that affect the effectiveness of online learning.

REFERENCES

1) Andun Sudijandoko. (2010). Pembelajaran Pendidikan Jasmani Yang Efektif dan. Berkualitas. Jurnal Pendidikan Jasmani Indonesia Vol. 7 No. 1.

2) Arif S. Sadiman, dkk. (2014). Media pendidikan: pengertian, pengembangan dan pemanfaatannya. Depok: PT. Raja Grafindo.

3) Arikunto, S. (2019). Prosedur Penelitian. Jakarta: Rineka cipta.

4) Arsyad, Azhar. (2019). Media Pembelajaran. Jakarta: PT. Raja Grafindo Persada.

5) Isman, M. (2016). Pembelajaran Moda dalam Jaringan (Moda Online). The Progressive and Fun Education Seminar, pp. 586–588.

6) Jamaluddin, D., Ratnasih, T., gunawan, H., & Panjiah, E. (2020). Pembelajaran Online Masa Pandemik Covid-19 Pada Calon Guru: Hambatan, Solusi, dan Proyeksi. Karya Tulis Ilmiah, Lembaga Penelitian dan Pengabdian Kepada Masyarakat UIN Sunan Gunung Djati, 1-8.

7) Riskey Oktavian & Riantina Fitra Aldya. (2020). Efektivitas Pembelajaran Online Terintegrasi di Era Pendidikan

8) 4.0. Jurnal Pendidikan dan Ilmu Pengetahuan.

9) Rohani. (2019). Media Pembelajaran. Sumatera Utara: Diktat.

10) Sari, D. P., & Sutapa, P. (2020). Efektivitas Pembelajaran Jarak Jauh Dengan Online Selama Pandemi Covid-19 Mata Pelajaran Pendidikan Jasmani Olahraga Dan Kesehatan. In Seminar Nasional Olahraga Vol 2 No 1.

11) Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta.

12) Sukiman. (2013). Pengembangan: Alfabeta.

13) Susilana Rudi, Riyana Cepi. (2011). Media Pembelajaran. Bandung: CV Wacana.

14) Syarifudin, A., S. (2020). Implementasi pembelajaran Online guna meningkatkan mutu pendidikan sebagai dampak diterapkannya social distancing. Jurnal Pendidikan Bahasa dan Sastra Indonesia, 5(1), 31-34.

15) Yaumi, Muhammad. (2018). Media & Teknologi   Pembelajaran. Jakarta: Prenadamedia.

Implementation of Preventive Maintenance Management on Multiline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Dede Roni[1], Atika Dwi Arsanti[2], Elaeys Mulia Bulqis[3], Revryand Alfaridzi[4], Tri Ngudi Wiyatno[5]

[1,2,3,4,5]Industrial Engineering Study Program, Faculty of Engineering Pelita Bangsa University

ABSTRACT: PT. Yili Indonesia Diary is a manufacturing company that produces ice cream under the Joyday brand. The problem that occurs is that there are packaging defects resulting from the packaging machine, namely Multiline Wrapping. Maintenance management is interpreted as an appropriate strategy to manage when maintenance must be carried out on machines. Therefore, the production process in the factory will not be hampered as long as the machine runs smoothly. Preventative maintenance needs to be carried out as the first step so that the machine is always ready to use and can avoid significant damage. The aim of this research is to analyze the implementation of preventive maintenance management on Multiline Wrapping machines. Qualitative research methods were adopted in this research and data were collected through observation, documentation and literature study. The research results explain that the machine maintenance strategy, especially for Multiline Wrapping machines at PT Yili Indonesia Diary, includes, among other things, Preventive Maintenance, Machine Repair, Replacement, and Opportunity Maintenance. Machine maintenance is very important because it can speed up the production process.

KEYWORDS: Maintenance Management, Preventive Maintenance, Smooth Production Process

I. INTRODUCTION

Manufacturing companies are a source of production and provide products that every consumer needs. Therefore, the production results of a company must be of high quality and can also adopt sophisticated machine technology. To produce quality products, industrial companies have to spend a lot of money to buy machines because technology is increasingly developing(Maryulina, 2010). The use of production machines must be optimized because they are one of the production factors. During the production process, the machines used must be in prime condition.

The goods and services produced will be of high quality if they are supported by machines and equipment that are in good condition. For a company, regular care or maintenance on production machines is a strategy in preparing machines/equipment so that they are maintained and remain sustainable.(Putra et al., 2020). Care (maintenance) that is carried out well can of course maintain production consistency, of course the company can achieve its targets according to production capacity. So that the machine can operate optimally, to guarantee this, a maintenance or maintenance system is needed on the machine.

Each machine has different characteristics, specifications and functions, therefore the maintenance requirements are also different. Most machines or equipment are required to stop operating, making it easier for maintenance work to run smoothly and produce good results. Of course, determining when or how long a machine will stop operating is also not easy, because each machine has a different level of difficulty.

Machines are tools that are useful in carrying out production activities to produce a product(Lubis, 2021).Whether the production process runs smoothly or not can be determined from the machine used. Because machines are one of the important organs for a company's existence, that is why maintenance is something that should not be missed. Machine maintenance management is interpreted as the right strategy for managing and knowing when a machine needs maintenance. To create quality

and competitive products, industrial maintenance management is carried out as a method of regulating activities to maintain production continuity(Kurniawan, 2013).

The key to ensuring that the machines/equipment used in the production process always perform at their best is maintenance that is always carried out regularly and in a planned manner(Lestari, 2022). In this way, the production process will not be disrupted and the machine work process in the factory will continue to run smoothly.

PT. Yili Indonesia Diary is a manufacturing company that produces ice cream under the Joyday brand. To create high quality ice cream products, PT. Yili Indonesia Dairy combines advanced technology, knowledge and hygienic processes in processing every ingredient used. There are many things you can learn more about the ice cream processing process, starting from preparing the raw materials to becoming a product that is ready to be distributed.

To be able to meet consumer needs, PT. Yili Indonesia Diary always tries to streamline its production process so that there is no waste in terms of time, costs or worker energy. In fact, there are still problems from various indications that make the production process ineffective and inefficient. One of the problems that occurs in the production process is that there are defects in the product packaging produced from the Multiline Wrapping machine, resulting in a defective product.

Figure 1.1 Defect Product from Multiline Wrapping Machine at PT. Yili Indonesia Diary

Source: PT. Yili Indonesia Diary, 2024

Based on the picture above, it can be seen that there are product defects resulting from the Multiline Wrapping machine components, the End Seal and Center Seal. In the packaging process, the End Seal and Center Seal are very important components because the End Seal has teeth which function to glue the two sides of the plastic packaging together with a heater or heat energy obtained from the machine, while the Center Seal functions to glue the two sides of the packaging in the middle.

The existence of defective products causes companies to experience losses in terms of time, requiring them to spend more on repairs, increasing production costs, so that targets are threatened with not being achieved. To minimize existing problems, steps are needed that can minimize problems that arise so that productivity can be significantly increased. In this case, Preventive Maintenance Management is used as an approach to overcome this problem.

In supporting care or maintenance in the course of the production process, PT. Yili Indonesia Diary implements maintenance activities on each machine to prevent damage, which is called Preventive Maintenance Management. So that the machines used for production can work optimally, maintenance on the machines supporting the production process must always be carried out regularly and in a planned manner.(Pardiyono & Hartanto, 2019). In this way, the production process will not be hampered because the performance of the machines in the factory runs smoothly.

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Referring to the background presentation, the problem formulation that can be determined is how to implement preventive maintenance management on the Multiline Wrapping machine at PT Yili Indonesia Diary so that it is always in a ready-to-use condition to expedite the production process. So this research aims to determine the optimization of the implementation of preventive maintenance management on the Multiline Wrapping machine at PT Yili Indonesia Diary in streamlining the production process. Thus, it can be understood that conducting this research aims to find out the answer to the problem formulation.

II.   THEORETICAL FOUNDATION
A.   Care Management

The development of machine maintenance started from Preventive Maintenance until it developed into Productive Maintenance. The first to use these two maintenance methods were manufacturing industries in the United States which placed all their activities in one department, namely the maintenance department.

Industrial maintenance management is a step in managing activities to maintain production in a sustainable manner which will create quality products that are competitive with maintenance of industrial machines and facilities.(Kurniawan, 2013).

Maintenance management can be defined as all management activities used to determine goals or priorities, maintenance, strategies and responsibilities(Pranowo, 2019).

Based on several definitions, maintenance management is interpreted as a step or method to produce goods or services through resource management by both companies and organizations by utilizing management functions, namely planning, operating, monitoring and improving operational processes. The broad scope of maintenance management covering manufacturing and services creates ideas about how to optimize input-production-output, or input-transformation-output, by utilizing the company's or organization's own resources.

B.   Care Management Goals

In general, the focus of the maintenance process is aimed at preventing or avoiding damage to machines or equipment by ensuring the level of skill and readiness of technicians and minimizing maintenance costs.(Putra et al., 2020). The following are the main goals of treatment:

a) Fulfillment of production targets is in line with plans due to production capabilities.
b) Production process activities are not disturbed, thereby creating high quality products.
c) Maintenance activities are carried out effectively and efficiently in order to keep maintenance costs low.
d) Limiting usage and storage and maintaining capital invested in the company in line with company policy for the specified time.
e) Increasing return of investment or profits which is the company's goal as best as possible and lowest total costs through the establishment of good cooperation between the main functions.

C.   Types of Treatment

a)   Planned Maintenance (Planned Maintenance)

Planned maintenance is maintenance that has been planned and determined in advance which is carried out in an organized manner with control, recording and thinking into the future. Therefore, the implementation of the maintenance program must be dynamic and requires active supervision and control from the maintenance department through information from machine/equipment historical records.

- Preventive maintenance (Preventive maintenance)

Preventive maintenance is maintenance or maintenance activities to prevent sudden damage from appearing and also to identify conditions or conditions that could result in production machines/equipment being damaged when used during the production process.

That way, production machines/equipment will be ready to use and ensure smooth operation during operations or production processes when all production facilities implement preventive maintenance.(Nasution et al., 2021). Therefore, it is possible to establish appropriate plans and schedules for more planned and careful maintenance and production activities.

- Corrective Maintenance (Corrective maintenance)

Repair maintenance is a maintenance activity that is carried out after a disturbance or damage occurs so that the machine/equipment is not working optimally.

- Predictive maintenance

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Predictive maintenance is a maintenance activity carried out at the time the date is determined after going through predictions of analysis results and evaluation of operational data taken to carry out predictive maintenance, this can be in the form of vibration, vibration, flow rate, temperature and others. Carrying out predictive maintenance refers to submitting data from the field via work orders to the maintenance department to carry out actions carefully and of course without harming the company.

b)   Unplanned Maintenance (Unplanned Maintenance)

Unplanned maintenance can also be called emergency maintenance in the form of breakdown / emergency maintenance. Breakdown/emergency maintenance is a reactive activity on machines/equipment that can still operate, until the machine/equipment is damaged and can no longer function. It is hoped that by carrying out this unplanned maintenance, it can extend the useful life and minimize the level of damage to production machines/equipment.

c)   Independent Maintenance (Autonomous Maintenance)

Independent maintenance is maintenance or maintenance activities carried out by operators or technicians themselves effectively and efficiently so that machines/equipment can increase productivity.

III.   RESEARCH METHODOLOGY

Qualitative research methods were adopted in this research. Qualitative research methods are data produced from research that is more related to the interpretation of data or facts found in the field and the presentation of the data is not in numerical form.(Sugiyono, 2015). This research is written using a case study after determining the writing topic specified in the problem formulation, before searching and collecting the necessary data.

The research was carried out at PT. Yili Indonesia Diary located in Bekasi Regency, West Java. The study focuses on the Multiline Wrapping machine maintenance process implemented in the company. Data was collected using direct observation techniques at PT. Yili Indonesia Diary, then supported by relevant sources in the form of books, journals, articles, results of previous research published on the internet.

IV.   RESEARCH RESULTS AND DISCUSSION

To keep the machine in good condition, efforts are needed to adopt an approach, one of which is Management Preventive Maintenance. Large-scale companies which in their production processes use large machines with all their functions generally use this approach. Preventive Maintenance Management would be best carried out on a scheduled and routine basis, to check whether the machine is in prime condition or not. This also functions as an anticipatory step if unexpected damage occurs so that it can be resolved immediately and of course the machine's useful life will last longer.

PT. Yili Indonesia Dairy is a subsidiary of the Yili Group which produces processed milk originating from China and is one of the largest in Asia. This ice cream factory located in West Java is capable of producing up to hundreds of tons of Joyday ice cream with various variants a day, of course the machines and equipment used in the production process are heavy machines. For example, Tipping Station Machine, Silo Powder Machine, Blanding Tank, Multiline Wrapping Machine and many other machines. A good maintenance system needs to be implemented to ensure that the machine can run well and optimally. The system implemented at PT. Yili Indonesia is Preventive Maintenance.

A.   Multiline Wrapping Machine Maintenance Strategy at PT Yili Indonesia Diary

Maintenance or upkeep of the Multiline Wrapping machine is carried out after every use, namely by means of visual inspection, at intervals for each shift/periodic task. Visual inspection is carried out when the system is operating. All forms of disturbance/damage are contained in the report which will be followed up for maintenance and repair. Carrying out maintenance maintenance and performance checks to cleaning machines/equipment usually requires free time which is carried out on a daily, weekly to monthly basis.

The following is a preventive maintenance management strategy carried out at PT Yili Indonesia Diary:

Figure 4.1 Maintenance Management Process Flow

Step 1 Preventive Maintenance (Preventive Maintenance)	→	Step 2 Machine Repair (Repairing)
Step 4 Opportunity Maintenance	←	Step 3 Replacement
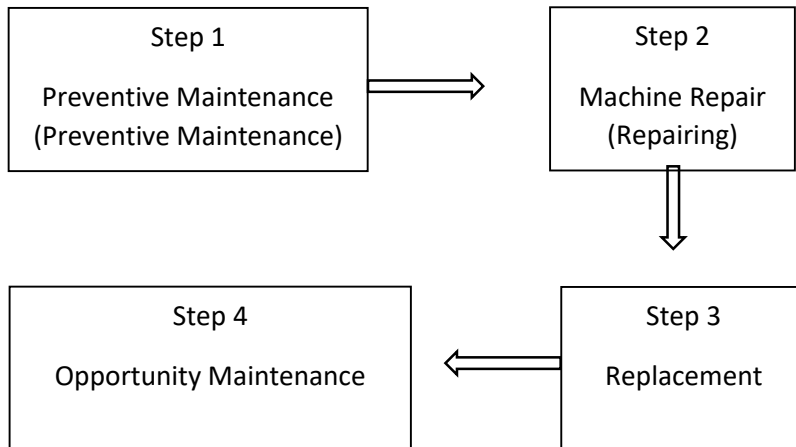
Step 1 Preventive Maintenance, the first step is carried out repeatedly based on the schedule set by the company. If a minor problem occurs, maintenance can be done by giving or adding lubricant/oil to the machine (lubrication). Lubrication functions to prevent friction and wear, of course the engine will always be in good condition.

One of the steps or efforts so that preventive maintenance can be carried out well, the company must create a programmed and coordinated preventive maintenance schedule. It is important to do this to prevent sudden damage and maintain work quality in line with what has been planned. The preventive maintenance schedule is determined based on the working hours of the Multiline Wrapping machine. The purpose of this activity is to maintain safety and sensitive components so that they are not damaged when they are in peak condition.

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Table 4.1 PT Yili Indonesia Diary Maintenance Schedule in the Maintenance Section

Equipment Name	Area	Point Inspection	Check Item	Cycle	
Multyline Wrapping Machine	Molding	output device	Apakah rantai jaringan sabuk konveyor outlet bergetar, dan apakah ada suara abnormal	Setiap minggu	Plan
					Actual
			Apakah ada kebisingan abnormal dalam pengoperasian sabuk konveyor pemotong, dan apakah	Setiap minggu	Plan
					Actual
		End Seal	Apakah sekrup pemasangan kursi pisau atas longgar dan disegel, apakah resistansi tabung pemanas	Setiap Bulan	Plan
					Actual
			Tidak ada gerakan lamban dari kursi pisau atas dan silinder pemotong, dan apakah ada	Setiap minggu	Plan
					Actual
		Up Liner	Apakah gerakan silinder dial kiri dan kanan konsisten, dan dudukan dial tidak goyang	Setiap shift	Plan
					Actual
		Center Seal	Apakah garis Center Seal jelas dan apakah ada Seal yang longgar	Setiap minggu	Plan
					Actual
			Apakah ada kebocoran udara di silinder dan pipa udara penyegelan panas penyegelan	Setiap minggu	Plan
					Actual
		Drive System	Periksa motor penggerak dan peredam setiap stasiun untuk kebocoran oli	Setiap Bulan	Plan
					Actual
		Distribution Cabinet	Apakah exhaust fan berfungsi dengan baik?	Setiap bulan	Plan
					Actual
			Apakah exhaust fan bocor bersih?	Setiap bulan	Plan
					Actual
			Apakah kipas knalpot dari setiap pengontrol servo berjalan normal	Setiap bulan	Plan
					Actual

Source: PT. Yili Indonesia Diary, 2024

Based on the table above, the following is the maintenance schedule that must be carried out by care/maintenance employees. The parts that must be checked, such as the Output Device, End Seal, Up Liner, Center Seal, Drive System and Distribution Cabinet, have been implemented as they should. The mechanic has checked according to a predetermined schedule, either daily, weekly or monthly. Here it can be seen that if the mechanic does not carry out maintenance, it can increase engine damage to other parts.

Step 2 Repairing (machine repair), the second step after preventative maintenance is carried out, namely continuing with engine repairs. Repair is interpreted as an effort to repair several parts of the machine that are experiencing problems. Repairs can be made at different points during the failure. In this case, technicians noticed that the Multiline Wrapping machine was experiencing downtime. At this point, the component that is experiencing the problem is checked and analyzed to see whether the component can be repaired, adding grease and oil (lubrication) without replacing the component. Or when the component experiences damage that really cannot be repaired, then proceed with the replacement stage of the problematic engine component.

Step 3 Replacement: In the third step, what is done is to replace components or equipment that are damaged or no longer suitable for use. The following is data on Multiline Wrapping machine components that are being replaced at PT Yili Indonesia Diary.

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Table 4.2 Multiline Wrapping Machine Components that Perform Replacement

Mesin	Sub-mesin	Unit fungsional	Bagian	Jumlah unit	Perawatan mingguan	Jumlah/tahun	Jenis perawatan
Multyline Wrapping Machine	End seal	End seal	Cutter silinder	9	1500	4	Penggantian
			Dies silinder	18	6000	1	Penggantian
			Bushings	18	3000	2	Penggantian
			Selang pemanas	36	12000	1	Penggantian
			Heating Element	36	12000	1	Penggantian
			Sensor suhu	11	12000	1	Penggantian
			Plug, Quick-lock 50V	9	12000	1	Penggantian
			Cutter	9	750	8	Penggantian
			Straight fitting	18	6000	1	Penggantian
			Air fittings	18	6000	1	Penggantian
			Valve Block	1	12000	1	Penggantian
Multyline Wrapping Machine	Center seal	Center seal	Collector ring	18	12000	1	Penggantian
			Pressure spring	36	12000	1	Penggantian
			Pipa Pemanas	18	12000	1	Penggantian
			Temperature Suhu	9	12000	1	Penggantian
			Air fitting	9	6000	1	Penggantian
			Sealing wheel piston	9	6000	1	Penggantian
			Drive wheel piston	9	6000	1	Penggantian
			Bearing	36	12000	1	Penggantian
			Bearing	36	12000	1	Penggantian

Source: PT. Yili Indonesia Diary, 2024

Based on the table above, the following are several components that require replacement in the End Seal and Center Seal sections. This component is the part that directly causes product packaging to become defective. Component replacement is based on the number of hours the engine has been running. To minimize downtime, replacement scheduling can be included in the weekly shutdown schedule. The following is the maintenance schedule for replacing Multiline Wrapping machine components at PT. Yili Indonesia Diary with the aim of making it easier to control the implementation of component replacement.

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

Table 4.3 Components that are replaced based on the length of working hours

No	Bagian	Perawatan mingguan (Jam Ke)	No	Bagian	Perawatan mingguan (Jam Ke)
1	Cutter silinder	1500	11	Valve Block	12000
2	Dies silinder	6000	12	Collector ring	12000
3	Bushings	3000	13	Pressure spring	12000
4	Selang pemanas	12000	14	Pipa Pemanas	12000
5	Heating Element	12000	15	Temperature Suhu	12000
6	Sensor suhu	12000	16	Air fitting	6000
7	Plug, Quick-lock 50V 10.0 A 插头，快锁 50V 10.0 A	12000	17	Sealing wheel piston	6000
8	Cutter	750	18	Drive wheel piston	6000
9	Straight fitting	6000	19	Bearing	12000
10	Air fittings	6000	20	Bearing	12000

Source: Data processed by researchers

Step 4 Opportunity Maintenance (Opportunity Maintenance), in the fourth step maintenance is carried out when the machine is in shutdown state. The purpose of opportunity maintenance is to utilize time and avoid idle/wasted time. At PT Yili Indonesia Diary, the simplest maintenance of opportunity maintenance is by cleaning, carrying out inspections on component parts which often cause product defects both by maintenance personnel and operators on production machines which is usually done every 2 days to ensure machine productivity. keeps running smoothly and the machine doesn't get damaged quickly.

B. The Importance of Machine Maintenance in a Smooth Production Process

In a company, the maintenance function is equal in importance to the production function. Maintenance management is defined as managing the maintenance of machines/equipment so that they remain ready for use. The production process is a method or method that uses machines/equipment in its activities, so that it can process input or input into output or output in the form of goods or services, which can finally be distributed to consumers according to their needs so that the company can take the expected profits.

Maintenance and smooth production should have a close relationship, because maintenance can ensure the smooth running of the production process. This means that when maintenance activities are carried out poorly, there will be disruption when the machine/equipment is used and the production process will be hampered. This is in line with research carried out by Habib Rolanda Putra (2020) which states that machine maintenance on the smoothness of the production process has a significant influence on the production process, this is because the number of machine down times is very high.

The negative thing for the company is when the machine experiences problems, such as disrupting the smooth production process, resulting in long production times so that there will be delays when the production results are distributed to consumers.

So, the relationship and link between maintenance and the smooth running of the production process is very close, meaning that if the machine/equipment used in the production process activities is damaged or not functioning then the ice cream production from PT. Yili Indonesia Diary cannot achieve the target, of course losses will be experienced by the company.

Implementation of Preventive Maintenance Management on Multyline Wrapping Machines to Squirt the Production Process at PT Yili Indonesia Diary

V.   CONCLUSION

Based on the presentation of research results and discussion, the following are the conclusions obtained:

1. Multiline Wrapping machine maintenance carried out at PT. Yili Indonesia Diary, namely the first stage is carried out with preventive maintenance, the second stage is carried out by replacing components when damage occurs and the second stage is carried out with opportunity maintenance.

2. The level of smoothness of the production process at PT. Yili Indonesia Diary experiences fluctuations, this can be seen from the company's target achievements which often experience damage to the packaging, resulting in defective products.

3. As for the maintenance of the Multiline Wrapping machine at PT. Yili Indonesia Diary aims to expedite the production process, basically so that the machine is always ready to use, minimizes damage to production activities and through maintenance can maintain the utility of the machine, of course it can minimize maintenance costs.

VI.   SUGGESTION

Based on the results of the explanation above, the author realizes that there are shortcomings and limitations in this research. However, it is hoped that this research will have a good impact on companies, especially in implementing preventive maintenance. Here are some suggestions from researchers:

1. Company

    For the companies that are the research sites, the researchers hope that this can be taken into consideration to better optimize the implementation of preventive maintenance.

2. Academic

    For academics, this research can be used for knowledge, reference or comparison for further research. For future researchers, the researchers hope to be able to deepen and expand in order to obtain new phenomena and knowledge related to the application of preventive maintenance management on production machines.

BIBLIOGRAPHY

1) Kurniawan, F. (2013). Industrial Maintenance Management. Beta Books: Yogyakarta.
2) Lestari, KI (2022). Evaluation of Heavy Equipment Maintenance Management at PT. United Tractors in Pekanbaru. Riau Islamic University.
3) Lubis, MFI (2021). Implementation of Preventive Maintenance on Production Machines to Increase Machine Reliability Using the Reability Centered Maintenance (RCM) Method. Indonesian Islamic University.
4) Maryulina, A. (2010). Analysis of Production Machine Maintenance at PT. Bangkinang P&P in Simalinyang Village. Sulthan Syarif Kasim Riau State Islamic University.
5) Nasution, M., Bukhori, A., & Novarika, W. (2021). Benefits of the Need for Maintenance Management for Workshops and Industries. Engineering Main Bulletin, 3814, 248–252.
6) Pardiyono, R., & Hartanto, T. (2019). Proposed Preventive Maintenance of Critical Components on High Pressure Pump Machines at Pt. Dian Swasetika Sentosa Using the Group Replacement Method. Infomatech, 21(2), 117–126. https://doi.org/10.23969/infomatek.v21i2.1985
7) Pranowo, ID (2019). Maintenance Systems and Management. CV Budi Utama.
8) Putra, ND, Saleh, HHM, & Asngadi, A. (2020). Analysis of Production Machine Maintenance at Pt. Haycarb Palu Mitra. Tadulako University Management Science Journal (JIMUT), 5(1), 61–68. https://doi.org/10.22487/jimut.v5i1.139
9) Sugiyono. (2015). Quantitative, Qualitative and R&D Research Methods (22nd ed.). Alphabet.

Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center

Minangoao P. Imam[1], Jalal P. Samsodin[2]

[1,2]Mindanao State University – Lanao National College of Arts and Trades, Marawi City, Philippines

ABSTRACT: The study aimed to investigate the influence of using Facebook application on the study habits of selected fifty (50) Grade 7 learners in Mindanao State University- University Training Center, school year 2021-2022. The study adapted descriptive research design using survey-questionnaire to help researchers gain relevant information quickly and effectively. The instrument has two (2) parts: part one, the personal profile of the respondents, such are: age, gender, parents' occupation and parents' monthly income and part two, the perceptions on the influence of using Facebook application on the learners' study habits. The instrument has twenty-two (22) items, and the respondents was given choices to answer using a 4-point Likert scales such Strongly Disagree=4, Disagree = 3, Agree = (2) Strongly Agree = 1.

The gathered data result was treated using the statistical tools such are: frequency, percentage, mean and standard deviation using a Statistical Product and Service Solutions SPSS) software. The statistical tools used are vital that enabling researchers to gain meaningful insights and interpret the results adequately. Moreover, based on the findings of the study, the demographic profile of the respondents revealed that 52% of the respondents were belonged to the age bracket of 12 to 15 years old, 72% were female. Additionally, many or 36% of the respondents' mothers' occupation were engaged in business, likewise 44% of the respondents' fathers' occupation were engaged in small businesses too. Moreover, on the respondents' parents' monthly income 54% of them assessed that around Php 5,001.00 to 10,000.00 as their parents' monthly income, and 72 % had one to two Facebook accounts registered and 72% answered that they spent three to five hours using Facebook application.

Meanwhile, the results also manifest that frequent used of Facebook application affects learners' study habit. The data showed average weighted mean is 2.568 and descriptively defined as "agree", this connotes that respondents use Facebook application for fun and popularity. This signified that the use of Facebook app affected the study habits of the learners. Thus, the major implication derived from the higher addiction to Facebook, where the study habit become poor and academic achievement reduced resulting to lower grades. It is highly recommended that to the learners to use Facebook as a tool for studying rather than using it unnecessarily. Likewise, the Facebook addiction resulted to learner-respondents' lower academic performance. Anent to this, the parents should set rules in using online applications.

KEYWORDS: Facebook addiction, study habits, academic performance, perceptions, influence

I. INTRODUCTION

The fast changing of technologies had immense impact on students' academic performance and behaviors. Learners are very interactive in digital resources to online learning platforms. Surprisingly, learners in turn, have benefited from increased access to information, personalized learning experiences, and opportunities for collaboration like the use of online applications, one of these is the Facebook application. Facebook is a well-received social networking site for learners which allows them to registered to create profiles, upload photos and videos and sending messages to be able to keep in touch with classmates, family and peers. The application was created by Mark Zuckerberg on 2004. This site is intended to give power to build community and bring the world close together. Learners now take their part in engaging online activities through Facebook. This application has made communicating more easily for teachers and learners especially during the Covid-19 Pandemic.

The impact of Facebook can either be good or bad in every learner into their academic activities. Even though a closer look on the real influence of Facebook reveals that it leads to several problems among the university students' academic

Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center

performances. The over use of Facebook maybe affecting the future and academic carrier of every student, but in spite of, spending time on Facebook also has a positive effect on their academic performance. Facebook application use by learners has specific pros and cons. particularly, the excessive use of online social media may contribute to misuse, dependence, and addictive behaviors. This case, it motivated the researchers to conduct an investigation on the significance usage of Facebook in every learner onto their academic success with the help of a survey conducted to gather data.

Furthermore, the study also used Gratification theory, Technological Determinism Theory and Concept Theory. These theories provide explanation to establish the relationship among the attributes, variables or data of the study. Moreover, the researchers were keen to inquire into the significance usage of Facebook for the grade 7 learners at Mindanao State University- University Training Center.

II.   METHODOLOGY

This study applied descriptive research design. The design was used to provide a detailed and accurate picture of the characteristics and behaviors of the particular subject of the study. Due to the time constraints, the researchers used survey-questionnaire as primary tool of the study and it is believed to be fast, efficient and inexpensive means of gathering information and very effective for measuring the respondents' behavior, preferences, intentions and attitudes towards the use of Facebook applications.

The study was conducted to selected fifty (50) grade 7 learners of Mindanao State University- University Training Center through random sampling procedure. This method is used to ensure that different segments in a population of the respondents are equally represented the opinions of students from each department. The researchers used a self-constructed questionnaire, which was evaluated by experts before its distribution. The instrument has two (2) parts: part one, the personal profile of the respondents and part two, the learners' perceptions on the influence of Facebook on their study habits.

In the process of data collection, as soon as the researchers gets approval to gather data, the researchers approached each of the respondents who met the criteria set in this study and asked if they are willing to participate and upon their approval right away, the questionnaire had been distributed. To block ambiguity which the respondents encounter in answering the questionnaires, the researchers explained clearly the instructions in order for them to give appropriate answers to the situations used in the instrument. After the retrieval of the instruments, the questionnaires were compiled; sorted and classified after that it was tabulated. Moreover, frequency, percentage, mean and standard deviation was used as the statistical tools of the study. The data were treated through Statistical Product and Service Solutions (SPSS) software using the 0.05 level of significance.

III.   RESULTS AND DISCUSSION

This section presents the results of the gathered data and its interpretation. A total of 50 learner-respondents of the study were surveyed as shown on Table I, this presents their age range. The results amazingly revealed that twenty-six or 52% of the respondents aged from 12 to 15 years old. This implied that the respondents met the standard age of grade 7 learners. The results also exposed that three (3) from the respondents aged 18 to 21 years old. This implied that these learners delayed enrolled in school and often dropped and return in school.

Table I. Age Range

Age Range	Frequency	Percentage	Rank
12-15 years old	26	52%	1st
15-18 years old	21	42%	2nd
18-21 years old	3	6%	3rd
Total	50	100%	

The Table II disclosed that majority of the learner-respondents were female with thirty-six or 72%; males are only fourteen or 28%. Nowadays, the ratio females over males is high. In relation to the study, according to Sheldon (2008) revealed that women were more likely to go to Facebook to maintain existing relationships, pass time, and be entertained whereas men were more likely to go to Facebook to develop new relationships or meet new people. The study confirmed that female learners have high interest using Facebook than male. The study disclosed that female learners using social networking site for getting information and remaining attached with their friends.

Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center

Table II. Gender

Gender	Frequency	Percentage	Rank
Female	36	72%	1st
Male	14	28%	2nd
Total	50	100%	

On learners-respondents' parents' occupation, the table 3 disclosed that 34% of the mother's engaged in business as source of income and 34% were housewives.

Table III. Frequency and Percentage Distribution on Mothers' Occupation

Mother's Occupation	Frequency	Percentage	Rank
Government Employee	12	24%	3rd
Business	18	36%	1st
Housewife	17	34%	2nd
Other Occupation	3	6%	4th
Total	50	100%	

Moreover, the Table IV brings out that majority of respondents' fathers' occupation is engaged in business with a percentage of 44% and the indicator other occupation got the lowest rank and percentage. Surprisingly, the results revealed that it is the same the majority of the mothers' occupation were engaged in business to. It is important to note that the parents of all respondents earned the minimum income per day. The school itself is a public school were tuition fees is free. The results implied that parents' occupation is affecting the quality education of the respondents.

On top of that, admittedly, financial support is the premier concern for the respondents' education. The results unwrapped on Table V, that respondents are limited into financial support. It is exposed that at least 54% of the parents' monthly income were Php 6,000.00 to 10,000.00 which ranked 1. Obviously, since majority of the parents engaged in business, this proved that the family of respondents had minimum daily profits.

Table IV. Frequency and Percentage Distribution of the Respondents' Father's Occupation

Father's Occupation	Frequency	Percentage	Rank
Government Employee	9	18%	3rd
Business	22	44%	1st
Farmer	15	30%	2nd
Other Occupation	4	8%	4th
Total	50	100%	

Therefore, they cannot send their children into private schools or advanced schools because of the tuition fees. In relation to the respondents used of Facebook applications, it brings out that respondents addicted in this apps were demanding unto parents' financial support because they spent more money in connection with data or paying bills for the internet connection and their academic performance is also inconstant.

Table V. Frequency and Percentage Distribution of the Respondents' Parents' monthly Income

Father's Income	Frequency	Percentage	Rank
Less than 5,000	11	22%	2nd
P 5,001-10,000	27	54%	1st
P 10, 001- P 15,000	9	18%	3rd
Others (please specify)	3	6%	4th
Total	50	100%	

Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center

On problem number two, the perceptions on the influence of using Facebook application on the learners' study habits. Table 6 unfold the number of Facebook accounts of respondents. The data shown that 48% of the respondents had one or two account and 30% had 2 to 3 accounts. This exposed that respondents are addicted to Facebook application. Therefore, their study habits were declining. According to Zayed A. (2022) that the effects of Facebook addiction are exhibited in the social, mental, and physical well-being of an individual which leads to various problems with relationships, decrease productivity at work or school, and worsening of underlying and mental issue.

Regarding the respondents' number of hours' access on Facebook, the Table VII revealed that Respondents' number of hours' access to Facebook, 72% spent 3 to 5 hours everyday which also ranked 1. The results implied that the respondents are Facebook addicted. It is noted that social media addiction is a behavioral addiction that cause of poor study habits and lower their academic achievements and disturbance of daily routine activities.

Table VI. Frequency and Percentage Distribution of the Respondents' Registered Facebook account

Registered Facebook account	Frequency	Percentage	Rank
1-2 Accounts registered	24	48%	1st
2-3 Accounts registered	15	30%	2nd
3-5 Accounts registered	10	20%	3rd
Total	35	100%	

Table VII. Frequency and Percentage Distribution of the Respondents' number of hours' access to Facebook

Number of hour access to Facebook	Frequency	Percentage	Rank
3-5 hours	36	72.0	1st
5- 8 ours	9	18.0	2nd
8-10 hours	3	6.0	3rd
Over a day	2	4.0	4th
Total	35	100%	

The Table VIII manifest that frequent used of Facebook application affects learners' study habit. The data showed average weighted mean is 2.568 and descriptively defined as "agree", this connotes that respondents use Facebook application for fun and popularity. Moreover, using Facebook has significantly affecting the study habits of the learners-respondents, leading to poorer academic achievement and lower grades. The more learners spend on Facebook, the lower their grades tend to be. Indicators number 6, "because of using Facebook app, I cannot be able to finish my homework in school", number 7, "I am using Facebook while in the classroom", number 9, "I am using Facebook to entertain myself alone while the teacher is not around", agreed by the respondents. This further implied that truly using Facebook without proper guidance can disturb the learners' academic performance.

Likewise, table 9 demonstrated that respondents' academic performance truly affected by Facebook addiction. As the data showed that respondents perceived the indicators as "agree", such are: "sometimes I am more interested in reading Facebook than the lesson in class", "the time I spend on Facebook takes away from studying or school work time", "sometimes I go on Facebook while I am in class", and "Facebook is now my recent most time-consuming hobby". This implied that respondents sacrifice school requirements by using Facebook most of the time. Meanwhile, indicator number 6 "If Facebook did not exist, I would get a lot more studying and school work done" perceived as "strongly agree", this proved that using Facebook greatly influence the academic performance of the learner-respondents negatively.

Influence of Facebook Use on the Study Habits of Selected Grade 7 Learners in Mindanao State University - University Training Center

VIII. Perceived Influence of Facebook on the Respondents' Study Habit

Statement	Mean	Standard Deviation	Interpretation
1. Facebook helps me to gain more knowledge in school activities.	2.40	0.629	Disagree
2. Facebook is like a habit to me in this age.	2.87	0.730	Agree
3. I am using Facebook for academic purposes.	3.11	0.681	Agree
4. I am using Facebook to contact my Family	3.63	5.586	Strongly Agree
5. I'm using Facebook to gain more information in school.	3.57	0.898	Disagree
6. Because of using Facebook app, I cannot be able to finish my homework in school.	1.71	1.098	Strongly Agree
7. I am using Facebook while in the classroom.	3.06	0.583	Agree
8. I am using Facebook while the teacher is discussing the lesson	2.22	5.586	Disagree
9. I am using Facebook to entertain myself alone while the teacher is not around.	2.83	0.834	Agree
10. Facebook can improve my reading skills.	2.63	1.217	Agree
Average Weighted Mean	2.568		Agree

Legend: 3.28-4.0 - Strongly Agree, 2.52-3.27 – Agree, 1.76-2.2.51-Disagree, 1.00-1.75 - Strongly Disagree

Table IX. Perceived Influence of Facebook on the Respondents' Academic Performance

Statement	Mean	Standard Deviation	Interpretation
1. Sometimes I go on Facebook while I am in class.	2.87	0.629	Agree
2. Facebook is now my recent most time-consuming hobby.	2.88	0.730	Agree
3. I lose track of time in class when I am on Facebook.	3.11	0.681	Agree
4. I am using Facebook while the teacher is discussing the lesson.	3.63	5.586	Strongly Agree

5. The time I spend on Facebook takes away from studying or school work time.	3.12	0.898	Agree
6. If Facebook did not exist, I would get a lot more studying and school work done.	3.37	1.098	Strongly Agree
7. I would be getting better grades if I spent less time on Facebook	1.77	0.583	Disagree
8. I am able to control my use of Facebook so that it does not interfere with studying or doing school work.	1.66	5.586	Strongly Disagree
9. I gain unnecessary information in using Facebook.	2.44	0.834	Disagree
10. Sometimes I am more interested in reading Facebook than the lesson in class.	2.51	1.217	Agree
Average Weighted Mean	2.588		Agree

Legend: 3.28-4.0 - Strongly Agree, 2.52-3.27 – Agree, 1.76-2.2.51-Disagree, 1.00-1.75 - Strongly Disagree

CONCLUSION

The gathered data signified that the use of Facebook app affected the study habits of the learners. Thus, the major implication derived is that the higher addiction to Facebook, the study habit become poor and academic achievement reduced resulting to lower grades. The learners may become so obsessed on scrolling through posts and chatting online that they overlook the time. This practice can hurt learner-respondents' mental health and negatively impact their focus and study habits. Persistent obstruction from Facebook is a major reason for lower grades and lessen academic achievement. Surprisingly, Facebook can improve the performance of the learner-respondents while at the same time it may impede their learning process as well.

With the data presented, tabulated, interpreted and formulated implications, the researchers manifest that the unlimited use of Facebook greatly affect the academic performance of the learners-respondents, thus is it required parents' constant check-up and observations on their children academic performance and set rules whenever they give technological gadgets for their children.

REFERENCES

1) Farrow, H. and Yuan, YC (2011). Building stronger ties with alumi Through Facebook to Increase Volunteerism andCharitable Giving. academic.oup.com
2) Gracia-Ibanez, V. and Vergara, M. (2016). Applying action research in CAD teaching to improve the learning experience and academic level.InternationalJournal.Springeropen.com
3) Haq, A.C., S. Ul (2012). Pattern of Facebook Usage and its impact on Academic Performance of University Students: A Gender Based Comparison. Bulletin of Education and Research, vol. 34, no. 2, pp. 19-28.
4) Nguyen, T. (2015). The Effectiveness of Online Learning: Beyond No Significant Difference and Future Horizons. semanticscholar.org.
5) Zayed, Ahmed (2022). Facebook addiction symptoms, causes, and effects. iamondrehabthailand.com

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

Hassan Elsan Mansaray[1], Victor Tamba Simbay Kabba[2], Hebert Borboh Kandeh[3], Abdulai Sillah[4]

[1]Department of Human Resource and Management, Institute of Public Administration and Management (IPAM), University of Sierra Leone.

[2,3]Institute of Geography and Development Studies, School of Environmental Sciences, Njala University

[4]Institute of Geography and Development Studies, School of Environmental Sciences, Njala University; Bank of Sierra Leone

ABSTRACT: The study used the RIAM technique to evaluate environmental sustainability using an environmental impact assessment through nine sessions of focus group discussions in the affected mining communities. The system's methodology involves assigning scores to impact component issues based on predetermined criteria, which are then transferred into arrangements that indicate the extent of positive or negative effects. The RIAM analysis reveals that kimberlite diamond mining has predominant negative environmental impacts across all three communities, A, B, and C. However, certain social and economic components reflected positive changes. Nevertheless, the positive impacts on those three communities are just about the same. From the total scores summary for the three communities, it is obvious that the kimberlite mining in the affected communities have negative effects than the positive effects. Based on these findings, recommendations were made for improvement.

KEYWORDS: RIAM, Mining, Environment, Socioeconomic, Communities,

1.0 INTRODUCTION

From considering pollution assessment to including a wider range of ecological evaluation, environmental impact assessment (EIA) has evolved to become a "holistic" EIA. The extractive industries are mostly to blame for land degradation, waste management, deforestation, and the spread of chemicals in rivers and streams, which lowers the quality of the water that humans drank. Human Rights Watch stated in 2014 that mining activities were the cause of the deteriorating environmental and social problems in mining communities, including concentrated land loss, negative effects on community displacement, as well as health and safety difficulties. Mineral extraction has long been connected to widespread deforestation, degraded soil, and environmental contamination in the local communities in Tankoro chiefdom. In addition to the pervasive environmental disruption, lost agricultural land, inadequate water accessibility, and deforestation (Awudi (2002); NACE 2009; NMJD 2010; Human Rights Watch 2014). This situation is what Vanclay (2017) refers to as 'mining-induced displacement', which involves the unplanned migration of impacted persons from their original housing and/or socioeconomic activities. Walser (2000 and Iimi 2007) mentioned the positive and negative impacts of mining in developing nations like Sierra Leone. When they earlier observed that mining has made a constructive impact on the economy of many countries and, can be measured in relation to employment and income generation. But also perceived that these socioeconomic benefits do not manifest at the community level directly. This research therefore takes a look at the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone using The Rapid Impact Assessment Matrix Method. Specifically, it attempts to address the following objectives: (i) to identify the specific economic indicators that have changed in the local communities in Tankoro chiefdom since the inception of Koidu Holdings' mining activities (ii) to evaluate the most significant environmental impacts resulting from Koidu Holdings' mining activities in the selected communities; and (iii) to analyse the social impacts ensuing from the mining investments in the selected mining communities.

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

2.0 MATERIALS AND METHODS

Case Study

Koidu Holdings is a diamond mining company operating in Sierra Leone. It is wholly owned by BSG Resources Limited through its subsidiary BSGR Diamonds Limited. BSG Diamonds was renamed OCTÉA Ltd to reflect and honour the remarkable quality of the plentiful octahedral diamonds' typical of the diamond deposits in Sierra Leone. Koidu Holdings was the first commercial diamond mining company in 2003, to invest in the development of the resource sector in Sierra Leone, focused primarily on the kimberlite deposits at the local communities in Koidu City in Tankoro chiefdom Koidu. Koidu Holdings is still mining the kimberlite diamonds around Kanniya Resettlement, Koakoyima and Sahr Quee Town (Kolver 2012; Koidu Holdings 2019).

Figure 1: **Map displaying study area in Tankoro Chiefdom-**
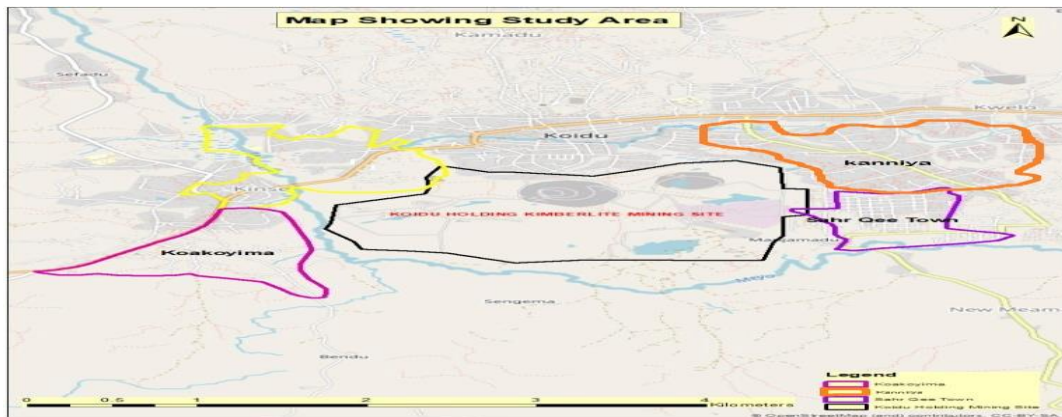
Statistics Sierra Leone (2022)

Koidu Holdings Kimberlite diamond mining site (Mining Magazine 2022)

METHOD

The study used the RIAM method to evaluate environmental sustainability using an environmental impact assessment through nine sessions of focus group discussions in the affected mining communities. Primary informants, representing Traditional Elders and Youths, engaged in structured interviews, providing detailed responses that illuminated the realities of the situation. Assistance from community members in recruiting group participants was crucial in setting the context for the study and preventing misconceptions that could bias future interactions with researchers. Due to the politicized nature of the study communities, recording devices were not permitted, and note-taking was advised. Responses during the focus group discussions were deliberated and agreed upon among members, ensuring accuracy and mitigating extreme or incorrect viewpoints. This process also validated the responses' authenticity (Patton 2002). The study aimed to understand the expectations of the residents of Kanniya Resettlement, Koakoyima, and Sahr Quee Town for employment opportunities, community development, and compensation from the mining activities in Tankoro chiefdom.

The methodology involves assigning scores to impact component issues based on predetermined criteria, which are then transferred into arrangements that indicate the extent of positive or negative effects. The abstract and intangible effects could be measured on a specified scale and the cumulative impacts could be logically contrasted with the use of the RIAM tool. Using the

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

established criteria, a score is assigned to each environmental component after the impacts of project activities are compared to those of the components. This score indicates the expected impact of each component. The key assessment criteria are divided into two categories:

A. important criteria that, when taken alone, have the potential to alter the score; and

B. valuable criteria that, when taken together, have the potential to alter the score but are not important enough to do so.

Group A is made up of the total quotation system multiplied by the scores assigned to every criterion. The weight of each criterion directly intervenes thanks to the idea of multiplication. Additionally, **group B** is made up of the whole quotation system plus the marks assigned to every criterion. This makes sure that a mark would not have a significant impact on the final outcome when taken alone (Pastakia 1998).

A measure of the importance of the relevant condition **(A1)** is assessed based on the person's interest or the space boundaries that would be impacted. The following is the definition of the scale: **0** - Irrelevant/no importance; **1** - Important just to the local condition; **2** - Important to the areas immediately out of the local condition; **3** - Important to the regional/national interest; **4** - Important to the national/international interest. The magnitude **(A2)** is defined as the measure of the scale of benefit/damage of an impact or condition. The scale is defined in the following way: **+3** - Major positive benefit; **+2** - Significant improvement in the status quo; **+1** - Improvement in the status quo; 0 - No change/status quo; -1 - Negative change to the status quo; **-2** - Significant negative effect or change **-3** - Major negative effect or change. Permanence **(B1)**: **1**-No change/ not applicable; **2**-Temporary; **3**-Permanent; Reversibility **(B2):1**-No change/ not applicable; **2**- Reversible; **3**- Irreversible; Cumulative **(B3)**: **1**- No change/ not applicable; **2**-Non-cumulative; **3**- Cumulative. The final assessment score **ES** is calculated as follows (Pastakia & Jensen 1998):

$$(a1) \times (a2) = aT \qquad (1)$$
$$(b1) + (b2) + (b3) = bT \qquad (2)$$
$$(aT) \times (bT) = ES \qquad (3)$$

Where, the separate criteria scores (a1) and (a2) are significant to the condition (group A) and have the potential to independently alter the final score; (bl) to (b3) are the individual criteria scores that are of value to the situation (group B), but individually should not be capable of changing the score obtained;

aT is the result of multiplication of all (A) scores;

bT is the result of summation of all (B) scores; and

the condition's assessment score is ES.

According to the weights assigned to them, it is a method of quantifying the qualitative and abstract impacts. The ES scores are determined by the RIAM tool, which also fits each component within the proper range bands (Pastakia 1998).

3.0 RESULTS AND DISCUSSIONS

Local impact assessments were performed through focus group discussions involving selected participants from each community. These groups, comprising two Traditional Elders and four Youths, varied for each of the nine sessions, resulting in a total of 18 Traditional Elders and 36 Youths across all communities. They were selected for their deep knowledge of Koidu Holdings' mining operations. This selection process, aiming to capture a range of perspectives, was instrumental in gaining a balanced understanding of the community's views on mining impacts. The focus group discussions, each lasting about 90 minutes, were designed to elicit detailed insights into the communities' concerns, perceptions, and ideas. Topics discussed included employment priorities, community development initiatives, benefits from Surface Rent payments, management of Community and Agricultural Development Funds, environmental impacts of mining, and the specific nature of Koidu Holdings' operations. This method aligns with the principle of pertinency, selecting participants for their expertise in the subject matter (Burrows & Kendall 1997).

The sustainability of these communities was critically assessed, considering environmental, social, and economic factors. Using RIAM allowed for a comprehensive assessment of the impacts, both positive and negative, transforming qualitative analysis into a semi-quantitative format. This method followed Sundara Kumar et. al., (2013) in scoring impact components against predefined criteria and translating scores into ranges indicative of the impact's magnitude. The evaluation of each component was based on interviews and corroborated through focus group discussions, with RIAM analysis utilizing the gathered information. The assessment criteria, outlined in Table 1, provided a structured approach to score each component, considering factors like the importance of the condition (a1), magnitude of change/effect (a2), permanence (b1), reversibility (b2), and cumulative effects (b3).

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

Table 1. Assessment criteria

Criteria	Scale	Description
al: Importance of condition	4	Important to national/international interest
	3	Important to regional/national interests
	2	Important to areas immediately outside the local condition
	1	Important only to the local condition
	0	No importance
a2: Magnitude of change/effect	+3	Major positive benefit
	+2	Significant improvement in status quo
	+1	Improvement in status quo
	0	No change/status quo
	-1	Negative change in status quo
	-2	Significant negative disbenefit or change
	-3	Major disbenefit or change
bl: Permanence	1	No change/not applicable
	2	Temporary
	3	Permanent
b2: Reversibility	1	No change/not applicable
	2	Reversible
	3	Irreversible
b3: Cumulative	1	No change/not applicable
	2	Non-cumulative/single
	3	Cumulative/synergistic

Source: Pastakia & Jensen, 1998

In the current study, focus group and initial interviews with respondents from the three communities have yielded a wealth of qualitative and quantitative information. The information has been included in the thorough analysis of all potential impacts on the three mining communities that were impacted. Three main categories were the focus of the impact assessment study, and numerous components were found and are listed in the tables below. The many impacts of mining were thoroughly examined, assessed using the previously mentioned standards, and each component was assigned a score. It is the process of quantifying the abstract and qualitative impacts in accordance with the weights assigned to them. After the local assessments, the researcher then used his knowledge derived largely from reviewing the relevant literature, to assign NATIONAL and INTERNATIONAL values:

Table 2. Range bands used for RIAM

Environmental Score (ES)	Range Bands	Range Value	Description of range band
+72 to +108	E	5	Major positive change/impact
+36 to +71	D	4	Significant positive change/impact
+19 to +35	C	3	Moderate positive change/impact
+10 to +18	B	2	Positive change/impact
+1 to +9	A	1	Slight positive change/impact
0	N	0	No change/status quo/ not applicable
-1 to- 9	-A	-1	Slight negative change/impact
-10 to -18	-B	-2	Negative change/impact
-35 to -19	-C	-3	Moderate negative change/impact
-71 to -36	-D	-4	Significant negative change/impact
-108 to -72	-E	-5	Major negative change/impact

Source: Adapted from Pastakia and Jensen, 1998

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

To ensure transparency and clarity, detailed RIAM score tables (Tables 3 to 5) and corresponding graphical representations (Figures 1 to 3) are presented, depicting the cumulative impact across the three communities. Kimberlite mining will generally have a negative impact on environmental components. However, positive impacts can also be found on the social and economic components.

Each component's impact was quantitatively assessed using the RIAM tool, which incorporates semi-quantitative data to generate a comprehensive environmental score. For instance, the proper numerical values have been allocated to components from environmental effect segments such as "farmland damage and deforestation," as detailed below. Given the significance of "farmland damage and deforestation" to both national and international interests. As a result, condition A1 is assigned a value of 4 on both segments. The environment will be significantly impacted negatively by farmland destruction and deforestation, which is why the magnitude of change/effect A2 is assigned a value of -2. For communities A and B, the input value for B1 is provided as 3, given that the effects are permanent. Furthermore, because B2 is irreversible, the input value is set to 3. Since mining operations have a cumulative negative impact on "farmland damage and deforestation," 3 is assigned as the input value for B3. Like the farmland damage and deforestation segments, each component is given a numerical value based on its importance, magnitude, permanence, reversibility, and cumulative effect. The ES scores are determined by the RIAM tool, which also fits all the components in the proper range bands, as shown below. The histograms, which represent the RIAM's results, provide a brief and straightforward synopsis of the overall impacts of mining in the three communities.

Table 3. Input values and RIAM scores for Environmental Impact (EI) Components

	Environmental Impact	Community A: Kanniya Resettlement						Community B: Koakoyima						Community C: Sahr Quee Town					
1	Components	A1	A2	B1	B2	B3	**ES RB**	A1	A2	B1	B2	B3	**ES RB**	A1	A2	B1	B2	B3	**ES RB**
2	Support livelihood	2	1	3	3	3	**18 +B**	2	1	3	3	3	**18 +B**	2	2	3	3	3	**36 +D**
3	Supply pipe borne water	1	-1	2	2	2	**-6 -A**	1	1	2	2	2	**6 +A**	1	2	2	2	2	**12 +B**
4	Wells/streams/ rain water	2	2	2	2	2	**24 +C**	2	0	2	2	2	**0 N**	1	1	2	2	2	**6 +A**
5	Water contamination	1	-3	3	3	3	**-27 -C**	1	-2	3	3	3	**-18 -B**	1	-2	3	3	3	**-18 -B**
6	Flooding	1	1	3	3	2	**8 +A**	1	1	2	2	2	**6 +A**	1	-1	3	2	2	**-7 -A**
7	Farmland damage	4	-2	3	3	3	**-72 -E**	4	-2	3	3	3	**-72 -E**	4	-3	3	3	3	**-108 -E**
8	Deforestation	4	-2	3	3	3	**-72 -E**	4	-3	3	3	3	**-63 -D**	4	-1	3	3	3	**-36 -D**
9	Visual landscape destruction	3	-2	3	3	3	**-54 -D**	3	-3	3	3	3	**-81 -E**	3	-3	3	3	3	**-81 -E**
10	Health problems	1	-2	2	2	3	**-14 -B**	1	-3	2	2	3	**-21 -C**	1	-2	2	2	3	**-14 -B**
11	Taking land of their forefathers for mining activities	1	-1	3	3	3	**-9 -A**	1	-1	3	3	3	**-9 -A**	1	-2	3	3	3	**-18 -B**
12	Relocate community	1	-2	3	3	3	**-18 -B**	1	-1	3	3	3	**-9 -A**	1	-3	3	3	3	**-27 -C**
13	Deprivation of employment opportunities	1	-2	2	2	3	**-14 -B**	1	-1	2	2	3	**-7 -A**	1	-3	2	2	3	**-21 -C**

Table 4. Input values and RIAM scores for Social Impact (SI) Components

	Social Impact Components	Community A: Kanniya Resettlement						Community B: Koakoyima						Community C: Sahr Quee Town					
		A1	A2	B1	B2	B3	ES RB	A1	A2	B1	B2	B3	ES RB	A1	A2	B1	B2	B3	ES RB
1	Selling foodstuff, planting and animal husbandry	1	3	2	2	2	**18 +B**	1	1	2	2	2	**6 +A**	1	3	2	2	2	**18 +B**
2	Use water for drinking and washing	1	-2	3	3	3	**-18 -B**	1	-1	3	3	3	**-9 -A**	1	-1	3	3	3	**-9 -A**
3	Use wood for cooking	1	-3	3	3	2	**-24 -C**	1	-2	3	3	2	**-18 -B**	1	-2	3	3	2	**-18 -B**
4	Ride motorbikes	1	1	2	2	2	**6 +A**	1	1	2	2	2	**6 +A**	1	1	2	2	2	**6 +A**
5	Do petty trading/business/merchandise	1	1	2	2	2	**6 +A**	1	2	2	2	2	**12 +B**	1	3	2	2	2	**18 +B**
6	Work as contractors, building the resettlement homes	1	2	2	2	2	**12 +B**	1	2	2	2	2	**12 +B**	1	1	2	2	2	**6 +A**
7	Teaching in schools	1	3	3	3	3	**27 +C**	1	2	3	3	3	**18 +B**	1	3	3	3	3	**27 +C**
8	Work as civil/public servants in government ministries, departments, and Agencies; City council and district council	1	2	3	3	3	**18 +B**	1	1	3	3	3	**9 +A**	1	2	3	3	3	**18 +B**
9	Mining	1	1	2	2	2	**6 +A**	1	1	2	2	2	**6 +A**	1	1	2	2	2	**6 +A**
10	Running Tele Centre	1	1	2	2	2	**6 +A**	1	2	2	2	2	**12 +B**	1	1	2	2	2	**6+A**
11	Weaving	1	1	2	2	2	**6 +A**	1	1	2	2	2	**6 +A**	1	2	2	2	2	**12 +B**
12	Displacement of local community	1	-3	3	3	3	**-27 -C**	1	-2	3	3	3	**-18 -B**	1	-3	3	3	3	**-27 –C**
13	Destruction of their forest which disrupted	3	-3	3	3	3	**-81 -E**	3	-3	3	3	3	**-81 -E**	3	-2	3	3	3	**-54 -D**

	traditional practices																				
14	No mosque or church to worship	1	-2	2	2	2	**-12 -B**	1	-2	2	2	2	**-12 -B**	1	-2	2	2	2	**-12 -B**
15	Health concerns in the community	3	-1	2	2	3	**-21 -C**	3	-1	2	2	3	**-21 -C**	3	-1	2	2	3	**-21 -C**

Table 5. Input values and RIAM scores for Economic Impact (ECI) Components

	Economic Impact	Community A: Kanniya Resettlement						Community B: Koakoyima						Community C: Sahr Quee Town					
	Components	A1	A2	B1	B2	B3	ES RB	A1	A2	B1	B2	B3	ES RB	A1	A2	B1	B2	B3	ES RB
1	Sales of goods and services	1	2	3	3	3	**18 +B**	1	1	3	3	3	**9 +A**	1	3	3	3	3	**27 +C**
2	Mining brings income to the community/CSR support: e.g. surface rent, community development funds etc.	3	3	3	3	3	**81 +E**	3	1	3	3	3	**27 +C**	3	3	2	3	3	**54 +D**
3	Construction of roads	2	3	3	3	3	**54 +D**	2	3	3	3	3	**54 +D**	2	3	3	3	3	**54 +D**
4	Support on education	3	3	3	3	3	**81 +E**	3	2	3	3	3	**54 +D**	3	2	3	3	3	**54 +D**
5	Building and refurbishment of schools	1	3	3	3	3	**27 +C**	1	2	3	3	3	**18 +B**	1	2	3	3	3	**18 +B**
6	Construction of Primary Health Units (PHUs)	4	3	3	3	3	**108 +E**	4	2	3	3	3	**72 +E**	4	3	3	3	3	**108 +E**
7	Building of Community Centres	1	3	3	3	2	**24 +C**	1	2	3	3	2	**16 +B**	1	**3**	3	3	2	**24 +C**
8	Create jobs for adults and youths	3	3	3	3	3	**81 +E**	3	2	3	3	3	**54 +D**	3	3	3	3	3	**81 +E**
9	Provision of wells/bore holes water	1	2	3	3	2	**16 +B**	1	2	3	3	3	**18 +B**	1	2	3	3	3	**18 +B**

10	Pipe borne water	1	0	2	2	2	**0 N**	1	-1	2	2	2	**-6 -A**	1	3	3	3	3	**27 +C**
11	Construction of resettlement homes	1	3	3	3	2	**24 +C**	1	0	1	2	2	**0 N**	1	2	3	3	2	**16 +B**
12	Construction of markets	1	**0**	2	2	2	**0 N**	1	0	2	2	2	**0 N**	1	3	3	3	3	**27 +C**
13	No effort to preserve the environment	3	-2	2	3	2	**-42 -D**	3	-2	2	3	2	**-42 -D**	3	-3	2	3	2	**-63 – D**

Table 6. Summary of scores for Community A: Kanniya Resettlement

Range	-108 to -72	-71 to -36	-35 to -19	-18 to -10	-9 to -1	0	1 to 9	10 to 18	19 to 35	36 to 71	72 to 108
Class	-E	-D	-C	-B	-A	N	A	B	C	D	E
EI	2	1	1	3	2	0	1	1	1	0	0
SI	1	0	3	2	0	0	5	3	1	0	0
ECI	0	1	0	0	0	2	0	2	3	1	4
Total	3	2	4	5	2	2	6	6	5	1	4

Table 7. Summary of scores for Community B: Koakoyima

Range	-108 to -72	-71 to -36	-35 to -19	-18 to -10	-9 to -1	0	1 to 9	10 to 18	19 to 35	36 to 71	72 to 108
Class	-E	-D	-C	-B	-A	N	A	B	C	D	E
EI	2	1	1	3	2	0	1	1	1	0	0
SI	1	0	3	2	0	0	5	3	1	0	0
ECI	0	1	0	0	0	2	0	2	3	1	4
Total	3	2	4	5	2	2	6	6	5	1	4

Table 8. Summary of scores for Community C: Sahr Quee Town
Communities A, B and C:

Range	-108 to -72	-71 to -36	-35 to -19	-18 to -10	-9 to -1	0	1 to 9	10 to 18	19 to 35	36 to 71	72 to 108
Class	-E	-D	-C	-B	-A	N	A	B	C	D	E
EI	2	1	2	3	1	0	1	1	0	1	1
SI	0	1	2	2	1	0	4	4	1	0	0
ECI	0	1	0	0	0	0	0	3	4	3	2
Total	2	3	5	5	2	0	5	8	5	4	3

Environmental Impact

There is a considerable negative impact on the environment of communities A, B, and C due to the kimberlite diamond mining by Koidu Holdings. This is mainly due to the alteration of land use, water contamination, flooding, farmland damage, deforestation, visual landscape or topography destruction, and nuisance due to dust and debris, and noise. As a result, all components selected for study under the environmental section got negative scores. Deforestation, loss of natural habitats, biodiversity, disease, and soil pollution will completely destroy the ecological balance of the area. There is a significant negative impact on the sociological and cultural environment of the area due to kimberlite mining. It has also led to the loss of agricultural land, residential area, health and hygiene, and sanitation. The development of roads, support on education, building and refurbishment of schools, construction of Primary Health Units (PHUs) resettlement homes, markets and Community Centres together with employment and community development are the positive effects of mining activities in the affected communities. Nevertheless, mining has a

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

negative impact on the social and economic segment in the three local communities in Tankoro chiefdom. As a consequence of the loss of land value and agricultural potential, earthmoving equipment, rehabilitation and resettlement of displaced persons. The kimberlite mining has negative impacts on the social and cultural segment in terms of loss of health and hygiene, sanitation, scenic beauty, and decreased traffic. Because, most of the resettled persons were living at the centre of Koidu City, which has created high transportation costs for the inhabitants. The input values fed in to the RIAM tool and the corresponding Environmental score are given in the Tables 3 to 5. The summary of RIAM scores for Kanniya Resettlement, Koakoyima and Sahr Quee Town are given in Table 6, 7 and 8. Graphical results of the RIAM tool are shown in Figures. 2, 3 and 4 for communities A, B, and C respectively. The graphical output gives us a rapid glance at the overall impact of the environment. N stands for neutral and +ve and –ve alphabets on x-axis that shows positive and negative impact of the components. From the results of the RIAM analysis, it was observed that the environmental component obtained more negative scoring and has serious negative impacts on the environment.
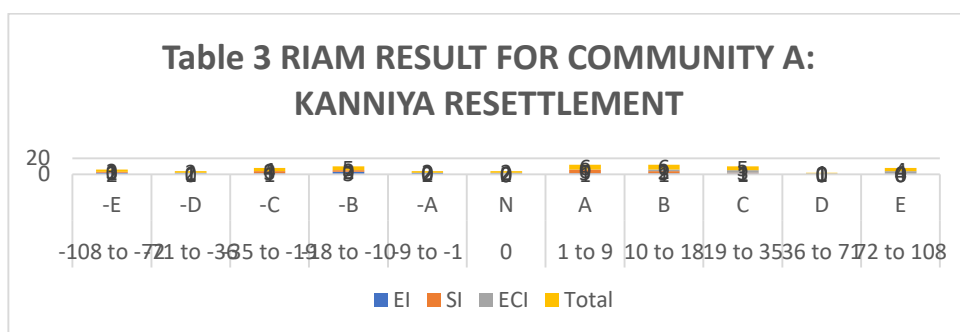
Figure 2 (Researcher's Study data 2022)

Figure 2 graph represents Community A, where we can see a significant number of components with slight positive change/impact in the economic sector (ECI), while the environmental impact (EI) shows a trend of moderate negative impacts.
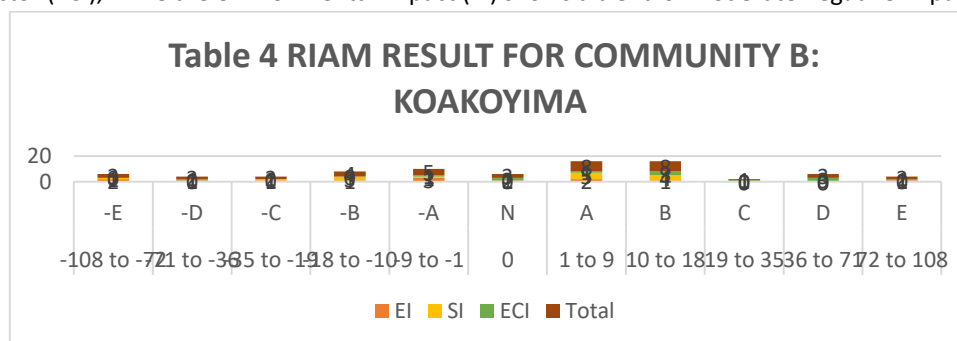

Figure 3 (Researcher's Study data 2022)

Figure 3 graph shows Community B, with a notable number of components in the slight and moderate positive change/impact for social (SI) and economic (ECI) aspects. The environmental impact (EI) also indicates a trend of moderate negative impacts.

Figure 4 (Researcher's Study data 2022)

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

Figure 4 graph shows Community C, with a noteworthy number of components in the slight and moderate positive change/impact for social (SI) and economic (ECI) aspects. The environmental impact (EI) also indicates a trend of moderate negative impacts.
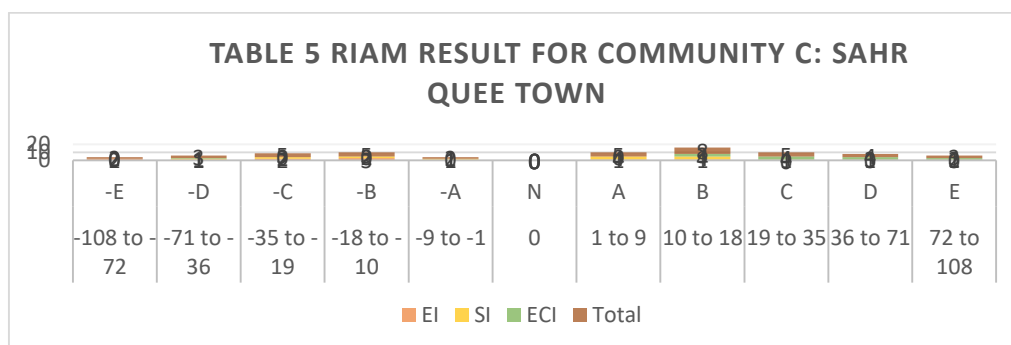
DISCUSSIONS
The key points discussed are detailed in the discussions report below:

Focus Groups Discussions' Report
Employment priority for affected communities
The priority provided by Koidu Holdings to affected communities when hiring individuals for their mining company was the first issue discussed by the three communities. All the three sessions in Koakoyima and Sahr Quee Town Traditional elders said:
'Koidu Holdings prioritized hiring all people residing in Kono district rather than just those from the affected communities. If you have the required job experience, regardless whether you were born in Kono or moved there, you will be given preference for employment'. However, the impacted areas expected to be given priority when it comes to employment or job openings, as the case may be.

Since the Kanniya community is new and lacks amenities found in the other two communities, such as clean running water, operating markets, churches, mosques, and other social and economic activities that can benefit the youth as well as the residents, the mining company was expected to give Kanniya youths and adults preference when it came to employment opportunities; the Kanniya Resettlement Youth commented. For example, she stated:
'We have to travel to Sahr Quee Town or old Kanniya to get the items or services we needed, such as internet or mobile phone top-up. Most importantly, we are unable to locate a mosque or church in our new neighborhood when we wish to worship God. Except that we must go to old Kanniya or the heart of Sahr Quee Town to observe our prayers. To carry out all of these activities, transportation costs are required. Therefore, it is essential that the corporation give young people from Kanniya Resettlement priority when it comes to employment'.

From the Kanniya Resettlement, all participants from the three sessions expressed similar opinion. They further informed the FGD that 'the relocation had cost them their farmland and their means of subsistence. Koidu Holdings should therefore offer preference to members of their community when hiring new employees'. Losing their homes is just one aspect of the displacement that drives entire communities to relocate; other losses include losing their land and means of subsistence. Communities that have been uprooted are often relocated in locations with little resources and close to mines that are dirty and polluted. Local groups that have strong cultural and spiritual ties to the lands and forests of their ancestors and who may find it difficult to live when these ties are disrupted can be particularly devastated by involuntary displacement (MMSD 2001; Singh, Srinivas & Naik 2015; Ghose 2018).

Moreover, mining can generate much-needed income and jobs. It may also encourage the growth of a more skilled labour force and result to investments on infrastructure, health care, and education. In the absence of a solid legal and policy framework, these anticipated gains are challenging to actualize. While upholding strict environmental and social norms, such a framework must promote mining's positive effects on economic and social growth. Without one, mining operations may threaten to harm the environment and endanger employees, which could, among other things, result in non-inclusive growth and encourage corruption (Crawford 2015).

The initial focus was on Koidu Holdings' employment practices. Participants from Koakoyima and Sahr Quee Town noted that 'the company prioritizes residents of the Kono district, regardless of their origin within the district'. This practice has been a point of contention, particularly for the newly established Kanniya community, which lacks basic amenities. Residents expressed a need for employment prioritization, especially considering their displacement and loss of farmland and traditional livelihoods. This sentiment underscores the broader impacts of displacement, including cultural and economic upheaval.

Development projects supported by Koidu Holdings
The development initiatives that have been implemented in the impacted communities were the second subject covered at the FGD fora. The Youths from Sahr Quee Town mentioned some of the improvements which Koidu Holdings have made in both their community and the other two communities (Koakoyima and Kanniya), including 'the construction of new markets, a Primary Health Unit (PHU), the renovation of schools, and the provision of pipe-bone water for the Sahr Quee Town community. Also dug some water wells/boreholes at the Kanniya Resettlement. Moreover, there is a community center for the youths in Koakoyima'. These assertions were also echoed by the traditional elders and youths from Kanniya resettlement and Koakoyima. However, the Koakoyima Traditional Elders remarked that 'the only structure Koidu Holdings has ever constructed in their community is the

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

Community Centre. The company that is conducting some CSR efforts in Koakoyima is its rival, Meya Mining' they remarked. 'However, the company has provided scholarships to students at all academic levels and has supported schools with educational resources' they mentioned as well. In the summer of 2020, NMJD carried out a study on the positive social and economic effects of diamond mining on regional communities in Sierra Leone. According to their research, there was poor living conditions in mining regions, and there was a number of issues that locals associate with mining, such as gender-based violence, teenage pregnancies and girls dropping out of school, a lack of and high price for basic foods, environmental degradation, such as contaminated water basins and abandoned pits that serve as breeding grounds for disease-carrying mosquitoes, and deceitful landowners. Communities in the study areas that were impacted by diamond mining generally believe that mining offers few socioeconomic advantages. Focus groups revealed that the only real gains for the areas were some sporadic infrastructure upgrades and poorly paid jobs for young people (NMJD 2020).

Discussion of Koidu Holdings' development initiatives revealed mixed responses. Participants acknowledged the construction of markets, health units, schools, and water provision in Sahr Quee Town and Kanniya Resettlement. However, Koakoyima residents felt underserved, receiving limited development support mainly from a rival company, Meya Mining. This disparity points to uneven benefits distribution and raises questions about corporate social responsibility fulfillment.

Surface Rent Payments by Koidu Holdings

How much have the members of the affected community benefited from the payments of Surface rent? was the third topic covered in the FGD meetings.

The traditional elders of Sahr Quee Town claimed that 'the development of markets, PHUs, schools, as well as the provision of water supplies and community centers in the three communities, have indirectly benefited the impacted areas'.

'The Surface Rent monies were also used to create a new Local Government office for the sake of local governance', according to the traditional elders of the Koakoyima and Kanniya Resettlement communities. 'The Paramount Chief is currently in contact with EDSA to arrange a transformer for the delivery of electricity to the recently resettled communities, particularly Kanniya Resettlement', they further disclosed to the FGD. However, the Town Chiefs, Mamie Queen, and the Youth Leader are the three stakeholders who have been mentioned by the Youths in all the communities and the three Traditional Elders as direct recipients of the 50% surface rent. Communities believe that existing laws are not being applied properly and that the legal and policy framework is insufficient to handle development concerns. The key factor contributing to the persistence of poverty is mentioned as corruption in the collection, management, and allocation of mining earnings. Local officials who receive subnational payments are viewed with suspicion and accused of working together with large-scale mining companies to scam locals. Local stakeholders view the redistribution mechanism as a whole as being severely insufficient, poorly and selectively administered, not effectively institutionalized, inadequately accounted for, and heavily centralized by the government. Therefore, the system does not offer the room, chance, or empowerment necessary for exercising guaranteed rights and benefiting from them. This is evidenced in the local communities in Tankoro chiefdom where the 50% Surface Rent paid to the impacted communities directly benefited Town Chiefs, Mamie Queen, and the Youth Leader. (NMJD 2020).

According to Sierra Leone Gem (2018), a publication of the National Minerals Agency (NMA), mining firms are required by law to pay landowners and authorized inhabitants for land use. No mining company will be granted a mining license if it does not provide proof that it has entered into an agreement with owners of the surface area for mining activities, in accordance with this condition. The agreement largely takes the form of a land lease, under which the company is required to pay annual surface rent to the landowners and other parties involved. On April 24, 2018, Koidu Limited made a surface rent payment of US$ 73,794 (seventy-three thousand, seven hundred ninety-four US dollars) to Tankoro Chiefdom, Kono District. However, if there is no corruption in the collection, management, and distribution of mining earnings, then communities can get compensation and huge money flows when a large mine is constructed, which can act as a key motivator for change and growth. These monetary flows have the power to alter the economic and social foundations of communities in locations that were previously outside the cash economy. The sorts of payments and how they are utilised are crucial factors in determining how mining might support community-level sustainable development. The distribution and impact of surface rent payments were questioned. While some infrastructure improvements were noted, concerns about the centralization and alleged mismanagement of funds were prevalent. This issue reflects broader challenges in ensuring equitable benefit-sharing and combating corruption, as highlighted in NMJD's 2020 report (MMSD 2001; NMJD 2020).

Furthermore, the mining royalty is an ad valorem tax, meaning that it levies taxes on the ore's worth at the time of sale or export. The mining royalty is, in theory, equal to the resource's utilization. In fact, the majority of nations have laws that declare any material found in the soil, subsurface, and even beneath territorial seas to be state property. As a result, the State only permits

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

mining companies to exploit their properties by giving them a mining right that is only good for a specific amount of time, over a specific region, and for a specific mineral. The mining royalty then functions legally as the opposite of a private resource being appropriated by the government. It is a significant and reasonably safe source of funding for the State because it influences production, regardless of the profitability of the mine (Bouterige et al 2019).

Management of community and agricultural development funds
The management of the community development funds in addition to the agricultural development funds was the fourth item brought up for discussions during the FGD. And the need to know the parties in charge of the funds. In response, the Sahr Quee Town traditional elder stated to the FGD that:
'The Paramount Chief, Senior District Officer, and Chiefdom Clerk are members of the committee that the NMA had previously established to oversee the community development funding. They too happened to be the account's signatories for the community development funds. There are now no agricultural funds available, because the funds have been substituted to crop compensation benefits'. The elders and youths of the three communities collaborated the elder of Sahr Quee Town's statement. The Traditional Elders of Kanniya Resettlement also indicated to the FGD that 'Koidu Holdings had pledged to construct a market, a PHU, as well as build and relocate schools to the newly resettled community, in addition to the development funding'. In order to reevaluate the community's role in resource use and preservation, Agrawal & Gibson (1999) first looked at the theoretical foundations of the community before examining the aspects of the community that was important to advocates for the community's involvement in resource management.
Participants discussed the management structures for community development funds, indicating a lack of agricultural funds due to a shift towards crop compensation benefits. Concerns were raised about the transparency and inclusivity of fund management, reflecting a need for more participatory and accountable governance structures (Agrawal & Gibson 1999; Mines and Minerals Development Act of 2022).

Resettlement of displaced communities
It was further discussed by all members in all the sessions of the FGD that 'a committee called Village Resettlement Committee (VRC) was established to examine the relationship between the mining company and the affected mining communities' people with the aim of resolving existing problems in the resettlement areas'. Members of the VRC comprised of the resettlement stakeholders including the Paramount Chief (PC) who is the chairman of the VRC. In its mandate, the VRC should be consulted on mining activities together with the welfare of affected mining communities. The VRC meeting point was at the TNA building where the committee discusses matters relating to the welfare of the affected communities. However, because of the constant disagreements on issues surrounding double - standard behaviour of the VRC leadership and benefits yet to be derived from the company, the PC decided to move all meetings to his 'Court Barry' at his resident and superintend all meetings afterward, as a result of these disagreements'.
Nevertheless, the VRC at one time decided to meet the company management directly, instead of the chairman of VRC who was blocking recommendations made to the company, according to the FGD. When they met the company and told them that because of the PC connivance with the company which was preventing the communities to get the benefits they were expecting from Koidu Holdings (for instance, relocation package) was the reason for meeting them directly. And, admonished Koidu Holdings to convey their message to the PC. But the company declined to do so, they confirmed.
The discussion on resettlement highlighted the role of the Village Resettlement Committee (VRC) and ongoing conflicts within this body, suggesting governance challenges and dissatisfaction among community members regarding resettlement policies and their execution. The majority of mining-induced displacement occurs when impacted individuals are forced to leave their initial residence and/or engage in socioeconomic activities. It can also have a significant negative impact on the socioeconomic standing of those who have relocated, but this is an inevitable byproduct of increasing mineral exploitation (Kemp 2017; Wilson 2019).

Environmental Impact of Mining
The fifth topic discussed by the FGD was the environmental impact of mining in the affected communities. According to the Youths of Sahr Quee Town, 'there are no immediate effects (for the time being) on the impacted communities'. As it was revealed during the Focus Group talks that 'Koidu Holdings planted trees and gave locals tree seedlings to plant in their neighbourhoods in an attempt to protect the environment. However, there was no follow-up by the corporations to evaluate the type of trees that were planted. As a result, several of the newly planted trees were neglected, and some of them died'. The study looked for the mining company intervention measures based on the environmental circumstances in the study communities. This was done to make it possible for the researcher to analyze the mining company's readiness to handle the environmental issues related to the mining

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

activities as part of their required corporate social responsibility (Mabey et. al., 2020). However, compared to open-pit mining, underground mining frequently results in significant subsidence, which disturbs surface vegetation in a variety of ways. It is crucial and still lacking to conduct a sufficient quantitative evaluation of the long-term impacts of underground mining on the development of various plant communities (Mi et al 2020).

Nevertheless, the Youths of Kanniya Resettlement and Koakoyima stated that 'Koidu Holding mining company had not made much of an effort to lessen the environmental impacts'. Whereas, the traditional elders of Sahr Quee Town claimed that 'the mining company was making some efforts to lessen the unfavourable environmental effects as a result of mining'. A Traditional Elders of Kanniya Resettlement also responded that: 'The Koidu Holdings company has dug some boreholes, particularly in the Kanniya resettlement community, which serve as a supply of drinkable water, to help reduce the severity of the water crisis. The mining company has also implemented other measures, such as routine watering of important roads inside the communities to reduce air pollution caused by increased dust release'. This meant Koidu Holdings must make additional efforts to reduce the damaging effects of mining on the environment in the local communities, and enhance the social services that normally come from the three mining communities, particularly Kanniya Resettlement. According to Rutenge (2016), large-scale mining projects, which are typically owned by multinational corporations, have sparked conflicts in the majority of the regions in which they operate. Many demonstrations over land conflicts, environmental damage, and subpar social services usually start in mining areas. Violence is frequently used to address these issues. However, in response to community unhappiness, communities where mining is taking place and mining companies usually work together to promote social services, either directly or indirectly. Nevertheless, communities impacted by mining are routinely excluded from the mining earnings and benefit-sharing (Rutenge 2016); Mabey et. al., 2020).

Environmental concerns were prominent, with varied reports on Koidu Holdings' efforts to mitigate impacts. While some tree planting initiatives were noted, a lack of follow-up and comprehensive environmental management was evident. This situation reflects a need for more robust environmental stewardship and community engagement in monitoring and mitigation efforts.

Type of Mining Performed by Koidu Holdings:

Based on the comments from the respondents in the impacted areas, the researcher decided to bring up a sixth issue at the FGD settings to confirm the type of mining Koidu Holdings is executing in the local communities in Tankoro chiefdom. Consistent with all FGD participants in the three communities, Koidu Holdings at present engage in underground mining. And, underground mining can leave large hollows behind by excessive diamond mining, which has had severe repercussions and implications for the environment. These openings, which have the power to literally swallow small towns, form a deep, cone-shaped breach in the ground. Many of these diamond mines produce pollution that contaminates the neighbouring soil or bodies of water in addition to leaving large holes in the earth's surface caused by the mining. Further effects are related to vibration, acoustic pressure, and noise while mining equipment and explosives are in use. This situation will undoubtedly disrupt more activities like agriculture and plantations as well as disrupting people's lives (Heart is Diamond 2017; Sukri et. al., 2020).

The concentration turned to the specifics of Koidu Holdings' mining operations. Participants noted the environmental consequences of underground mining, emphasizing the need for stricter environmental controls and mitigation strategies to address the negative impacts on local ecosystems and community livelihoods.

The discussions revealed that the communities' dissatisfaction stemmed from unmet expectations regarding employment, community development, and compensation, as well as exclusion from mining benefits.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

In general, the RIAM analysis reveals that kimberlite diamond mining has predominant negative environmental impacts across all three communities, A, B, and C. However, certain social and economic components reflected positive changes. Nevertheless, the positive impacts on those three communities are just about the same. From the total scores summary for the three communities, it is obvious that the kimberlite mining in the affected communities have negative effects than the positive effects. Based on these findings, there is need to develop recommendations for improvement.

4.2 Recommendations for Improvement

The discovery together with mining of diamonds in Kono district in the 1930s is acknowledged as the beginning of formal mineral exploitation in Sierra Leone. Large-scale mining operations started after the enactment of the Minerals Act of 1927. The discovery of alluvial diamond deposits in the early 1930s generated a paradigm shift in mining in Sierra Leone with the beginning of artisanal and small-scale mining (ASM).

Assessing the Socio-Economic and Environmental Impact of Koidu Holdings on Local Communities in Tankoro Chiefdom, Kono District, Sierra Leone - Using the Rapid Impact Assessment Matrix Method

The objectives of the focus group discussions were to get information about the problems, perceptions, and ideas of diverse community groups on the positive and negative impacts of mining in the three communities. The discussions revealed that the communities' dissatisfaction stemmed from unmet expectations regarding employment, community development, and compensation, as well as exclusion from mining benefits. On the whole, kimberlite diamond mining has major negative environmental impacts across all three communities. However, certain social and economic benefits reflected positive changes. Nevertheless, the positive impacts on those three communities are just nominal.

Therefore, it is necessary to put forward the following recommendations based on the FGD outcome:

- That mining should be done legally and correctly without hurting the communities that will be impacted, by setting up a robust monitoring and regulatory machinery that will ensure Koidu Holding lawfully conducts itself.
- The NMA should reestablish an inclusive stakeholders committee for the even - distribution of the 50% surface rent to the direct beneficiaries; instead of being paid directly to the Town Chiefs, Mamie Queen, and the Youth Leader of Tankoro chiefdom.
- So as to promote transparency and accountability, the NMA should not only limit the development funds' committee membership to the Paramount Chief, Senior District Officer, and Chiefdom Clerk, who are also signatories to the development funds' account. But to expand the committee to include selected members of the affected communities to oversee the community development funds as well.
- Members of the Village Resettlement Committee (VRC) should comprise of the resettlement stakeholders together with the Paramount Chief (PC) as observer not as chairman of the VRC for more transparency and accountability. And, the VRC should collectively discuss matters relating to the welfare of the affected communities and collectively voiced their verdicts directly to Koidu Holdings management going forward,
- to lower the damaging environmental effects of mining in these communities, NMA, EPA and other stakeholder organizations must enhance their monitoring efforts and implement legal obligations.
- To conclude, with the aim of promote sustainable development in the affected communities, these suggestions could be considered to improve environmentally responsible mining practices and reduce harmful environmental impacts.

REFERENCES

1) Agrawal, A. and Gibson, C. C. (1999), Enchantment and disenchantment: The role of community in natural resource conservation. World Development, Vol.27, No 4, 1999, pp. 629-649.
2) Bouterige Y., de Quatrebarbes C. and Laporte B. (2019) Mining taxation in Africa: What recent evolution in 2018? https://ferdi.fr/dl/df-or6tiKfYoxkaX2bEWMXkumBb/ferdi-p257-mining-taxation-in-africa-what-recent-evolution-in-2018.pdf
3) Burrows D and Kendall S (1997), Focus groups: What are they and how can they be used in nursing and health care research? Social Sciences in Health 3, 244–253
4) Crawford A. (2015), The Mining Policy Framework: Assessing the implementation readiness of member states of the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development Synthesis Report October 2015
5) Ghose J. (2018), Giving back to affected communities with mining revenues. https://www.teriin.org/policy-brief/giving-back-affected-communities-mining-revenues
6) Heart is Diamond (2017), Real Vs Synthetic Diamonds https://www.heart-in-diamond.com/cremation-diamonds/mines.
7) Kemp, D., Owen, J. R., & Collins, N. (2017). Global Perspectives on the state of reset tlement practice in mining. Impact Assessment and Project Appraisal, 35(1), 22–33. http://doi.org/10.1080/14615517.2016.1271544.
8) Koidu Holdings (2019), Talk to us! https://www.koiduholdings.com/contact-us.php
9) Kolver L. (2012), Octéa Diamond Group launched at Koidu diamond mine. Published 3rd August 2012. Copyright Creamer Media (Pty) Ltd. All rights reserved.
10) Mabey P.T., Li W., Sundufu A.J. and Lashari A.H. (2020), Environmental Impacts: Local Perspectives of Selected Mining Edge Communities in Sierra Leone. Sustainability 2020, 12, 5525; doi: 10.3390/su12145525 www.mdpi.com/journal/sustainability
11) Mi J., Yang Y., Hou H., Zhang S., Raval S., Chen Z., Hua Y. (2020) The long-term effects of underground mining on the growth of tree, shrub, and herb communities in arid and semiarid areas in China. Published: LDD Land Degradation and Development https://doi.org/10.1002/ldr.3751
12) MMSD (2001), Local communities and Mines. The Mining, Minerals and Sustainable Development Project MMSD.

13) NMJD (2020), Sierra Leone: Benefits of diamond mining to local communities? Network Movement for Justice and Development.

14) Pastakia C.M.R. (1998), The Rapid Impact Assessment Matrix (RIAM) – A New Tool for Environmental Impact Assessment. VKI, Agern Alle 11, DK-2970 Hørsholm, Denmark e-mail: cmp@vki.dk

15) Patton M.Q. (2002), Qualitative Evaluation and Research Methods, (3rd ed.), London and New Delhi: Sage Publications.

16) Pastakia, C. M. R. and Jensen, A. (1998): The Rapid Impact Assessment Matrix (RIAM) for Environmental Impact Assessment, Environmental Impact Assessment Review, 18(5), pp. 461-482

17) Rutenge M.M. (2016), Gold-Mining Multinationals and Community Interaction in Tanzania towards Localised Social Accountability. This dissertation is part of the Research Programme of CERES.

18) Sierra Leone Gem (2018), "Sharing Benefits with Local Communities Mining Companies Pay Over Le.10 billion As Surface Rent". The official Newsletter of the National Minerals Agency Year 5 | Edition 1 January - June 2018.

19) Singh, A.N., Srinivas, M. And Naik, B.N. (2015), Forecasting the impact of surface mining on surrounding cloud computing. Journal of Computer Sciences and Applications Vol. 3, No. 6, 2015, pp 118-122. doi: 10.12691/jcsa-3-6-1

20) Sukri, Ariana, Ekawaty D., Syam F and Amiruddin A. (2020), Dilemma of mining: economic development and ecological risks. IOP Conf. Series: Earth and Environmental Science 575 (2020) 012245 IOP Publishing doi:10.1088/1755-1315/575/1/012245

21) Sundara Kumar K., Uday Nagendra G., Veerendranath L., Bhavya Bhanu S., Sowjanya N.L.C. (2013) Evaluation of Environmental Sustainability of Landfill Sites using Rapid Impact Assessment Matrix Method. International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-2, Issue-6, August 2013.

22) Wilson S.A. (2019) Mining-induced displacement and resettlement: The case of rutile mining communities in Sierra Leone. Journal of Sustainable Mining journal homepage: www.elsevier.com/locate/jsm.

Online Autism Literacy to Improve Acceptance of Mothers of Children with Autism Spectrum Disorders

Kumala Windya Rochmani

Departemen Psikologi, Fakultas Ilmu Pendidikan dan Psikologi, Universitas Negeri Yogyakarta, Yogyakarta, DIY, 55281, Indonesia

ABSTRACT: The spectrum of autism developmental disorders is vast and diverse, ranging from mild to severe impairments. If parents lack knowledge about autism, maternal acceptance levels tend to be low. Autism literacy through the internet serves as a medium to provide beneficial, extensive, cost-effective, and easily accessible information and knowledge. This study aims to assess the effectiveness of online autism literacy in increasing maternal acceptance of autistic children. The research utilized a single-subject design, involving only one subject, following the ABA Single-case Experiment Design. The single-case experimental method was employed in this study, where autism literacy intervention was delivered through the website www.careautism.wordpress.com. A Maternal Acceptance Scale was used to evaluate the subject's psychological state before and after the intervention. The research's significance lies in providing empirical evidence on the effectiveness of online autism literacy in enhancing maternal acceptance of autistic children. Visual inspection and descriptive analysis methods were employed for data analysis. The study's results indicate that autism literacy intervention through the internet can improve maternal acceptance of autistic children, with an increased mean score between the baseline and intervention phases.

KEYWORDS: online media, literacy, autism, parental acceptance.

I. INTRODUCTION

Disability is the inability of a person due to intellectual, psychiatric, cognitive, neurological, or physical impairment, which can be permanent. It results in limitations in social interaction, communication, learning, mobility, decision-making, and self-care, requiring ongoing social support (Radissa et al., 2020). People with disabilities often face barriers in accessibility, education, employment, and participation in social life. According to statistical information from the World Health Organisation, there are more than one billion people worldwide living with disabilities. In Indonesia, based on statistical information from the Central Statistics Agency (BPS), there were approximately 12 million people with disabilities in 2018. A person with a disability experiences various limitations and has various types, one of which is autism spectrum disorder.

Autism or autism spectrum disorder (ASD) is a neurological condition that affects a person's social development, communication and behaviour. The Diagnostic and Statistical Manual of Mental disorder (DSM-V) defines autism as a developmental disability that affects various aspects of activity or life characterised by qualitative communication, behaviour, social contact, and hobbies (Lord et al., 2018). In this condition, individuals with autism experience difficulties in interacting socially, communicating with others, exhibiting behaviours appropriate to certain situations, and showing limited interests and activities. The different characteristics of autism in each individual and the complex problems they have require comprehensive treatment from parents, medical practitioners or doctors, psychology professionals, therapists, nutritionists and government agencies. (Hyman et al., 2020).

Based on the results of research by Ogretir & Ulutas (2009) Parents and carers of children with autism often report increased levels of stress, depression and anxiety. The study revealed that the highest level of parental stress is experienced when the child is still in the early developmental stage, namely when the child's behaviour has not been established so that they still need to undergo intensive therapy and are still in the early stages of school. Parenting stress in parents has a lasting impact such as parental acceptance of the child, psychological disorders, mental disorders or psychopathology, unstable emotions that interfere with parent-child relationships (Bromley et al., 2004). Negative impacts will be more experienced by mothers, such as physical and emotional exhaustion, decreased physical health, increased risk of disease, sleep disturbances so that these impacts

affect the mother's ability to care for her child. Mothers who experience emotional disturbances or high levels of stress have a decreased or low quality of interaction and are generally experienced by mothers in early adulthood to middle adulthood (Lovejoy et al., 2000). Less harmonious relationships, less mutual support in the family environment can affect individual development and overall family well-being (Conger et al., 2010). The stress experienced by parents of children with GSA can affect parenting patterns so that children's development tends to be negative (Ogretir & Ulutas, 2009).

Baumrind suggested that parenting patterns can be divided into authoritarian, permissive, ignoring/rejecting, and authoritative. Various follow-up studies were conducted by other researchers. Rohner developed the concept of PARTheory (parental acceptance-rejection theory) (Rohner, Khaleque, & Cournoyer, 2007) that defines parental acceptance as parents' perceptions of their care for their children. Parental acceptance comes in the form of strong attention, love, and respect, trust, good communication, and mutual involvement so that children feel psychologically safe from their parents. Parental acceptance is included in the warmth dimension of parenting which is derived into several aspects, namely parental warmth, parental coldness, child abuse, child neglect, and other forms of child rejection. The theory contains the dimensions of parental warmth, which is a continuum divided into 4 categories, namely: (1) warmth and affection; (2) absence of affection; (3) hostility and aggressiveness; (4) indifference and neglect; and (5) rejection in other forms.

Research conducted by Reinke & Solheim (2014) found that parents, especially mothers with children on the autism spectrum, tend to seek online support from other parent communities through social media and online forums. They use these platforms to share experiences, obtain useful information, and seek emotional support in dealing with the challenges faced in caring for their children. The availability of this information can influence parents' acceptance of their child's condition. By having more knowledge, parents can make better decisions in caring for their child.

Since 1970, Health Education has recognised the term 'health literacy' and has seen it as a social policy. Health literacy encompasses an individual's ability to access, read, understand and utilise health information effectively to make accurate decisions and follow treatment instructions (Reber & Reber, 2010; Roundtable on Health Literacy, 2012; Vandenbus, 2007). With the advancement of information technology, the internet has played a very important role as a medium in improving literacy. Parents who have limited understanding of autism symptoms and treatments may experience low levels of health literacy (Grant, 2016). When parents become aware of autism symptoms in their child, they often experience high levels of stress and face difficulties in finding relevant information to determine effective interventions for their child. To overcome this challenge, parents can utilise the benefits of information technology, such as websites, which can be a source of information and also provide the emotional support needed (Grant, 2016).

Parents can utilise websites as a source of information and emotional support. There are several advantages in utilising websites, including (Zaidman-Zait & Jamieson, 2007): (1) easy and quick access to information, (2) affordable cost to access the information, (3) availability of information around the clock, (4) data security and anonymity in accessing information, and (5) the opportunity to communicate with parents through online communication tools. However, there are some drawbacks that need to be considered in using websites as a source of information, such as the volume of knowledge or diverse information, as well as the absence of an official review or assessment of the accuracy of the information provided. Based on previous research, that parents may exploit are more likely to trust sources obtained through sources managed through trusted organisations or by professionals, compared with information provided by some parents who (Bernhardt and Felter, 2004; Taylor, Alman, & Manchester, 2001).

In this study, researchers prepared an autism literacy programme through the use of the internet as an alternative to provide an understanding of autism to parents of autistic children. This literacy programme integrates the concept of psychoeducation about autism. Through a cognitive-behavioural intervention approach, information provided to individuals can influence cognitive, emotional and behavioural changes. Psychoeducation is one form of intervention that adopts a cognitive-behavioural approach, and in this context, it is conducted for parents as a form of experiential learning. Psychoeducation for parents of autistic children is usually conducted through face-to-face sessions. However, there are several obstacles such as limited time, location, energy, and cost. The objectives of face-to-face psychoeducation are to improve children's language skills and interaction with parents, improve coping skills, reduce behavioural disorders in autistic children, and increase parents' acceptance and understanding of autistic children (Hidayati, 2013).

Based on the description above, the researcher revealed that parents react with confusion, anxiety, sadness, and tend to reject when their child is diagnosed with autism. This is due to parents' lack of knowledge about their child's condition and treatment, lack of understanding about self-management, and lack of information about the experiences of others who have autistic children. Therefore, it is important for parents of autistic children to obtain the knowledge and information needed to understand their child's condition, cope with the problems that arise, and show acceptance towards their child.

Online Autism Literacy to Improve Acceptance of Mothers of Children with Autism Spectrum Disorders

Previous researchers have overcome the limitations of face-to-face psychoeducation by introducing internet-based psychoeducation Alexander & Grannum (2022) and (Vismara et al., 2013) conducted studies that used various media such as narratives, slide presentations, video examples, Applied Behaviour Analysis therapy exercises, video conferences, and websites. The results of these studies recommend the use of internet media as an alternative in providing psychoeducation to parents. The psychoeducation material delivered to parents is based on the Applied Behaviour Analysis (ABA) approach with the aim of providing knowledge about the recognition of signs and symptoms of autism, the diagnosis process, and the necessary treatment. Other researchers, such as (Brookman-Frazee et al., 2006), have studied the topic in depth, suggesting materials on stress management, self-control, problem-solving skills, and strengthening family function and social support.

Psychoeducation has the flexibility of a model that can be adapted to individual situations (Lukens & McFarlane, 2004). In one study, a psychoeducational approach through internet-supported literacy through a website and psychology consultation through Facebook was used. The aim was to change parents' behaviour through increased knowledge. The model of behaviour change through internet-based interventions (Ritterband et al., 2009) includes factors such as knowledge, motivation, beliefs, skills, cognitive restructuring and self-monitoring. Knowledge acceptance and individual learning processes are important in behaviour change (Fink, 2003). It is hoped that internet-supported autism literacy can help parents understand their child's condition, deal with problems, and accept their child better.

Research on interventions to improve mothers' acceptance of autistic children using online media is scarce. Therefore, this study aims to determine the effect of intervention with literacy materials about autism using online media to increase the acceptance of mothers of autistic children.

II. METHOD

The criteria for research subjects were: (1) mothers of autistic children in the age range of 3-8 years; (2) the child has received a diagnosis of autism spectrum disorder by a doctor or psychologist; (3) the mother's age ranges from 25-45 years; (4) the mother's last education level is at least high school or equivalent; (5) has the ability to use a computer or laptop; (6) has the ability to access email, Facebook, and websites without assistance; and (7) has a parental acceptance score in the low to moderate category. The instruments used in this study include the parental acceptance scale, subject consent sheet, diary, intervention session observation sheet, research evaluation sheet, and interview guide.

The research design was to use a single-subject design equipped with a number of subjects of 1 person and using the ABA Single-case Experiment Design research guide (Barlow & Hersen, 1984; Sunanto, Takeuchi, Nakata, 2005). Subjects followed the measurement stages, namely before intervention, during intervention, after intervention, and at follow-up. Descriptive analyses based on diaries and interview data were used to complete the research data.

The purpose of the intervention was to present material to the subject about the meaning and symptoms of autism. The intervention provided in this study was based on the Care-Autis literacy module, which included knowledge about autism, self-management, information about other parents' experiences, and experiences of children with autism. The literacy module is delivered through a website at www.careautism.wordpress.com. The intervention was also complemented by a psychology consultation service through Facebook that only accepted members or followers of the research subjects. Face-to-face interviews were conducted between the subjects and the facilitating psychologist twice during the A1 baseline and once during the follow-up session. Subjects followed the intervention by reading information and knowledge materials on the website for 1-1.5 hours per day. The subject accessed the website within 8 sessions. Subjects can conduct online consultations with psychologists via email.

The visual inspection method is used for quantitative data analysis by taking into account the results of the level of stability (level stability), direction tendency (trend/slope), and the level of change in the source or data (level chage Kazdin, 2011; Barlow & Hersen, 1984; Sunanto, Takeuchi, Nakata, 2005). The assumption used in measuring the level of stability is if 80%-90% of the data is at 15% above the mean then it is said to be stable. The split-middle method was used to analyse directional tendency using the median value of the data. Analysis of the level of change in data between conditions is calculated by reducing the last score in the first condition with the first score in the second condition. An overview of the subject's psychological dynamics was obtained through interviews with the subject.

III. RESEARCH RESULT

Subject descriptive data based on observations and interviews can be used to analyse the subject profile. The subject of this study has initials as Mrs C and is 32 years old with a D3 educational background. She has two daughters aged 7 years and 2 years. At the age of 3, Mrs C's first child was diagnosed with autism. When she found out about this condition, Mrs C felt confused and did not know what to do. She had no support from family or friends who could help her. Mrs C was also limited in actively seeking information, with sources of information limited to the doctor or therapist working with her son. This hindered timely,

Online Autism Literacy to Improve Acceptance of Mothers of Children with Autism Spectrum Disorders

targeted and sustainable treatment for her child. In addition, Mrs C also lacked support from her husband who was busy working all day. Based on observation data at school, Mrs C tended to be alone and did not join other parents who were waiting for their children. She sat more and was seen accessing social media through her mobile phone rather than discussing or interacting with other parents.

During the intervention process, Mrs C experienced difficulties in accessing websites and using a laptop. However, she felt that the intervention provided reminders about the symptoms of autism and the basic treatments needed. She also received materials on self-management which greatly helped her in reducing anxiety and stress in her daily routine. Mrs C felt more in control of her emotions when dealing with her son's behaviour. During this process, Ibu C gained an understanding and enlightenment that the way she cares for her children has a huge impact on their behavioural responses. She realised that if she wanted to see positive changes in her children, she needed to change her behaviour, parenting approach, and the way she responded to her children's emotions, especially in dealing with their challenging behaviour.

The measurement instrument in this study was a parental acceptance scale adapted from the parental acceptance scale developed by (Rohner et al., 2012) Information about the results of the measurement of the research scale can be found in figure 1 which shows that Mrs C experienced a significant increase in parental acceptance from the pre-test to the post-test phase and decreased in the follow-up phase.
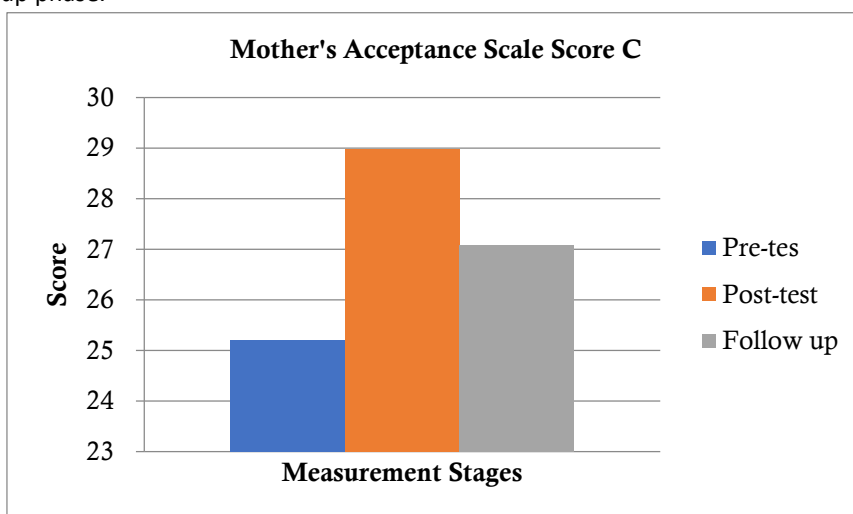
Figure 1. Measurement Results of Parental Acceptance Scale

The findings of the data analysis of this diary are the influence of negative events experienced by the subject on the acceptance of autistic children. Negative events can come from the child's negative behaviour or situations and conditions from the environment (outside the child's behaviour) that make the mother experience negative emotions. If there is a negative event, the subject's acceptance tends to decrease. If there is no negative event, then the subject's acceptance tends to increase. The dynamics of parental acceptance influenced by this negative event can be seen in Figure 2.
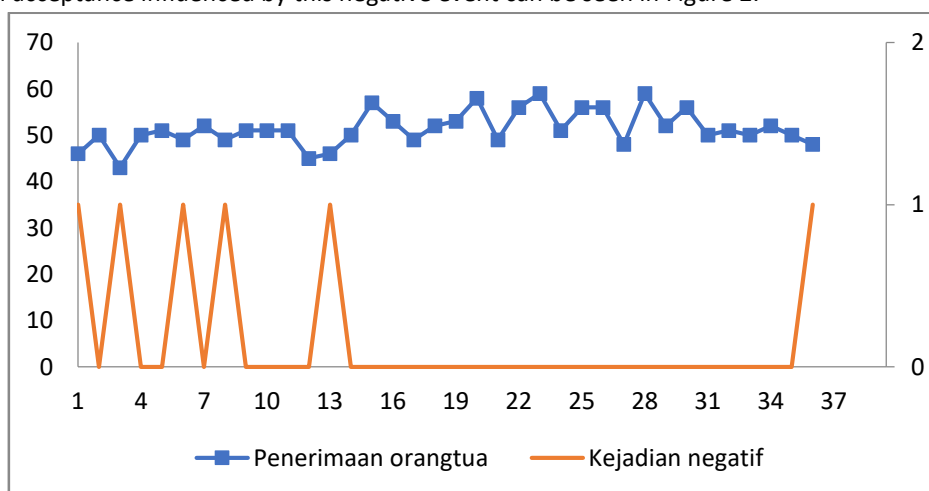
Figure 2. Mrs C's behaviour score in the daily logbook

Online Autism Literacy to Improve Acceptance of Mothers of Children with Autism Spectrum Disorders

The level of stability, slope, and change in parental acceptance have been visually analysed using behavioural data recorded in the daily logbook. Variable stability analysis showed that Mrs C's acceptance in phases A1 and A2 had the same level of stability. Analysis of directional tendency using the split middle method showed a change in direction and level of change influenced by the intervention. In phase A1, there was no change in direction with the median remaining at 50. In phase B, there was an increase in the median from 53 to 56. While in phase A2, there was a decrease in the median from 51 to 50. The change in Mrs C's level of acceptance from phase A1 to phase B showed an increase of 7 points in a positive or improving direction. The direction trend (slope) of the subject can be seen in Figure 3.
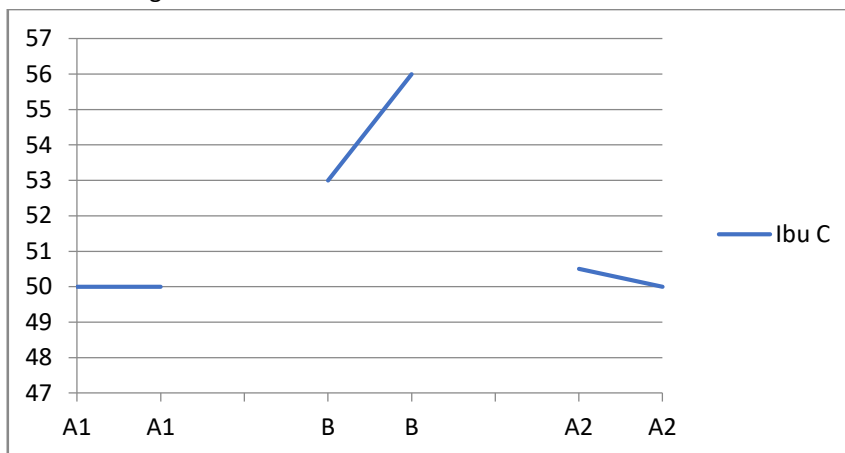

Figure 3. Directional Tendency (slope) Mother's Parental Acceptance C

DISCUSSION

The intervention on the subject is a form of literacy about autism provided through online media. This online literacy is also accompanied by references to other sources of information as an addition if there is material or information that is not understood. In addition, there are also references to psychologists who can be contacted to discuss daily activities, child behaviour, child development, communication with families about parenting, and other topics according to the subject's needs.

Knowledge and information about autism is needed by parents, especially mothers who care for and assist autistic children. Mothers are expected to have good enough knowledge to understand their children's conditions and be able to provide care, teaching and assistance at home so that autistic children develop better. Things that affect the psychological dynamics of parents of autistic children are educational background, parenting experience, knowledge about autism, socioeconomic conditions, and family factors as a social support system (Ergüner-Tekinalp & Akkök, 2004). Parents, especially mothers, are expected to continue learning because knowledge and information about autism often changes and develops as research and treatments progress. The learning process is also expected to change from conventional to more technological (Rohner et al., 2012).

The problems experienced by parents of autistic children are very diverse depending on the various aspects that affect Rohner et al., 2012; Arsli; (Gray, 2006). Parents can seek information and gain knowledge to overcome the problems that arise (Oosterling et al., 2010). In this case, the subject Mrs C did not have information when she found out about the autism diagnosis given by the doctor to her child. Mrs C lives in Jogja with her husband and two daughters. She felt overwhelmed with household chores and caring for her first child who was diagnosed with autism. Mrs C and her husband come from West Java province, so when they lived in Yogyakarta, they did not have an extended family support system in childcare. Within these limitations, Mrs C had limited abilities and support which made her rely solely on seeking information through doctors, therapists, teachers, or stories from other parents. (Fink, 2003) states that changes in new knowledge obtained can be shown by changes in attitudes, emotions, and behaviour in daily life. With the changes in knowledge that indicate a significant learning process in the research subject. Mother C gained meaning and enlightenment that the mother's response greatly influences the child's behaviour. In addition, the research subject realised that the parenting patterns obtained from her grandmother influenced Mrs C's parenting patterns for children. The subject got the meaning that the knowledge about autism was still very lacking and the subject also needed a partner or group of parents who could learn together. This shows that parents need to learn from this millennial generation.

According to research by (Ritterband et al., 2009) internet-based interventions can bring about changes in individual behaviour. Autism literacy focuses on providing knowledge, information and co-operation between parents, teachers, therapists and autistic children. In this intervention, psychoeducation focuses on the process of re-teaching through information sources in the website, while the process of psychotherapy through psychological consultation and daily self-monitoring records may not achieve optimal results. This may hinder the subject's behaviour change mechanism to be maximised.

IV. CONCLUSIONS

Conclusion

The results showed that there was an increase in parental acceptance in the research subjects. The researcher realizes that there are limitations in this study related to internet use. These limitations include using the internet before it is optimal for individuals, accessing websites, social media (Facebook), and using laptops. In addition, limitations related to subject inclusion criteria are the unbalanced level of knowledge and ability of subjects in accessing websites and the use of computers/laptops that are not measured. There are also limitations in the form of intervention, namely writing. However, these limitations can be overcome by making changes to the magazine, writing articles to be read and written in short, clear and easy-to-understand language, and equipped with appropriate images and videos. In addition, it is important to optimize the use of the internet as an intervention tool.

REFERENCES

1) Arsli, A. O. (2006). Penerimaan orangtua yang memiliki anak Autis. Skripsi. Tidak Dipublikasikan. Yogyakarta: Fakultas Psikologi UGM.

2) Alexander, G. K., & Grannum, D. R. (2022). School Garden Benefits: Health Promotion and Environmental Conservation. NASN School Nurse (Print), 37(2), 79–82. https://doi.org/10.1177/1942602X211058783

3) Bromley, J. O., HARE, D. J., Central, K. D., & EMERSON, E. (2004). Mothers supporting children with autistic spectrum. 409–423. https://doi.org/10.1177/1362361304047224

4) Brookman-Frazee, L., Stahmer, A., Baker-Ericzén, M. J., & Tsai, K. (2006). Parenting interventions for children with autism spectrum and disruptive behavior disorders: Opportunities for cross-fertilization. Clinical Child and Family Psychology Review, 9(3–4), 181–200. https://doi.org/10.1007/s10567-006-0010-4

5) Conger, R. D., Conger, K. J. C., & Martin, M. J. (2010). Socioeconomic Status , Family Processes , and Individual Development. 72(June), 685–704. https://doi.org/10.1111/j.1741-3737.2010.00725.x

6) Ergüner-Tekinalp, B., & Akkök, F. (2004). The effects of a coping skills training program on the coping skills, hopelessness, and stress levels of mothers of children with autism. International Journal for the Advancement of Counselling, 26(3), 257–269. https://doi.org/10.1023/B:ADCO.0000035529.92256.0d

7) Fink, L. D. (2003). A self-directed guide to designing courses for significant learning. University of Oklahoma, February.

8) Grant, N. E. (2016). Assisting parents of children with autism to make intervention decisions by improving their health literacy about evidence [The University of Queensland]. In School of Health and Rehabilitation Sciences. https://doi.org/10.14264/uql.2016.218

9) Gray, D. E. (2006). Coping over time: The parents of children with autism. Journal of Intellectual Disability Research, 50(12), 970–976. https://doi.org/10.1111/j.1365-2788.2006.00933.x

10) Hidayati, F. (2013). Pengaruh Pelatihan "Pengasuhan Ibu Cerdas" Terhadap Stres Pengasuhan Pada Ibu dari Anak Autis. Psikoislamika: Jurnal Psikologi Dan Psikologi Islam, 10(1). https://doi.org/10.18860/psi.v10i1.6359

11) Hyman, S. L., Levy, S. E., Myers, S. M., Children, O. N., & Disabilities, W. (2020). Identi fi cation , Evaluation , and Management of Children With Autism Spectrum Disorder. 145(1). https://doi.org/10.1542/peds.2019-3447

12) Kazdin, alan e. (2011). Single-Case Research Design. In methods for clinical and applied setting. https://doi.org/10.4324/9780429488184-9

13) Lord, C., Elsabbagh, M., Baird, G., & Veenstra-vanderweele, J. (2018). Autism spectrum disorder. The Lancet, 6736(18), 1–13. https://doi.org/10.1016/S0140-6736(18)31129-2

14) Lovejoy, M. C., Graczyk, P. A., Hare, E. O., & Neuman, G. (2000). MATERNAL DEPRESSION AND PARENTING BEHAVIOR : A META-ANALYTIC REVIEW. 20(5), 561–592.

15) Lukens, E. P., & McFarlane, W. R. (2004). Psychoeducation as Evidence-Based Practice: Considerations for Practice, Research, and Policy. Brief Treatment and Crisis Intervention, 4(3), 205–225. https://doi.org/10.1093/brief-treatment/mhh019

16) Ogretir, A. D., & Ulutas, I. (2009). The Study of The Effects of the Mother Support Education Program on the Parental Acceptance and Rejection Levels of the Turkish Mothers. Humanity & Social Sciences Journal, 4(1), 12–18.

17) Oosterling, I., Visser, J., Swinkels, S., Rommelse, N., Donders, R., Woudenberg, T., Roos, S., Van Der Gaag, R. J., & Buitelaar, J. (2010). Randomized controlled trial of the focus parent training for toddlers with autism: 1-year outcome. Journal of Autism and Developmental Disorders, 40(12), 1447–1458. https://doi.org/10.1007/s10803-010-1004-0

18) Radissa, V. S., Wibowo, H., Humaedi, S., & Irfan, M. (2020). Pemenuhan Kebutuhan Dasar Penyandang Disabilitas Pada Masa Pandemi Covid-19. Focus: Jurnal Pekerjaan Sosial, 3(1), 61. https://doi.org/10.24198/focus.v3i1.28735

19) Reinke, J. S., & Solheim, C. A. (2014). Online Social Support Experiences of Mothers of Children with Autism Spectrum Disorder. Shtayermman 2013. https://doi.org/10.1007/s10826-014-0039-9

20) Ritterband, L. M., Ph, D., Thorndike, F. P., Ph, D., Cox, D. J., Ph, D., Kovatchev, B. P., Ph, D., Gonder-frederick, L. A., & Ph, D. (2009). A Behavior Change Model for Internet Interventions. 18–27. https://doi.org/10.1007/s12160-009-9133-4

21) Rohner, R. P., Khalewue, A., & Cournoyer, D. E. (2012). Introduction to Parental Acceptance-Rejection Theory, Methods, Evidence, and Implications. Introduction to PARTheory, 9(3), 88–113. http://www.cspar.uconn.edu/introductiontoparentalacceptance2011.pdf%0Ahttps://doi.org/10.1016/j.adolescence.2018.07.007%0Ahttp://doi.wiley.com/10.1002/jclp.22750

22) Vismara, L. A., Mccormick, C., & Monlux, K. (2013). Preliminary Findings of a Telehealth Approach to Parent Training in Autism. https://doi.org/10.1007/s10803-013-1841-8

23) Zaidman-Zait, A., & Jamieson, J. R. (2007). Providing web-based support for families of infants and young children with established disabilities. Infants and Young Children, 20(1), 11–25. https://doi.org/10.1097/00001163-200701000-00003

Evaluation of Sensory Characteristics of Rubber Tree (Hevea Brasiliensis) Sawdust and Leaves as Alternative Biofuels

Adrian R. Ramos[1], Hazel Ann S. Acuña[2], Jayka Vielenar P. Ramirez[3], Regine B. Palmes[4], Anwar I. Kolong[5]

[1,2,3,4] STEM students, MBHTE-Concepcion National High School
[5] SST-I, MBTE- Concepcion National High School

ABSTRACT: In the face of rising fuel costs and environmental concerns, the need for alternate energy sources is growing. Charcoal, generated from animal and vegetable sources, has emerged as a viable alternative fuel. Briquetting, which compresses organic materials into compact briquettes, offers an environmentally responsible solution for waste management and energy production in the Philippines. Basilan, noted for its agricultural methods, generates a substantial amount of agricultural waste, including rubberwood sawdust (RBS) and Rubber Tree Leaves which is perfect for briquette production due to its lignocellulose content. Charcoal briquettes, made of charcoal fines and binder, are an economical, smokeless, and long-lasting fuel option which may poses sustainable solution as the conventional method of charcoal manufacture, which involves tree felling, poses ecological concerns. This exploratory experimental design study investigates the viability and possibility of utilizing biocharcoal from dried leaves of rubber trees and rubberwood sawdust (Hevea brasiliensis) as an environmentally benign and cost-effective option. This study intends to create a sustainable cooking fuel alternative to standard charcoal by reusing agricultural trash. The study aims to developed briquettes and assesses their physical characteristics such durability, efficiency, kindling time, burning time, and heating quality to three identified evaluators. Overall, the positive responses from those who were interviewed shed light on the promising potential of rubber sawdust charcoal briquettes ($\bar{x} = 4.8$ (liked very much)) and rubber tree leaves ($\bar{x} = 4.23$ (liked very much)) as a viable and environmentally friendly energy source for applications involving heating and cooking. Due to limited laboratory apparatuses, researchers recommended for a further evaluation of the developed briquettes such doing proximate analysis (e.g. measuring the moisture and ash content) established strong data to support the existing data.

KEYWORDS: Briquettes, Energy, Development, Hedonic scale, Sustainable Development

INTRODUCTION

The increasing concerns surrounding fuel costs, growing energy demands, and environmental degradation have brought the search for sustainable energy solutions to the forefront of global discussions. In this vast landscape, charcoal shines as a symbol of hope, providing a different option to traditional sources of fuel. According to Kataki & Kataki (2022), briquetting is a method that compresses organic materials or biomass into compact briquettes. This technique shows great potential for waste management and energy production. According to the DOST, charcoal briquettes, which are more efficient than ordinary charcoal, burn longer, are easier to ignite, produce intense heat, and have little smoke. Compared to plain charcoal, briquettes are less messy and more accessible to handle because they are compact and uniform in size. They are also easy to ignite, burn slowly, give more intense heat per unit volume, and are almost smokeless when burning. Charcoal briquettes made from agroforest wastes may lessen the extensive charcoaling of wood, thus helping protect what is left of the country's forest resources. (Engr. Belen B. Bisana, head of DOST-FPRDI's Bio-Energy and Equipment Development Section (BEEDS).

Moreover, given the urgent demand for sustainable energy sources, researchers have shifted their focus towards agricultural waste, an abundant resource that holds immense potential. It is worth mentioning that scientists and environmentalists have shown great interest in rubber tree leaves and sawdust, which are abundant byproducts in regions like the Philippines. Shakir et al. (2023) highlight the significant lignocellulose content found in rubberwood sawdust (RBS), making it environmentally friendly and a viable option for composite materials.

Evaluation of Sensory Characteristics of Rubber Tree (Hevea Brasiliensis) Sawdust and Leaves as Alternative Biofuels

In light of this context, our paper aims to assess the sensory qualities of rubber leaves and sawdust when used as charcoal briquettes. Our research is centered around examining the Durability, Efficiency, Kindling Time, Burning time and Heating quality to gain valuable insights into their potential as renewable energy sources. This research is in line with the findings of Patil et al. (2021), who suggest incorporating biomass into briquette production for power generation as a sustainable solution to waste disposal and pollution challenges.

The leaves of rubber trees and the sawdust, which are highly abundant and economically important in regions such as the Philippines, show potential as a cost-effective raw material for producing charcoal. In addition, Narzary and Das (2022) highlight the potential of using charcoal and binders to improve the physiochemical properties of briquettes, thereby increasing their effectiveness as alternative fuel sources.

We are conducting a study to assess the sensory characteristics of rubber tree both its leaves and sawdust and investigate their potential socio-economic impacts especially in our municipality, where communities impacted by limitations on wood charcoal production, we aim to support sustainable development initiatives.

We believe, that in a time marked by pressing environmental concerns and energy difficulties, the assessment of different fuel sources becomes incredibly significant. By conducting this research, this will provide foundational information in doing the briquettes and to uncover the potential of rubber leaves and sawdust as effective solutions for addressing urgent energy and waste management issues. Our findings could contribute to a more environmentally friendly and sustainable future.

RESEARCH METHODS

Research Design

This study is an exploratory experimental design. Exploratory research is described as a type of research design in which research is conducted to learn more about a problem that isn't well defined. The researchers will only conduct a physical assessment of the briquettes and shall use survey questionnaire to obtain data. The use of Likert scale will be used to assess evaluators' satisfaction/observation towards the developed briquettes. In addition, the researchers will explore the published literature regarding briquette technology as well as affiliation of biomass that are left unused. The use of biomass is widely documented and unique procedures can be established to suit the availability of organic wastes.

Materials Used

Along with the Collected Biomass materials of Rubber Sawdusts and Rubber leaves. The study used the following materials namely, PVC pipe (28 cm), Container/bowl, Pan and Stove and Mesh Sieve 120. Graduated cyclinder, Triple beam balance. Study mainly use cornstart as a binder.

Development Procedures

The design requires the development of a process using the existing print and digital materials. During this study, the focus is on the practical implementation of the conceptualized process to determine its feasibility. This stage will involve conducting a straightforward design and trial process to develop a more practical briquette formulation. In this study, there were two different set-ups and biomass materials used. The initial recipe for Rubber Tree Leaves briquettes required 187.5 grams of Pulverized biomass, 250 ml of water, and 250 grams of Starch. This mixture could produce 17 briquettes. The second recipe consisted of 90 grams of Starch, 240 ml of water, and 120 grams of Pulverized Rubber Sawdust Charcoal, resulting in 18 briquettes. The time it takes for carbonization varies depending on the mass of biomass. For example, a batch of 2 sacks of dried rubber leaves required 2 hours of controlled fire, while 2 sacks of rubber sawdust needed 3-3.5 hours under the same conditions.

Following the carbonization process, the material is then pulverized using a 120-mess sieve. Combine the starch and water in a pan until the starch is fully dissolved. Place the wet mixture on medium heat and stir until it becomes sticky. It will take approximately 5-7 minutes for it to reach the desired consistency. Once the mixture is complete, gradually incorporate the pulverized biomass until it reaches the desired consistency, neither too dry nor too wet. Next, the compaction process involved using PVC as a molder and inserting wood to compact the carbonized biomass. Apply firm pressure with your hand to ensure proper compaction. After applying the substance, it needed to be left to dry for 10-15 hours under the heat. Below are the general steps of the briquette's development.

Evaluation of Sensory Characteristics of Rubber Tree (Hevea Brasiliensis) Sawdust and Leaves as Alternative Biofuels

Figure 1. General steps in the development of charcoal briquettes

Evaluation of Sensory Characteristics of Briquettes

Three respondents will be selected by the researchers to assess the durability, efficiency, kindling time, burning time, and heating quality of the carbonized rice hull briquettes. Prior to utilizing the carbonized briquettes, the student researchers will provide an introduction to the components used in their production and subsequently offer instructions on their proper usage. Users will compare the performance of the developed briquettes with conventional charcoal and assess the acceptability level of the product using a hedonic rating scale (See table 1). a) Durability - refers to the capacity of the briquettes to withstand damage when exposed to external forces. The respondents will assess the briquettes' durability by testing how easily they disintegrate.b) Efficiency - the effectiveness of the briquette is crucial. It determines the speed at which it can bring the water to a boil. The participants would utilize the briquettes for cooking purposes and carefully monitor the speed at which the briquettes bring the food to a boil.c) Ignition Speed - this determines the rate at which the briquettes catch fire.The respondents will carefully observe the briquettes as they are lit to determine how quickly or slowly they ignite.d) Burning Time - it determines the duration of the product's burn when used. The respondents will assess the briquettes once they are ignited, including their heat production duration and longevity when in use.e) Heating Quality - it determines the level of heat produced by the briquettes. The respondents will assess the heat generated by the briquettes and determine the effectiveness of the briquettes for heating purposes.

Table 1. Scale for the Scorecard on the Acceptability Level of Each Sensory Characteristic of the developed briquettes

Scale	Interval	Degree of Response
5	4.20 - 5.00	Liked Very Much
4	3.40 - 4.19	Liked Moderately
3	2.60 - 3.39	Neither Liked nor Disliked
2	1.80 - 2.59	Disliked Moderately
1	1.00 -1.79	Disliked Very Much

RESULTS AND DISCUSSIONS

Table 2. Evaluation of Sensory Characteristics of the Rubber Sawdust Briquettes

Sensory Characteristics	Rate	Remarks
a) Durability	4	Liked Moderately
b) Efficiency	5	Liked Very Much
c) Kindling Time	5	Liked Very Much
d) Burning Time	5	Liked Very Much
e) Heating Quality	5	Liked Very Much
Average Rating	**4.8**	**Liked Very Much**

Evaluation of Sensory Characteristics of Rubber Tree (Hevea Brasiliensis) Sawdust and Leaves as Alternative Biofuels

Throughout the course of the interviews, the participants consistently expressed satisfaction with their experiences using rubber sawdust charcoal briquettes, emphasizing several important qualities. However, some participants expressed concern about the perceived softness of the briquettes in comparison to traditional charcoal or other fuel sources. According to the people interviewed, they found that the briquettes had a delicate texture that made them more likely to break and fall apart when handled and transported. It was found that the fragility of the briquettes was influenced by various factors, such as the composition of the materials and the binding agents employed in the manufacturing process.

The significance of optimizing the sawdust-to-binding-agent ratio is highlighted by this discovery. It is crucial to achieve maximum compactness and hardness in order to ensure that the briquettes are durable and can withstand handling and transport. Improving the structural integrity of the briquettes could greatly enhance their practicality and increase user satisfaction.

Despite this problem, the interviewees were generally pleased with how well the briquettes performed in other aspects. The exceptional ability of the briquettes to quickly boil water was highly praised. This feature emphasizes the briquettes' ability to heat up quickly and boil water faster, making it a valuable option for those looking for efficient heating solutions. The briquettes were highly regarded for their fast ignition and consistent flame, making them an ideal option for outdoor heating and cooking, like camping or picnics, thanks to their impressive efficiency.

In addition, the interviewees mentioned the briquettes' ability to burn for a longer period of time and generate high levels of heat. These enhancements not only enhanced the overall user experience but also offered practical advantages in terms of ease, effectiveness, and ecological friendliness. With a longer burn time, refueling becomes less frequent, making it easier to use and reducing the total amount of fuel used. The high heat generation is beneficial for cooking and heating, ensuring consistent and reliable performance. Nevertheless, the feedback received from the individuals interviewed highlights the promising potential of rubber sawdust charcoal briquettes as a sustainable and eco-friendly energy source for heating and cooking purposes. Although there is potential for enhancing durability, the overall advantages of these briquettes make them a compelling choice for individuals in search of sustainable and efficient fuel alternatives.

Table 3. Evaluation of Sensory Characteristics of the Rubber Leaves Briquettes

Sensory Characteristics	Rate	Remarks
a) Durability	4.66	Liked Very Much
b) Efficiency	4.33	Liked Very Much
c) Kindling Time	4.33	Liked Very Much
d) Burning Time	3.66	Liked Moderately
e) Heating Quality	4.33	Liked Very Much
Average Rating	**4.23**	**Liked Very Much**

The respondents shared positive experiences regarding the use of charcoal briquettes made from rubber tree leaves, highlighting several important characteristics. Based on the respondents' findings, they noted that the burning period of the briquettes was a highly significant aspect. Although the respondents found several positive aspects of the briquettes, they mentioned that the burning time did not meet their expectations when compared to traditional methods.

This feedback brought attention to an important area that could be improved. Throughout the burning time test, a total of 187.5 grams of biomass briquettes, which is equal to 17 briquettes, were burned for a duration of 47 minutes and 14 seconds. The burn duration of this is shorter compared to that of sawdust briquettes. The main factor contributing to this variation is the composition and texture of the briquettes. Charcoal briquettes made from rubber tree leaves have a smoother texture compared to sawdust. The finer texture of the material allows for a faster ignition and burning process, leading to a shorter overall burn time.

These observations highlight the importance of fine-tuning the composition of the briquettes to improve their burning duration. One possible approach is to modify the combination of materials in order to find the right balance between ignition efficiency and sustained burning. By tackling this problem, we can greatly enhance the practicality and user satisfaction of charcoal briquettes made from rubber tree leaves. This would make them a much more feasible option compared to conventional fuel sources.

CONCLUSIONS AND RECOMMENDATIONS

The results of the survey suggests that biomass from rubber tree such as sawdust and leaves can utilize as alternative biofuel as briquettes. The transformation of rubberwood sawdust and leaves into charcoal briquettes offer a promising solution for sustainable and renewable energy sources. This innovative process not only provides a renewable energy option but also

Evaluation of Sensory Characteristics of Rubber Tree (Hevea Brasiliensis) Sawdust and Leaves as Alternative Biofuels

addresses environmental concerns such as deforestation, waste utilization, greenhouse gas emissions, and energy efficiency. General results found that both rubber sawdust charcoal briquettes and rubber tree leaf charcoal briquettes received generally positive feedback. This suggests that these fuel sources have the potential to be sustainable and efficient for cooking purposes. The briquettes' quick ignition, steady flame maintenance, strong heat production, and long burning period were all appreciated by the participants. Some issues were brought up regarding the durability and vulnerability of the rubber sawdust briquettes during handling and transport, as well as the shorter burning time of the rubber tree leaf briquettes due to their fine texture.

In order to improve the performance and user satisfaction of both types of briquettes, it is advised to optimize the ratio of sawdust to binding agent for the rubber sawdust briquettes. This will help enhance their compactness and hardness, ultimately reducing the likelihood of breakage. For both kinds, improving the fixed carbon content, reducing the moisture content, and lowering the ash content will improve the heat production and burning efficiency. It is also suggested to explore methods for prolonging the burning time of rubber tree leaf briquettes, such as making adjustments to the material composition and density. By consistently incorporating user feedback and conducting thorough durability testing, we can ensure that the briquettes meet the practical demands.

REFERENCES

1) Arayata, Ma.,C., (2022). DOST urges LGUs to learn charcoal briquetting. November 18, 2020.
   https://www.pna.gov.ph/articles/1188950
2) Basilan. (2024, February 12). In Wikipedia. https://en.wikipedia.org/wiki/Basilan
3) Ecoport, 2009. Ecoport database. Ecoport. Retrieved from: https://www.feedipedia.org/node/1635
4) El-Haggar, S. M. (2006). Sustainability of Agricultural and Rural Waste Management. Sustainable Industrial Design and Waste Management, 223-260. https://doi.org/10.1016/B978-012373623-9/50009-5
5) Kataki, R., & Kataki, M. D. (2021). Weeds as a renewable bioresource: Prospects for bioconversion to biofuels and biomaterials through a cascade of approaches. Biofuels and Bioenergy, 437-461. https://doi.org/10.1016/B978-0-323-85269-2.00021-6
6) Khorasgani, N.B., Sengul, A.B. & Asmatulu, E. Briquetting grass and tree leaf biomass for sustainable production of future fuels. Biomass Conv. Bioref. **10**, 915–924 (2020). https://doi.org/10.1007/s13399-019-00465-7
7) Narzary, A., & Das, A. K. (2022, August). Study of effects of addition of charcoal and binder derived from taro on physiochemical properties of briquettes made from tree leaves. Sustainable Energy Technologies and Assessments, 52, 102119. https://doi.org/10.1016/j.seta.2022.102119
8) Patil, R. A., Deshannavar, U. B., Ramasamy, M., Emani, S., Issakhov, A., & Khalilpoor, N. (2021, May 26). Briquetting of Dry Sugarcane Leaves by Using Press Mud, Cow Dung, and Buffalo Dung as Binders.
   International Journal of Chemical Engineering, 2021, 1–12. https://doi.org/10.1155/2021/8608215
9) Romallosa, A. R., & Kraft, E. (2017). Feasibility of Biomass Briquette Production from Municipal Waste Streams by Integrating the Informal Sector in the Philippines. Resources, 6(1), 12. https://doi.org/10.3390/resources6010012
10) Shakir, A., Ahmad, M.,I., Yusup, Y., Rafatullah, M., (2023).From waste to wealth: converting rubber wood sawdust into green mycelium-based composite. Biomass conversion and biorefinery . 10.1007/s13399-023-05113-9

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

Desi Tri Nilasari[1] , Tri Kartika Pertiwi[2] ,Hesty Prima Rini[3]

[1,2,3] Management Study Program, Faculty of Economics and Business, East Java "Veteran" National Development University

ABSTRACT: Consumers have an interest in repurchasing a product due to several factors, namely brand image, quality, price and the balance between the benefits obtained and the sacrifices made (Customer Perceived Value). This research aims to test the influence of brand image, quality, and price on repurchase interest in Merapi Mountain outdoor products, and to test the influence of brand image, quality, and price on repurchase intention with customer perceived value (CPV) as an intervening variable for outdoor products Merapi Mountain. The variable measurement scale used is a Likert scale with a score rating (1-5) and a sample of 122. Data processing in this research uses smartPLS (Partial Least Square) software with outer model and inner model measurement models. The results of this research show that brand image and quality have a positive and significant effect on repurchase intention. Price has an insignificant positive effect on repurchase interest. Brand image, quality, and price have a positive influence on repurchase intention with CPV as an intervening variable.

KEYWORDS: Customer perceived value, Brand Image, Quality, Price, Repurchase Intention.

INTRODUCTION

Indonesia is a country that has many brands that are popular with consumers, one of which is in the outdoor sector which is popular with nature lovers and those who have a hobby of traveling. It is not surprising that more and more outdoor product brands are emerging, such as the local brand which is quite popular, namely Eiger, Consina, Rei, Cozmeed, Kalibre, and Cartenz, Merapi Mountain plus various outdoor festivals which are increasingly being held in various cities and have received a positive response from those interested in outdoor activities, giving rise to interest in purchasing these local brands of outdoor products. There are many outdoor products in the tent category that appear in many shopping searches, and purchasing interest, apart from quality and price, many people decide to buy a product because the brand is already embedded in their minds, so the strategy to grow the brand image in the minds of consumers needs to be improved, along with data on brands that are known and embedded in the minds of consumers. which makes consumers buy something because they already know the brand either from advertising or references from fellow consumers.
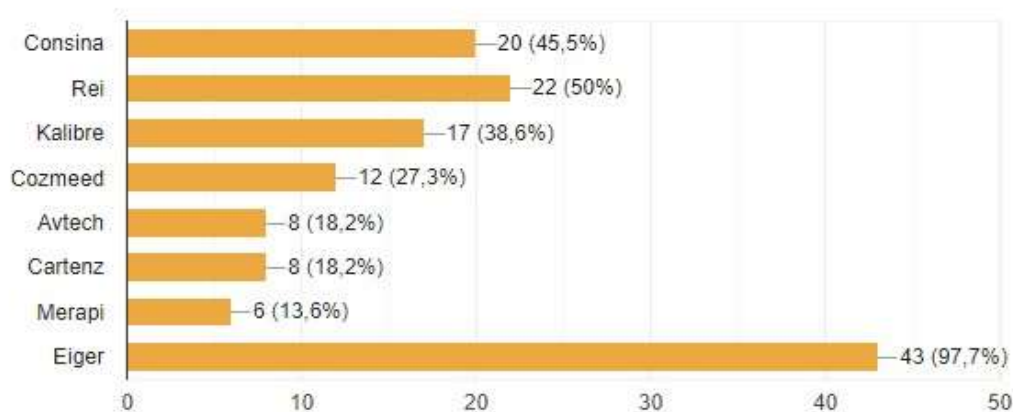

Figure 1.2 Brands that appear in consumers' minds
Source: Processed data observations (*www.docs.google.com/forms February 19, 2022*)

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

Based on the picture above, the brands that have become attached to society are dominated by Eiger brand products, then Rei, Consina, Kalibre, Cozmeed, Avtech, Cartenz, and Merapi are at the bottom. Image is the public's perception of a product brand. A good image of the product will benefit the company because consumers will subconsciously recommend the product to others. On the other hand, a bad image of the product will make consumers spread the bad information to other people. It can be seen that interest in buying Merapi Mountain is still lower compared to other competitors, so consumers are more interested in other brands that have been ingrained in the minds of each community.

When choosing outdoor products, consumers will tend to choose brands that they know well and that provide more value to themselves, both functionally and emotionally. This will influence consumer buying interest in determining which outdoor products to choose. This is supported by data obtained from Google Trends regarding sales of outdoor products which can be seen in the following diagram.

Penjualan Tenda Periode	8/29/2021 - 8/14/2022	Merapi	Consina	Rei	Eiger
		444	489	507	492
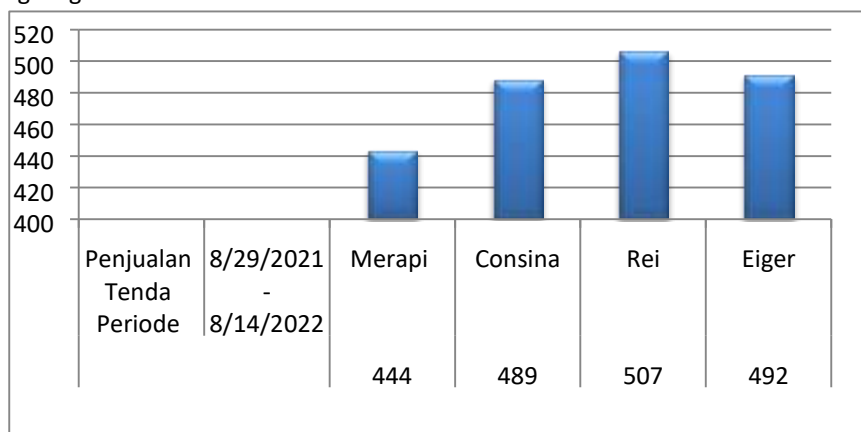
Graph 1.2Tent Sales Period 08/29/2021-08/14/2022

Source : https://trends.google.co.id/shopping/googleshoppingdata is processed

Based on the diagram above which is sourced from Google Trends in the shopping and Google Shopping categories in Indonesia, it can be seen that sales of tents in the last 12 months at Merapi Mountain are in last place and are dominated by Rei. Consumers' interest in repurchasing will take into account several other things besides the brand image they know, namely quality, price, and balance between the benefits obtained and the sacrifices made (*Customer Perceived Value*).

STUDY THEORY Repurchase Intention

. Repurchase can occur when a purchase is made more than once. Repurchase behavior only involves repurchasing the same particular brand repeatedly (Peter and Olson 2014). Repurchase interest is purchase interest that is based on purchase experiences that have been made in the past (Thamrin & Francis 2012). According to (Ali: 2013) indicators of buying interest can be identified as follows:

1. Transactional Interest, namely a person's tendency to buy a product.
2. Referential interest, namely a person's tendency to refer to other people.
3. Preferential interest, namely interest that describes the behavior of someone who has a major preference for a product. This preference can only be replaced if something happens to the preferred product, where the consumer's behavior makes the product they have consumed the main choice.
4. Exploratory interest, this interest describes the behavior of someone who is always looking for information about the product they are asking for and looking for information to support the positive properties of the same product.

Customer Perceived Value

Customer perceived value is the difference between a customer's perspective evaluation of all benefits and overall costs and comparison with existing alternatives. (Kotler and Keller: 2016), Customer perceived value is essentially the result of customer evaluation of benefits compared to costs. Based on research conducted by (Hung-Che Wu: 2013) several indicators can be taken as follows:

a. The benefits of the product are commensurate with the value of the money paid.
b. Products offer reasonable prices
c. Overall, the product is a great value.

Brand Image

Brand image is a consumer's view of a product that they know well through experience when using the product or when obtaining product information from people or other sources (Kotler. P & Keller: 2016). If the company has a strong positive brand

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

image, customers will be loyal to the company's various product lines and they are willing to buy without hesitation. A brand is a name, symbol, sign, or image or can also be combined to be used as the identity of an individual or a company that sells products or services (Firmansyah 2019). Products or services will be easily recognized by the presence of a brand image that has been ingrained in the minds of consumers, even people or consumers who are already familiar with a product will accidentally mention products that are similar to brands that they already know. The indicators that form a brand image according to (Simamora: 2008) are:

a. Maker's image (Corporate Image).
b. Product/consumer image (product image)
c. User image (User Image)

Quality

Product quality can be interpreted as all the characteristics and abilities of the product/service to meet the needs of consumers (Philip Kotler & Keller, in Purwanto 2021). The higher the quality of the product, the higher the consumer's decision to repurchase a product (Chaudhuri in Ayu's research 2021). Fandy, Tjiptono. 2016 product quality has the following indicators:

1. *Performance*
2. *Features*
3. *Reliability*
4. *Conformance to specifications*
5. *Durability*
6. *Serviceability*,
7. *Aesthetics*
8. *Perceived quality*

Price

Price is the amount charged for a product or service (Kotler and Armstrong, 2009). Consumers will compare the prices of several products of their choice and then evaluate whether or not the price is by the value of the product and the amount of money they have to spend. Prices set above competitors' prices are seen as reflecting better quality, while prices set below the price of competitors' products will be seen as cheap products or seen as low-quality products (Leliana and Suryandari, 2004). According to Kotler and Armstrong, translated by Sabran (2012), price indicators that can be used in this research include:

a. Price affordability
b. Price match with product quality
c. Company price competitiveness
d. Matching price with benefits

Conceptual framework
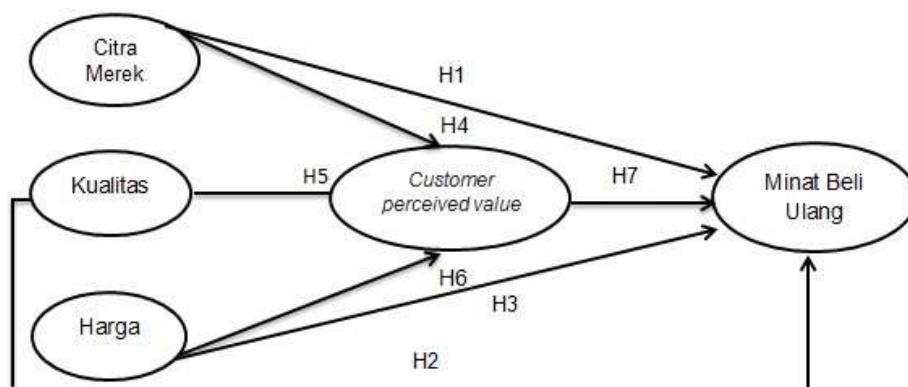
Hypothesis

H1: Brand image has a positive effect on repurchase intention.
H2: Quality has a positive effect on repurchase intention.
H3: Price has a positive effect on repurchase intention.
H4: Brand image has a positive effect on repurchase intention with CPV as an intervening variable.
H5: Quality has a positive effect on repurchase intention with CPV as an intervening variable.

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

H6: Price has a positive effect on repurchase intention with the CPV variable as an intervening variable.

H7: Customer perceived value has a positive effect on repurchase intention

Research Methodology Population

Population is a generalized area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then conclusions drawn (Sugiyono, 2019). Meanwhile, the population in this study was the Surabaya Mountain Climbing Community with 175 members.

Sample

The sampling technique is a way to determine a sample whose number corresponds to the sample size which will be used as the actual data source by paying attention to the characteristics and distribution of the population to obtain a representative sample. using the Slovin formula, namely: $n = N / (1 + (N \times e^2))$ with the following elements:

n = Number of samples searched N = Number of population e = Tolerated margin of error

So, with a margin of error set at 5%, a sample of 122 respondents can be obtained.

Analysis Techniques

Data processing in this research uses smartPLS (Partial Least Square) software with outer model and inner model measurement models. The PLS method can describe latent variables (not directly measurable) and is measured using indicators. The series of tests in the measurement model or outer model are validity tests and reliability tests. There are two types of validity tests, namely convergent and discriminant validity tests. To measure validity, the convergent validity test parameters can be determined based on the results of the smartPLS algorithm output in the form of outer loading, AVE, and commonality.

ANALYSIS AND DISCUSSION

Validity test (*Convergent Validity*)

Convergent validity is measured using the outer loading parameter or loading factor. To measure construct validity, the factor loading value can be seen and the factor loading must be 0.5 or more and ideally 0.7 and the AVE value of each variable is more than 0.5. The following are the outer loading values for each indicator in this research variable as follows:

Table 4.12 Convergent Validity Values

Variable	Indicator	Loading Value	AVE	Information
Brand Image	X1.1	0.865		Valid
	X1.2	0.813	0.689	Valid
	X1.3	0.811		Valid
Quality	X2.1	0.729		Valid
	X2.2	0.755 0.763		Valid
	X2.3	0.847		Valid
	X2.4	0.790		Valid
	X2.5	0.861		Valid
	X2.6		0.647	Valid
	X2.7	0.835		Valid
	X2.8	0.844		Valid
Price	X3.1	0.842		Valid
	X3.2	0.821	0.731	Valid
	X3.3	0.901		Valid
Repurchase Interest	Y.1 Y.2	0.819 0.751		Valid
	Y.3	0.732		Valid
			0.632	Valid
	Y.4	0.772		Valid
Customer Perceived Value	Z.1	0.820		Valid
	Z.2	0.808	0.592	Valid
	Z.3	0.755		Valid

Source: Primary data processed.

Based on the table above, the factor loading value of all manifest variables is > 0.7 and the AVE value is > 0.5, showing that all indicators in the research variables can be said to meet convergent validity and were excluded from the study.

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

Reliability Test

Reliability is a tool for measuring a questionnaire which is an indicator of a variable or construct. A questionnaire is said to be reliable or reliable if a person's answers to the questions are consistent/stable from time to time.

Table 4.15 Reliability Test Value

Variable	Cronbach's Alpha	Composite Reliability	Information
Brand Image	0.775	0.869	Reliable
Quality	0.922	0.936	Reliable
Price	0.817	0.891	Reliable
Customer Perceived Value	0.710	0.837	Reliable
Repurchase Interest	0.769	0.853	Reliable

Source: Primary data processed

The value of all variables in the Composite Reliability reliability test is >
0.70. Therefore, it can be concluded that the variables tested are valid and reliable.

Structural Model or Inner Model

The structural model is evaluated by looking at the percentage of variance explained, namely by looking at the R-Square value for the endogenous latent construct, testing the model fit, and significance testing to answer the research hypothesis.

Table 4.16 R² Value of Endogenous Variables

Model	R Square
Customer Perceived Value	0.420
Repurchase Interest	0.584

Source: Primary data processed

The model of the influence of brand image, quality, and customer price perceived value gives a value of 0.420, which can be interpreted as a variable *customer perceived value* that can be explained by variables brand image, quality, and price was 42.0% while the remaining 58.0% (100%-42.0%) was explained by other variables outside this research.

Hypothesis testing

In the bootstrapping method, the criteria for acceptance or rejection of the hypothesis areIf the significance value of the t-test is > 0.05 then H_0 accepted and Ha is rejected. This means that there is no influence between the independent variable and the dependent variable. If the significance value of the t-test is <0.05 then H_0 rejected and Ha accepted. This means that there is an influence between the independent variable and the dependent variable. The significance value of p - pvalue < 0.05 (alpha 5%).

Table 4.19 Hypothesis test

Hypothesis	Original Sample (O)	T Statistics (|O/STDE V|)	P Value	natio n
Brand image has a positive effect on repurchase intention	0.233	3,115	0.002	Accepted
Quality has a positive effect on repurchase interest	0.187	2,607	0.009	Accepted
Price has a positive effect on repurchase interest	0.091	1,364	0.173	Rejected
Brand image has a positive effect on repurchase intention with CPV as an intervening variable	0.150	3,045	0.002	Accepted
Quality has a positive effect on repurchase intention with CPV as an intervening variable	0.171	3,837	0,000	Accepted
Price has a positive effect on repurchase intention with CPV as an intervening variable	0.191	3,716	0,000	Accepted

Customer perceived value has a positive effect on repurchase interest	0.508	5,677	0,000	Accepted

DISCUSSION

1.   Test results, the first hypothesis is that brand image has a positive and significant effect on repurchase interest. If the company has a strong positive brand image, customers will be loyal to the company's various product lines. They are willing to buy without hesitation, this is because a good brand image will make it easier for people to recognize a product and enable them to be interested in repurchasing the product, so the brand image of Merapi Mountain outdoor products is important for consumers to make their choice in purchasing outdoor products. Research (Pertiwi 2021) states that product knowledge can increase buying interest because the brand image is part of product knowledge that will stick in the minds of consumers regarding a product to be purchased. The results of this research agree with the theory of Kotler, Philip & Kevin Lane Keller, and are supported by research from Triawan (2017), Nurfitriana (2018), and Kawirian (2019) which shows that brand image has a positive and significant effect on consumer repurchase interest.

2.   The results of testing the second hypothesis state "Quality has a positive and significant effect on repurchase interest". The higher the quality of the product, the higher the consumer's decision to repurchase the product. The results of this research also support research from Satriya (2017), Haqiqi (2021), and Ika (2020) which states that quality has a significant and positive influence on repurchase intention.

3.   The results of testing the third hypothesis state "Price has an insignificant positive effect on repurchase interest. The results of this research state that price has no significant effect on repurchase intention with a positive relationship direction. This means that price does not have a significant effect. This means that price is not the main support for interest in buying Merapi Mountain outdoor products and also the price offered does not discourage interest in buying Merapi Mountain outdoor products. This research is by research by Nisa (2018), which states that price does not have a significant effect on interest in purchasing products. However, the results of this research contradict the results of research by Suhartini (2020) which shows that price has a significant effect on consumers' repurchase interest. Based on the research results, price does not affect repurchase interest because the price is considered affordable and competitive for outdoor activity lovers. so that consumers no longer think about the prices set by Merapi Mountain where the price of the product is by the benefits felt by consumers, because there is a lot of competition, companies prioritize the brand and quality of the products offered, and as a result, consumers do not look at the price of an existing product. Merapi Mountain products have good quality and unique designs which make consumers ignore the price of Merapi Mountain products, and thus consumers will make repeat purchases in the future. Because the presence of perceived value makes consumers loyal and not concerned about existing prices.

4.   The results of testing the fourth hypothesis state "Brand image has a positive and significant effect on repurchase intention with CPV as an intervening variable. If the company continues to form a positive brand image, creates distinctive characteristics of the brand, and introduces the product brand to the wider community, the impact is that consumers will feel that the products they buy have good value and consumers will not hesitate to purchase the product because it uses a known product brand. widely by society. This research is in accordance with research by (Wijayanti 2018) and Triawan (2017), who stated in their research that brand image has a positive influence on customer perceived value, specifically brand image focuses on building long-term relationships with customers and is mutually beneficial for competitive advantage.

5.   The results of testing the fifth hypothesis state "Quality has a positive and significant effect on repurchase intention with CPV as an intervening variable. To achieve high customer value, a company needs to provide better product quality than its competitors. Customers assess that the perceived value and benefits are commensurate with the sacrifices they have made in accordance with the quality of the product they have received. Customer assessments of products or services are usually based on the quality inherent in the product or service. In accordance with research by Nurdin (2018) which states that product quality has a positive and significant effect on repurchase interest which is influenced by perceived value.

6.   The results of testing the sixth hypothesis state "Price has a positive and significant effect on repurchase intention with CPV as an intervening variable." The product price applied by a company is a consideration for customers whether they are willing to pay for a product based on their perception of the product. If a product requires consumers to incur costs that are greater than the benefits received, then what happens is that the product has negative value. On the other hand, if consumers think that the benefits they receive are greater, then what will happen is that the product will have positive value. An appropriate price means the value that is perceived as appropriate at the time the transaction is carried out, Adlaan (2012). This research is in accordance with the results of research from Runaika (2020) and Iswanti (2022).

7.   The results of the seventh test state "Customer perceived value has a positive and significant effect on Repurchase Intention". Customer Perceived value increases in consumers because consumers feel the benefits of the product which will then

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

influence repeat purchase interest. Customers' repurchase intention can be increased by offering added value and benefits to the product so that CPV can be formed.

CONCLUSION

Based on the results of this research which were discussed in the previous chapter, several conclusions can be drawn to answer the problems in this research. Several conclusions can be drawn, namely:

1) For Merapi Mountain outdoor products, brand image contributes to repurchase interest.
2) For Merapi Mountain outdoor products, product quality contributes to repurchase interest.
3) For Merapi Mountain outdoor products, the product price does not contribute to repurchase interest.
4) For Merapi Mountain outdoor products, brand image contributes to repurchase interest through customer-perceived value.
5) For Merapi Mountain outdoor products, product quality contributes to repurchase interest through customer-perceived value.
6) For Merapi Mountain outdoor products, the product price contributes to repurchase interest through customer-perceived value.
7) For Merapi Mountain outdoor products, customer-perceived value contributes to repurchase interest.

SUGGESTION

Based on the conclusions that have been described that can be conveyed from this research so that it can be used as a source of ideas and input for companies and the development of this research in the future, the recommended extensions of this research include:

1. For the Merapi Mountain Outdoor product industry

For outdoor products, Merapi Mountain is expected to continue to strive to create innovations in the latest designs to maintain and improve the brand image. This will make consumers always remember the products offered and have the desire or interest to buy again. Always strive to maintain quality, especially product reliability and also Merapi Moutain products are expected to increase customer perceived value for outdoor products.

2. Suggestions for further research

Based on the results of the researcher's experience in conducting research, the researcher provides the following suggestions to researchers and students: For future researchers who will take research that has a similar or similar theme, it would be best to add variables such as social influence, digital marketing, and consumption experience that can be related to this research because the variables used for this research may not yet be widely developed.

REFERENCES

1) Ayu, OA2021. The Effect of Brand Equity on Repurchase: Conceptual Research. Faculty of Economics and Business, Diponegoro University, Indonesia. Journal of Economics and Business.Vol 5 No.2.
2) Fandy, Tjiptono. 2016. Service, Quality & Satisfaction. Yogyakarta: Andi.
3) Firmansyah, MA (2019). Product and Brand Marketing: Planning and Strategy. Qiara Media Publisher.
4) Haqiqi, Nur. 2021. The influence of product quality on consumer purchasing interest in Andritani Farm vegetable plantations, Cianjur Regency. Piksi Ganesha Polytechnic, Bandung. MEA Scientific Journal (Economic Management and Accounting). Vol. 5. No. 3.
5) Hung-Che Wu. (2013). An Imperical Study of The Effect of Service Quality, Perceived Value, Corporate Image, and Customer Satisfaction on Behavioral Intentions in The Taiwan Quick Service Restaurant Industry. Journal of Quality Assurance in Hospitality and Tourism, 14: 364-390.
6) Ika, Nuruni. 2020. Product Quality and Brand Image on Repurchase Interest in Pond's Men Products. Management of UPN Veteran East Java. Journal of Economics And Business Volume 1 Number 3.
7) Kawirian, Agung. 2019. The Influence of Product Quality, Price and Brand Image on Purchasing Decisions on Eiger Bags in North Cikarang. Faculty of Economics, Pelita Bangsa University, Bekasi.
8) Kotler, Philip and Armstrong, Garry. 2009. Marketing Principles. Jakarta
9) Kotler:P and Keller.KL2016.Marketing Management (15th edition).United States of America: Pearson Education.
10) Leliana and Suryandari. (2004). Price Perception in Customer Shopping Behavior. Business and Management Journal, (Accredited Journal), 4 (2)

11) Nurdin Sahidillah. 2018. Lifestyle, Perceived Value, and Customer Value on Purchase Intention. BSI University. Vol. 10, No. 2

12) Pertiwi, Tri K. 2021. Analysis of Product Knowledge and Shopping Experience on Intention to Buy an Oppo Smartphone at Shopee with Perceptions of Risk. Department of Master Management, Faculty of Economics and Business, National Development University "Veteran" East Java Vol.04 No 4

13) Peter, J. Paul and Jerry C. Olson. 2002. Consumer behavior and marketing strategy. Translation. Jakarta: Erlangga

14) Sabran, 2012, Marketing Management, Volumes 1 and 2 Ed. 13, PT. Erlangga, Jakarta.

15) Satriya, Arief Adi. 2017 The Influence of Price, Promotion, and Product Quality on Consumer Purchase Interest at Company A-36. Faculty of Management and Business, Ciputra University, Surabaya. Journal of Management and Start-Ups. Volume 2 Number 1.

16) Simamora, 2008, Consumer Behavior Research Guide, PT. Gramedia Pustaka Utama, Jakarta

17) Sugiyono. (2019). Quantitative, Qualitative, and R&D Research Methods. Bandung: Alphabeta.

18) Suhartini.2020.Customer Purchase Interest Seen from the Price Aspect. Sultan Agung College of Economics. Journal of Economics & Sharia Economics Vol 3 No 2.

19) Thamrin and Tantri Francis. 2012. Marketing Management. Jakarta : PT RajaGrafindo Persada.

20) Triawan, RD 2017. The Influence of Brand Image and Value Perception on Intention to Purchase a Honda Type PCX 150 Motorcycle (Study of Cafe Visitors at Tunjungan Plaza Surabaya). Faculty of Economics, Surabaya State University. Journal of Management Science Volume 05.

21) Wijayanti, Okta. 2018. The Relationship between Brand Image, Perceived Value, and Purchase Intention in Kubang H. Ridwan By Weaving in Limapuluh Kota Regency. Andalas University Campus Ii Payakumbuh.

The Role of CPV as a Mediation of Factors That Influence Repurchase Intention in Outdoor Products

Implementation of Operational Management at the Manufacturing Company (Pt Nippon Indosari Corpindo, Tbk) Sari Roti

Andi Pangeran[1], Iqbal Afra[2], Tito Peter Lenando[3], Dr. Ir. Tri Ngudi Wiyatno, M.T.,IPU (lecturer)[4]

[1,2,3,4]universitas Pelita Bangsa Fakultas Ekonomi And Bisnismagister Manajemen Ekonomi Bekasi

ABSTRACT: Operational management is very important for all types of industries, one of which is manufacturing. Manufacturing companies are concerned with production processes on a large scale that use equipment and machinery to manage raw materials into finished goods.

PT Nippon Indosari Corpindo Tbk "SARI ROTI "is one of the leading bread manufacturing companies in Indonesia. This Journal discusses how SARI ROTI applies operations management concepts to achieve competitive advantage and meet growing market demand.

Based on these objectives, researchers use qualitative research with qualitative analysis methods in which research is conducted by analyzing data using theoretical foundations as the basis of analysis. The data analyzed is secondary data, which is data that comes from existing sources and is not self-processed data

The results showed that this company is a company that successfully runs the overall operations management concept, so that the company is able to produce quality products and ensure the cleanliness of all its products, as well as efficient in terms of the production process and distribution of products produced with a wide marketing area coverage.

I. INTRODUCTION

Food that is practical and easy to carry is currently a prima donna among the people, one of the foods that is bread. Many people who consume bread as a food substitute for rice because the nutritional content contained is not much different, but they do not know whether the bread is produced cleanly (hygienic) or not. All that lies in the production process where the bread is made and packaged and then marketed. In addition, the cleanliness of the factory that produces the bread and the supply chain (Supply-chain) from raw materials to finished products to the hands of consumers. Of course, it is not easy for the product to have high quality so that consumers are satisfied with the product.

The bakery manufacturing industry has a high level of competition. PT Nippon Indosari Corpindo Tbk is the first and largest producer of bulk bread in Indonesia. The company produces a variety of products under the brand "Sari Roti", "Sari Kue" and "Sari Choco" halal, quality, safe for consumption and affordable by the public. Sari Roti, as the market leader, needs to implement an effective operations management strategy to maintain its position. The application of proper operations management concepts can help Sari Roti optimize its production process, improve efficiency, and produce high-quality products that suit consumer tastes. Operational management is one of the important factors in the activities of the enterprise. Operational management is a planning process that focuses on production activities ranging from finance, human resources and marketing. In production activities, good management is needed to achieve goals and control operational activities. Good operational management will be in line with the activities and maximum production performance. Operational management leads to planning activities so as to create a production process that is maintained and maintained.

Operational Management

According to Zulian Yamit (2003), operational management has the following characteristics: have the goal to be able to produce goods and services, has the main activity that is in the transformation process activities, has a mechanism that can control an operation.

Implementation of Operational Management at the Manufacturing Company (Pt Nippon Indosari Corpindo, Tbk) Sari Roti

According Heizer, Render, and Munson (2015**)** operational management is set of activities that generate value in the form of goods and services by converting inputs into outputs.

According to Stevenson (2018) Operational Management is a set of principles, concepts, and techniques used to plan, organize, control, and improve the production process and delivery of products and services.

From the above definitions, it can be concluded that operations management is the science and art of managing the process of transforming inputs into outputs in an effective and efficient way to achieve organizational goals. Operations management includes a variety of activities, such as production planning, inventory control, scheduling, quality management, and operating system design.

Implementation of Operational Management

Slack, Chambers, and Johnston (2013), the application of operational management is a field of study that focuses on the design, operation, and control of production systems and the delivery of products and services.

Chase, Jacobs, and Aquilano (2017), the application of operational management is the management of production systems and transformation processes within an organization to create and deliver products and services that meet customer needs in an effective and efficient manner.

Jumadi (2021), the application of operational management is an activity in organizations in producing goods and services through a series of planning, organizing, implementing and monitoring activities to achieve efficient and effective results.

It can be concluded that the application of operational management is the science and art of managing the process of transforming inputs into outputs in an effective and efficient way to achieve organizational goals. The application of operational management includes various activities, such as production planning, inventory control, scheduling, quality management, and operating system design.

The main purpose of implementing operational management is to optimize the process of transforming inputs into outputs in an effective and efficient manner.

Effective means achieving a set goal, while efficient means using the minimum possible resources.

Implementation of operational management includes various activities, such as:

- Planning: determining what products to make, how much, and when.
- Control: manage inventory levels of raw materials, in-process goods, and finished products.
- Schedulling: set the order and timing of production activities.
- System design: choosing and designing the right operating system to achieve the company's goals.
- Management: ensuring products meet established quality standards.
- Resource managemANent: managing the workforce involved in the production process.
- Chain management: managing relationships with suppliers, distributors, and customers.
- Management: managing the buildings, equipment, and infrastructure used in the production process.

Some factors to consider in implementing operational management include:

- Customers: what products customers need, how much, and when they need them.
- Competitor: what competitors do, and how companies can compete with them.
- Technology: new technologies are available, and how they can be used to improve the efficiency and effectiveness of operations.
- Regulations: what regulations a company must comply with, and how they can affect a company's operations.

Implementation of operational management is an ongoing process. The company must constantly evaluate and improve the implementation of its operations management to remain competitive in a dynamic market.

RESEARCH METHODS

This type of research is qualitative research with a qualitative analysis method where research is carried out by analyzing data using theoretical foundations as the basis of analysis (W. J. Creswell & Creswell, 2018). The theoretical basis used is operational management theory, namely: project management, managing quality, process strategy, and the research object is PT. Nippon Indosari Corpindo Tbk which is a manufacturing company engaged in the first and largest mass bread producer in Indonesia. The company produces various products under the brands "Sari Roti", "Sari Kue" and "Sari Choco". The data analyzed is secondary data, which is data that comes from existing sources and is not data that is processed by yourself (J. W. Creswell, 2014). The data analyzed is in the form of news sourced from trusted sites such as Tribun and Otorider.com.

Implementation of Operational Management at the Manufacturing Company (Pt Nippon Indosari Corpindo, Tbk) Sari Roti

II. RESULTS AND DISCUSSION

Company Profile

PT Nippon Indosari Corpindo Tbk ("Sari Roti") was established in 1995 by Wendy Sui Cheng Yap. Initially, this company produced only plain bread and simple sweet bread. The company has its first factory located in Block W, Jababeka Industrial Estate, Cikarang. This company is not necessarily accepted by consumers because they have to compete with local bakery products are cheaper. However, over time, Sari Roti developed into one of the largest bakery companies in Indonesia by offering a wide range of bakery products, cakes, and snacks that are innovative and high quality. Demand for products is increasing after people are aware of the culture of healthy living by consuming healthy foods. The company increased production capacity by adding two lines of machines (bread and sweet bread) in 2001, demand is increasing after sari roti increase machine capacity so as to meet consumer demand continues to increase. In 2003 the company changed its name to PT. Nippon Indosari Corpindo, in 2005 the company expanded its business by establishing a second plant in Pasuruan, East Java followed by the construction of a third plant in Cikarang, West Java in 2008. The company conducted an initial public offering in 2010 on the Indonesia Stock Exchange under the issuer code ROTI. Since becoming a public company PT. Nippon Indosari Corpindo, Tbk continues to expand its production and distribution network by operating 5 new factories in Semarang, Central Java (2011), Medan, North Sumatra (2011), Cibitung, West Java (2012), Makassar, South Sulawesi (2013), and Palembang, South Sumatra (2013). Sari Roti offers a wide range of innovative and high quality bakery, pastry and snack products. Sari Roti products can be found in supermarkets, minimarkets, grocery stores, and bakeries throughout Indonesia.

- **Products**

  Here are some categories produkof Bakery Products:
    - o Sari Roti offers a wide range of roti tawar, including White roti, wheat roti, and sweet roti.
    - o Sweetbread: Sari Roti offers a wide variety of sweet breads, including stuffed sweetbreads, fried sweetbreads, and special sweetbreads.
    - o Cake: Sari Roti offers a wide variety of cakes, including sponge cakes, layer cakes, and pastries.
    - o Snack menu: Sari Roti offers a wide variety of snacks, including donuts, martabak, and pastels.

- **Awards and certificates**

  The company has received various awards and certificates that make this company more solid and the public is increasingly convinced that SARI ROTI products are clean and healthy products. In 2006 the company received a HACCP (Hazard Analysis Critical Control Point) certificate, namely a food safety guarantee certificate as proof of the company's commitment to prioritizing the 3H (Halal, Healthy, Hygienic) principles in every SARI ROTI product. In addition, all SARI ROTI products have been registered through the Indonesian BPOM Agency and obtained Halal certificates issued by the Indonesian Ulema Council. Now, SARI ROTI has registered itself as the largest bread producing company in Indonesia with various awards achieved, including Top Brand and Top Brand for Kids from 2009 until now, Marketing Award 2010, Original Brand 2010, Investor Award 2012, and awards from Forbes Asia "Best under a Billion" 2013

- **Company's vision and Mission**
    - o Company's Vision

      Continues to grow and maintain its position as the largest bakery company in Indonesia through extensive market penetration and in using a wide distribution network to reach consumers throughout Indonesia.
    - o Company's Mission

      Producing and distributing a variety of products that are "Halal", high quality, hygienic and affordable for all Indonesian consumers.

- **Financial Information**

  In 2022, PT Nippon Indosari Corpindo Tbk ("Sari Roti") posted net revenue of Rp 4.9 trillion and laba Net Profit of Rp 614 billion.

Implementation of Operational Management in Sari Roti

The implementation of effective operations management has been the main key to Sari Roti's success in achieving competitive advantage and meeting growing market demand. Here are some examples of implementing operations management in Sari Roti:

1. **Production Planning**

   Sari Roti uses an integrated production planning system to predict demand, determine raw material needs, and develop optimal production plans. Raw materials into things that must be maintained by the company in order to maintain quality, in the production process of raw materials are strictly selected before being processed into bread dough. Raw materials

sent by suppliers are first checked through a strict process with the aim that the selected suppliers can maintain consistent quality of the raw materials received. The process of making bread knows several process methods, ranging from processes that require only one mixing such as straight dough mixing and no time dough mixing, to the process of making bread that requires two mixing processes such as sponge and dough mixing the company produces bread continuously for 24 hours a day and 7 days a week to meet the needs of consumer, The resulting product has a life cycle (Product Life Cycle) is short because the essence of bread does not use preservatives, the average age of this product 3-4 days from the time of completion of production.

2. **Inventory Control**

   Sari Roti implements a strict inventory control system to ensure adequate availability of raw materials and finished products. This is done through real-time monitoring of raw material stocks, the implementation of an efficient reordering system, and effective warehouse management. Because product produced has a short life Cycle (Product Life Cycle). SARI ROTI directly markets its products so that there is no inventory that accumulates in the warehouse because of the short life cycle. SARI ROTI does not hoard the goods produced in the warehouse this is done to maintain the quality of the goods so that the goods sold are fresh. The company applies the Just in Time (JIT) system so that the goods produced are in accordance with consumer demand and the company does not hoard goods in the warehouse which of course in addition to increasing costs also decreases the quality of the goods produced. Inventory set by the company is not only the inventory in the warehouse of the company but the inventory of goods sold in the sales agents scattered marketing area SARI ROTI, the company ensures that no agent who has their bread inventory is too much and no agent who has too little bread inventory for sale. The company ensures that the inventory spread across the agents matches the demand of the consumers so this will minimize the return of unsold products by the agents.

3. **Scheduling**

   Sari Roti uses a sophisticated production scheduling system to ensure a smooth production process and minimize waiting time. This is done by determining the order and timing of each stage of production, allocating resources optimally, and monitoring the progress of production in real-time. Delivery of bread to SARI ROTI sales outlets is done every day up to two times a day depending on the high and low demand from each customer. The company sets the lead time or deadline for submitting orders no later than 2 days before delivery, so that the company can arrange production time at the factory and can send fresh products.

4. **Location selection**

   Sari Roti continuously innovates and improves its operating system. This is done by applying the latest production technology, designing an efficient factory layout, and paying attention to ergonomic aspects in the work. There are seven factories that currently produce SARI ROTI and spread in several regions to serve consumers SARI ROTI. The location of the factory is determined based on the marketing area of the bakery products, this is done to shorten the time while saving distribution costs as well as to increase the production capacity of the factory. The company is trying to build new factories with locations close to the intended marketing area. This step can save the cost of product distribution where the company does not need to spend a lot of distribution costs because the factories are scattered in the marketing area of the product, the product that reaches the consumer is really in a fresh state because the time required to send the product is very short besides this is done to prevent expired products before they reach the hands of consumers.

5. **Quality Management**

   Sari Roti has a strong commitment to the quality of its products. This is evidenced by the implementation of a strict quality control system at every stage of production, from the selection of raw materials to the packaging of products. SARI ROTI also conducts regular product inspections and implements defect repair programs to ensure that the products produced meet high quality standards. The company always maintains the quality of the products produced by maintaining the quality of raw materials used to produce bread, raw materials must through strict selection that has been set by the internal company and must be guaranteed halal so as to produce good quality bread in terms of appearance, texture, aroma, taste and also guaranteed Halal of bread produced. SARI ROTI maintain the quality of the bread produced by selecting the bread before it is packaged and marketed, bread must meet the standards of shape and size that have been set by the company so that the quality of the resulting product is the same. The company keeps the goods sold are always of high quality so as to maximize sales and minimize return goods.

6. **HR and Work Plan**

   SARI ROTI has employees reaching about 1200 people so that they can continue to operate production for 24 hours, SARI ROTI employees are set based on the Hold Constant Employment system so that when production demand rises or falls

the company continues to recruit and retire employees. The company recruit workers to be placed as employees based on education level, for example employees with high school education level will be placed in the production section to make bread, they will be trained on how to make bread, measure the raw materials to be mixed, arrange the production on the cooling rack, and pack the production in large packaging to be put carrier. This company has used the SAP system in managing their work and HR planning so that it is easier and more efficient than using a manual system, they use SAP to monitor Business Processes and decision making to develop their business, besides that the company can save costs because the time to design performance and also HR can be done in a short time.

7. **Supply Chain**

SARI ROTI distribution chain optimization is very high considering they have a product with a short life span, SAP is used to monitor the supply of raw materials and also the sale of products to large agents, they do not need to bother to take care of the transaction because this is done automatically by the SAP system, the system will also inform can be customized, in addition the business map becomes clearer because all are integrated with each other. Small agents such as traditional markets and small shops are also spearheading the sale of SARI ROTI products, they play an important role in marketing bread in the hands of consumers who cannot go to the modern market, besides that sari roti distributed through mobile agents from one place to another by using cart, making it more efficient to reach the target them. Return system at this company is very concerned, this is done to maintain the quality and safety of food, the company recalls the bread that has not been sold in retail regai, one day before the expiration date indicated on the packaging. For this reason, the company deliberately uses a different colour bread packaging binder every day of the week, which is to facilitate officers in making product withdrawals by looking at the colour of the packaging binder. Bread-bread returnees from the market are then sent back to the factory, put into a shredder to prevent abuse or falsification of quality, before finally sold to third parties who will process it into animal feed and fish.

8. **Company Layout**

SARI ROTI prioritizes speed and efficiency in its production without neglecting the quality aspect, the company prioritizes smooth production where the factory is made very wide thus the flow of workers becomes free, in addition SARI Roti factory also adopts the concept of Product-oriented layout where the machines are located close together and connected to each other and the production process takes place every day. SARI ROTI factory is also very clean sanitation in the factory, the factory layout does not have a corner of the room that has the potential to be a place of microbial growth and also dust, besides that before entering the factory every employee will be sprayed with alcohol to kill germs and will be aerated so that dirt such as hair loss can. In addition, this factory also performs machine maintenance flexibly, the extensive factory layout allows machine maintenance to be carried out in the factory, cleaning and machine maintenance are divided into two categories, the first is CIP (Clean in Place) where the tools are cleaned in the factory directly without having to be dismantled first, and there are also those who apply COP (Clean out Place) where the machine is cleaned in the factory by disassembling first, then the dirt from the machine will be disposed of to a waste disposal site Bread is made through several stages that must go through several machines ranging from dough making machines to bread wrapping machines, machines placed adjacent based on their respective functions, the reception room for raw materials that come is located adjacent to the raw material storage warehouse so that when the raw material comes it does not need to be moved far because it is not efficient and will make the flow not smooth, then the weighing place for raw materials to be processed is in the raw material storage warehouse so that storage, mixing machines with pressing machines are placed side by side so that the dough that has been mixed can be directly pressed to eliminate gas levels in the dough, a place for printing and roasting and fermentation are placed close together but a bit far apart from the previous two machines, this is intended so that there is ample space to bring the finished dough to the printing press, then after printing the dough is baked and after it is cooked it will be put on a special rack that has a so that when packaged bread does not evaporate and damp, then the rack is located next to the bread packaging machine so that the bread that has been cold can be directly packaged quickly and directly distributed to consumers.

III. CONCLUSION

PT Nippon Indosari Corpindo Tbk ("Sari Roti") has successfully applied its operating management concepts effectively to achieve competitive advantage and meet the increasing market demand. The implementation of proper operations management strategies has helped Sari Roti in optimizing its production processes, increasing efficiency, producing high quality products, and maintaining its position as a market leader in the bread manufacturing industry in Indonesia.

Implementation of Operational Management at the Manufacturing Company (Pt Nippon Indosari Corpindo, Tbk) Sari Roti

The company is able to optimize operations management in carrying out their business processes, assisted by SAP systems that also make it easier for them to run their business. The company can optimize production and distribution efficiently so that the products produced are of high quality and completely clean and healthy. Quality control is very concerned from the start of raw materials to finished products, this is evidenced by the strict selection of incoming raw materials in order to produce good quality bread in terms of appearance, texture, and taste.

This company is a company that successfully runs the overall operations management concept, so that the company is able to produce quality products and ensure the cleanliness of its products, as well as efficient in terms of production and distribution of products produced with a wide marketing area coverage.

REFERENCES
1) AOSCM: Articles onOperations and Supply Chain Management (OSCM) Volume 1, Nomor1, Jun2022 Journal Cakrawala Of Scientific Horizons Vol.2, No.8, April 2023
2) Chase, R.B., Jacobs, F.R., dan Aquilano, N.J. 2006. Operation Management. 11thedition. New York: The McGraw Hill Companies, Inc
3) Charmaine, Kelly, Irene Vangoh, Jane Eveline Susilo, Joan Goh, Viona, NUSANTARA : Jurnal Ilmu Pengetahuan Sosial, 10 (4) (2023): 1881-1888
4) Creswell, J.W. and Creswell, J.D. (2018) Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Sage, Los Angeles. https://carlbamford.weebly.com/uploads/4/4/1/3/4413567/operations_management_6th_ed.pdf
5) Heizer, Jay dan Barry Render. (2015), Operations Management (Manajemen Operasi), ed.11, Penerjemah: Dwi anoegrah wati S dan Indra Almahdy, Salemba empat, Jakarta.
6) Friday. (2021). Manajemen Operations Management. Purwodadi: CV. Sarnu Is Lucky.
7) Stevenson, William J., Chuong, Sum Chee. 2014. Manajemen Operation Management: PerspektifAsian perspectives, edisi9-Book-1 edition. Salemba Four. Jakarta.
8) Slack, Chambers, dan Johnston (2013) https://spada.uns.ac.id/pluginfile.php/814614/mod_resource/content/1/E-book%20Service%20Operations%20Management.pdf
9) Yamit, Zulian. (2003). "Manajemen Production and Operations Management". Edisi Second Edition.Yogyakarta: FE UII.
10) Jurnal OPTIMA Vol 6 No 2 2022 II Fendy C, Chisty A, Julian FH, Shieny TP
11) Website Sari Roti https://www.sariroti.com/
12) https://www.academia.edu/8964074/Manajemen_Operasi_Sari_Roti
13) https://repository.widyatama.ac.id/server/api/core/bitstreams/aee09540-85ac-4e85-a67f-5baff3b3136c/content

Improving Advertising Text Writing Skills through Using the Flipaclip Application for Class XII DKV Students at Pasirian State Vocational School

Dwi Purwati[1], Fani Dwiarianti[2], Arman Rumatoras[3], Anita Candra Puspita Ningrum[4], Anthoni Rumkedy[5], Yunita Anas Sriwulandari[6], Purwatiningsih[7]

[1]SMK Negeri Pasirian , [2]SMK Pancasila Mojowarno, [3]SMP Yapis 2 Fakfak, [4]SDN Rejoso Kidul 1, [5]SMK Negeri 3 Kepulauan Tanimbar, [6]Universitas Insan Budi Utomo, [7]SMP Negeri 2 Kepanjen

[1,2,3,4,5,6,7]Indonesia

ABSTRACT: Technological sophistication is able to change the order of life, especially the world of education. The role of education is very important in preparing individuals to become extraordinary leaders and motivators. Language learning must be directed at improving the ability of students and teachers to communicate both verbally and in relevant writing. Based on the results of observations of Indonesian language lessons in class From the problems that have been explained, it can be concluded that the writer is interested in the problem of the lack of use of technology in learning which causes writing advertising texts to be uninteresting and boring. This research aims to describe the development of animation and graphic based learning media and explain the feasibility results of media products based on animation and graphic design using applications *FlipaClip* in learning advertising texts, slogans and posters for class XII DKV students at SMK Negeri Pasirian.

KEYWORDS: learning, technology, advertising text

I.   INTRODUCTION

Technological developments in the era of industrial revolution 4.0 and society 5.0 have changed human civilization rapidly. The use of artificial intelligence (AI), dependence on IoT (Internet of Things) and the sophistication of robots can change the order of life, especially the world of education. Meanwhile, Society 5.0 is a pattern of social life that is integrated with technology to create a better world. This is where the role of education is very important in preparing individuals to become extraordinary leaders and motivators.

The role of education in facing the era of industry 4.0 and society 5.0 according to Dwi Nurani, S.KM, M.Si, Education Curriculum Implementation Analyst at the Directorate of Elementary Schools when filling the national seminar "Preparing Professional Education in the Era of Society" is "educators minimize their role as learning material providers, educators become inspirations for the growth of students' creativity. Educators act as facilitators, tutors, inspirers and true learners who motivate students to be "Free to Learn."

The essence of learning language and literature in the industrial and social era is to convey language as a medium for learning communication. Language learning must be directed at improving the ability of students and teachers to communicate both verbally and in writing which is relevant to the independent curriculum, that language learning competency is directed at four language skills, namely listening, reading, speaking and writing which are appropriate to the characteristics of students, learning resources. , strategies and learning content. Therefore, every teacher must have the skills to choose learning strategies that are more closely related to student success. In the digital era and the development of social media, this innovative approach is expected to increase student interest and participation in learning, (Harun, et al, 5882:2023)

Listening and reading skills are receptive skills because they are activities to absorb information conveyed through listening and reading, while speaking and writing skills are productive skills because the skills are expressed in written form or produce a discourse. The skills aspect is the most difficult aspect because writing is the skill of expressing ideas, ideas, feelings in written form so that other people can understand the contents of the writing. Writing skills are a skill that is very useful for

Improving Advertising Text Writing Skills through Using the Flipaclip Application for Class XII DKV Students at Pasirian State Vocational School.

everyone. Writing skills cannot be mastered by themselves but with serious and continuous practice. Several research results show that the use of media in learning can increase student interest and involvement (Faradila and Aimah, 2018:508; Nurfadhillah, et al., 2021:254; Magdalena, et al., 2021:324).

Advertising writing skills are very important for students. Through writing activities, students can express their ideas in written form using their language skills. It is very important to pay attention to students' writing skills regarding the extent to which students are skilled at writing. Learning Indonesian involves basic competency in writing advertisements using short, clear and concise text structures and linguistic rules. Advertisements are a type of written media to inform the general public about a product or service which is often also used in print or electronic media.

Based on the results of observations of Indonesian language lessons in class learning variations in writing advertising texts. (3) Lack of students' ability to write advertising texts (4) inappropriate learning media in writing advertising texts. (5) Lack of use of technology in learning.

From the problems described above, it can be concluded that the writer is interested in the problem of the lack of use of technology in learning which causes writing advertising texts to be uninteresting and boring. This research aims to describe the development of animation and graphic based learning media and explain the feasibility results of media products based on animation and graphic design using applications*FlipaClip*in learning advertising texts, slogans and posters for class XII DKV students at SMK Negeri Pasirian. Therefore, writing advertising text using animated video and graphic media is the key or the right way to create a work of writing good advertising text.

According to Wright (1978) in Liliweri (1992:20) that advertising is one of the persuasive communication processes which focuses on an effort to market the goods being sold, services, as well as certain thoughts or ideas. Dunn and Barban (1978) in Widyatama (2007:15) explain that advertising is non-personal communication in conveying a message in an effort to persuade with persuasive sentences about an item being sold, services and so on by a company to consumers, non-commercial institutions as well as personal.

Animation is a series of still images which are then arranged or assembled in such a way as to create the illusion of movement. In general, the illusion of movement is a change that is detected visually by the eye so that the changes that occur are the result of changes in position. In a broad sense, changing colors can also be called a form of animation.

The FlipaClip application is an application developed so that children can draw and create storyboards and then turn them into animated videos, cartoons and gifs. In this application there is digital drawing media such as brushes with various shapes and colors as well as the option to enter text. How to use it is also easy, just choose the brush you want to use then draw with your finger. Kids can also import audio from music.

II.   RESEARCH METHODS

As an effort to prove and solve the problems raised in this research, the researcher has determined and designed a research design, namely using the Classroom Action Research (PTK) method. Classroom Action Research is research carried out by teachers in their own classes through self-reflection, with the aim of improving their performance so that student learning outcomes increase (Wardani and Kuswara, 2009, p. 1.15).

Several reasons for choosing PTK are (1) PTK is very conducive to making teachers sensitive and responsive to the dynamics of learning in their classes; (2) PTK can improve teacher performance so that they become professionals in teaching and learning process activities; (3) by implementing the stages in PTK, teachers are able to improve the learning process through an in-depth study of what happens in their class; (4) the implementation of PTK does not interfere with the main duties of a teacher, because there is no need to leave the class while the KBM is taking place; (5) teachers become more creative, because they are always required to make innovation efforts to implement and adapt various learning theories and techniques, as well as teaching materials that they understand.

The procedures for implementing PTK that the researchers carried out were adapted from Arikunto (2010, p. 138), as follows.

The flow in the PTK chart can be described as follows.

a.   Action Planning

In action planning, the things that researchers need to pay attention to are as follows:

1)   load learning scenarios,

2)   prepare the necessary facilities and supporting equipment in the classroom. If a particular observation instrument is needed, it is necessary to state how it will be made, who will use it, and when it will be used,

Improving Advertising Text Writing Skills through Using the Flipaclip Application for Class XII DKV Students at Pasirian State Vocational School.

3) prepare instruments to record data regarding the process and results of actions, and
4) carrying out simulations of implementing corrective actions to test the implementation of the design.

b. Implementation of Actions

Implementation of actions includes who, when, where and how to do them. Action scenarios that have been planned, implemented in actual situations. At the same time, this activity was also accompanied by observation activities and followed by reflection activities.

c. Action Observation (Observation)

In the observation section, observations are carried out by observers which include the process and results of implementing activities. The purpose of conducting observations is to collect evidence of the results of actions so that they can be evaluated and used as a basis for reflection.

d. Reflection

In the reflection section, data analysis is carried out regarding the processes, problems and obstacles encountered and continued with reflection on the impact of implementing the actions taken.

III. RESULT AND DISCUSSION

Conditions that are the background to the problem, why this practice is important to share, what is your role and responsibility in this practice. Learning advertising texts aims to train students in conveyingideas or ideas in the form of steps to create promotional media to market a product they make. Class XII DKV advertising text learning at Pasirian State Vocational School usually uses teaching materials that do not highlight local wisdom products made by them themselves. Teachers use advertising text teaching materials in textbooks because they are more practical and without preparation. This is not appropriate to the student environment. Teachers who use teaching materials that are not appropriate to the environment of students in the Pasirian State Vocational School area which is in a developing rural area, make them lack real logical references. For example, many students in the environment have their own businesses such as making bracelets from beads, bouquet making services, traditional home made snacks, teachers can use these as teaching materials for advertising texts. In this way, the teaching materials used by teachers are more contextual, allowing students to have real experience and get to know the world of business.

Pasirian State Vocational School chose 3 of the six dimensions of the Pancasila Student Profile, namely local wisdom, sustainable living and entrepreneurship. Providing real experience and an entrepreneurial orientation in learning advertising texts is a form of implementation of Strengthening the Pancasila Student Profile (P5) in the Merdeka Curriculum in Indonesian language subjects.

The use of the Project Based Learning model makes students more active and the learning outcomes are in the form of real products, not just concepts or theories. PjBL is also highly recommended for implementing the Independent Curriculum.

My role and responsibility in this practice is to carry out optimal learning practices in the classroom by collaborating on the use of learning models and selecting entrepreneurship-based learning media so that the learning objectives and student outcomes can be as expected.

Some of the challenges faced to achieve this goal are as follows:

1. The limited ability of teachers to present interactive learning and prioritize student activity.
2. Students are not yet accustomed to learning using a project-based learning model (Project Based Learning) so they still need adjustments.
3. Lack of parental support in implementing effective learning, such as lack of parental attention in monitoring students' learning progress.

Starting from exploring the problem, continuing with preparing tools, then taking action and finally evaluating the parties involved, including:

1. Teachers as creators of learning scenarios and implementers of learning activities.
2. Lecturers and Civil Service Teachers as lecture guidance facilitators.
3. Students are the central figures who carry out learning activities.
4. The school principal acts as a supervisor and provides input on the planning and implementation of actions.
5. The school supervisor acts as a consideration at the problem exploration stage.

The steps taken to face these challenges are as follows:

1. Prepare the facilities needed to carry out optimal learning.
2. Coordinating with various parties regarding several things that are needed, such as the schedule for using the Axi class Lab,

providing Smart screens, LCD projectors and sound in class, a stable internet network, as well as coordinating with colleagues to assist in documenting learning activities.

3. Choose the right learning model and media so that active and enjoyable learning activities are held.
4. Develop student entrepreneurship-based teaching materials so that students have real references because they are close to their lives in order to achieve optimal learning outcomes.
5. Disseminate information to students about project based learning for learning advertising texts. Students are given a project to present advertising text in the form of a creative and interesting advertising video.

The resources or materials needed to implement this strategy are optimizing technology such as for recording activities, computer facilities for editing, and social media for publishing student products.

The impact of the actions and steps taken produces effective results. This can be seen based on the increase in learning outcomes due to utilizing IT and entrepreneurship-based learning media. For example, learning to find the content or information of advertising texts that they hear, students actively listen carefully and even practice because the learning media is real, namely through video shows made by each group. The project based learning model which is student-centred and product-based has been proven to increase students' activeness and enthusiasm in learning. Student responses related to the strategies carried out are:

1. The teaching and learning atmosphere in the classroom becomes more enjoyable because many students are actively involved in learning activities.
2. Through YouTube videos, access to learning material becomes faster.
3. Students feel happy with the discussion way of learning Groups because they can work together with other friends in solving a problem.
4. Publication of student products on the Instagram social media page makes students feel cooler and more contemporary. The factor in which the strategies implemented were not successful was that there were still students who were not active in learning activities, both in discussions and group work and overall learning activities. Therefore, teachers as facilitators in learning must facilitate all students to learn fairly.

IV. CONCLUSION

The impact of the actions and steps taken produces effective results. This can be seen based on the increase in learning outcomes due to utilizing IT and entrepreneurship-based learning media. For example, learning to find the content or information of advertising texts that they hear, students actively listen carefully and even put into practice because the learning media is real, namely through video shows made by each group. The project based learning model which is student-centered and product-based has been proven to increase students' activeness and enthusiasm in learning. Student responses related to the strategies carried out are:

1. The teaching and learning atmosphere in the classroom becomes more enjoyable because many students are actively involved in learning activities.
2. Through YouTube videos, access to learning material becomes faster.
3. Students feel happy with the discussion way of learning Groups because they can work together with other friends in solving a problem.
4. Publication of student products on the Instagram social media page makes students feel cooler and more contemporary. The factor in which the strategies implemented were not successful was that there were still students who were not active in learning activities, both in discussions and group work and overall learning activities. Therefore, teachers as facilitators in learning must further facilitate all students to learn fairly.

REFERENCES
1) Hello, Liliweri. 1992. Basics of Advertising Communication, Bandung: Cipta Aditya Bhakti.
2) Arikunto, Suharsimi, Research Procedures: A Practical Approach, Revised Edition VI, Jakarta: PT Rineka Cipta, 2010.
3) Anadiroh, M. (2019). META-ANALYSIS STUDY OF PROBLEM BASED LEARNING (PBL) LEARNING MODELS. Jakarta: UIN Jakarta Repository.
4) Andayani, FM (2017). Analysis of Teacher Problems Related to Planning and Implementing Biology Learning Tools Using Problem Based Learning Models and Reality Media in High Schools. Journal of Education, 425-429.

Improving Advertising Text Writing Skills through Using the Flipaclip Application for Class XII DKV Students at Pasirian State Vocational School.

5) Faradila, SP, & Aimah, S. (2018). Analysis of the Use of Learning Media to Increase Students' Interest in Learning at SMA N 15 Semarang. Proceedings of the Unimus National Student Seminar, Vol. 1.

6) Harun, Ahmad, et al. Tiktok as Rhyming Media in Thematic Learning Platform: Phenomenological Study at SD Negeri 3 Duwet Tumpang Malang. IJMRA Journal vol 06 issue 12 2023.

7) Istarani. (2012. 58). Innovative Learning Model. Medan: Media Persada

8) Jihad, A. and Haris A..2013. Learning Evaluation. Yogyakarta: Multi Pressindo.

9) Koswara, S. 2009. Popular Food Technology Series (Practice Theory). Bread Processing Technology. E-BookPangan.com.

10) Widyatama, Rendra, Introduction to Advertising, Yogyakarta: Pustaka Book Publisher, 2007.

Multifunctional Nanocomposites in B4C-Tic-Tib₂-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

Z. Kovziridze[1], N.Nijaradze[2], G. Tabatadze[3], T. Cheishvili[4], N. Darakhvelidze[5]

[1,2,3,4,5]Georgian Technical University, Institute of Bionanoceramics and Nanocomposite Technology, Bionanoceramics and Nanocomposite Materials Science Center, Georgia, 0175, Tbilisi, Kostava Str. 69

ABSTRACT

Goal - to receive on first stage β - SIALON containing nanocomposites by reactive sintering method at 1400^0C, with nitrogen process from origin composition in TiC-BN-**SiC-B₄C-Si-Al-Al₂O₃** (nanopowder) system. By using this method of synthesis, it became possible to receive nanocomposites with different percentages of β - SIALON. Our task was to study the phase composition of received consolidated materials in the TiC-TiB₂-BN-SiC-B₄C-β-SiAlON-Al₂O₃ (nanopowder-400nm.) system.

Method. The obtained mass was grounded in an attritor and the consolidated composite was obtained by hot pressing at 1620^0C during 40 minutes, with glass perlite (Armenia) dope 2 mass%, delaying at final temperature for 8 min, under 30 MPa pressure and vacuum – 10^{-3} Pa. Perlite from Aragatc contained 96 mas. % glass.

To study the phase composition of the composites, we conducted an X-ray structural analysis on the DRON-3 device. And to study the microstructure, we conducted research on an optical microscope -AC100 and a raster electron microscope "Nanolab 7" of the company "OPTON". The values of the electrical parameters of the studied composites were calculated on the basis of the obtained "lgp- t" dependence. We have studied mechanical properties.

Result. In TiC-TiB₂-BN-**SiC-B₄C-** β-**SiAlON-Al₂O₃ – C Carbon Fiber** system we obtained nanocomposites with high mechanical properties. The advantage of this method is that compounds, which are newly formed thanks to interaction going on at thermal treatment: Si₃N₄, Si, AlN are active, which contributes to **β**-SiALON formation at relatively low temperature, at 1300-1350^0C. It is evident that inculcation of ALN in crystal skeleton of ß-Si₃N₄ is easier since at this temperature interval crystal skeleton of Si₃N₄ is still in the process of formation. ß-SiALON was formed at 1450^0C. Part of boron carbide was transformed into boron nitride in nitrogen environment and in titanium diboride, which in the case of both composites is in small quantities.

Conclusion. The phase composition of the obtained composite provides high physical-technical and performance properties of these nanocomposites. Compression strength-2198 MPa, Bending strength-271 MPa, Thermal expansion coefficient a_{20-700}-3.8 10^{-6} ^{0}C.

KEYWORDS: nanocomposite; hot press; electron microscope; phase composition; B4C-BN-TiC-TiB₂-SiC-β-SIALON-Al₂O₃ nano-powder system.

1. INTRODUCTION

SIALON is a general name for a large family of silicon nitride-based ceramic alloys, it was first adopted in the beginning of 1970.β-SIALON is the most well-known phase. Its chemical formula $Si_{6-z}Al_zO_zN_{8-z}$ (z = 0–4.2) and its hexagonal crystal structure are similar to the structure of β-Si₃N₄.

SIALON is distinguished by: high hardness, strength, wear resistance. It retains these properties under high temperature conditions.

Composites working at high temperatures should be characterized by high density, hardness, thermal resistance and should retain these properties when working at high temperatures. Composites obtained from highly refractory oxide ceramics retain their hardness at high temperatures but are characterized by a high coefficient of thermal expansion and therefore low thermal resistance. Carbide-based ceramics have a relatively high coefficient of thermal expansion, but they are oxidized easily when working at high temperatures. Because of this, science has turned its attention to obtain super high-strength composites - SIALONs [1-7]. The results

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

of our work [8-10] show that the composites obtained with the SIALON matrix are highly refractory materials with high performance properties and retain these properties when working at high temperatures. For the study we used electron microscopic, optical and X-ray phase analysis methods.

The paper describes the preparation of a super-ceramic composite with high macro and micro-mechanical properties of SIALON carbide at relatively low temperatures using an innovative, simple technology. As is known, SIALONS are obtained at temperatures of 1800-2000 ^{0}C. With the help of vitrified (96 mas. % glass phase) perlite-2-3 mas. % dopant, we obtained similar material at 1450 ^{0}C and in the composition with titanium carbide, boron nitride, boron carbide, silicon carbide and aluminum oxide (nanopowder), we were able to obtain eutectic precipitation at relatively low temperature - 1620 ^{0}C by hot pressing. The material is so hard, that it damaged the diamond beads when trying to treat it, and a 3000 atmosphere water jet failed to cut the specimen.

X-ray is performed on DRON-3. Electron microscopic research was performed on a raster electron microscope "Nanolab 7" of the company "OPTON". No special form of samples is required for this study, only a sample fracture is required. It should be noted that the fracture is better to be new, because after some time the surface of the fracture might be covered with dust particles or oxides, which reduces the contrast and makes it difficult to distinguish phases In addition, the ions continue to move on the surface of the new fracture for some time, which makes the study very interesting.

2. MAIN PART

To obtain the composites, we prepared mixtures, the composition of which is given in Table 1. To C-18 composite we have added carbon fiber, which is characterized by high elasticity modulus (200-935GPa), high- tensile strength (1-3 GPa), with these properties it is the desired component, since it strengthens the composite material [11].

The samples were made in a cylindrical shape by the semi-dry method, the molding pressure was 20 MPa. After drying the samples were burned out in a silite oven at a temperature of 1450^{0}C. Mode 5^{0}C /min. At the final temperature the samples were kept for 40 minutes.

The physical-technical characteristics and electrical properties of the finished samples, compression strength and bending strength, impact viscosity, density, thermal resistance and thermal expansion coefficients were studied.

MATERIAL COMPOSITION OF COMPOSITES. TABLE 1

Composite index	kaolin (Ukraine)	TiC	Al	Al$_2$O$_3$	SiC	Si	Perlite Aragats (Armenia)	BN	Y$_2$O$_3$	MgO	B$_4$C	Carbon fiber
Composition of the initial component, mass%												
C-19	5	-	17	22	21	20	2	-	1.5	1	10.5	_
C-18	_	-	18	20	23	19	_	-	1.5	1	14.5	3
C-16	-	5	16	18	20	17	2	9	1.5	1	10.5	-
C-17	-	6	16	18	22	17	2	11	1.5	1	5.5	-

The bending strength was measured on a German-made disrupting machine R-100, which has a device determining the strength limit of the specimens on a three-point bend. The loading speed was 5 mm/hr.

When determining the bending strength limit, the maximum stress is calculated by the following formula:

$\sigma_{bend.} = 3/2 \cdot Pl_0/bh^2$,

where :P- is the force at which the sample was disrupted, kg; l_0- distance between supports at 3-point load = 25 mm; b- sample cross-section width, mm; h- the height on which the stress is applied to the specimen, mm. The test results of C-19 and C-18 composites are given in Table 2.

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

Table 2.The physical-technical characteristics of composites

Composite name	Density g/cm^3	compression strength $\sigma_{press.}$ MPa	Bending strength $\sigma_{bend.}$ MPa	Impact viscosity a, kj/m^2	Thermal expansion coefficient α, 10^{-6}(20-700^{0}C)
C-19	3,11	1844,4	262	17,62	3,81
C-18	2,99	2189,8	264	18,14	3,83
C-16	3.12	2194.4	268	18.90	3.78
C-17	3.16	2198.5	271	18.80	3.82

Impact viscosity was determined by the pendulum impact testing machine. When the sample is crushed, the scale marks the swing angle of the pendulum β. Impact-bending strength is calculated by the following formula:

$A_{imp.}$ =A/S

where: A - work spent to crush sample, kilo joules (kJ); S - the cross-sectional area of the samples, m^2. For the C-19 composite samples: the cross-sectional dimensions were 1 cm x 0.35 cm; a = $\frac{6,17}{1 \times 0,35}$=17,62 kJ/m^2 ; for the C-18 composite samples: the cross-sectional dimensions were 1 cm x 0.2 cm; a = $\frac{6,17}{1 \times 0,34}$= 18.14 kJ / m^2.

As can be seen from Table 2, the bending strength and the impact viscosity of both composites (C-19, C-18) are almost the same and amount to 262; 264 MPa and 17.62; 18.14 kj/m^2 respectively. Ceramic composites experience thermal load sand gas-thermal impacts when working at high temperatures. In all ceramic materials there are invisible micro-cracks [12] and when the strength of the product is less than the loads, these loads are converted into the decomposition stress energy. At critical loads, high energies develop, causing decomposition of the product.

To determine these energies, Z. Kovziridze proposed a formula for calculating the failure stress energy [13-14], which establishes a universal interdependence between the failure stress energy of a product, the mass of the product, and the rate of crack development under critical stress conditions. The Z. Kovziridzes formula for calculating the failure stress energy is as follows:

E_{td}=ma $_{c.p.}$,

Where E_{td} is the failure stress energy, kilo joules; m- sample mass, g; $a_{c.p.}$- the crack development rate –2000 m/sc.

In our case the sample dimensions were 5,2x5,2x45mm, the sample mass was 3.86g. According to Z. Kovziridze's formula the failure stress energy is:

E_{td}=ma$_{c.p.}$=3,86x2000=7,72 kJ.

The thermal expansion coefficient of the composites (C-19, C-18) was determined with the help of a quartz vertical dilatometer -DKV for measuring the temperature coefficient of linear thermal expansion in the temperature range (20-700^{0}C). Table 2 and Figure 1 show that this indicator is the same for both composites and is a = 3.88 and 3.80 • 10^{-6}, respectively.

It is known from the literature [13] that the coefficient of thermal expansion of corundum ceramics is high and is $\alpha_{20-300C}$= 6,2 • 10^{-6}. While the low-oxygen content of refractory compounds, namely silicon carbide, is a = 5,18 • 10^{-6} and is characterized by high thermal resistance [15] It should be noted that the composites we obtained (C-19, C-18) are characterized even by a lower coefficient of thermal expansion, respectively a = 3,88 and 3.80 • 10^{-6} and a correspondingly higher thermal resistance, which is very important for composites that have to work for a long time at high temperatures and in an aggressive medium (Fig. 1).
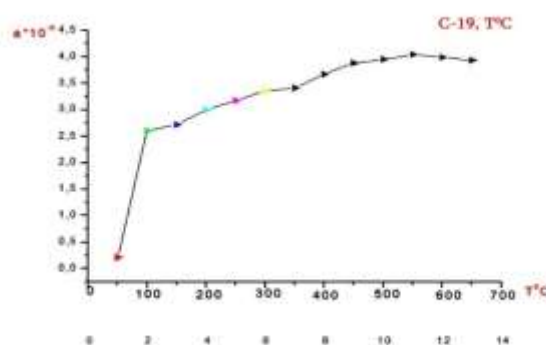
a

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes
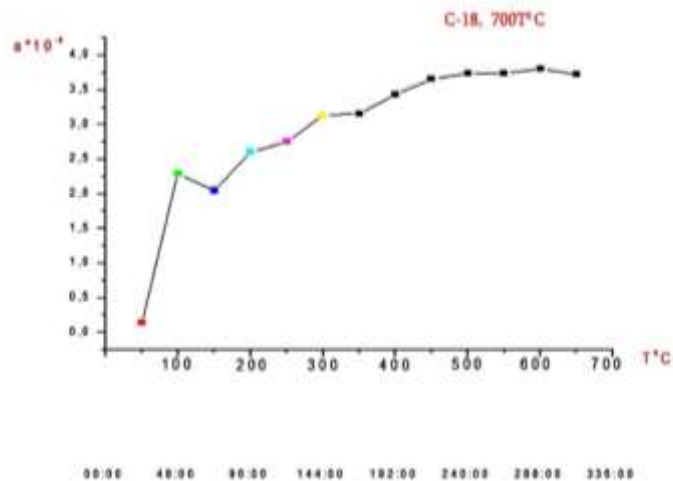
b

Fig. 1. Thermal expansion coefficient and

Temperature interdependence

Electrical characteristics have been established for the composite of compositions (on the device created by Prof. T. Cheishvili - CH-24) which were obtained as a result of the "resistance-temperature" dependence experiment. The volumetric electrical resistance of the composites was determined in the section allowing measurements at high-temperatures in the range of 20-300^{0}C, by using an electron ohm meter as the measuring instrument. Graphite electrodes were placed on the surface of the prismatic samples (the upper measuring electrode had a diameter of 14 mm and the lower measuring electrode had a diameter of 16 mm).The dependence of the test specimens on the "specific resistance-temperature" is linear, revealing the peculiarities that an increase in temperature causes a decrease in electrical resistance. Besides the C-19 specimen is characterized by lower values of electric resistance than the specimen C-18, C-16, C17. The difference between the electrical resistances is particularly noticeable at room temperature (the difference is approximately by three degree), but it is less evident at high temperatures (the difference decreases to one degree), which is clear from the material reflecting the results of the experiment (Fig. 2).

The values of the electrical parameters of the study composites were calculated on the basis of the obtained "lgp- t" dependence. Three electrical characteristics were determined for composites: the temperature coefficients of electrical sensitivity (B) and electrical resistivity (α_T) the activation energy of electrical conductivity (Ea), the value of which are presented in Table 3. The difference between the electrical characteristics was found to be significant (C-18 composite data are approximately 5 times higher than those obtained for C-19 composite).

It should be noted that composites have a negative α_T (resistance decreases with increasing temperature) and low value of Ea- (realization of electronic type of electrical conductivity is expected for both materials).

The results obtained should be related to the basic phases represented in C-19 and C-18 composites obtained by the synthesis at 1450^{0}C, under the same conditions. Regarding the compositions C-16 and C-17, the "log $_{p-T}$" dependences, which occupy an intermediate position between C-19 and C-18, it can be noted that the compositions contain two "new" ingredients - TiC and BN. In some high-temperature synthesis of composites, one cannot exclude the participation of these in the formation of a new semiconductor phase - TiB$_2$. Based on the composition of the composition C-16 and C-17 (Table 1), the expected amount of TiB$_2$ should be greater in the composition of C-17. This is also confirmed by the electrical properties in comparison with composition C-16; composition C-17 has lower values of resistivity and activation energy.

According to the results of X-ray phase analysis, the leading phase in the composite of both compositions is SIALON. They also contain five other crystalline compounds of different nature. Due to their electrical properties they can be divided into two groups: Dielectrics (a- Al$_2$O$_3$, BN, AlN) and semiconductors (SiC, Si). Considering the identical conditions for obtaining the C-19 and C-18 composites, the factor determining their low resistance and activation energy values could have been the number of SiC and Si solid phases with semiconductor properties existed in the study materials.

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes
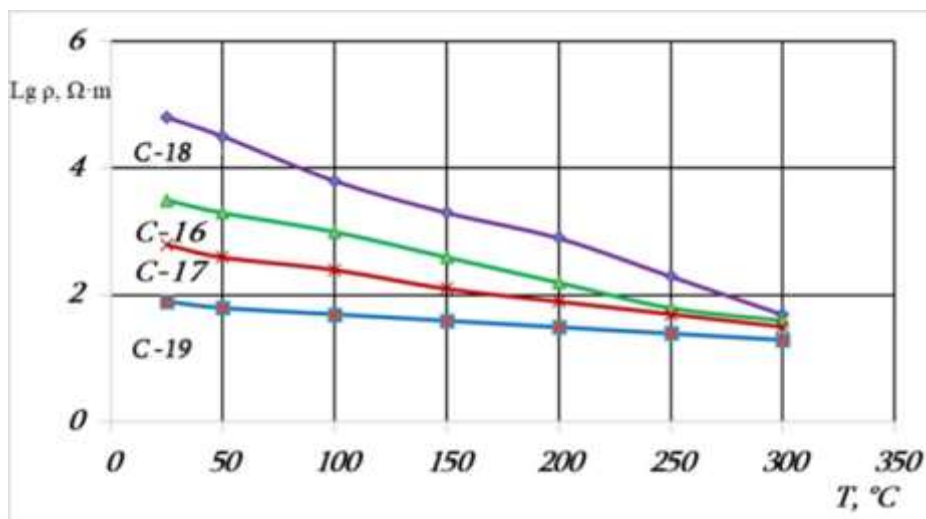
Fig. 2. Specific electrical resistance and

Temperature dependence

Based on the comparison of the electrical characteristics of composites, it can be assumed that the concentrations of SiC and Si in the C-19 composite must be higher than in the C-18 composite. This could be detected by two approaches: by determining the amount of SiC and Si or by the density of the materials. Both approaches proved to be unusable for C-19 and C-18 composites, since quantitative calculations based on the available X-ray were impossible (due to the abundance of crystal phases and the coincidence of their characteristic intensity peaks) and also the negligible differences between mass densities. (d = 3.11 for C-19; d = 2.99 g /cm^3 for C-18). In any case, the number of SiC in C-19 could not have been higher than in C-18, judging by the material composition of the test composites.

At the same time, X-ray phase analysis revealed the presence of Si in both composites, which could affect the electrical conductivity of the composite. But the Si content in the initial mixture (according to the material compositions) is identical and amounts to wt. 20%. At the same time, the C-19 composite body contains two natural rocks (kaolin and perlite) that contain silicon dioxide. Kaolin (5 wt.%) and perlite (2.0 wt.%) provide approximately 5.2 wt.% and 3.0 wt.% Si in the C-19 composition, respectively. The reason for this is the structural breakdown of the mineral kaolinite in the geopolymer (kaolin) caused by the temperature and the possibility of conducting the parallel alumothermic process:

$4 Al + 3 SiO_2 = 2Al_2O_3 + 3Si.$
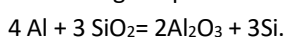
This process will result in an additional 2.4% by weight of Si in the C-19 composite, and it is practically expected that the amount of Si in C-19 will be 24.4% by weight. A contributing factor to the uptake of Si from SiO$_2$ may be the formation of a liquid phase caused by the low-temperature melting of perlite-1240^{0}C. Aluminum nitride is formed by the reaction of a portion of the aluminum powder in the initial mixture with nitrogen by the following reaction:

$2 Al + N_2 = 2 AlN.$
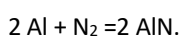
Table 3: **Electrical characteristics values of the composites**

Sample №	Coefficient of electrical sensitivity, B(ΩmK)	Activation energy of electrical conductivity, ΔE(ev)	Temperature coefficient of electrical resistance, aΔ$_t$ (ΩmK^{-1})
C-18	-7170	1,24	-2,6•10^{-2}
C-19	-1560	0,27	-5,7•10^{-3}
C-16	-1625	0.65	-1.4.10^{-2}
C-17	-815	0.32	-6.8.10^{-3}

As a result of decomposition of kaolinite at high temperatures part of the aluminum powder restores silicon from SIO$_2$ according to the reaction above. This process could lead to a change in the ratio between an increase of the amount of semiconductor Si

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

and AlN carrying the insulating properties in favor of Si, this would lead to the increase in electrical conductivity in the C-19 composite.

Structural study

The test specimens were prepared using the same technology as described in previous papers [16-21], i.e. the SIALON was synthesized in the nitrogen medium at 1400–1450^0 C, and then the obtained mass was grounded in an attritor and the consolidated composite was obtained by hot pressing at 1620^{0}C. , 40 minutes, delaying at final temperature for 8 min. under 30 MPa pressure.

70 μM of study samples of the composite obtained in this mode were cut from 70 mm diameter and 8 mm thick discs. The cut was made on a 395-M profile grinding machine with a 100 mm-diameter metal binding diamond cutting disc, diamond grain size 50/40 μm, cutter rotation speed 4000 rpm, cutting speed 0.7 mm / min.

The surface of the cut specimens was ground on a 3 G71 flat-bottomed grinding machine with a 200 mm- diameter diamond abrasive disc on a Bakelite binder, diamond grainsize-50/40μm.

Phase analysis of hot-pressed samples was performed on an X-ray machine DRON-3 using CuKα rays.
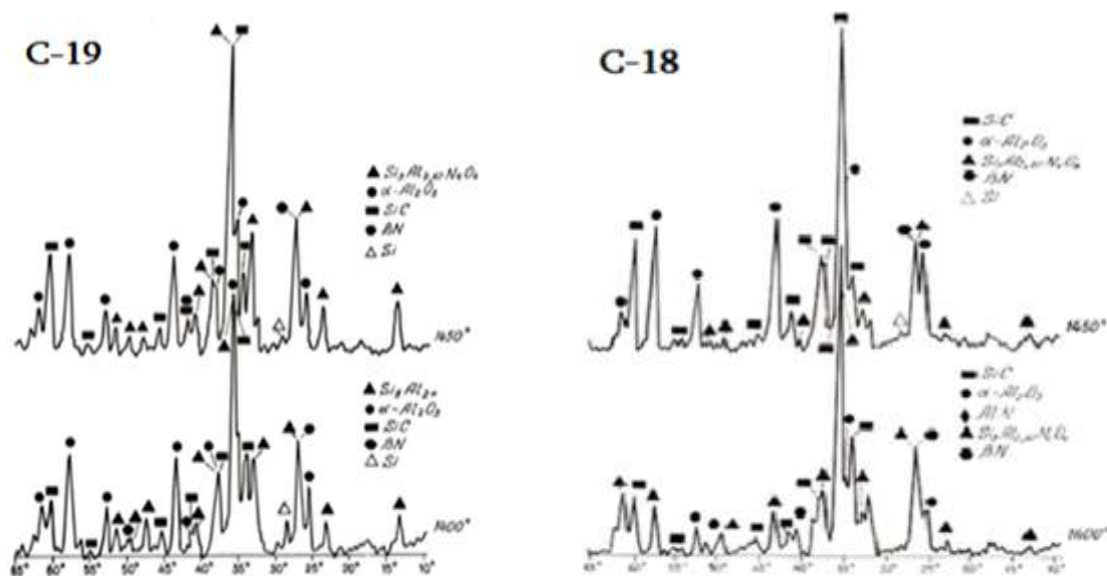
FIg.3. C-19 and C-18 composites X-ray (1400-1450^{0}C)

Examination of the X-Ray patterns of the samples burned out at 1400-1450^{0}C (Fig. 3) shows that at 1400^{0}C the characteristic reflexes of the SIALON are already observed in both composites, and at 1450^{0}C their intensity is relatively increased. Judging by the intensity of the characteristic peaks of the SIALON, the number of SIALONs formed in the C-19 composite is relatively larger than in the C-18 composite, which can be explained by the presence of kaolin in the C-19 composition. In our opinion, this is due to the nitrogenation of the thermodynamically active kaolinite core $Al_2O_3.2SiO_2$, which was formed as a result of the decomposition of the mineral kaolinite. The following phases have been observed in both composites: Si-AL-O-N, SiC, α-Al_2O_3, BN, and Si (small amount unreacted.).

Part of boron carbide and titanium carbide in the composites was converted to boron nitride and titanium diboride upon burning out in nitrogen medium at 1400^{0}C by the following reaction: $B_4C+2N_2=4BN+C$, and $B_4C + 2TiC = 2TiB_2 + 3C$, which in the case of both composites is in small quantities. Newly formed, fine-grained boron nitride improves the microstructure, which is a prerequisite for high mechanical properties, such as: high thermal conductivity, low thermal expansion, good resistance to thermal shocks, easy workability, chemical inertness and low wettability with molten metals. It is used in radiators, boron-alloyed silicon semiconductors, welding trays, crucibles, microwave tubes, sputtering targets, high-precision welding, foundry production, etc.

Analysis performed using an optical microscope showed that the composites in both cases were silicon car bide and corundum grains located in the matrix (Fig. 2). At the same time the microstructure of C-18 composite is more fine-grained. It can be assumed that during the sintering process of C-19 composite, due to the composition of these composites, more liquid phase is generated than during the sintering process of C-18, contributing to the sintering intensity, which is evidenced by the relatively low porosity of C-19 composite. At the same time, the liquid phase promotes the appearance of small grains and their subsequent recrystallization into large grains.

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

Electron microscopy shows the surface of a well-sintered specimen, on which crystals of the basic phases contained in C-19 composites are clearly seen, namely silicon carbide and corundum grains distributed in the SIALON matrix, even the finest grains of boron nitride are also observed, which are better seen when magnified at close-up (Fig. 4).

When identifying grains of silicon carbide and corundum, along with SEM images, we relied on the results of X-ray diffraction analysis and X-ray spectral microanalysis.

Figure 5 and 6 shows the micro-X-ray spectral analysis image s of the C-19 and C-18 composites, the spectrum of the 3 sections and the scheme of the constituent elements, their percentage content, which shows that the main constituent (matrix) of the composite is SiAlON-BN.

a)   b)

c)   d)
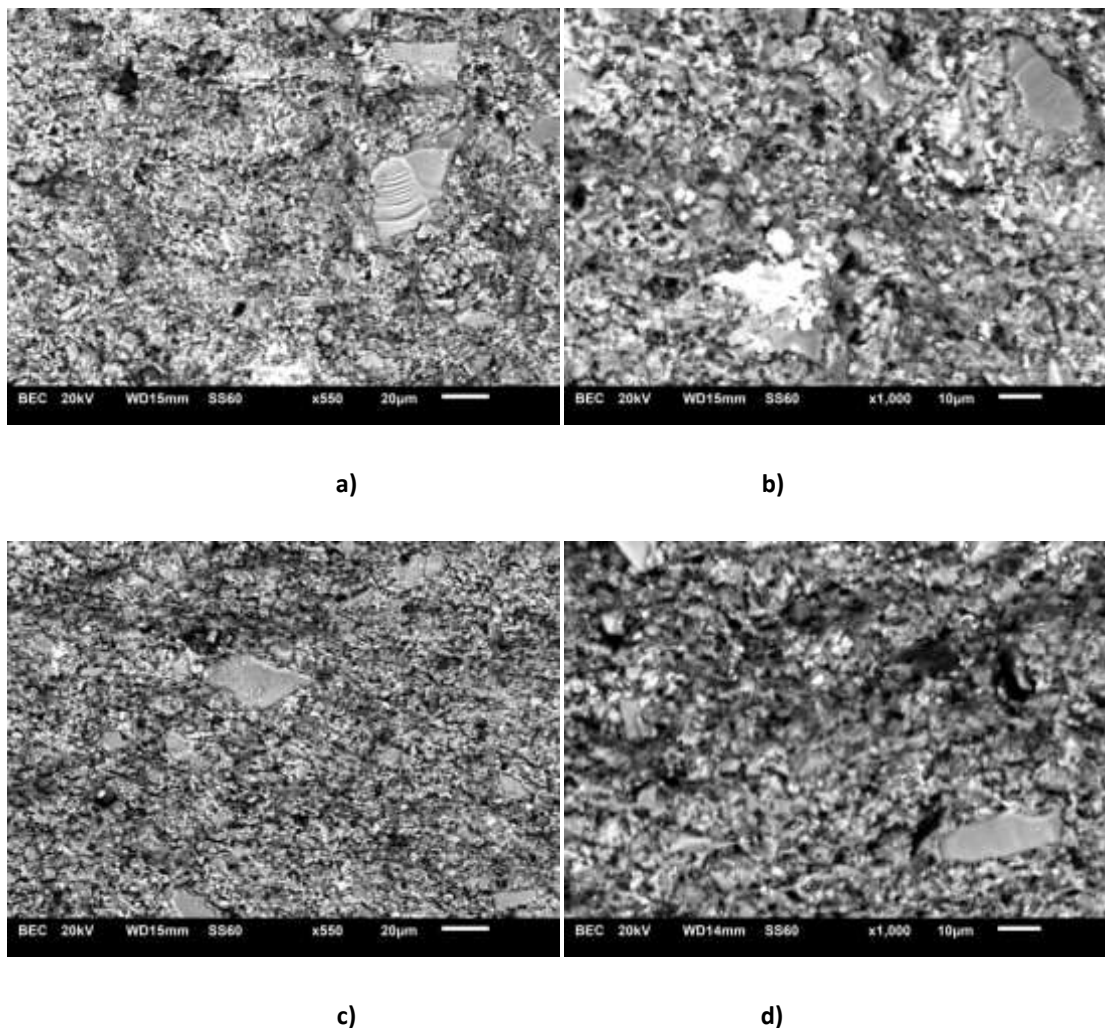
Fig.4. C -19 (a, b) and C -18 (c, d) composites

Electronic-microscopic images at different magnifications

X - 550; X-1000
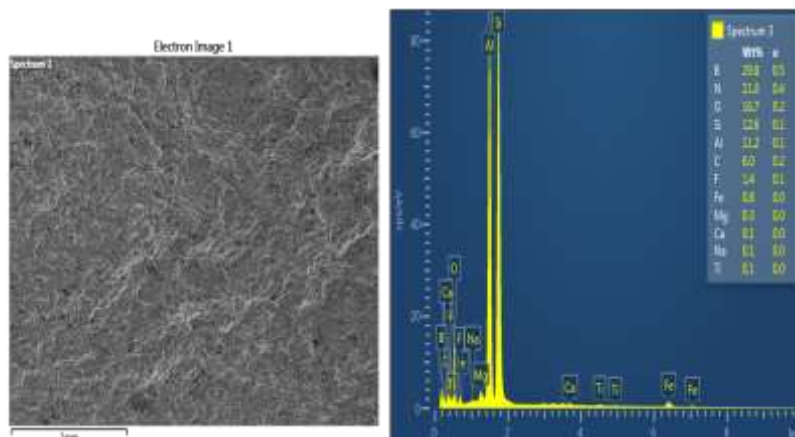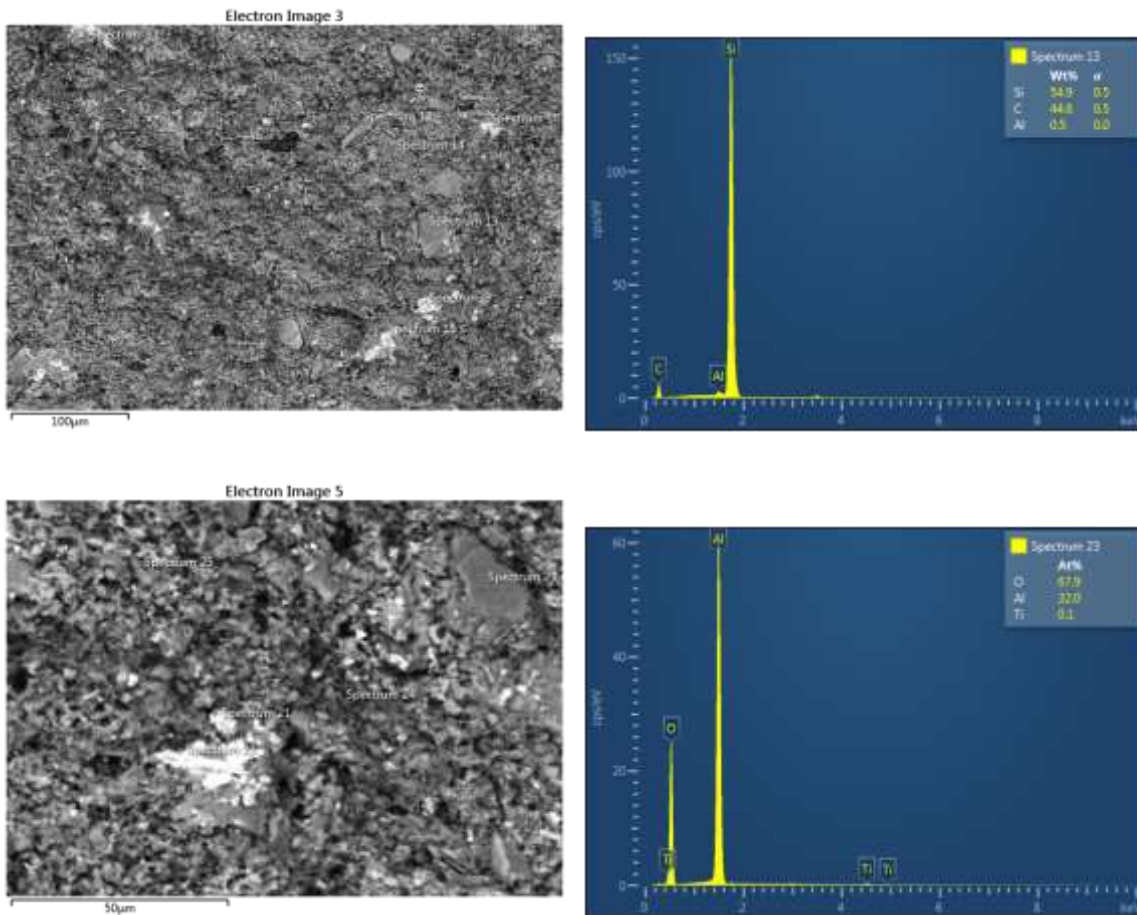
Fig. 5. Electronic-microscopic and micro -X-ray spectral images of C -19 composite
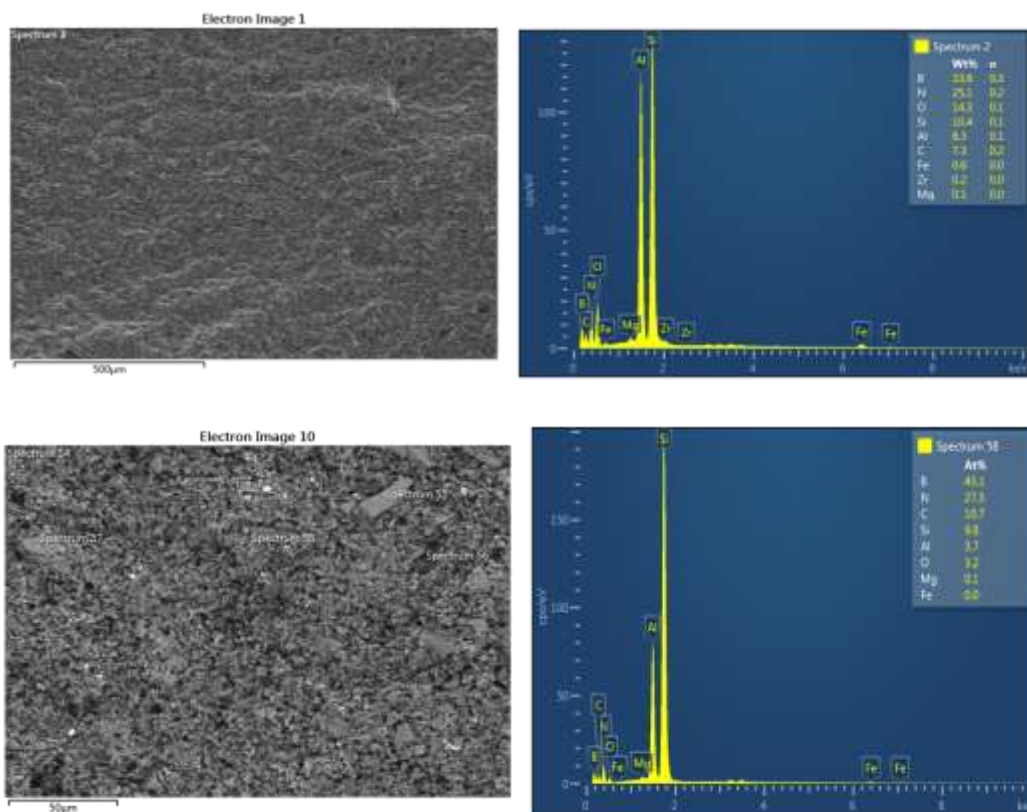
Fig. 6. Electronic-microscopic and microrentgeno -X-ray spectral images of C -18 composite

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes
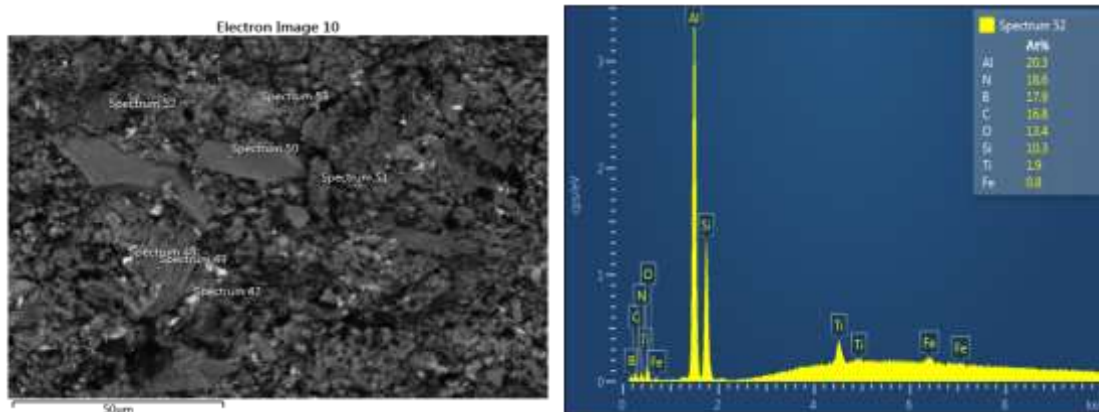
Fig.7 Electronic-microscopic and microrentgeno -X-ray spectral images of C -16 composite

Fig.7 and Fig 8 shows the micro-X-ray spectral analysis image s of the C-16 and C-17 composites, the spectrum of the sections and the scheme of the constituent elements, their percentage content, which shows that the main constituent (matrix) of the composite is TiC, B_4C, TiB_2, SiC, Al_2O_3, SiAlON-BN.
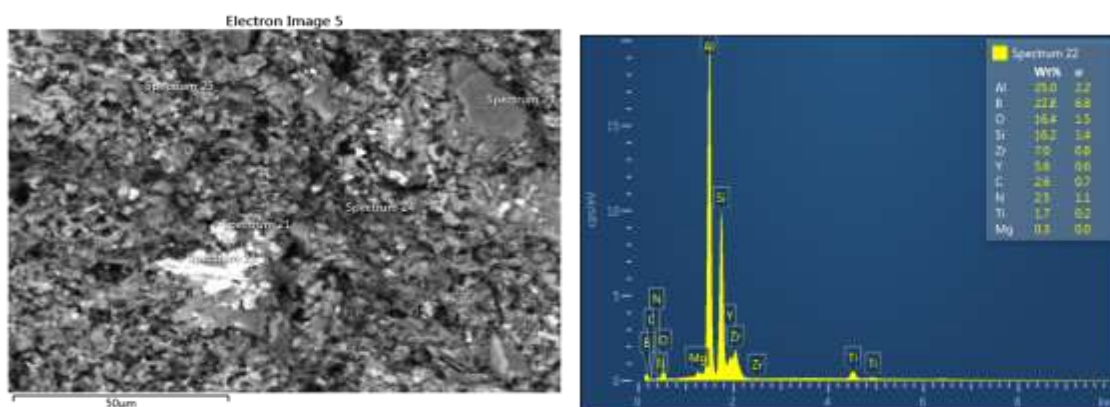
Fig.8 Electronic-microscopic and microrentgeno -X-ray spectral images of C -17 composite

Table 4 shows the test condition of SIALON.

Table 4

<<*** Test condition-SiAlON-100 ***>>

Test mode	Load-unload		
Sample name	SiAlon-zv	Sample No.	#1
Test force	100.000[gf]	Minimum force	0.200[gf]
Loading speed	1.0(7.1448[gf/sec])	Hold time at load	5[sec]
Hold time at unload	3[sec]	Test count	23
Parameter name	Temp	Parameter	20
Comment	20.06.17-SiAlon-zv-100;DHV5-3		
Poisson's ratio	0.190		
Cf-Ap,As Correction	ON	Indenter type	Vickers
Read times	2	Objective lens	50
Indenter elastic	1.140e+006[N/mm2]	Indenter poisson's ratio	0.070

<<*** Test result ***>>

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

SEQ	Fmax	hmax	hp	hr	DHV-1	DHV-2	Eit	Length	HV	Data name
	[gf]	[um]	[um]	[um]			[N/mm2]	[um]		
1	100.753	2.0927	1.0353	1.3623	1124.606	4595.143	2.023e+005	12.133	1269.108	SiAlon-100(1)
2	100.862	2.1408	1.1973	1.4454	1075.849	3439.729	2.028e+005	10.673	1641.878	SiAlon-100(2)
3	100.954	2.1185	1.0085	1.3472	1099.608	4852.203	1.911e+005	11.989	1302.427	SiAlon-100(3)
4	100.844	2.1300	0.9980	1.3526	1086.598	4949.256	1.881e+005	11.623	1384.295	SiAlon-100(4)
5	100.935	2.1822	1.1183	1.4290	1036.181	3945.265	1.855e+005	12.721	1156.721	SiAlon-100(5)
6	100.624	2.0945	1.0240	1.3135	1121.301	4691.482	1.921e+005	11.843	1330.428	SiAlon-100(6)
7	100.551	2.1229	1.0193	1.3350	1090.715	4731.042	1.868e+005	11.551	1397.624	SiAlon-100(7)
8	100.826	2.1357	1.0016	1.3362	1080.626	4912.610	1.834e+005	11.550	1401.679	SiAlon-100(8)
9	100.826	2.1173	0.9846	1.2881	1099.473	5084.458	1.815e+005	11.404	1437.730	SiAlon-100(9)
10	100.825	2.1761	1.0974	1.4160	1040.858	4092.733	1.848e+005	11.697	1366.620	SiAlon-100(10)
11	100.807	2.1566	1.0491	1.3859	1059.580	4477.130	1.857e+005	----	----	SiAlon-100(11)
Average	100.801	2.1334	1.0485	1.3646	1083.218	4524.641	1.895e+005	11.718	1368.851	
Std. Dev.	0.120	0.029	0.064	0.049	28.966	502.835	7155.469	0.529	125.730	
CV	0.119	1.372	6.141	3.617	2.674	11.113	3.777	4.518	9.185	

<<*** Force-Depth graph ***>>
Force-Depth graph

Depth[um]
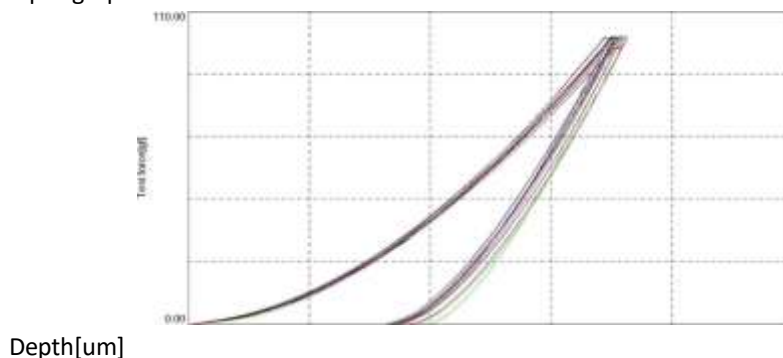
<<*** Depth-Time graph ***>>

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes
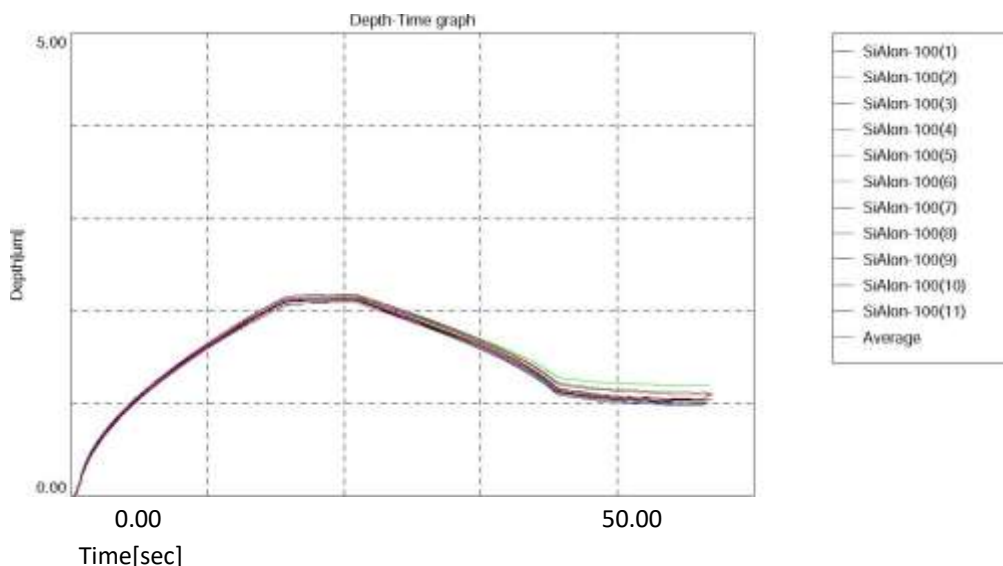

Fig. 9 Mikromechanical charaqteristics of SIALON.

The results of micro-X-ray spectroscopy and electron microscopy of the given composites are consistent with X-ray structural analysis. In the matrix of composites C-19 and C-18 there are represented: β-SiALON-Al_2O_3-SiC, BN crystals are distributed in the matrix and In the Composites CH-16 and CH-17 there are represented TiC-TiB_2-BN-SiC-B_4C-β-SiAlON-Al_2O_3 phases. Table 5 shows d the data on phase components in C-19 and C-18 composites.

To determine the porosity, we selected the field of vision and determined its area. In the field of vision, we calculated the number of pores according to the size of their diameter; determined the volumetric content and the middle diameter of pores for each composite. The total pore content in C-19 composite is approximately Pvol = 3,7%, for C-18 -Pvol = 4,8%, the middle size of the pores makes up Pm $\approx$ 3,75 and 4.5 μM accordingly.

The maximum and minimum size of SiC grains in C-19 composite is 9-3 μM, middle size = 6 μM; in C -18 composite - 8-4 μM, middle size = 6 μM.

The maximum and minimum size of aluminum oxide grains is 1 / 1μM for C-19 composite and 1/ 0,8 μM for C-18 composite. The average size of aluminum oxide grains in each composite is 1 and 0.8μM, respectively. As for boron nitride, its dimensions are minimal and approximately equal to an average of 200 nM.

The average grain size in total Km = 6.5 and 6.6 μM, respectively. Glassy phase volume fraction Gvol = 3 and 1% respectively;

Crystal shape factor

$F_{kf}C_{-9}$=Dmax/Dmin=10.56/5.54=1.91;

$F_{kf}C_{-10}$=Dmax/Dmin=10.56/6.25=1.69.

Crystal distribution factor in the matrix by our visual estimation, F_{kd} = 0.9.

The unreacted residue of silicon is about 2 wt.%. In other cases, the Si mass in the than initial composition should be taken to be no more 18-19 percent. The carbon fiber dopant increased the mechanical properties by

Table 5. Data on phase components in C-19 and C-18 composites

| Compo-site	Phase name	Field of vision S, μM^2	Number of counted grains (pores), n	Grains (pores) Dmid. μM	Max. size of grain (pore) Dmax. μM (average)	Min. size of grain (pore) Dmin. μM (average)	F_{kf} –shape factor Dmax/Dmin
	SiC		12	11	9	3	
	Al2O3		250	1	1	1	
C-19	SiALON	2070	55	14	32	18	
	BN		45	0.2	0.25	0.16	
	Average		90.5	6.5	10.56	5.54	1.91
	Pores		10	3.75	4	3,5	1,15

**Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes**

	SiC		15	10	8	4	
	Al2O3		280	0.8	1	0.8	
C-18	SiALON	2070	50	9	33	20	
	BN		45	0.22	0.27	0.18	
	Average		97.5	6,6	10.56	6.25	1.69
	Pores		12	4.5	5	4	1.25

3 wt.% in C-18 (Table 2). The crystalline phase

is: in C-19, 100-(V porous +V glassy)=100-(3.7+3) =93.3, while in C-18: 100-(V porous++V glassy) = 100-(4.8 + 1) = 94.2.

The dependence of the micro- and macro- mechanical characteristics of the materials on the crystalline phase content in the composite was calculated according to Z.Kovziridze's [22] formula:

$$\sigma_d = \frac{P.Fkd}{Km\ Kv\ Fkf},$$

Where: P-load; Km- middle size of crystals; K v- volume fraction of crystals in the matrix; F $_{kd}$-crystals distribution factor in the matrix, which is determined by the researcher; in case of equal distribution it equals to 1, in case of unequal distribution = 0.9; Fkf-crystal shape factor, is taken as the ratio of the largest characteristic size of a crystal to the smallest, which allows us to characterize the shape of a given set of crystals, according to which we are able to define correlation of mechanical characteristic in the matrix from the crystal phase characteristics in our proposed formula. By inserting the data of Table 4 into the formula we get:

$$\sigma_d = \frac{2187.5\ x\ 0.9}{6.5\ x\ 94.2\ x\ 1.69} = \frac{1968.75}{1035} = 1.9.$$

The dependence of the macro-mechanical characteristics of the materials on the porous phase content in the composite was also determined according to Kovziridze [23] formula.

$$\sigma_{m/p} = \frac{P}{F_p \cdot P_d \cdot P_{vol} \cdot P_m} =$$

$$= \frac{2187.5}{0.9\ x\ 1.25\ x\ 4.5\ x\ 4.8} = \frac{2187.5}{24.3} = 90\ MPa/\mu M^2$$

Where: P-is load, MPa; F$_p$- shape factor of the pore; Pd- pores distribution factor in the matrix. Determination of this value and the evaluation of its significance depends on the researcher, based on the morphological picture depending on how the pores are distributed in the material and what size they are. The value of the factor can vary from 1 to 0.8. If the pores are evenly distributed in the matrix and are about the same size, the factor is determined to be equal to 1; if the pores are unevenly distributed, the factor equals to 0.9 and if the coalescence process of pores is initiated, factor is 0.8; Pvol.-volumetric fraction of the porous phase in the matrix; Pm- the average size of the pores.

3. CONCLUSION

The obtained composites have been studied and determined the phase composition of the composites; in the case of both composites the main phase, i.e. the matrix is TiC-TiB$_2$-B4C- SiAlON-SiC-BN-Al2O3, in which the BN grains are distributed, originated in the nitrogenation process as a result of the decomposition of boron carbide by nitrogen and the replacement of carbon with nitrogen. The composites are well sintered and the crystals are bonded together with a layer of SiAlON. Material of high physical-technical characteristics is obtained. The advantage of this method is that compounds, which are newly formed thanks to interaction going on at thermal treatment: Si$_3$N$_4$, Si, AlN are active, which contributes to **β**-SiALON formation at relatively low temperature, at 1300-1350^{0}C. It is evident that inculcation of ALN in crystal skeleton of ß-Si$_3$N$_4$ is easier since at this temperature interval crystal skeleton of Si$_3$N$_4$ is still in the process of formation. ß-SiAlON was formed at 1450^{0}C. Part of boron carbide was transformed into boron nitride in nitrogen environment and in titanium diboride, which in the case of both composites is in small quantities.

Multifunctional Nanocomposites in B4C-Tic-Tib2-Sic-BN-Al2O3-Sialon-C Carbon Fiber System for Armor Fillets, Turbine Discs and Wings, High-Temperature Wear Resistant Nodes

Composite with low resistance (specific resistance approximately about 10^2 Ohm.M), activation energy (E = 0.27 eV) and the temperature coefficient of electrical resistance ($\Delta\alpha$ T = 0.057 k^{-1}) with main part of β-SiAlON. Compression strength-2198 MPa, Bending strength-271 MPa, HV=1368. Thermal expansion coefficient a_{20-700}-3.8 10^{-6} ^{0}C.

REFERENCES

1) Osman Sahin, Orhan Uzun, Malgorzata Sopicka-Lizer, Hasan Gocmez, Ugur Kolemen. Dynamic hardness and elastic modulus calculation of porous SiAlON ceramics using depth-sensing indentation technique. Journal of the European Ceramic Society 28 (2008) p.1235–1242.

2) Z. Hou, F. Ye, L. Liu, - Effects of pore shape and porosity on the dielectric constant of porous β-SiAlON ceramics, J. Eur. Ceram. Soc. 35 (2015) 4115–4120.

3) G.J. Zhang, J.F. Yang, T. Ohji, - Fabrication of porous ceramics with unidirectionally aligned continuous pores, J. Am. Ceram. Soc. 84 (6) (2001) 1395–1397.

4) B. Li, K. Liu, C.R. Zhang, S.Q. Wang, - Fabrication and properties of borazine derived boron nitride bonded porous silicon aluminum oxynitride wave-transparent composite, J. Eur. Ceram. Soc. 34 (15) (2014) 3591–3595.

5) J.F. Yang, Y. Beppu, G.J. Zhang, T. Ohji, S. Kanzaki, - Synthesis and properties of porous single-phase β-SiAlON ceramics, J. Am. Ceram. Soc. 85 (7) (2002), 1879–1881.

6) C. Zhang, R. Janssen, N. Claussen, - Pressureless sintering of β-SiAlON with improved green strength by using metallic Al powder, Mater. Lett. 57 (2003)3352–3356.

7) S.-L. Hwang, I.-W. Chen, - Reaction hot pressing of α- and β-SiAlON ceramics, J. Am.Ceram. Soc. 77 (1994) 165–171.

8) F. Çalıskan, Improvement in sinterability of β-SiAlON produced from kaolin, J. Alloy. Compd. 602 (2014) 14–149.

9) Z.Kovziridze, N.Nijharadze, G.Tabatadze, T.Cheishvili, Z.Mestvirishvili, E.Nikoeleishvili, M.Mshvildadze, N.Darakhvelidze. Obtaining of Nanocomposites in SiC-SiAlON and Al_2O_3-SiAlON System by Alumothermal Processes. //Journal of Electronics Cooling and Thermal Control, 2014, 4, 105-115. http://dx.doi.org/10.4236/jectc.2014.44012

10) Bradley A. Newcomb, Han G.Chae, - Handbook of Properties of Textile and Technical Fibres (Second Edition) 2018, Pages 841-871.

11) Z. Kovziridze, N. Nijharadze, G. Tabatadze, N. Darakhvelidze, Z. Mestvirishvili, -Smart Materials in the System SiAlON-SiC-Al2O3-TiB2-ZrB2, Bit's 2nd Annual World Congress of Smart materials 2016. p. 558. Singapore

12) Griffith A.A-phil, Trans. Roy. Soc. London A. 221.1920.1963.

13) Kovzirize Z. The Decomposition Stress Energy Formula. Georgian Ceramics Association, Journal "Ceramics and Advanced Technologies"#1 (39), 2018. pg. 11-23.

14) Z.Kovziridze. Failure Stress Energy Formula. Journal of Electronics Cooling and Thermal Conrtol. 2018.8.pp.31-47. Http: // www.scirp.org/journal/jectc.

15) SamsonovG.V., Physico-chemical Properties of Oxides, M., Metallurgy, 1978.

16) SamsonovG.V., Properties of High-melting-point Compounds, Short Reference Book. M., Metallurgy. 1978.

17) Kovziridze Z., NiJaradze N., Tabatadze G., Cheisvili T., Daraxvelidze N., Mestvirisvili Z., Msvildadze M., Nikoleisvili E. – Obtaining SiAlON,s by Nitroalumthermal Processes, Georgian Ceramics Association, Journal "Ceramics and Advanced Technologies", # 2 (32), 2014, pg. 23-31.

18) Z.Kovziridze, N.Nijharadze, G.Tabatadze, T.Cheishvili, Z. Mestvirishvili, E.NikoeleiShvili, M.Mshvildadze, N.Darakhvelidze. - Obtaining of Nanocomposites in SiC-SiAlON and Al_2O_3-SiAlON System by Alumothermal Processes. Journal of Electronics Cooling and Thermal Control, 2014, 4, pg. 105-115.http://dx.doi.org/10.4236/jectc.2014.44012

19) Enquan He, Jianshe Yue, Lei Fan, Chao Wang and Hongjie Wang, - Synthesis of single phaseb-SiAlON ceramics by reaction-bonded sintering using Si and Al_2O_3 as raw materials. doi:10.1016/j. scriptamat. 2011.03.040.

20) Peng Jiang, Xiao fang Wu,Wendong Xue, JunhongChen,Wei Wang,Yong Li; - In-situ synthesis and reaction mechanism of β-SiAlON in the Al-Si_3N_4-Al_2O_3compositematerial /http://dx.doi.org/10.1016/ j.ceramint. 2016.10.088.

21) Xing Deng, Xiangcheng Li, Boquan Zhu, Pingan Chen; - In-situ synthesis mechanism ofplate-shaped β-Sialon an ditseffect on Al_2O_3–Crefractory properties. http://dx.doi.org/10.1016/j.ceramint.2015.07.071

22) Z. Kovziridze. - The Formula of Dependence of Mechanical Characteristics of Materials on Crystalline Phase Composition in the Matrix. Advances in Materials Physics and Chemistry Vol.10 No.8, August 2020. ISSN: 2331-1959. DOI**:** 10.4236/ampc.2020.108013.

23) Z. Kovziridze. - Macro-Mechanical Properties Porous Phase Dependence Formula. Journal of the Georgian Ceramists Associstion. Ceramics and Advanced Technologies.Vol. 20 1(39). 2018. Pp.28-34.

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

Padlika Zulfatoni[1], M. Firmansyah[2]

[1,2] Faculty of Economics and Business, University Of Mataram & Lombok, Indonesia

ABSTRACT: One of the primary goals of any municipality is human development when it comes to regional development. Reducing poverty and improving community welfare and human resources are the primary goals. The poverty rate in NTB Province has dropped dramatically, and the income and economic growth in the area have increased, thanks to the many regional development initiatives that the province has launched. Finding out how local original income, balancing funds, and economic development influence the poverty rate in NTB province is the main objective of this research. Using a battery of tests and regression analysis, we compile a dataset consisting of panel data from ten NTB Province regencies and cities covering the years 2012–2022. The results obtained from this study show that local original funding (PAD) has a significant impact on reducing poverty rates and balancing funds that significantly reduce poverty rates in the NTB province. However, economic growth impacts increasing the poverty rate in NTB province, although not significantly. This may happen because Indonesia's economic growth fluctuates, thus affecting the increase in poverty. Fluctuations occur due to factors such as national economic conditions, supply-demand, government policies, etc. This can affect the economic growth of NTB, and it also impacts the increasing poverty rate in NTB. In addition, the increasing population is one of the factors that contribute to economic fluctuations and the increase of poor people in NTB.

KEYWORDS: Regional Development, Local Original Revenue (PAD), Balancing Fund, Economic Growth, Poverty

INTRODUCTION

Regional development is one of the government's focuses, not only in infrastructure development but in human development itself. In its implementation, local governments have full authority over regional development. This follows Law Number 22 of 1999 and Law Number 32 of 2004 concerning regional decentralization by regional governments and conducting regional autonomy for regional governments to regulate all regional financial and development policies.

An important part of decentralization programs is Regional Original Revenue (PAD), which is an instrument of local government power for running and funding regional autonomous operations. Various valid sources of local original income, including taxes, regional levies, and money from the administration of segregated regional resources, contribute to PAD. To measure their success, local governments use these revenue streams as a baseline for their Local Original Revenue.

The balance fund, often known as the transfer fund, is an additional source of regional income alongside regional original revenue (PAD). With its roots in the state budget, the balancing fund seeks to maintain fiscal parity between the federal and state levels of government while also facilitating the exercise of regional autonomy by the states in the financing of their own programs and initiatives. While both the equalization fund and Regional Original income (PAD) aim to finance regional autonomy operations, their respective income sources are different. The appropriate distribution of PAD and Balancing Funds throughout the regions will have an effect on economic development in those areas.

Research and data related to economic growth are needed to determine the state of economic growth. With sustainable economic growth, the picture and performance of national and local governments can be indicators for improving public welfare. If economic growth increases, it is likely to affect the regional economic capacity (GRDP). If GDP increases, it will equal economic welfare distribution (Trickle Down Effect). In the efforts of the national government to improve welfare for the community by

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

providing decent employment to improve economic performance, the government implements national development. One of the strategic objectives to implement this national development is to reduce the number and percentage of poverty rates.

LITERATURE REVIEW

A. Local Original Revenue (PAD)

According to Law No. 33 of 2004, Regional Original Revenue is defined as funds collected by levies in accordance with Regional Regulations (Perda) in accordance with relevant regional laws and regulations. Several sources of revenue in the area contribute to PAD. Since substantial funding is required for regional development, it seeks to generate revenue for the area by means other than depending only on balanced funds from the federal government. For the sake of carrying out regional operations, local governments should investigate the possibility of their areas generating substantial regional earnings. The PAD allows for more regional income generation, which in turn allows for more regional autonomy in spending on routine and local government expenses.

According to (Paat et al., 2019), Regional Original Revenue (PAD) is a source of regional revenue taken from the regions and used as the primary capital of local governments in financing regional activities. In accordance with regional autonomy, local governments have the authority to optimize Regional Original Revenue (PAD), both in increasing PAD income and improving PAD compositions. To accelerate economic growth, local governments position PAD as capital to obtain positive externalization of economic growth (Mintalangi, 2019).

Local government policies should support PAD optimization to improve public services. If the exploitation of PAD is carried out excessively, the influence will burden the community later. According to (Lewis, 2003) He explained that although local governments have the authority to collect levies and taxes, they must consider their central coast.

B. Balancing Fund

Transfer/balance funds are sourced from the State Budget given to each region in the country. Indonesia needs to finance regional needs in the implementation of decentralization. Deep (Paat et al., 2019), according to (Toselong et al., 2016), the equalization fund is divided into several parts, Profit Sharing Fund (PSF), Special Allocation Fund (DAK), and General Allocation Fund (DAU) are the three;

C. Economic Growth

(Amdan &; Sanjani, 2023), It states that economic growth is an increase in per capita yield in the long run. This understanding includes three aspects, namely: process, per capita yield, and long-term. An economy that develops and changes over time is a dynamic aspect of economic growth. (Paat et al., 2019) explain through the opinion of Simon Kuznet that the economic growth of a country is an increase in the ability of a country to provide goods for its population caused by the ability and progress of mastery of technology, institutions, and ideological adjustments needed.

D. Poverty

Poverty is a living condition in which many people cannot obtain sufficient resources to meet minimum basic needs (Adnyani & Wiagustini, 2018). Deep (Susanto & Pangesti, 2021) Explained that poverty occurs due to various inequalities, such as inequality in the distribution of subsidies, the amount of natural resources that do not meet the adequacy of human resources, and differences in wage levels.

Poverty theory explains that poverty is an individual problem caused by individual weaknesses that are unable to meet their needs, causing apathy, surrender, lack of effort, and lack of ambition to build the future, resulting in violence and crime (Prakoso et al., 2022) (Amdan &; Sanjani, 2023).

As for other views, according to (Sumodiningrat, 1999), explaining that poverty does not only arise due to welfare problems but contains several topics such as vulnerability problems, closing access to job opportunities, mistrust or emotional impotence, spending on poor people's subsidies, increasing dependency ratios, and poverty culture (Arifin, 2020). Poverty alleviation strategies must be improved, and harmful cultural values such as apathy, politics, feeling helpless, and so on must be reduced (Huraerah, 2019).

METHOD

In order to analyze its data, this study used quantitative methods. This study employs panel data covering the districts and cities of West Nusa Tenggara province from 2012 to 2022 on four indicators: Regional Original Income, Balancing Fund, Economic Growth, and Poverty.

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

The Central Statistics Agency (BPS) of West Nusa Tenggara Province (NTB) website provides the financial and poverty statistics used in this research. These statistics are based on real data obtained by BPS NTB province. We will use the data to determine how economic development, Regional Original Income (PAD), and the Balancing Fund have affected poverty rates in NTB Province.

A crucial and needed aspect of research is the process of analytical methods. The analysis method itself is a tool used as an intermediary to obtain the desired research data processing results. The desired research output will also be correct on target using the proper analysis method.

A. *Panel Data Regression*

One kind of regression analysis that uses panel data as its data structure is known as panel data regression analysis. Combining time series data with between data (cross Section), panel data is a powerful tool for data scientists. Two kinds of regression are available in panel data regression: multiple linear panel data regression and basic linear regression. Due to the small sample size of the dependent variable, this research used a straightforward linear analytic approach. This research will make use of the following data.

Table 1: Research Panel Data

No	District/City	Year	Billion (Rp) PAD (X1)	Billion (Rp) DP (X2)	(%) PE (Z)	Thousand Souls Poverty (Y)
1	Lombok Barat	2012	94	656	5.27	112
		2013	130	780	5.26	110
		2014	169	964	5.7	110
		2015	171	1,127	6.39	133
		2016	200	1,255	5.7	110
		2017	290	1,367	6.54	110
		2018	301	1,112	0.57	103
		2019	279	1,329	3.84	105
		2020	216	1,108	-7.03	100
		2021	294	1,287	3.4	105
		2022	268	1,204	3.46	99
2	Lombok Timur	2012	87	1,066	7.93	227
		2013	145	1,501	7.85	219
		2014	180	1,244	11.44	219
		2015	189	1,286	12.59	222
		2016	236	1,749	10.23	216
		2017	398	1,799	9.88	215
		2018	261	1,773	7.33	196
		2019	289	1,857	7.84	193
		2020	328	1,614	-1.44	183
		2021	386	2,055	5.17	190
		2022	333	1,982	7.15	189
3	Lombok Tengah	2012	110	837	13.72	148
		2013	114	947	6.24	145
		2014	131	994	6.28	145
		2015	154	1,062	5.6	147
		2016	157	1,568	5.65	145
		2017	280	1,657	6.43	142
		2018	194	1,712	3.14	130
		2019	204	1,537	4.04	128
		2020	206	1,463	-6.67	128

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

No	Region	Year	PAD	Balanced Funds	Economic Growth	Poverty
		2021	163	1,712	4.03	132
		2022	324	1,939	3.55	128
4	Lombok Utara	2012	25	341	4.08	74
		2013	45	402	4.11	72
		2014	55	414	4.59	72
		2015	103	469	4.87	72
		2016	134	604	5.22	71
		2017	150	586	6.14	69
		2018	131	603	-0.87	62
		2019	146	729	5.86	64
		2020	103	554	-7.46	60
		2021	61	734	1.38	61
		2022	146	622	3.49	59
5	Mataram	2012	95	544	4.57	50
		2013	139	580	11.28	46
		2014	202	677	14.58	46
		2015	225	757	13.59	46
		2016	288	981	12	44
		2017	386	941	11.63	44
		2018	358	881	8.73	43
		2019	373	895	8.42	43
		2020	363	822	-4.15	42
		2021	392	970	5.5	44
		2022	446	1,051	7.54	45
6	Sumbawa	2012	71	784	6.67	78
		2013	67	886	6.44	74
		2014	124	846	6.63	74
		2015	136	926	6.42	73
		2016	144	1,124	5.42	71
		2017	248	1,243	6.86	69
		2018	145	1,218	4.16	64
		2019	163	1,314	4.86	63
		2020	179	1,113	-4.18	63
		2021	202	1,217	1.87	66
		2022	171	1,255	3.21	64
7	Sumbawa Barat	2012	34	391	-26.27	21
		2013	41	457	3.53	22
		2014	42	498	-1.31	22
		2015	49	540	107.07	23
		2016	53	998	7.02	22
		2017	142	947	-19.41	22
		2018	66	859	-34.57	20
		2019	68	820	-1.15	20
		2020	119	607	28.79	20
		2021	141	799	-0.33	22
		2022	101	915	24.14	21
8	Dompu	2012	26	436	8.54	37

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

		2013	27	495	7.38	36
		2014	75	619	12.6	36
		2015	71	885	12.75	36
		2016	84	582	10.23	34
		2017	134	895	10.63	33
		2018	93	931	8.55	30
		2019	105	903	7.4	31
		2020	110	869	-1.39	31
		2021	125	893	3.89	33
		2022	108	1,021	6.63	33
		2012	43	873	5.95	74
		2013	78	828	5.11	74
		2014	100	893	6.01	74
		2015	108	1,332	6.36	74
		2016	108	1,332	5.3	72
9	Kabupaten Bima	2017	110	1,347	6.27	72
		2018	136	1,348	4.04	72
		2019	135	1,348	4.26	71
		2020	131	1,254	-3.53	71
		2021	140	1,515	1.79	75
		2022	139	1,342	2.83	74
		2012	14	401	5.6	15
		2013	15	444	5.58	15
		2014	23	467	5.89	15
		2015	30	552	5.75	15
		2016	30	698	5.79	15
10	Kota Bima	2017	53	707	6.65	15
		2018	46	640	4.74	14
		2019	58	653	5.12	14
		2020	47	641	-4.95	14
		2021	46	594	2.08	16
		2022	57	657	2.7	16

Source: NTB Provincial BPS Database

B. Research Framework

Figure 1 provides a description of the research framework, which is evident from the research's title:

Figure 1: Research Framework

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

RESULT AND DISCUSSION

In this study, data on Regional Original Income (PAD), Balancing Fund, Economic Growth, and Poverty Data by District/City in NTB province time series during 2012-2022. This research data was obtained from several sources, such as the Central Statistics Agency (BPS) of NTB Province, Bappeda of NTB Province, and Bappenda of NTB Province (West et al., 2022).

A. Normality Test

A measure for data normality is required prior to performing a regression analysis. Assessing whether the data utilized in the study follows a normal distribution is the purpose of the normality test. (Pratiwi, 2021) Ascertain whether or not residual regression data follows a normal distribution by utilizing the declared normality test. (Situmorang et al., 2018) Declares that the probability of discovering that a variable follows a normal distribution is greater than 0.05. The subsequent outcomes present the results of the logarithmic test for normality of panel data conducted with the Wilk test and Stata Version 17.

Table 2: Panel Data Normality Test

```
. swilk padx1 dpx2 pex3 kemiskinany, lnnormal

          Shapiro–Wilk W test for 3-parameter lognormal data

     Variable │    Obs        W        V        z     Prob>z
─────────────┼──────────────────────────────────────────────
        padx1 │    110   0.91313    7.768   -1.446   0.92594
         dpx2 │    110   0.95593    3.941   -1.451   0.92665
         pex3 │    110   0.52255   42.696   -0.856   0.80405
  kemiskinany │    110   0.87603   11.086   -1.432   0.92394
```

Source: Stata Ver. 17 Data Processing

Based on the results of the normality test above, the results of all variables are PAD (X1) of 0.92594, Balancing Fund (X2) of 0.92665, Economic Growth (X3) of 0.80405, and poverty (Y) of 0.92394. Since all probability variables are > 0.05, all variables are normally distributed.

B. Multicollinearity Test

The purpose of the collinearity test is to ascertain whether variables are highly or perfectly correlated. A multicollinearity test does not apply to a variable when Vif is <10 (Nandita et al., 2019). Presented below are the outcomes of the panel data multicollinearity test.

Table 3: Panel Data Multicollinearity Test

```
.
. vif

     Variable │      VIF     1/VIF
─────────────┼─────────────────────
         dpx2 │     1.66   0.603015
        padx1 │     1.65   0.604919
         pex3 │     1.00   0.995777
─────────────┼─────────────────────
     Mean VIF │     1.44
```

Source: Stata Ver. 17 Data Processing

Based on the results of the multicollinearity test above, the result is 1.44<10, meaning that the variable is considered free from the multicollinearity test.

C. Heteroscedasticity Test

The heteroscedasticity test is a test to see the condition of a regression model and whether the error variance is constant. In this assumption, the error value or the difference from the variable's value will be tested to determine whether it has a constant value. If the prob value > 0.05, the variable passes the heteroscedasticity test (Satyahadewi et al., 2023). The following are the results of the heteroscedasticity test from the panel data.

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

Table 4: Heteroscedasticity Test

```
. . estat hettest

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of kemiskinany

H0: Constant variance

    chi2(1) =   2.68
Prob > chi2 = 0.1015
```

Source: Stata Ver. 17 Data Processing

Based on the above results, prob>chi = 0.1015. That is, the probability is 0.1015. Because the probability is > 0.05, the data is accessible from heteroscedasticity tests.

D. Best Model Selection Test

The Lagrange Multiplier (LM) Test, the Chow Test, and the Haussman Test are the three methods for determining the optimal model selection test. In order to determine the optimal model for regressing panel data among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), the aforementioned three techniques are implemented.

I. Test Chow

Utilizing the Common Effect Model (CEM) and the Fixed Effect Model (FEM), the Chow test is a statistical comparison between the two models. Twenty-four (Winantisan et al., 2024)Common Effect Model (CEM) application occurs when the p-value is greater than 0.05. Conversely, in the case where the p-value is less than 0.05, the Fixed Effect Model (FEM) is employed. In this chow test, the hypothesis is that H0 employs the Common Effect Model (CEM) while H1 utilizes the Fixed Effect Model (FEM). The outcomes of the panel data chow test are as follows.

Table 5: Chow Test

```
. *uji Chow (CEM VS FEM)

.
. regres kemiskinany padx1 dpx2 pex3 i.id

      Source |       SS          df      MS        Number of obs   =       110
-------------+------------------------------------   F(12, 97)       =    874.05
       Model |  348047.423        12  29003.9519   Prob > F        =    0.0000
    Residual |   3218.7955        97  33.1834587   R-squared       =    0.9908
-------------+------------------------------------   Adj R-squared   =    0.9897
       Total |   351266.218      109  3222.62585   Root MSE        =    5.7605
```

Source: Stata Ver. 17 Data Processing

Based on the findings presented in the state ver.17 data, it is evident that the probability values for all variables are less than 0.05 (0.0000 < 0.05). This indicates that the Fixed Effect Model (FEM) is the most appropriate model, rejecting H0 and accepting H1.

II. Haussman Test

The purpose of the Haussman test is to determine which of the Random Effect Model (REM) and the Fixed Effect Model (FEM) is superior. As per the findings of Rahmadeni (2019), the Random Effect Model (REM) is the model that is chosen when the p-value < 0.05. When the p-value is less than 0.05, however, the Fixed Effect Model (FEM) is applied. Given that a suitable model has been identified between CEM and FEM using the aforementioned Chow Test, with FEM being determined to be the superior model, the Haussman test will be employed to determine whether REM or FEM is the superior model for panel data processing.

If REM is the best model, it will proceed to the third test, the Langgerage Multiplier (LM) test, to determine the best between CEM and REM. However, if FEM is the best model choice, then the Langgerage Multiplier (LM) test is not needed. The hypothesis of this haussman test is H0 for FEM test and H1 for REM test. Here are the results of the Hausman test.

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

Table 6: Haussman Test

```
. estimates store REM

. xtreg kemiskinany padx1 dpx2 pex3, re sa

Random-effects GLS regression          Number of obs    =        110
Group variable: id                     Number of groups =         10

R-squared:                             Obs per group:
    Within  = 0.3409                                     min =         11
    Between = 0.7419                                     avg =       11.0
    Overall = 0.4062                                     max =         11

                                       Wald chi2(3)     =      35.10
corr(u_i, X) = 0 (assumed)             Prob > chi2      =     0.0000
```
        Source: Stata Ver. 17 Data Processing

Based on the results of the Hausman test above, it is seen that the prob result < 0.05, which is 0.000 < 0.05, meaning that the best model to be used in this panel data is FEM, which means H0 is accepted, and H1 is rejected. This is in line with the results of the model test from (Satyahadewi et al., 2023), which gets a result of 0.0000 < 0.05 and uses FEM as its best model. With FEM as the best model, there is no need for Langgerage Multiplier (LM) Test.

E. Panel Data Regression Analysis

Panel data regression analysis combines data from time series and cross-section data. This study uses panel data from local original income (PAD), balancing funds, and economic growth as independent variables. At the same time, poverty is the dependent variable, using cross data from districts/cities in NTB Province in the 2012-2022 time frame.

For this study panel's regression data, the Fixed Effect Model (FEM) was determined to be the best model to apply based on the outcomes of the best model selection test. Here is the structural equation expressed using the Fixed Effect Model (FEM) method:

$Y=(\alpha+uit)+Xit\beta+vit$

Known:

Y: Dependent variable

X: Independent Variable

α: Beta Coefficient of the Constant (intercept)

β: beta coefficient of the independent variable

U: Data panel

V: Vector

Some hypotheses that will be generated in the following panel data regression include:

I.   Local Original Income (PAD) (X1) affects Poverty (Y)

II.   Equalization Fund (X2) affects Poverty (Y)

III.   Economic Growth (X3) affects Poverty (Y).

The following is the result of the Analysis of the Panel data Test.

Table 7: Panel Data Regression

Panel	Coefficient value	P-Values	Information
PAD -> Poverty	-0.0296896	0.024	significant
Balancing Fund -> Poverty	-0.010088	0.007	significant
Economic growth -> Poverty	0.526619	0.255	insignificant

    Source: Stata ver. 17

Based on the results above, the following hypothesis is obtained:

The Effect of Local Original Income (PAD), Transfer Funds (Balanced Funds), and Regional Economic Growth on the Regional Poverty Rate of West Nusa Tenggara Province (NTB)

I.   PAD (X1) has a negative effect with P-values of 0.024 < 0.05, a significant effect
II. The Balancing Fund (X2) has a negative effect with P-values of 0.007 < 0.05, having a significant effect
III. Economic growth (X3) has a positive effect of 0.255 > 0.05, not significant

According to the regression findings shown above, PAD (local original income) significantly contributes to poverty reduction in the province of West Nusa Tenggara. There is a negative coefficient and a significant relationship between local original income and poverty, as seen in the panel data regression findings. The correlation coefficient is 0.024, which is less than the significance level of 0.05. Clearly, PAD (local original income) has a substantial impact on lowering poverty rates in NTB province. According to Rahmadeni (2019), local native income significantly and negatively affects poverty in East Java.

The following result is the balanced Fund, which significantly influences poverty, which is 0.007 < 0.05 with a negative coefficient. This shows that the Balancing Fund significantly impacts reducing poverty rates in NTB province. This result rejects the statement (Paat et al., 2019), which states that the value of local original income is positive for poverty and does not have a linear effect on poverty in Bitung.

The following result is that economic growth has an insignificant influence on poverty, which is 0.255 > 0.05 with a positive coefficient. It can be assumed that economic growth does not reduce poverty but increases poverty, even if it is not significant. These results support the statement of (Damaang and Halim, 2019), which states that economic growth is positive for poverty but not significant in the Mamuju district. This can happen because economic growth in NTB province fluctuates. In addition, increasing population also affects economic growth and increases poverty. Based on the panel data above, economic growth can decrease. Although data still increases and decreases, the increase in economic growth needs to be compared with the y-o-y (Year on year).

CONCLUSIONS

Every region and province of NTB needs local original income, balancing funds, and economic growth. In this study, each influences the poverty rate, which is still a national development problem. Local original income significantly influences reducing the poverty rate in NTB province, as well as the balancing fund, which contributes significantly to the reduction in the poverty rate. However, economic growth impacts increasing the poverty rate in NTB, although not significantly.

REFERENCES

1) Adnyani, N. P. N. W., & Wiagustini, N. L. P. (2018). COMPARATIVE STUDY: FINANCIAL PERFORMANCE OF SARBAGITA REGIONAL GOVERNMENT WITH FINANCIAL BALI PROVINCIAL GOVERNMENT. *E-Journal of Management of Udayana University*, *7*(2). https://doi.org/10.24843/ejmunud.2018.v7.i02.p20

2) Amdan, L., &; Sanjani, M. R. (2023). Analysis of Factors Affecting Economic Growth in Indonesia. *EKOMA: Journal of Economics, Management, Accounting*, *3*(1). https://doi.org/10.56799/ekoma.v3i1.2089

3) Arifin, J. (2020). The culture of poverty in poverty reduction in Indonesia. *Socio Informa*, *6*(2). https://doi.org/10.33007/inf.v6i2.2372

4) Damaang, N., &; Halim, A. (2019). *The effect of economic growth on poverty rates*. *16*(2), 272–275.

5) Hurrah, A. (2019). Accessibility of the Poor in Healthcare Service in Bandung, West Java, Indonesia. *KnE Life Sciences*. https://doi.org/10.18502/kls.v4i13.5324

6) Lewis, D. (2003). Theorizing the organization and management of non-governmental development organizations: Towards a composite approach. *Public Management Review*, *5*(3). https://doi.org/10.1080/1471903032000146937

7) Mintalangi, S. (2019). Analysis of Regional Tax and Retribution Performance on PAD Revenue in South Minahasa Regency. *EMBA Journal*, *9*(1).

8) Nandita, D. A., Alamsyah, L. B., Jati, E. P., & Widodo, E. (2019). Regression Panel Data to Determine Factors Affecting GRDP in DIY Province in 2011-2015. *Indonesian Journal of Applied Statistics*, *2*(1), 42. https://doi.org/10.13057/ijas.v2i1.28950

9) Paat, D. C., Koleangan, R. A. M., &; Rumate, V. A. (2019). THE EFFECT OF LOCAL ORIGINAL INCOME (PAD), BALANCING FUNDS ON ECONOMIC GROWTH AND IMPACT ON POVERTY IN BITUNG CITY. *JOURNAL OF REGIONAL ECONOMIC AND FINANCIAL DEVELOPMENT*, *19*(1). https://doi.org/10.35794/jpekd.15774.19.1.2017

10) Prakoso, A. F., Haryono, A., &; Hermanto, F. Y. (2022). TEACHING MICROECONOMICS BASED ON ENTREPRENEURSHIP PEOPLE'S ECONOMY AND LOCAL WISDOM: HOW? *JOURNAL OF APPLIED BUSINESS ADMINISTRATION*, *6*(1). https://doi.org/10.30871/jaba.v6i2.3666

11) Pratiwi, R. (2021). Analysis of Parking Levy Receipts on Local Original Revenue (Case Study of Binjai City Government in 2015-2019). In *Angewandte Chemie International Edition, 6(11), 951–952.*

12) West Nusa Tenggara Province, B. (2022). *West Nusa Tenggara Provincial Government Financial Statistics 2021*.

13) Rahmadeni. (2019). The Effect of Local Original Income (PAD), Labor and Unemployment on Poverty Rate in Riau Province. *Mathematical Sciences and Statistics*, *5*(1), 50–57.

14) Satyahadewi, N., Aprizkiyandari, S., &; Risky Oprasianti. (2023). Regression of Panel Data in Analysis of Factors Affecting HDI in West Kalimantan. *Statistics*, *23*(2), 123–131. https://doi.org/10.29313/statistika.v23i2.2201

15) Situmorang, C. V., Rosinta, E., Simarmata, B., &; Simanullang, B. A. (2018). Analysis of the effectiveness and contribution of hotel and restaurant taxes to local revenue in Deli Serdang. *Smart Scientific Journal*, *II*(2).

16) Sumodiningrat, G. (1999). SOCIAL SAFETY NET AND COMMUNITY EMPOWERMENT. *Journal of Indonesian Economy and Bussiness*, *14(3)*.

17) Susanto, R., &; Pangesti, I. (2021). THE EFFECT OF INFLATION AND ECONOMIC GROWTH ON THE POVERTY RATE IN INDONESIA. *JABE (Journal of Applied Business and Economics), 7*(2). https://doi.org/10.30998/jabe.v7i2.7653

18) Please, R., Hapid, H., &; Antong, A. (2016). ANALYSIS OF FINANCIAL STATEMENTS AS A BASIS FOR ASSESSING THE FINANCIAL PERFORMANCE OF THE LOCAL GOVERNMENT OF PALOPO CITY. *Equilibrium: Scientific Journal of Economics, Management and Accounting*, *1*(1). https://doi.org/10.35906/je001.v1i1.47

19) Winantisan, R. N. N., Tulug, J. E., Rumokoy, L. J., Richarda, O. :, Winantisan, N. N., Tulung, J. E., Rumokoy, L. J., Management, J., Economics, F., &; Business, D. (2024). the Effect of Age and Gender Diversity on the Board of Commissioners and Directors. *EMBA Journal*, *12*(1), 1–12.

The Case of Probationary Teachers in Teaching Senior High School Students

Glenn Mar D. Degracia

Graduate School, Ilocos Sur Polytechnic State College, Santa Maria, Ilocos Sur, Philippines

ABSTRACT: One of the challenges that new teachers face in the Philippines is the probationary period. Probationary teachers are those who are newly hired and are subject to a probationary period of usually one to two years. During this time, they are expected to demonstrate their competence and effectiveness as teachers, and their performance is closely monitored by school administrators.

This study strived to determine the experiences of Probationary Teacher in teaching senior high school students, how they overcome their obstacles and their coping mechanisms. This qualitative study employed case study research to determine experiences of Probationary Teacher in teaching senior high school students, how they overcome their challenges and their coping mechanisms, involving ten Probationary senior high school teachers of the Schools Division of Ilocos Sur who participated voluntarily. The data was gathered through each informant's voice-recorded narrative and analyzed thematically.

Findings showed that Probationary teachers experienced most with Academic and Behavioral Dynamics, Age-related challenges in handling behavior, Student attitudes and lack of respect, Challenges in adjusting to higher-order thinking skills, Sensitivity to student feelings and compliance issues, Transition and Adjustment Period of adjustment from elementary to SHS teaching, Challenges in adapting teaching methods from elementary to SHS, Emotional challenges and feelings of uncertainty, Pedagogical Challenges - Teaching loads and complexities of SHS curriculum, Perception of spoon feeding and need for adaptation in lesson delivery, Challenges in delivering unfamiliar subjects or lessons, Student attitudes towards learning and compliance, Disruption caused by students' lack of focus and disrespect, Student reliance on gadgets and games for engagement. Despite the experiences encountered by these Probationary teachers, they describe how the overcome the obstacles in teaching senior high school learners by Creating an Inclusive and Supportive Environment, Engaging Teaching Methods, Engaging Teaching Methods, Effective Classroom Management, Adapting Instruction to Individual Needs, Utilizing Technology and Trends, Continuous Assessment and Feedback, they also describe their coping mechanisms as Challenges in Teaching Senior High School Learners, Maintaining Professionalism and Positivity., Stress Management and Self-care, Passion for Teaching and Professional Development, Emotional Regulation and Self-Reflection

Probationary teachers' resiliency and determination is evident during these difficulties. Hence, administrators are encouraged to provide adequate support for Probationary teachers to keep their effectiveness in teaching senior high school learners.

KEYWORDS: Challenges, Coping Mechanisms, Probationary Teachers, Senior High School Students

INTRODUCTION

The teaching profession in the Philippines is highly regarded for its role in shaping the country's future. The quality of education is highly dependent on the competence and dedication of its teachers. However, public school teachers in the Philippines are faced with numerous challenges that affect their effectiveness and job satisfaction. One of the major issues is the low salary scale, which makes it difficult for many teachers to make ends meet. This has led to a high turnover rate, with many teachers leaving the profession in search of better-paying jobs. The research gap for the teaching effectiveness of senior high school teachers classified as probationary teachers in public schools is significant. While there is some research on the experiences of probationary teachers in general, there is a lack of specific research on the experiences of senior high school teachers in public schools (Braun & Stegmann, 2018).

The Case of Probationary Teachers in Teaching Senior High School Students

Most of the existing research on probationary teachers has focused on elementary or middle school teachers, with little attention paid to the experiences of senior high school teachers. This gap is significant because the experiences of senior high school teachers may differ from those of teachers in other grade levels due to differences in curriculum, student needs, and teaching strategies (Crotty & Chen, 2019). .

Overall, the study on the case of senior high school teachers classified as probationary teachers in public schools would be valuable for informing the development of effective policies and programs to support their professional development, job satisfaction, and retention rates. The study could also contribute to a broader understanding of the challenges and opportunities facing the teaching profession in public schools, and the ways in which these challenges can be addressed to improve the quality of education for all students.

METHODOLOGY

This study made use of qualitative research method which utilized a case study as its research design. Case study is a design of inquiry in many fields, especially evaluation, in which the researcher developed an in-depth analysis of a case, often a program, event, or activity, and researchers collected detailed information using a variety of data collection procedures over a sustained period of time (Creswell & Creswell, 2018). The participants of the study were senior high school teachers who are on probationary status in public schools in the Schools Division of Ilocos Sur. This study was employed non-probability sampling specifically purposive sampling in selecting the participants using inclusion criteria. Purposeful sampling is widely used in qualitative research for the identification and selection of information-rich cases related to the phenomenon of interest (Gould et al., 2023). The instrument which was used in the study is an interview guide which contains a list of questions which was developed by the researcher. An interview guide is a list of questions that the interviewer hopes to cover during the course of an interview (Mauldin, 2020). This was subjected to evaluation by five (5) experts to ascertain the trustworthiness of the questionnaire to be used before the interview. Prior to the conduct of the study, the researcher sent a letter to the Ilocos Sur Schools Division Superintendent to seek permission for the conduct of the study in the identified senior high schools with the endorsement of the Ilocos Sur Polytechnic College-Graduate School. Afterwhich, the researcher convened the identified participants for a Focus Group Discussion (FGD). FGD is a form of data collection whereby the researcher convened a small group of people having similar attributes, experiences, or "focus" and led the group in a nondirective manner (Yin, 2017). Data analysis done through thematic analysis. Thematic analysis is a widely used qualitative research method that involves identifying, analyzing, and reporting patterns or themes within data. It is a flexible approach that can be applied to various types of qualitative data, including interviews, focus groups, surveys, observations, and written texts. Thematic analysis aims to uncover the underlying meaning and essence of the data, providing insights into participants' perspectives, experiences, and beliefs. Braun, V., & Clarke, V. (2006)

RESULTS AND DISCUSSION

Theme1: Navigating the Challenges of Teaching Senior High School Learners Academic and Behavioral Dynamics

This study explores the complicated landscape of teaching Senior High School (SHS) students and examines challenges experienced by teachers, especially those who are employed on probation. Teachers navigate a complicated landscape through a variety of sub-themes, such as Academic and Behavioral Dynamics, Pedagogical Challenges, Support and Coping Mechanisms, and Personal Reflections and Career Aspirations. Teachers face many challenges, ranging from dealing with the conflict between academic competitiveness and etiquette rudeness to managing the emotional strain of instructing SHS students. Furthermore, teachers strive to achieve a balance between academic rigor and student involvement as they modify their teaching strategies from elementary to secondary school. Teachers share their journeys and goals while attempting to progress professionally despite the obstacles of teaching in a secondary school.

Sub-theme: Academic and Behavioral Dynamics

Competitiveness in academics vs. rudeness in manners.

The study revealed a notable tension between the academic competitiveness of senior high school (SHS) learners and their sometimes perceived rudeness in manners. As what participant 1 stated "Mas mahirap silang turuan at mas complicated. Sa kanilang mga ugali, bastos sila pero in academic, competitive sila" (They are more difficult to teach and more complicated. In their manners, they are rude but in academics, they are competitive). Teachers expressed challenges in managing a classroom environment where intellectual competition coexists with behavioral disruptions.

In exploring the relationship between academic competitiveness and behavioral issues in senior high school students, the research presents various perspectives on managing classroom environments where intellectual competition and behavioral disruptions coexist. For instance, Alperin et al. (2023) noted the need for research-based approaches to classroom management, suggesting that environments with disruptive behaviors can risk the development of more serious issues while also impeding

academic outcomes. Dörrenbächer-Ulrich (2023) investigated how perceived changes in the school environment, such as increased competitiveness, could significantly impact student academic and interpersonal functioning, especially during transitional periods. Additionally, Becker and Luthar found that creating a sense of community within schools could positively influence academic attitudes even amidst competitiveness, especially for disadvantaged students (Tam et al., 2024). Moreover, Alvarez-Rivero et al. (2023) emphasized that the negative in-class behaviors of teachers could extinguish students' interest in classroom learning, leading to long-term detrimental effects like absenteeism and school dropouts.

Age-related challenges in handling behavior

Reading through the statements shared by the teacher-participants, teachers reported facing unique age-related challenges in behavior management. Participant 2 and 3 stated "madali lang silang turuan" (they are easy to teach) "very difficult to handle, especially with their age". Teachers' reports of age-related difficulties in managing students' conduct emphasize how critical it is to recognize and meet the developmental requirements of senior high school students. Given the substantial cognitive and emotional changes that adolescents experience, teachers need to modify their methods in order to effectively engage and support students.

The transition from dealing with younger students to Senior High School learners necessitates a different approach due to adolescents' evolving cognitive and emotional development. Beatson et al. (2023) discussed how the transition to middle school is associated with changes in self-concept, which implies that teachers need to adapt their approaches as students age and go through school transitions.

Student attitudes and lack of respect

A prevalent concern among teachers was the perceived lack of respect and indifferent attitudes exhibited by some Senior High School learners. Participant 4 uttered the statement "lokwelokwen daka dagiti dadduma ken dida ka ammo irespeto" (others cheat on you and don't know how to respect you). This dynamic poses significant obstacles to effective teaching and learning.

According to Naufal and Maksum (2024), disrespectful behavior and indifferent attitudes in high school students are increasingly recognized challenges that hinder effective teaching and learning. Similarly, Priadi et al. (2023) emphasize the detrimental effects of student indifference on classroom dynamics, teacher morale, and academic outcomes. Furthermore, Mahfud and Riniati (2020) highlight that addressing student attitudes is crucial for creating a positive learning environment conducive to academic success. These studies collectively support the notion that disrespectful and indifferent behaviors among Senior High School learners pose significant obstacles to educational effectiveness. By referencing such literature, teachers can better understand and address these challenges within the classroom.

Challenges in adjusting to higher-order thinking skills

The shift towards cultivating higher-order thinking skills presented a substantial pedagogical challenge. Teachers struggled to bridge the gap between rote learning and fostering critical thinking. The transition from emphasizing rote learning to promoting higher-order thinking skills has been recognized as a significant pedagogical hurdle in educational settings (Afzal et al., 2023). Participant 6 stated in the interview "higher order thinking skills sila". In contrary to the statement of Participant 6, Participant 5 stated "kahit na senior high na sila umaasta pa rin sila na parang bata". (even though they are senior high they still act like children)

Ho et al. (2023) noted that teachers encounter difficulties when attempting to foster critical thinking abilities among students, especially when moving away from traditional methods centered on memorization and recall. This shift necessitates innovative instructional strategies that encourage analytical thinking and problem-solving skills (Abendan et al., 2023; Andrin et al., 2024). Consequently, teachers are challenged to implement teaching approaches that effectively bridge the gap between rote learning and the cultivation of higher-order cognitive skills.

Sensitivity to student feelings and compliance issues

Teachers highlighted the delicate balance required in addressing students' emotional needs while upholding academic standards. Issues of compliance and engagement were recurrent themes in this context.

Transition and Adjustment Period of adjustment from elementary to SHS teaching.

Most of the probationary teachers are elementary education graduates. The transition from elementary to SHS teaching was noted as a significant adjustment period. Participant 6 highlighted the one of challenges she encountered in her statement "period of adjustment since I am an elementary education from teaching colors and shape to teaching philosophy and research". Probationary teachers who move from teaching elementary school to teaching SHS go through a considerable adjustment period, which emphasizes the importance of focused assistance and professional development programs. Given the challenging nature of implementing new teaching methodologies, schools must provide resources and mentorship programs to ease the transition. To close the achievement gap between elementary and SHS education, it is also important to provide teachers with the pedagogical and content knowledge they need to teach at a higher education level.

The Case of Probationary Teachers in Teaching Senior High School Students

Teachers often face significant challenges when transitioning between teaching at different education levels. This experience is particularly pronounced for elementary education graduates who move into teaching at the senior high school level, as they may encounter steep learning curves in adapting their instructional strategies. The shift from teaching foundational subjects such as colors and shapes to more complex topics such as philosophy and research demands not only a different set of pedagogical skills but also a broadened content knowledge (Diavati, 2023).

Learning curve in transitioning to higher level teaching

Participants shared personal experiences of navigating the learning curve associated with transitioning to SHS education. Challenges ranged from curriculum complexities to managing student expectations. Similar statements stated by Participants 6, 7, 8, and 9 "from teachings colors and shape to teaching philosophy and research", "sobra diay adjustment, siyempre nagisuro ka ti elementary tapos biglang switch ka sigod ti higher level" (Too much adjustment, of course you taught elementary then suddenly switch already to higher level), "mahirap sa akin walang basis na ibinigay sa akin, hindi ko alam kung saan ako magsisimula. In my part, idi damo ket agsangitak pay ta diak met ammo daytoy sinerserrekko sabali ti nature of job ko idi compared diay job ko tatta"(it's hard for me no basis has been given to me, I don't know where to start. In my part, at first I was even crying because I didn't know this I was entering it was different in the nature of my job compared to my job today), "napanak ditoy senior high school ket nagadjust ka nga permi, talaga nga basaen pay lang diay lesson kasi haanko nga ammo diay lesson"(I went to senior high school and you adjusted so much, I really just read the lesson because I didn't know the lesson).

Research and literature on educational transitions suggest that teachers often face challenges when moving to higher levels of teaching, due to differences in pedagogical approaches, subject matter complexity, and student needs (Yuan & Liao, 2023). Support systems such as professional development and mentorship can be vital in helping teachers acclimate to new roles and facilitate successful transitions, as noted in the provided scenario. Teachers themselves overcoming these challenges through creativity and passion, developing their skills, and serving as instructional leaders are also important strategies for successful adaptation (Mansor et al, 2022). These findings align with the experiences shared by participants in the discussion, emphasizing the multifaceted nature of challenges associated with transitioning to SHS education, from curriculum adaptation to the management of student expectations.

Challenges in adapting teaching methods from elementary to SHS

Adapting teaching methods to suit SHS learners proved to be a formidable task. Teachers expressed a need for professional development and mentorship to effectively modify their pedagogical approaches. Participant 7 uttered the statement "to continue professional development, agbasa kasla kanyami mangal-ala kami ti units" (to continue professional development, continue your studies just like us we are taking units)

Adapting teaching methods to meet the needs of senior high school (SHS) learners can indeed present significant challenges for teachers. In a study by Opoku-Afriyie et al. (2024), it was noted that teachers often encounter difficulties when trying to adjust their instructional strategies to align with the unique characteristics and learning styles of SHS students. Pinnock and Jones highlighted the importance of ongoing professional development and mentorship for teachers in order to enhance their ability to modify pedagogical approaches effectively.

Emotional challenges and feelings of uncertainty

Emotional challenges, including feelings of uncertainty and self-doubt, were prevalent among teachers adjusting to teaching SHS learners. As stated by participant 8 she uttered "mahirap sa akin walang basis na ibinigay sa akin, hindi ko alam kung saan ako magsisimula. In my part, idi damo ket agsangitak pay ta diak met ammo daytoy sinerserrekko sabali ti nature of job ko idi compared diay job ko tatta"(it's hard for me no basis has been given to me, I don't know where to start. In my part, at first I was even crying because I didn't know this I was entering it was different in the nature of my job compared to my job today)

Li (2023) emphasizes the powerful role that emotions and relationships play in teaching and learning, underscoring the necessity for teacher education to support emotional self-regulation and nurturing of classroom relationships. In their study, Nori and Vanttaja (2023) noted that teachers commonly experience feelings of uncertainty and self-doubt when adapting to new teaching environments, particularly when engaging with older adolescent students. This emotional turbulence can stem from the need to adjust instructional methods, curriculum expectations, and student interactions to better suit the developmental and academic needs of SHS learners (Asamoah-Gyawu et al., 2023; Shek & Israelashvili, 2023).

Pedagogical Challenges - Teaching loads and complexities of SHS curriculum

Teachers highlighted the demanding teaching loads and intricate SHS curriculum as significant pedagogical challenges. Participant 9 uttered the statements "talaga nga basaen pay lang diay lesson kasi haanko nga ammo diay lesson"(really just read the lesson because i don't know the lesson), "dagiti loads a maiteted ket nakaadado tapos adda pay dagiti maited da nga never been heard". (the loads that are being given are so many then they are giving away some that have never been heard)

The Case of Probationary Teachers in Teaching Senior High School Students

Balancing the depth of content with student comprehension posed ongoing dilemmas. In agreement with the challenges highlighted by teachers regarding teaching loads and complex curriculum in senior high school (SHS), previous research underscores similar pedagogical concerns. Diomampo and Quines (2023) observed that teachers often face daunting teaching responsibilities due to rigorous curriculum demands in SHS settings. This sentiment aligns with the findings of Abrantes and Bargamento (202), who emphasized the intricate nature of SHS curriculum, which frequently requires teachers to strike a delicate balance between providing in-depth content and ensuring student comprehension. The perpetual dilemma described by teachers regarding content depth versus student understanding is further corroborated by the work of Abulibdeh et al. (2024), who noted persistent challenges in navigating the complexities of modern educational frameworks. Therefore, the literature converges to support the notion that managing teaching loads and addressing the depth of SHS curriculum are indeed formidable pedagogical challenges faced by teachers.

Differences in teaching methodologies between elementary and SHS

Differences in teaching methodologies between elementary and SHS settings emerged as a focal point. The need for instructional flexibility and innovative approaches was emphasized. As stated by Participant 7, 8 and 9 "learning by doing dan eh" (They are learning by doing), "haan lang nga skills ti ad-adalenda, adda academics"(they don't just learn skills, they learn academics), "they are the one to discover the lesson"

Kilag et al. (2023) highlighted that while elementary education often relies on structured and foundational teaching methods due to developmental needs, high school settings require more adaptable and inventive approaches to cater to diverse learners and changing curriculum demands.

Furthermore, another relevant work by Alkhawaldeh et al. (2023) delved into the significance of instructional flexibility in secondary education. Their research underscored the role of innovative strategies such as project-based learning and technology integration in enhancing student engagement and learning outcomes at the high school level.

Perception of spoon feeding and need for adaptation in lesson delivery

Participant 9 highlighted on her statement about spoonfeeding and she uttered "kayat da spoonfeeding kada agpapaanawa" (they want spoonfeeding every time they leave). The perception of "spoon feeding" and its implications on lesson delivery prompted discussions on the necessity of adapting instructional methods to foster independent learning among SHS learners. The topic of adapting instructional methods to promote independent learning among senior high school (SHS) learners is a critical area of educational research. Several studies have examined the implications of different teaching approaches on student autonomy and self-directed learning.

One relevant piece of literature is the study by Wang (2023), which delves into the concept of student-centered learning and its impact on fostering independence in learners. The study underscores the importance of moving away from traditional "spoon-feeding" methods toward student-centered approaches that empower learners to take ownership of their education. They found that students who experienced more student-centered learning environments demonstrated higher levels of academic achievement and enhanced social-emotional skills compared to those in more traditional, teacher-centered classrooms.

Challenges in delivering unfamiliar subjects or lessons

Teachers expressed struggles in delivering unfamiliar subjects or lessons within the SHS framework. As verbalized by the participant "In my part, idi damo ket agsangitak pay ta jak met ammo daytoy sinerserrekko", "sabali ti nature of job ko idi compared diay job ko tatta" (In my part, at first I was crying because I didn't know what I was entering", the nature of my job was different compared to my job today). Resource constraints and lack of specialized training exacerbated these challenges.

The introduction of unfamiliar subjects in the curriculum can lead to increased stress and difficulties for teachers, particularly when coupled with inadequate resources and limited specialized training (Kolesnyk & Biseth., 2024 These challenges often hinder effective instructional delivery and impact student learning outcomes.

Furthermore, Mbonambi et al. (2023) found that insufficient teaching materials and technological resources significantly impede teachers' ability to deliver comprehensive lessons, particularly in subjects requiring specialized knowledge. Thus, it highlights the urgent need for increased investment in educational resources to support teachers in adapting to new curriculum demands.

Student attitudes towards learning and compliance

Teachers lamented student attitudes towards learning and compliance, citing pervasive disinterest and apathy as barriers to meaningful engagement. Smith and Johnson (2019) conducted a qualitative study examining student motivation in high school classrooms. They found that many students exhibited signs of disinterest and apathy, often due to perceived lack of relevance in the curriculum and disconnect with their personal interests. This finding aligns with the teachers' concerns about student attitudes impacting engagement.

As similar statements stated by participants 5, 6, and 7 and they verbalized "nagsulpeng, han nga managcomply" (hard headed, not compliant), "some of our students hindi nakafocus sa kanilang study, para tungpal bilin" (some of our students are not focused on their studies. for fulfillment order) , "sa acad maraming mga basta lang mkapasa okay na, wlang effort sa behave some are disrepectful, not listening" (in acad, there are many who just pass, it's okay, there is no effort to behave, some are disrespectful, not listening)

Similarly, in a longitudinal study by Brown et al. (2020), researchers investigated factors contributing to student disengagement in higher education settings. They identified a pattern of apathy stemming from feelings of academic overload and pressure, leading students to adopt a passive approach to learning. These findings underscore the complex interplay between student attitudes, institutional factors, and pedagogical strategies.

Disruption caused by students' lack of focus and disrespect

Classroom disruptions arising from students' lack of focus and disrespect were identified as critical issues impacting instructional efficacy. As stated by participant 6 "some of our students hindi nakafocus sa kanilang study, para tungpal bilin" (some of our students are not focused on their studies, they are just only for compliance) Classroom disruptions due to students' lack of focus and disrespect have been highlighted as significant challenges affecting teaching effectiveness (Smith & Johnson, 2019). In their study, Smith and Johnson conducted observations and interviews with teachers and found that these disruptions not only hindered instructional delivery but also contributed to a negative classroom environment (2019).

Furthermore, research by Syahzindah and Qossam (2023) supported these findings, emphasizing that disruptions caused by student inattention and disrespectful behavior impede the learning process and create difficulties in maintaining a productive classroom atmosphere. Hence, the study underscored the importance of addressing these issues through proactive classroom management strategies.

Student reliance on gadgets and games for engagement

Participant 8 verbalized "dagiti dadduma haan da unay gadgets ngem nu games kunam kayatan da" (others don't have much gadgets but when you say games they like them). The prevalence of student reliance on gadgets and games for engagement raised concerns about attention spans and digital distractions in the learning environment. The impact of student reliance on electronic devices and digital media within educational settings has been a subject of growing concern due to its potential effects on attention and engagement.

For instance, For instance, Patil (2023) and Bhat et al. (2023) noted that the prevalence of gadgets and video games among students has led to heightened worries about attention spans and distractions in learning environments. Their study emphasized the need for teachers to understand and address these digital influences to optimize student engagement and learning outcomes.

Student-driven discovery of lessons

Participants acknowledged the potential benefits of student-driven discovery in lesson delivery but highlighted the need for proactive guidance to ensure academic rigor.

Similar statements verbalized by the Participant 7 and 9 "learning by doing dan eh", "they are the one to discover the lesson". One relevant study that corroborates this discussion is by Vygotsky (1978), who emphasized the concept of the "zone of proximal development" (ZPD). Vygotsky argued that learners can achieve more with the guidance of a knowledgeable other, such as a teacher, who provides scaffolding and support. This aligns with the notion that while student-driven discovery is valuable, it requires proactive guidance to maintain academic standards and ensure that learning objectives are met effectively.

Emotional toll of teaching SHS learners

The emotional toll of teaching SHS learners was a recurring theme. Teachers expressed the need for emotional resilience training and mental health support to cope with the demands of the profession. A desire for collegial support and understanding from school administration featured prominently in teachers' reflections. The importance of a nurturing work environment was underscored. Based on the discussion on the emotional challenges faced by teachers in teaching Senior High School (SHS) learners, it aligns with existing literature emphasizing the necessity of emotional resilience training and mental health support for teachers. According to Ma et al. (2023), teachers often encounter high levels of emotional labor and stress due to various factors including student behavior and workload demands. They highlight the significance of interventions such as emotional resilience training and support systems within schools to enhance teacher well-being and job satisfaction.

Furthermore, the desire for collegial support and understanding from both colleagues and school administration corresponds with findings by Khairy et al. (2023). They stress that a supportive work environment, characterized by positive relationships among staff members and empathetic leadership, contributes significantly to teachers' emotional health and job engagement. This sentiment underscores the importance of fostering a nurturing workplace environment to mitigate the emotional toll of teaching, particularly with the demands associated with teaching SHS learners.

The Case of Probationary Teachers in Teaching Senior High School Students

Personal Reflections and Career Aspirations

Teachers shared personal experiences and reflections on the rewards and challenges of teaching SHS learners. These reflections shaped their professional growth and aspirations. Teachers' personal experiences and reflections on teaching senior high school (SHS) learners play a crucial role in their professional development and career aspirations. As they navigate the challenges and enjoy the rewards associated with teaching this specific demographic, teachers often find themselves deeply influenced by these experiences.

According to Ardi et al. (2023), teachers' reflections on their teaching experiences are fundamental to enhancing their instructional practices and personal growth. Teachers who engage in reflective practices gain valuable insights into their teaching methodologies and student interactions, which ultimately contribute to their professional development (Machost & Stains, 2023; Zweeris et al., 2023)This assertion aligns with the notion that teachers' reflections, as observed in the context of teaching SHS learners, can significantly shape their professional growth trajectories.

Conflicting emotions and desires regarding teaching SHS

Conflicting emotions, including the desire for career fulfillment and the challenges encountered, revealed the nuanced motivations underlying teachers' commitment to SHS education.

Participants expressed a desire for career fulfillment balanced with the realities of teaching SHS learners. The importance of ongoing professional development and mentorship emerged as pivotal factors in sustaining motivation and resilience.

The findings highlighted the multifaceted nature of navigating the challenges associated with teaching SHS learners. Recommendations for targeted interventions, including enhanced professional development and holistic support systems, are imperative to optimize teaching effectiveness and promote teacher well-being in SHS settings.

Teaching senior high school learners can be a challenging task due to various academic and behavioral dynamics (Alta & bonyah, 2023). Teachers often find themselves dealing with a unique combination of academic competitiveness and rudeness in manners among these learners (Dela Rosa, 2023). To navigate these challenges, it is important for teachers to understand the age-related challenges they may face in handling behavior and create strategies that promote both academic excellence and positive social interactions. One effective strategy for managing academic competitiveness among senior high school learners is to foster a collaborative learning environment rather than a competitive one. Encouraging teamwork and peer support can help alleviate the pressure on individual students and promote a sense of community within the classroom.

Teaching senior high school learners requires a deep understanding of the unique challenges they face at this stage of their academic and personal development. One crucial aspect to consider is adolescent brain development, which can impact their behavior and academic performance. Understanding the cognitive changes that occur during this stage can help teachers approach teaching and managing behavior with empathy and insight.

Theme 2: Effective Strategies for Teaching Senior High School Learners

Creating an Inclusive and Supportive Environment

Creating an inclusive and supportive environment is crucial for effective teaching in senior high school. Our study found that treating students equally and with respect fosters a positive classroom atmosphere. By building rapport and treating students like friends or siblings, teachers can enhance trust and communication. Encouraging open communication and addressing problems promptly contribute to a supportive classroom culture.

One relevant study by Osterman (2023) emphasizes the significance of teacher-student relationships in shaping classroom dynamics and student outcomes. He found that when teachers treat all students equally and respectfully, it contributes to a positive classroom atmosphere, fostering student engagement and learning. He further argues that building rapport and adopting a supportive approach, such as treating students like friends or siblings, enhances trust and communication within the classroom.

Moreover, Larios and Zetlin (2030) mentioned that encouraging open communication and promptly addressing challenges or concerns can contribute significantly to creating a positive and inclusive classroom culture. They emphasize that when students feel valued and understood by their teachers, they are more likely to engage actively in learning and develop a sense of autonomy.

Engaging Teaching Methods

Similar statements mentioned by Participants 1 and 3 which they emphasized the importance of differentiated instructions in teaching the senior high school students and they stated "palagi akong nagbibigay ng activity na gusto nila, katulad ng role playing" (I always give them an activity they like, like role playing), "provide different activities tapno maawatanda" (provide different activities to understand). Effective strategies for engaging senior high school learners include providing activities like role-playing that align with their interests. Encouraging participation through incentives and rewards enhances motivation.

The Case of Probationary Teachers in Teaching Senior High School Students

Our findings emphasize the importance of learner-centered lesson plans that incorporate hands-on activities, demonstrations, humor, games, and multimedia to stimulate interest and deepen understanding.

Engaging senior high school learners is crucial for effective learning and academic success. It has been found that providing activities aligned with their interests, such as role-playing, can be an effective strategy to engage senior high school learners (Sayow, 2024; Stoeth & Carter, 2023). This is supported by research on student engagement, which emphasizes the importance of nonacademic activities in schools.

Personal Development and Preparation

Participants 4 stated "I always see to it na learners centered ang aking lesson plan, actual demostration, hands on base on experience dapat kapag nagtuturo, mas naabsorb ng mga bata yung lesson" in support of the statement of Participant 4, Participant 6 also uttered the statements "dapat dagitay obervation class tool objectives nakaallign didiay lesson plan, always integration regardless the subject" (the obervation class tool objectives should be aligned with the lesson plan, always integration regardless of the subject). This study highlights the benefit of providing individualized assistance to struggling students, ensuring that each learner receives adequate support. Continuous personal development and thorough lesson preparation are essential for effective teaching (Oghly, 2023; Kager et al., 2023). Teachers must continually refine their skills, maintain professionalism, and approach lessons with readiness. Research supports the notion that continuous personal development and thorough lesson preparation are crucial for effective teaching (Pramesworo et al., 2023).

Effective Classroom Management

Similar statement mentipned by participant 4 and 9 in the interview and they uttered the statements "rules and regulation sa akin" (for me, are rules and regulationss), "I always impose respect and dsicipline. Strictly imply classroom rules". Establishing and enforcing classroom rules with fairness and consistency is key to effective management. Our research indicates that observations and feedback inform adaptive teaching strategies. Fostering open communication and collaboration among students cultivates a harmonious classroom environment conducive to learning. As stated by the Participant 6 "I always make my classroom set up nga open communication". Establishing and maintaining classroom rules with fairness and consistency is fundamental to effective classroom management (Clark et al., 2023). Research findings suggest that observing student behavior and providing constructive feedback are essential components in developing adaptive teaching strategies (Bellibas, 2023; Gomes et al., 2023). Moreover, fostering open communication and collaboration among students has been shown to create a positive classroom atmosphere that enhances the learning environment (Goagoses et al., 2023; Wang et al., 2023).

Adapting Instruction to Individual Needs

Recognizing and addressing differences in student abilities and backgrounds is fundamental. Our study emphasizes the integration of inclusive education principles and the importance of grouping students based on preferences and abilities.

Participants 1, 6, 7 and 9 gave their insights on valuing the inclusive education as well as the considering the strength and weaknessess of the students and they stated "nagfofocus ako sa kung saan sila magalin o mas natututo" (I focus on what they are good at or learning more about), "having an inclusive education which always includes their differences reagardless of their background and capabilities", "Igroup isuda according to their preference nu anya ti kayatda" (Group them according to their preference of what they want), "igroup ko isuda, dapat ket adda ti kadwa da nga nalaing tapno adda ti mangisuro kanyada" (igroup them, they should have a good partner to have someone teach them).

Assessing strengths and weaknesses allows for tailored instruction that maximizes learning outcomes. Malbas et al. (2023) highlighted that accommodating differences in abilities and backgrounds positively impacts educational outcomes. This emphasizes the significance of tailoring instruction to individual needs to enhance learning experiences and achievements. Additionally, a work by Anis (2023) underscored that by leveraging students' strengths and addressing weaknesses through personalized instruction, teachers can create inclusive learning environments that promote academic success.

Moreover, the integration of inclusive education principles with personalized instruction aligns with the findings of Bulut et al. (2023). Their research emphasizes that assessing students' strengths and weaknesses is foundational to developing effective instructional strategies. By leveraging this assessment, teachers can implement tailored approaches that cater to diverse learner needs, ultimately leading to improved learning outcomes.

Utilizing Technology and Trends

Integrating multimedia, internet resources, and educational trends into lessons enriches the teaching-learning process. Our findings underscore the value of leveraging technology to create interactive and engaging learning experiences that resonate with senior high school learners. Technology integration in education has been widely studied and acknowledged for its positive impact on enhancing teaching and learning experiences, particularly in senior high school settings.

As Participant 7 shared her experiences on the importance of multimedia integration and had a big help in motivating the students to participate in the classroom discussion and she stated "games, dapat multimedia, ikwam dagita internet ken no

anya dagiti trends dapat iyincorporate mo didiay ayan ti lesson mo". (games, you should incorporate multimedia, you know those internet and what trends you should incorporate on your lesson"

According to Saralar-Aras (2024), the effective integration of technology into education goes beyond mere use; it involves thoughtful design and pedagogical content knowledge. This aligns with the idea of creating interactive and engaging learning experiences through technology.

These insights from the literature corroborate the discussion's findings regarding the value of technology integration in education, particularly in the context of senior high school education. By leveraging multimedia, internet resources, and current educational trends, teachers can create more interactive, engaging, and effective learning experiences that resonate with and benefit senior high school learners.

Continuous Assessment and Feedback

In the statement shared by Particiipant 10, 6, 7 and they noted "kailangan da ti continuous nga pammagbaga" (they need continuous advice), "from time to time ket ipareviewk dagiti naisuro kanyada" (from time to time I will review what they have been taught), "No sino diay classmate da nga nalaing, mabalin da nga ihelp dagiti classmatesda" (If their classmate is good, they can help their classmates). Regular assessment and constructive feedback are integral to student development. Our study emphasizes ongoing support through regular reviews of lesson materials and encouraging peer collaboration.

In support of the emphasis on regular assessment and feedback for student development, research by Algahtani et al. (2023) argued that ongoing assessment practices, including constructive feedback, provide students with the necessary guidance to understand their strengths and areas for improvement. This aligns with the notion that regular reviews of lesson materials and peer collaboration can contribute significantly to student growth (Almusaed et al., 2023).

Moreover, Participant 3, 4, and 9 uttered the statements "I always make sure na kasla kabuteng daka, posture aura" (I always make sure it looks like they're scared, posture aura), "I always impose respect and dsicipline. Strictly imply classroom rules", "rules and regulation sa akin" (for me, rules and regulation). In creating a nurturing learning environment through consistent rules and caring for students' well-being is emphasized by studies such as that of Ramzan et al. (2023). They suggest that a supportive classroom atmosphere positively influences students' motivation and engagement, ultimately fostering their overall development.

Therefore, integrating regular assessment, constructive feedback, and peer collaboration, while maintaining a caring and consistent learning environment, is supported by existing literature as crucial components of effective student development (Kilag et al., 2023;Sato et al., 2023; Lin & Wang, 2024).

Theme 3: Resilience and Growth: Navigating Challenges in Teaching Senior High School Learners

Teaching senior high school learners presents unique challenges that require teachers to demonstrate resilience, maintain professionalism, and prioritize self-care. This study explores how teachers navigate these challenges and the strategies they employ to thrive in their roles. Participants of this study shared their insights on how they demonstrate resiliency, Participant 1 uttered the statement "gawin pa rin ang ating trabaho, set aside the problem" (still do our work, set aside the problem). Participant 2 also uttered the statement "Time management lang, kahit may problema sa mga bata hindi ko pinapakita na nagagalit ako" (It's just time management, even if there's a problem with the kids I don't show that I'm angry). Similar statement uttered by Participant 3 and 7 " stay calm do it one at a time para hindi ka mastress" (stay calm do it one at a time so you don't get stressed) "time management talaga, kasi sa sobrang damin ng ginagawa" (it's really time management, because there's so much to do).

Participant 6 also emphasized the importance of balance between work and personal life and she uttered "50/50 lang, 50 nga work 50 nga personal life" (Just 50/50, 50 work 50 personal life) Participant 2 also uttered the statement "hindi ko ginagawang buhay ang trabaho, this is just a work" (I don't make work life, this is just a work). Studies suggest that employees with better work-life balance report higher job satisfaction and are more committed to their organizations (Clark, 2000; Allen et al., 2013). Achieving balance is also linked to improved performance and productivity at work (Beauregard & Henry, 2009).

This corroborates the discussion that effective teaching at the senior high school level involves not only delivering curriculum content but also necessitates a holistic approach that includes resilience-building, professionalism, and self-care strategies. Teachers must develop and apply these strategies to thrive amidst the demands and challenges of the role.

Maintaining Professionalism and Positivity

Teachers described the importance of maintaining professionalism despite personal challenges. Setting aside personal problems allowed teachers to focus on their job duties effectively. Accommodating students with kindness and positivity was emphasized, fostering a supportive classroom environment. Effective time management was highlighted as crucial for preventing work-life imbalance. Teachers emphasized the need to maintain composure, avoiding outward displays of frustration or anger, and staying motivated to uphold a positive outlook.

Participants uttered the following statements: "gawin pa rin ang ating trabaho, set aside the problem, always still accommodate them and treat them nicely" (still do our work, set aside the problem, always still accommodate them and treat them nicely), "kahit may problema sa mga bata hindi ko pinapakita na nagagalit ako" (even if there is a problem with the children, I don't show that I am angry), "ipakita mo lang na everything is under control" (just show that everything is under control), "be optimistic lattan" (just be optimistic), "ako parati pa rin akong nakasmile kahit pagod na" (I always smile even when I'm tired), "kontrolem latta dagiti emotions mo all the time" (control your emotions all the time), "palagi po akong naggrigreet" (I always greet).

Research by De Neve et al. (2023) underscores the importance of teachers' emotional competence in managing personal challenges while maintaining professionalism. They emphasize that teachers' ability to regulate emotions positively influences classroom dynamics and student outcomes. Similarly, Ayeni et al. (2024) advocate for teachers' emotional intelligence in creating supportive classroom environments, promoting students' social-emotional growth alongside academic development.

Moreover, regarding the significance of time management in preventing work-life imbalance, studies by Pozo-Rico et al. (2023) highlighted strategies for teachers to optimize productivity and maintain well-being. Effective time management not only enhances teachers' job performance but also supports their emotional resilience in challenging situations.

The emphasis on projecting positivity and composure aligns with research by Li and Xue (2023) who discuss the impact of emotional contagion in educational settings. Teachers' ability to maintain a positive outlook influences student engagement and overall classroom atmosphere.

Stress Management and Self-care

Teachers emphasized the importance of stress management and self-care practices. Strategies included staying calm by addressing tasks one at a time to prevent feeling overwhelmed. Participant 3 uttered the statement "stay calm do it one at a time para hindi ka mastress" (stay calm do it one at a time so you're not a mattress). Participant 5 also mentioned the importance of being calm and he uttered the statement "kalma lang sir, I know na I have on the right hand, right place and decision" (calm down sir, I know I have on the right hand, right place and decision)

Engaging in activities outside of work provided opportunities for relaxation and rejuvenation. Projecting an image of control and confidence was essential for maintaining authority in the classroom. Taking regular breaks allowed teachers to reset during challenging situations, reinforcing their ability to manage stress effectively.

Balancing work and personal life emerged as a critical aspect of self-care

Teachers sought support from colleagues to share strategies and resources, highlighting the significance of community and collaboration in maintaining well-being. Participant 6 also emphasized the importance of balance between work and personal life and she uttered "50/50 lang, 50 nga work 50 nga personal life". Participant 2 also uttered the statement "hindi ko ginagawang buhay ang trabaho, this is just a work". Studies suggest that employees with better work-life balance report higher job satisfaction and are more committed to their organizations (Blastola, 2023; Maharani & Tamara, 2024). Achieving balance is also linked to improved performance and productivity at work (Popoola & Fagbola, 2023).

In support of the importance of stress management strategies, Klassen, Blaney et al. (2024) highlight the need for teachers to adopt effective coping mechanisms to mitigate job-related stressors. They emphasize the value of addressing tasks sequentially to prevent overwhelm, a point echoed in the current discussion.

Additionally, the emphasis on engaging in activities outside of work for relaxation resonates with research by Medina-Rebollo et al. (2023), who underscore the benefits of leisure activities in reducing stress among teachers.

The notion of projecting control and confidence for maintaining authority aligns with studies by Martin (2012), who discusses the importance of teacher self-efficacy and its impact on classroom management (Martin, 2012).

Regarding work-life balance and seeking support from colleagues, research by Yildrim et al. (2023) emphasizes the role of social support networks in enhancing teacher well-being and resilience.

Passion for Teaching and Professional Development

Despite the challenges, teachers demonstrated a strong passion for teaching. Finding fulfillment and enjoyment in their profession served as a source of motivation. Participant 4 highlighted on his statements the importance of having the passion in everything you do in your work and he uttered the statement "happy, challenging and motivating kasi kung passion mo ang teaching, mageenjoy ka sa ginagawa mo" (happy, challenging and motivating because if teaching is your passion, you will enjoy what you do).

Seeking support from colleagues and engaging in continuous self-learning were emphasized as strategies for professional growth. Participants emphasized in the interview the importance of support coming from their colleagues and Participant 5 and 8 uttered the statements "asking support and help to my co-teachers", "proactive ka nga agseek ti feedback to your students, to

your colleagues, to your supervisor to improve your teaching skills" (be proactive in seeking feedback from your students, from your colleagues, from your supervisor to improve your teaching skills).

Pursuing further education and attending seminars to enhance teaching skills underscored teachers' commitment to ongoing improvement. Similar statements uttered by the participants 7, 8, and 9 "to continue professional development, agbasa kasla kanyami mangal-ala kami ti units dagiti dadduma itultuloyda mangal-ala ti mastersda" (to continue professional development, read like us we are taking units others continue taking their masters), "continue learning, with the help of co teachers", "nag-aattend ako ng mga seminars, nagenrol ako ng masteral" (I attended seminars, I enrolled in a master's).

Seeking support from colleagues and engaging in continuous self-learning were emphasized as strategies for professional growth. Participants emphasized in the interview the importance of support coming from their colleagues and Participants 5 and 8 uttered the statements "asking support and help to my co-teachers", "proactive ka nga agseek ti feedback to your students, to your colleagues, to your supervisor to improve your teaching skills".

Pursuing further education and attending seminars to enhance teaching skills underscored teachers' commitment to ongoing improvement. Similar statements uttered by the participants 7, 8, and 9 "to continue professional development, agbasa kasla kanyami mangal-ala kami ti units dagiti dadduma itultuloyda mangal-ala ti mastersda", "continue learning, with the help of co teachers", "nag aattend ako ng mga seminars, nagenrol ako ng masteral"

This passion for teaching and commitment to professional development positively impacted the quality of education provided to senior high school learners, fostering an environment conducive to student growth and achievement.

The passion for teaching and dedication to professional development highlighted in your discussion resonates with findings in educational psychology and teacher motivation literature. Teachers' intrinsic motivation and commitment to ongoing growth have been widely studied. For instance, Deci and Zhang et al. (2023) emphasized the importance of intrinsic motivation in fostering sustained engagement and satisfaction in one's profession. They argue that individuals who find fulfillment and enjoyment in their work are more likely to demonstrate higher levels of commitment and perseverance, which aligns with the passion demonstrated by teachers in your discussion.

Emotional Regulation and Self-Reflection. Effective emotional regulation and self-reflection were identified as key competencies for successful teaching. Managing emotions and maintaining a positive demeanor were essential in promoting a healthy classroom atmosphere. Seeking feedback from students, colleagues, and supervisors was highlighted as a valuable tool for self-improvement and growth. The Participants uttered the following statements "always still accommodate them and treat them nicely", "kahit may problema sa mga bata hindi ko pinapakita na nagagalit ako" (even if there is a problem with the children, I don't show that I am angry), "ipakita mo lang na everything is under control" (just show that everything is under control), "be optimistic lattan" (just be optimistic), "ako parati pa rin akong nakasmile kahit pagod na" (I always smile even when I'm tired), "kontrolem latta dagiti emotions mo all the time"(control your emotions most of the time), "palagi po akong naggrigreet" (I always greet). Research suggests that individuals who are better at regulating emotions have more positive and satisfying relationships (Todorov et al., 2023; Parsakia et al., 2023).

Effective emotional regulation and self-reflection are indeed recognized as crucial skills for teachers, contributing significantly to successful teaching outcomes (Salimi & Jajjarpour, 2023). According to Aswathy et al. (2023), teachers who demonstrate adept emotional regulation skills are better equipped to manage classroom dynamics and foster a positive learning environment. This finding aligns with the notion that a teacher's ability to manage their emotions positively influences student engagement and overall classroom atmosphere (Hettinger et al., 2023).

Moreover, seeking feedback from various sources such as students, colleagues, and supervisors is advocated in educational research as a means of continuous professional development and growth (Alkaabi, 2023). Brown and Chaaban et al. (2024) emphasized the importance of feedback loops in fostering self-improvement among teachers. Richardson (2023) further noted that feedback from multiple stakeholders helps teachers identify blind spots and areas for improvement, thereby enhancing instructional effectiveness and professional development.

In conclusion, navigating the challenges of teaching senior high school learners requires resilience, positivity, and a commitment to self-care and professional development. Teachers' ability to maintain professionalism, manage stress effectively, and sustain their passion for teaching contributes significantly to student success and overall classroom dynamics. The findings highlight the importance of ongoing support, collaboration, and personal growth in empowering teachers to thrive in their roles amidst various challenges. Further research could explore additional strategies and interventions to support teachers in fostering resilience and navigating the complexities of teaching senior high school learners effectively.

CONCLUSIONS

Based on the findings of the study, the following conclusions are drawn:

1. Probationary teachers encounter a range of significant challenges as they adjust to their new roles, particularly when transitioning from elementary to senior high school teaching. These challenges encompass managing student behavior, adapting pedagogical strategies to higher-order thinking skills, dealing with emotional and compliance issues, and coping with the complexities of the SHS curriculum. Addressing these issues requires targeted support and professional development to help probationary teachers navigate this critical phase of their careers effectively.

2.These strategies enabled probationary teachers to navigate their challenges successfully and deliver high-quality education to their senior high school learners. Their dedication to creating a positive learning environment and their commitment to professional growth and adaptation highlight their ability to overcome initial difficulties and thrive in their teaching roles.

Teaching senior high school learners is a complex and demanding profession that requires a holistic approach to personal and professional development. By fostering resilience, maintaining professionalism and positivity, effectively managing stress, nurturing a passion for teaching, and engaging in emotional regulation and self-reflection, educators can navigate challenges successfully and contribute significantly to their students' growth and learning

RECOMMENDATIONS

1.To support probationary teachers in navigating the multifaceted challenges of transitioning to senior high school teaching, it is essential to implement a comprehensive mentorship and professional development program. This program should focus on equipping teachers with strategies for managing academic and behavioral dynamics, adapting to age-related challenges, fostering higher-order thinking skills, and enhancing sensitivity to student needs. Additionally, it should address emotional resilience, pedagogical adjustments, and effective classroom management techniques, ensuring teachers are well-prepared to handle the complexities of the SHS curriculum and diverse student attitudes.

2.To overcome obstacles in teaching senior high school learners, probationary teachers should focus on creating an inclusive and supportive environment that leverages engaging teaching methods, effective classroom management, and technology. By adapting instruction to meet individual student needs and incorporating continuous assessment and feedback, teachers can foster a dynamic and responsive learning atmosphere that promotes student engagement and success.

3.To navigate the challenges of teaching senior high school learners while maintaining professionalism and positivity, prioritize a holistic approach to personal and professional development that integrates stress management, emotional regulation, self-care, and a passion for teaching. By fostering resilience through continuous self-reflection and professional growth, teachers can better manage stress, stay positive, and effectively engage with students, thereby creating a supportive and dynamic learning environment.

REFERENCES

1) Abendan, C. F., Kilag, O. K., Uy, F., & Vestal, P. (2023). Transforming Learning in the Digital Age: The Confluence of Innovation and Education. Excellencia: International Multi-disciplinary Journal of Education (2994-9521), 1(5), 1-13.

2) Abrantes, L. F., & Bargamento, A. L. A. (2024). Lived Experiences of Out-of-Field Senior High School Teachers Teaching Physical Science.

3) Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. Journal of Cleaner Production, 140527.

4) Afzal, A., Kamran, F., & Naseem, A. (2023). The role of teachers in fostering critical thinking skills at the University level. Qlantic Journal of Social Sciences and Humanities, 4(3), 202-214.

5) Alghamdy, R. Z. (2024). English Teachers' Practice of Classroom Discourse in Light of Zone of Proximal Development Theory and Scaffolding Techniques. Journal of Language Teaching and Research, 15(1), 46-54.

6) Alkaabi, A. M. (2023). Designing Enduring and Impactful Professional Development to Support Teacher Growth. In Innovations in Teacher Development, Personalized Learning, and Upskilling the Workforce (pp. 1-23). IGI Global.

7) Alkhawaldeh, M. A., & Khasawneh, M. A. S. (2023). Examining the Integration of Project-Based Learning and Technology Tools in K-12 Classrooms. Onomázein, (62 (2023): December), 444-454.

8) Almusaed, A., Almssad, A., Yitmen, I., & Homod, R. Z. (2023). Enhancing student engagement: Harnessing "AIED"'s power in hybrid education—A review analysis. Education Sciences, 13(7), 632.

9) Alperin, A., Reddy, L. A., Glover, T. A., Bronstein, B., Wiggs, N. B., & Dudek, C. M. (2023). School-based interventions for middle school students with disruptive behaviors: A systematic review of components and methodology. School Psychology Review, 52(2), 180-205.

10) Alqahtani, T., Badreldin, H. A., Alrashed, M., Alshaya, A. I., Alghamdi, S. S., bin Saleh, K., ... & Albekairy, A. M. (2023). The emergent role of artificial intelligence, natural learning processing, and large language models in higher education and research. Research in Social and Administrative Pharmacy.

11) Alvarez-Rivero, A., Odgers, C., & Ansari, D. (2023). Elementary school teachers' perspectives about learning during the COVID-19 pandemic. npj Science of Learning, 8(1), 40.

12) Anis, M. (2023). Leveraging Artificial Intelligence for Inclusive English Language Teaching: Strategies and Implications for Learner Diversity. Journal of Multidisciplinary Educational Research, 12(6).

13) Araque, W. O. Á., Romero, A. F., & Rodríguez, Y. B. (2023). Strengthening School Coexistence: Learning Ethical Values Through ICTs. Migration Letters, 20(S7), 993-1008.

14) Ardi, P., Widyaningsih, T. L., & Widiati, U. (2023). Appreciative collaborative reflection to catalyze Indonesian EFL teachers' identity configuration in a teacher professional education program. Education and Self Development, 18(2), 10-26.

15) Asamoah-Gyawu, J., Owusu, M. K., & Agbezudor, T. (2023). Adjustment of Students to the Tertiary Landscape: The Dynamic Influence of Psychosocial Education. Asian Journal of Education and Social Studies, 41(1), 38-47.

16) Aswathy, D. V., Betty, P. J., Baby, T., Renimole, K. J., & Sudha, K. S. (2024). Emotional Intelligence And Prosocial Behaviour, Among Prospectiveteachers At Secondary Level. Educational Administration: Theory and Practice, 30(5), 3164-3171.

17) Atta, S. A., & Bonyah, E. (2023). Teaching mathematics for social justice: The challenges and the prospects in the Ghanaian senior high schools. Golden Ratio of Social Science and Education, 3(1), 50-60.

18) Ayeni, O. O., Chisom, O. N., Al Hamad, N. M., Osawaru, B., & Adewusi, O. E. (2024). Enhancing STEM education through emotional intelligence and counseling techniques.

19) Azhari, Z., & Zainil, Y. (2024). Differentiated Teaching and Learning Applied in English Classes of Phase F of Senior High School. Journal of English Language Teaching, 13(1), 360-383.

20) Bastola, S. (2023). Impact of work-life balance on employee job sat

21) Bastola, S. (2023). Impact of work-life balance on employee job satisfaction in Nepalese insurance companies. Perspectives in Nepalese Management, 379.

22) Beatson, R., Quach, J., Canterford, L., Farrow, P., Bagnall, C., Hockey, P., ... & Mundy, L. (2023). Improving primary to secondary school transitions: A systematic review of school-based interventions to prepare and support student social-emotional and educational outcomes. Educational Research Review, 100553.

23) Bellibaş, M. Ş. (2023). Empowering principals to conduct classroom observations in a centralized education system: does it make a difference for teacher self-efficacy and instructional practices?. International Journal of Educational Management, 37(1), 85-102.

24) Bhat, A. N., Tahir, S., & Kumar, R. (2023). The Influence of Early Exposure to Smart Gadgets on Children. Tuijin Jishu/Journal of Propulsion Technology, 44(2), 2023.

25) Blaney, J. M., Hernandez, T. E., Feldon, D. F., & Wofford, A. M. (2024). Transfer Student Receptivity in Patriarchal STEM Contexts: Evidence of Gendered Transfer Student Stigma in Computer Science From a Mixed Methods Study. Community College Review, 00915521231218233.

26) Braun, S., & Stegmann, K. (2018). The Challenges of New Teachers: Examining the Experiences of Novice Middle and High School Teachers in Urban Contexts. Journal of Education and Learning, 7(4), 142-152.

27) Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3(2), 77-101.

28) Bulut, O., Gorgun, G., Yildirim-Erbasli, S. N., Wongvorachan, T., Daniels, L. M., Gao, Y., ... & Shin, J. (2023). Standing on the shoulders of giants: Online formative assessments as the foundation for predictive learning analytics models. British Journal of Educational Technology, 54(1), 19-39.

29) Chaaban, Y., Al-Thani, H., & Du, X. (2024). A systems-thinking approach to evaluating a university professional development programme. Professional development in education, 50(2), 296-314.

30) Clark, K. N., Blocker, M. S., Gittens, O. S., & Long, A. C. (2023). Profiles of teachers' classroom management style: Differences in perceived school climate and professional characteristics. Journal of School Psychology, 100, 101239.

31) Crotty, E., & Kelly, O. (2020). Mentoring and Support for Beginning Teachers in Rural Schools: A Scoping Review. Irish Educational Studies, 39(1), 27-44.

32) De Neve, D., Bronstein, M. V., Leroy, A., Truyts, A., & Everaert, J. (2023). Emotion regulation in the classroom: A network approach to model relations among emotion regulation difficulties, engagement to learn, and relationships with peers and teachers. Journal of youth and adolescence, 52(2), 273-286.

33) DelaRosa, E. (2023). Experiences and Coping Strategies of Senior High School Teachers in Southern Nueva Vizcaya: A Glimpse on a Teacher's Life. Psychology and Education: A Multidisciplinary Journal, 6(10), 928-939.

34) Diavati, M. (2023). Sustainable Education. Enhanced CLIL-ing. A Wake-Up Call Transforming English Language Education for Sustainable Learning in the 21st Century. A Case Study From Greece. US-China Education Review, 13(4), 251-260.

35) Diomampo, L. V. L., & Quines, L. A. (2023). Resilience and Reflection: Illuminating the Joy and Sorrow of Junior andSenior High School Teachers with Multiple Ancillary Services During the Time of Pandemic. European Journal of Education Studies, 10(7).

36) Dörrenbächer-Ulrich, L., Dilhuit, S., & Perels, F. (2023). Investigating the relationship between self-regulated learning, metacognition, and executive functions by focusing on academic transition phases: a systematic review. Current Psychology, 1-28.

37) Duan, S., Chu, W., & Liu, H. (2023). "Seeking Resilience, Sustaining Development": A Self-Narrative Study of Early Career English Teacher Resilience from an Ecological Perspective. Sustainability, 15(16), 12386.

38) Eaves, T., Mauldin, L., Megan, C. B., & Robinson, J. L. (2020). The professional is the personal: A qualitative exploration of self-care practices in clinical infant mental health practitioners. Journal of Social Service Research, 47(3), 369-387.

39) Goagoses, N., Suovuo, T. B., Winschiers-Theophilus, H., Suero Montero, C., Pope, N., Roetkoenen, E., & Sutinen, E. (2024). A systematic review of social classroom climate in online and technology-enhanced learning environments in primary and secondary school. Education and Information Technologies, 29(2), 2009-2042.

40) Gomes, S., Costa, L., Martinho, C., Dias, J., Xexéo, G., & Moura Santos, A. (2023). Modeling students' behavioral engagement through different in-class behavior styles. International Journal of STEM Education, 10(1), 21.

41) Gould, R., Xerri, M. J., & Fitzgerald, A. (2023). Who matters most? The salience sampling method for identifying and reporting key informants for qualitative components of MMR designs. In Handbook of Mixed Methods Research in Business and Management (pp. 260-274). Edward Elgar Publishing.

42) Hettinger, K., Lazarides, R., & Schiefele, U. (2023). Motivational climate in mathematics classrooms: Teacher self-efficacy for student engagement, student-and teacher-reported emotional support and student interest. ZDM–Mathematics Education, 55(2), 413-426.

43) Ho, Y. R., Chen, B. Y., Li, C. M., & Chai, E. G. Y. (2023). The distance between the humanities and medicine: Building a critical thinking mindset by interdisciplinary dialogue through mind mapping. Thinking Skills and Creativity, 50, 101420.

44) Kager, K., Mynott, J. P., & Vock, M. (2023). A conceptual model for teachers' continuous professional development through lesson study: Capturing inputs, processes, and outcomes. International Journal of Educational Research Open, 5, 100272.

45) Khairy, H. A., Liu, S., Sheikhelsouk, S., EI-Sherbeeny, A. M., Alsetoohy, O., & Al-Romeedy, B. S. (2023). The Effect of benevolent leadership on job engagement through psychological safety and workplace friendship prevalence in the tourism and hospitality industry. Sustainability, 15(17), 13245.

46) Kilag, O. K. T., Evangelista, T. P., Sasan, J. M., Librea, A. M., Zamora, R. M. C., Ymas, S. B., & Alestre, N. A. P. (2023). Promising Practices for a Better Tomorrow: A Qualitative Study of Successful Practices in Senior High School Education. Journal of Elementary and Secondary School, 1(1).

47) Kilag, O. K. T., Uy, F. T., Abendan, C. F. K., & Malbas, M. H. (2023). Teaching leadership: an examination of best practices for leadership educators. Science and Education, 4(7), 430-445.

48) Kilag, O. K., Marquita, J., & Laurente, J. (2023). Teacher-Led Curriculum Development: Fostering Innovation in Education. Excellencia: International Multi-disciplinary Journal of Education (2994-9521), 1(4), 223-237.

49) Kilag, O. K., Tokong, C., Enriquez, B., Deiparine, J., Purisima, R., & Zamora, M. (2023). School Leaders: The Extent of Management Empowerment and Its Impact on Teacher and School Effectiveness. Excellencia: International Multi-disciplinary Journal of Education (2994-9521), 1(1), 127-140.

50) Kolesnyk, L., & Biseth, H. (2024). Professional development in teacher education through international collaboration: when education reform hits Ukraine. Professional Development in Education, 50(2), 347-359.

51) Larios, R. J., & Zetlin, A. (2023). Challenges to preparing teachers to instruct all students in inclusive classrooms. Teaching and Teacher Education, 121, 103945.

52) Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment: Meta-analysis of student engagement and its influencing factors. Behavioral Sciences, 13(1), 59.

53) Li, S. (2023). The effect of teacher self-efficacy, teacher resilience, and emotion regulation on teacher burnout: a mediation model. Frontiers in Psychology, 14, 1185079.

54) Lin, J., & Wang, Y. (2024). Unpacking the mediating role of classroom interaction between student satisfaction and perceived online learning among Chinese EFL tertiary learners in the new normal of post-COVID-19. Acta Psychologica, 245, 104233.

55) Ma, P., Zhang, L., Dong, H., & Yu, J. (2023). The relationships between teachers' emotional labor and display rules, trait emotions, exhaustion, and classroom emotional climate. Frontiers in Psychology, 14, 957856.

56) Maharani, A., & Tamara, D. (2024). The occupational stress and work-life balance on turnover intentions with job satisfaction as mediating. SA Journal of Human Resource Management, 22, 2369. isfaction in Nepalese insurance companies. Perspectives in Nepalese Management, 379.

57) Maharani, A., & Tamara, D. (2024). The occupational stress and work-life balance on turnover intentions with job satisfaction as mediating. SA Journal of Human Resource Management, 22, 2369.

58) Mahfud, M., & Riniati, W. O. (2023). Exploring the Role of Teacher-Student relationships in Academic Achievement: a qualitative study in primary schools. The Eastasouth Journal of Learning and Educations, 1(02), 76-83.

59) Malbas, M., Kilag, O. K., Diano Jr, F., Tiongzon, B., Catacutan, A., & Abendan, C. F. (2023). In Retrospect and Prospect: An Analysis of the Philippine Educational System and the Impact of K-12 Implementation. Excellencia: International Multi-disciplinary Journal of Education (2994-9521), 1(4), 283-294.

60) Mansor, A. N., Hamid, A. H. A., Medina, N. I., Vikaraman, S. S., Abdul Wahab, J. L., Mohd Nor, M. Y., & Alias, B. S. (2022). Challenges and strategies in managing small schools: A case study in Perak, Malaysia. Educational Management Administration & Leadership, 50(4), 694-710. https://doi.org/10.1177/1741143220942517

61) Mbonambi, T. R., Gamede, B. T., & Ajani, O. A. (2023). Investigating the challenges of teaching and learning business studies in South African rural high schools: in pursuit of enhanced classroom practices. Multicultural Education Journal, 9(2), 31-44.

62) Medina-Rebollo, D., Fernández-Ozcorta, E. J., Sáenz-López Buñuel, P., & Fernández-Gavira, J. (2023). Analysis of the Practice of Nautical Activities in Schools. Education Sciences, 13(12), 1202.

63) Naufal, N., & Maksum, M. N. R. (2024). Management of Strengthening Character Education in Junior High School. Munaddhomah: Jurnal Manajemen Pendidikan Islam, 5(2), 126-135.

64) Nori, H., & Vanttaja, M. (2023). Too stupid for PhD? Doctoral impostor syndrome among Finnish PhD students. Higher Education, 86(3), 675-691.

65) Oghly, J. S. Z. (2023). A Japanese approach to in-service training and professional development of science and physics teachers in Japan. American Journal of Public Diplomacy and International Studies (2993-2157), 1(9), 167-173.

66) Opoku-Afriyie, P., Bordoh, A., & Eshun, I. (2024). Congruence Between Intended and Observed Transactions in the Implementation of the Senior High School (SHS) Social Studies Curriculum in Ghana. Open Journal of Educational Research, 78-99.

67) Osterman, K. F. (2023). Teacher practice and students' sense of belonging. In Second International Research Handbook on Values Education and Student Wellbeing (pp. 971-993). Cham: Springer International Publishing.

68) Parsakia, K., Rostami, M., & Saadati, S. M. (2023). The Relationship between Emotional Intelligence and Marital Conflicts Using Actor-Partner Interdependence Model. Journal of Psychosociological Research in Family and Culture, 1(1), 23-28.

69) Patil, A. (2023). Psychology in the Age of Technology Dependence and the Mobile Dilemma.

70) Popoola, S. O., & Fagbola, O. O. (2023). Work motivation, job satisfaction, work-family balance, and job commitment of library personnel in Universities in North-Central Nigeria. The Journal of Academic Librarianship, 49(4), 102741.

71) Popoola, S. O., & Fagbola, O. O. (2023). Work motivation, job satisfaction, work-family balance, and job commitment of library personnel in Universities in North-Central Nigeria. The Journal of Academic Librarianship, 49(4), 102741.

72) Pozo-Rico, T., Poveda, R., Gutiérrez-Fresneda, R., Castejón, J. L., & Gilar-Corbi, R. (2023). Revamping teacher training for challenging times: Teachers' well-being, resilience, emotional intelligence, and innovative methodologies as key teaching competencies. Psychology research and behavior management, 1-18.

73) Priadi, G., Umari, T., Donal, D., & Mansor, R. (2023). Gender Differences in Student Resistance towards Teachers: A Comparative Study Between Male and Female Students. Jurnal Psikologi Terapan (JPT), 6(1), 9-17.

74) Ramzan, M., Javaid, Z. K., Kareem, A., & Mobeen, S. (2023). Amplifying Classroom Enjoyment and Cultivating Positive Learning Attitudes among ESL Learners. Pakistan Journal of Humanities and Social Sciences, 11(2), 2236-2246.

75) Richardson, J. C., Castellanos Reyes, D., Janakiraman, S., & Duha, M. S. U. (2023). The Process of Developing a Digital Repository for Online Teaching Using Design-Based Research. TechTrends, 67(2), 217-230.

76) Salimi, E. A., & Najjarpour, M. (2023). Unpacking EFL Teachers' Understandings and Strategies of Self-Awareness Competence in the Classroom. Teaching English as a Second Language Quarterly (Formerly Journal of Teaching Language Skills), 42(4), 45-69.

77) Sandra, R. P., Hwang, W. Y., Zafirah, A., Hariyanti, U., Engkizar, E., Hadi, A., & Fauzan, A. (2024). Crafting Compelling Argumentative Writing for Undergraduates: Exploring the Nexus of Digital Annotations, Conversational Agents, and Collaborative Concept Maps. Journal of Educational Computing Research, 07356331241242437.

78) Saralar-Aras, İ., & Türker-Biber, B. (2024). Enhancing technological pedagogical content knowledge of prospective teachers through mathematics lesson plan development. Education and Information Technologies, 1-22.

79) Sato, S. N., Condes Moreno, E., Rubio-Zarapuz, A., Dalamitros, A. A., Yañez-Sepulveda, R., Tornero-Aguilera, J. F., & Clemente-Suárez, V. J. (2023). Navigating the New Normal: Adapting Online and Distance Learning in the Post-Pandemic Era. Education Sciences, 14(1), 19.

80) Sayow, E. L. M., & Marsevani, M. (2024). Improving high school students' speaking skill through role play strategy: A classroom action research. English Learning Innovation, 5(1), 132-141.

81) Shek, D. T., & Israelashvili, M. (2023). The Transition to Secondary School: A Definition and Conceptualization of Adjustment During Adolescence. In Prevention of Maladjustment to Life Course Transitions (pp. 247-288). Cham: Springer International Publishing.

82) Stoeth, A. M., & Carter, K. (2023). Climate change summit: testing the impact of role playing games on crossing the knowledge to action gap. Environmental Education Research, 29(12), 1796-1813.

83) Stout, S. K. (2023). Distracted, Bored, and Disengaged: How to Reengage Gen Z Learners in the Secondary School Classroom (Doctoral dissertation, The University of North Dakota).

84) Syahzindah, M., & Qossam, B. (2023). Analysis of students' behavior problem in EFL classroom: A qualitative study at language class program (Doctoral dissertation, Universitas Islam Negeri Maulana Malik Ibrahim).

85) Tam, H. L., Chan, A. Y. F., Fung, T. T. O., & Isangha, S. O. (2024). The mediating effect of psychological strengths and resilience on enhancing youth employability through social entrepreneurship education and training. Children and Youth Services Review, 156, 107325.

86) Todorov, E. H., Paradis, A., & Ha, T. (2023). Emotion Regulation Difficulties and Relationship Satisfaction in Adolescent Couples: The Role of Conflict Resolution Strategies. Journal of youth and adolescence, 52(8), 1753-1767.

87) Wang, L. (2023). The Impact of Student-Centered Learning on Academic Motivation and Achievement: A Comparative Research between Traditional Instruction and Student-Centered Approach. Journal of Education, Humanities and Social Sciences, 22, 346-353.

88) Wang, W., Tie, F. H., Omar, I. M. B., Chen, W., Li, P., & Shi, C. (2023). An Empirical Study on the Creative Learning Environment Fostering Student Creativity: A Multiple Mediation Analysis Using Smart PLS 4. Journal of Educational and Social Research, 13, 24.

89) Welsh, R. O. (2023). Administering discipline: An examination of the factors shaping school discipline practices. Education and Urban Society, 00131245231208170.

90) Winter, A. M. (2023). Connecting Rural Students to School Using Culturally Relevant Teaching (Doctoral dissertation, Johns Hopkins University).

91) Yildirim, M., Turan, M. E., Albeladi, N. S., Crescenzo, P., Rizzo, A., Nucera, G., ... & Chirico, F. (2023). Resilience and perceived social support as predictors of emotional well-being. J. Health Soc. Sci, 8, 59-75.

92) Yuan, R., & Liao, W. (2023). Critical thinking in teacher education: where do we stand and where can we go?. Teachers and Teaching, 29(6), 543-552.

93) Zhang, L. J., Fathi, J., & Naderi, M. (2023). A cross-lagged panel analysis of self-efficacy, teacher grit, teaching enjoyment, and work engagement among foreign language teachers. Journal of Multilingual and Multicultural Development, 1-19.

94) Zweeris, K., Tigelaar, E. H., & Janssen, F. J. J. M. (2023). Studying curriculum orientations in teachers' everyday practices: A goal systems approach. Teaching and Teacher Education, 122, 103969.

The Effect of Squat Training with Barbell and Resistance Band on Leg Power of Volleyball Athletes

Dikdoyo Rudiyanto[1], Fauzi[2], Ujang Nurdin[3], Afeb Chesa Arianto[4]

[1,2,3,4] Department of Sport Science, Yogyakarta State University, Yogyakarta Indonesia

ABSTRACT: The purpose of this study was to determine (1) the effect of squat training with barbell on increasing leg power of volleyball athletes, (2) the effect of squat training with resistance band on increasing leg power of volleyball athletes, (3) the difference in the effect of squat training with barbell and resistance band squats on increasing leg power of volleyball athletes. The type of research is experimental. The sample used is volleyball athletes totalling 20 athletes with an age range of 14-16 years. The leg power test instrument uses a vertical jump. Data analysis techniques using Paired Sample Test and Independent Samples Test. The results showed that (1) There is a significant effect of squat training with barbell on leg power of volleyball athletes (p 0.000 <0.05), (2) There is a significant effect of squat with resistance band on leg power of volleyball athletes (p 0.000 <0.05), (3) There is a significant difference in squat training with barbell and resistance band squats on increasing leg power of volleyball athletes. Squat training with resistance band is better than squats with barbell on increasing the leg power of volleyball athletes, with a difference of 1.30. The implication of the research results that to increase the leg power of volleyball athletes can be done by applying squat training with barbell and resistance band. This means that athletes are given exercises that are in accordance with their characteristics so that in the training process they feel happy and motivated to follow the training process, so that the training objectives will be maximised. Then another implication is that by encouraging coaches to apply suitable exercises can trigger athlete involvement in training.

KEYWORDS: squats with barbell weighting, resistance band squats, leg power

INTRODUCTION

Volleyball is a team sport played by six people per team. In volleyball matches the height of the net for men is 2.43 metres and for women is 2.24 metres (Hiskya & Wasa, 2019; Lima et al., 2019; Ogilvie & McCormack, 2021). Volleyball games will run well and smoothly if each player has mastered the basic techniques of the game. Some basic volleyball techniques include; serving, passing, smashing, and blocking (Fikri et al., 2021; Zonifa, 2020). In addition to mastering the basic techniques of volleyball in general, each player is also required to have a good physique. While spiking & blocking a player has to jump vertically in order to make contact with the ball from maximum height. The characteristics of volleyball are a game that requires players to jump, so strong power is needed (Kumar et al., 2016). Explosive power (muscular power) is a person's ability to use maximum strength exerted in the shortest time possible (Gumbira, 2021; Jariono et al., 2022). Power is a combination of strength and speed or the maximum exertion of muscle force with maximum speed, strong and fast abilities are needed especially for actions that require maximum power capabilities such as smash movements.

Getting a good power ability, must be done structured and continuous training. Training is the process of doing sports activities based on a systematically arranged training programme, aiming to improve the athlete's ability in an effort to achieve the maximum possible achievement, especially carried out in preparation for a match (Wijaya et al., 2020). Methods for training leg muscle power, including pliometric exercises, half squats, squats, lunges, up and down the bench, and others (Mesfar et al., 2022). One of the methods that will be applied in this study is barbell squats and resistance band squats. Squats are a very simple movement. This movement can be started from a standing position then squat and return to a standing position as before.

The second weight training is a form of power training using resistance bands. Resistance bands are an efficient and portable fitness tool made of rubber with a hand grip that becomes a support. Rubber resistance bands have various elasticities, in this study medium-sized resistance bands can be used for training to increase power. Good training is not enough to only provide technical material, but improving the quality of physical conditions, one of which is power, is important. In the field there are still

The Effect of Squat Training with Barbell and Resistance Band on Leg Power of Volleyball Athletes

many coaches who do not know the form of power training using rubber resistance bands. The combination of resistance band exercises is very effective in increasing jump height and leg strength, increasing speed, agility and power (Agopyan et al., 2018; Aloui et al., 2020; Katushabe & Kramer, 2020). In addition, training using resistance bands can also increase joint strength and can be used for aerobic exercise.

Based on the background that has been stated above, the researcher is interested in conducting research with the title "The Effect of Squat Training with Barbell and Squat Resistance Band on Increasing Limb Power of Volleyball Athletes". The objectives to be achieved in this study are: (1) the effect of squat training with barbell on increasing the leg power of volleyball athletes, (2) the effect of squat training with resistance band on increasing the leg power of volleyball athletes, (3) the difference in the effect of squat training with barbell and squat resistance band on increasing the leg power of volleyball athletes.

METHODS

This type of research is experimental. Experimental research is research conducted to determine the effects caused by a treatment given intentionally by the researcher (Rogers & Revesz, 2019). The population as well as the sample used are volleyball athletes totalling 20 athletes with an age range of 14-16 years. The instrument to measure leg power uses a vertical jump with centimetres. Data analysis techniques include descriptive analysis, prerequisite tests (normality and homogeneity tests), hypothesis testing using paired sample tests and independent sample tests. Analysis using SPSS version 20.0 for windows software. The squat training programme with barbell and resistance band squats on increasing leg power is presented in Table 1.

Table 1. Squat Training Programme with Barbell

sessions	intensity	Rep	Set	Rec	Interval	rhythm
1-4	5 kg	5	4	30 Second	2 minutes	Quick
5-8	5 kg	5	5	30 Second	2 minutes	Quick
9-12	5 kg	5	6	30 Second	2 minutes	Quick
13-16	5 kg	5	7	30 Second	2 minutes	Quick

Table 1. Squat Training Programme with Resistance Band

sessions	intensity	Rep	Set	Rec	Interval	Rhythm
1-4	Medium	5	4	30 Second	2 minutes	Quick
5-8	Medium	5	5	30 Second	2 minutes	Quick
9-12	Medium	5	6	30 Second	2 minutes	Quick
13-16	Medium	5	7	30 Second	2 minutes	Quick

RESULTS

The research process was carried out for 16 meetings over 8 weeks. The results of descriptive statistical analysis of pretest and posttest leg power of volleyball athletes are presented in Table 2.

Table 2. Results of Descriptive Analysis of Pretest and Posttest Statistics of Limb Power

Data Power Tungkai		N	Minimum	Maximum	Mean	Std. Deviation
squats with barbell	Pretest	10	31.00	38.00	34.60	2.01
	Posttest	10	32.00	40.00	36.00	2.26
squats with resistance band	Pretest	10	32.00	38.00	34.60	2.01
	Posttest	10	33.00	42.00	37.30	2.98

Based on the descriptive statistics of Table 1, it shows that the leg power of volleyball athletes training squats with barbell at the pretest averaged 34.60 at the time of the posttest increased by an average of 36.00, and the leg power of volleyball athletes training squats with resistance band at the pretest averaged 34.60 at the time of the posttest increased by an average of 37.30. The data normality test uses the Shapiro-Wilk method with a significance level of 0.05. The results of the normality test are presented in Table 3:

The Effect of Squat Training with Barbell and Resistance Band on Leg Power of Volleyball Athletes

Table 3. Normality Test Analysis Results

Data Leg Power		Shapiro-Wilk		
		Statistic	df	Sig.
squats with barbell	Pretest	.967	10	.858
	Posttest	.964	10	.833
squats with resistance band	Pretest	.954	10	.717
	Posttest	.963	10	.821

Based on statistical analysis of normality tests that have been carried out using the Shapiro-Wilk test, data on leg power of volleyball athletes training squats with barbell and squat resistance bands during pretest and posttest obtained normality test results with a significance value of p> 0.05, which means the data is normally distributed.

The homogeneity test uses the Levene Test with a significance level of 0.05. The results of the homogeneity test are presented in Table 4:

Table 4. Results of Homogeneity Test Analysis

Test of Homogeneity of Variances				
leg power	Levene Statistic	df1	df2	Sig.
Pretest squats with barbell	0.015	1	18	0.314
Pretest squats with resistance band	0.015	1	18	0.273

Based on the results of the analysis in Table 4, it can be seen that the pretest-posttest leg power of volleyball athletes training squats with barbell and squat resistance bands obtained sig. p> 0.05, so the data is homogeneous.

Hypothesis analysis using t-test, t-test used is Paired Sample Test and Independent Samples Test. Analysis using the help of SPSS version 20.0 for windows at a significance level <0.05. The results of the hypothesis test are presented in Table 5:

Table 5. Results of Analysis Paired Sample T Test

Paired Samples Test								
	Paired Differences					t	df	Sig. (2-tailed)
Data	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Postest squats with barbell	-1.40	0.70	0.22	-1.90	-0.90	-6.332	9	.000
Pretest - Posttest squats with resistance band	-2.70	1.49	0.47	-3.77	-1.63	-5.713	9	.000

Based on the analysis results in Table 5, the pretest-posttest squat with barbell obtained a t value of 6,332 with a significance value of p of 0.000 <0.05. These results indicate that "There is a significant effect of squat training with barbell on the leg power of volleyball athletes".

Based on the analysis results in Table 5, the pretest-posttest squat with barbell obtained a t value of 5.713 with a significance value of p of 0.000 <0.05. These results indicate that "There is a significant effect of squat training with resistance band on the leg power of volleyball athletes".

The difference in the effect of squat training with barbell and resistance band squats on increasing the leg power of volleyball athletes, presented in the following table:

Table 6. Results of Analysis Paired Sample T Test

Data	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
	-2.492	18	.023	-1.300	.52175	-2.39615	-.20385

The Effect of Squat Training with Barbell and Resistance Band on Leg Power of Volleyball Athletes

Squats with barbell and resistance band squats	-2.492	12.760	.027	-1.300	.52175	-2.42933	-.17067

Based on the results of the analysis in Table 6, the calculated t value is 2.492 with a significance value of p of 0.023 <0.05. These results indicate that "There is a significant difference in squat training with barbell and resistance band squats on increasing leg power of volleyball athletes. Squat training with resistance band is better than squats with barbell on increasing the leg power of volleyball athletes, with a difference of 1.30.

DISCUSSION

Based on hypothesis testing, it is known that there is a significant difference in the effect of squat training with (barbell and resistance band) on leg power. Based on the analysis, it turns out that the squat training group with resistance band is better than the squat training group with barbell on leg power. Although the resistance band training group is better than the free weight training group, both groups experienced an increase in athlete's leg power. As stated (Stricker et al., 2020) that strength improvements can be obtained through various types of resistance training methods and equipment, including bodyweight, free weights, resistance bands, kettlebells, medicine balls, and machines. Increased strength with resistance programmes has shown improvements in several performance measures, such as vertical jump, countermovement jump, and sprint time as well as increased maximal oxygen uptake with the combination of resistance and aerobic training programmes.

Squats are a very simple movement. This movement can be started from a standing position then squatting and returning to a standing position as before. Squats are a sport to train muscle strength and endurance of the leg muscles, especially the muscles in the legs. People who do squats will get an ideal body shape and even athletic, squats can also accelerate fat burning in the body. By doing squats regularly, it will train the speed of movement and strength of the leg muscles found in the legs. Squat training is essentially a form of weighted exercise to increase and develop leg muscle strength. Squat training is a form of exercise that is done systematically and repeatedly using internal or external loads. Squat training is a form of pliometric exercise, especially to increase leg muscle strength. In general, squats are performed in a squatting position, standing back to squat again, either by using only your own body weight or using additional weights such as resistence bands. The movement and load that the body is exposed to during squats will make the muscles of the knees, thighs, chest, back, and arms work to perform the perfect squat movement. The benefit is that exercises that are done regularly and correctly can provide real results to build muscle and burn fat without causing injury.

The exercise form of squat training with resistance band is a physical exercise that provides additional weight to increase leg muscle strength, and the portion of the exercise must also be increased regularly (Elinopita & Setiana, 2021). Training using resistance bands is basically to increase muscle strength and furthermore resistance bands can also be increased to train muscle power. Studies (Wiriawan, 2021) showed that there was a significant effect of the squat jumps resistance band training form on leg muscle power. Research results (Yoon et al., 2017) showed that the use of elastic bands provided significant improvements in the levels of cognitive function, physical function, and muscle strength. Study (Aloui et al., 2020) add weekly elastic band exercises to a standard conditioning regimen produces small gains in actions that may have an important influence on handball performance, especially the ability to run, change direction, and make repeated changes in direction. Therefore, such simple exercises can be used as part of handball training.

Analysis study conducted by (Lopes et al., 2019) showed that resistance training using elastic bands has an effect on increasing muscle strength similar to conventional resistance training using weight machines and dumbbells in adult individuals. Resistance bands have advantages including being cheaper when compared to conventional resistance devices such as weight machines and dumbbells, easy to use and easy to carry. Research (Foley et al., 2017) This study investigated the effects of loop resistance bands, placed around the distal thigh, on medial knee collapse and muscle activity during barbell back squats. More specifically, these bands were evaluated in relation to training status (trained or untrained) and load (3RM or BW). Interestingly, there was a significant influence of load intensity (3RM or BW) on lower extremity muscle activity.

(Guillot et al., 2019) proved that elastic band training significantly improved sit-and-reach (29.16% increase, p = 0.01) as well as side split stretch performance (2.31% increase, p < 0.001) (Figueiredo et al., 2018) states that resistance training is the most effective method for increasing muscle mass. (Stricker et al., 2020) suggests that resistance training is a specialised method of conditioning that involves the use of various modes of training with a variety of resistive loads, from body weight to barbells. Resistance training programmes can include the use of free weights (barbells and dumbbells), weight machines, medicine balls, kettlebells, elastic hoses, or the body's own weight to provide the resistance needed to increase strength. This resistance band is an exercise tool made of rubber with the rubber ends becoming a fulcrum and causing the muscles to contract against external loads in order to increase endurance, strength, and muscle mass. Training using resistance bands has been shown to increase muscle activation and be an effective method of increasing muscle mass. The better the power the athlete has, the better the

The Effect of Squat Training with Barbell and Resistance Band on Leg Power of Volleyball Athletes

athlete will be able to perform technical movements in sports, because it is known that power will allow muscles to perform physical work explosively.

CONCLUSIONS

Based on the results of the research and the results of the data analysis that has been done, the conclusions are obtained (1) There is a significant effect of squat training with barbell on the leg power of volleyball athletes (p 0.000 <0.05), (2) There is a significant effect of squat training with resistance band on the leg power of volleyball athletes (p 0.000 <0.05), (3) There is a significant difference in squat training with barbell and resistance band squats on increasing the leg power of volleyball athletes. Squat training with resistance band is better than squats with barbell on increasing the leg power of volleyball athletes, with a difference of 1.30. The implication of the research results is that to increase the leg power of volleyball athletes can be done by applying squat training with barbell and resistance band . This means that athletes are given exercises that are in accordance with their characteristics so that in the training process they feel happy and motivated to follow the training process, so that the training objectives will be maximised. Then another implication is that by encouraging trainers to apply suitable exercises can trigger athlete involvement in training.

REFERENCES

1) Agopyan, A., Ozbar, N., & Ozdemir, S. N. (2018). Effects of 8-week Thera-Band training on spike speed, jump height and speed of upper limb performance of young female volleyball players. *International Journal of Applied Exercise Physiology*, *7*(1), 63–76.

2) Aloui, G., Hermassi, S., Hammami, M., Cherni, Y., Gaamouri, N., Shephard, R. J., Van den Tillaar, R., & Chelly, M. S. (2020). Effects of elastic band based plyometric exercise on explosive muscular performance and change of direction abilities of male team handball players. *Frontiers in Physiology*, *11*, 604983.

3) Elinopita, T., & Setiana, I. (2021). Can Resistance Band Exercise Increase Arm Strength of Volleyball Extracurricular Students at Aletheia Christian Middle School Malang. *Journal of Equatorial Physical Education*, *2*(1), 9.

4) Figueiredo, V. C., de Salles, B. F., & Trajano, G. S. (2018). Volume for muscle hypertrophy and health outcomes: the most effective variable in resistance training. *Sports Medicine*, *48*, 499–505.

5) Fikri, A., Dlis, F., Tangkudung, J., & Hidayat, A. (2021). The Effect of Push-Up Exercises on the Precision of Men's Permata Club Volleyball Smash. *International Journal of Human Movement and Sports Sciences*, *9*(6), 1104–1108.

6) Foley, R. C. A., Bulbrook, B. D., Button, D. C., & Holmes, M. W. R. (2017). Effects of a band loop on lower extremity muscle activity and kinematics during the barbell squat. *International Journal of Sports Physical Therapy*, *12*(4), 550.

7) Guillot, A., Kerautret, Y., Queyrel, F., Schobb, W., & Di Rienzo, F. (2019). Foam rolling and joint distraction with elastic band training performed for 5-7 weeks respectively improve lower limb flexibility. *Journal of Sports Science & Medicine*, *18*(1), 160.

8) Gumbira, A. (2021). LEG MUSCLE POWER VOLLEYBALL ATHLETE. *International Conference of Sport for Development and Peace*, *3*(1), 31–36.

9) Hiskya, H. J., & Wasa, C. (2019). Effect of double leg bound exercise on explosive capability of leg muscle power in the UnmuS volleyball men's team. *International Journal of Mechanical Engineering and Technology*, *10*(2), 1453–1460.

10) Jariono, G., Nurhidayat, N., Nugroho, H., Nugroho, D., Amirzan, A., Budiman, I. A., Fachrezzy, F., Sudarmanto, E., & Nyatara, S. D. (2022). Strategies to improve jump service skills at volleyball student activity unit of Muhammadiyah University of Surakarta. *Linguistics and Culture Review*, *6*(S3), 37–48.

11) Katushabe, E. T., & Kramer, M. (2020). Effects of combined power band resistance training on sprint speed, agility, vertical jump height, and strength in collegiate soccer players. *International Journal of Exercise Science*, *13*(4), 950.

12) Kumar, S., Goswami, J., & Kumar, A. (2016). Effect of training program on volleyball skills of inter-university level volleyball players. *International Journal of Movement Education and Sports Sciences (IJMESS)*, *4*(1), 21–25.

13) Lima, R., Palao, J. M., Moreira, M., & Clemente, F. M. (2019). Variations of technical actions and efficacy of national teams' volleyball attackers according to their sex and playing positions. *International Journal of Performance Analysis in Sport*, *19*(4), 491–502.

14) Lopes, J. S. S., Machado, A. F., Micheletti, J. K., de Almeida, A. C., Cavina, A. P., & Pastre, C. M. (2019). Effects of training with elastic resistance versus conventional resistance on muscular strength: A systematic review and meta-analysis. *SAGE Open Medicine*, *7*, 2050312119831116.

15) Mesfar, A., Hammami, R., Selmi, W., Gaied-Chortane, S., Duncan, M., Bowman, T. G., Nobari, H., & van den Tillaar, R. (2022). Effects of 8-week in-season contrast strength training program on measures of athletic performance and lower-

limb asymmetry in male youth volleyball players. *International Journal of Environmental Research and Public Health*, *19*(11), 6547.

16) Ogilvie, M. F., & McCormack, M. (2021). Gender-collaborative training in elite university sport: Challenging gender essentialism through integrated training in gender-segregated sports. *International Review for the Sociology of Sport*, *56*(8), 1172–1188.

17) Rogers, J., & Revesz, A. (2019). Experimental and quasi-experimental designs. In *The Routledge handbook of research methods in applied linguistics* (pp. 133–143). Routledge.

18) Stricker, P. R., Faigenbaum, A. D., McCambridge, T. M., LaBella, C. R., Brooks, M. A., Canty, G., Diamond, A. B., Hennrikus, W., Logan, K., & Moffatt, K. (2020). Resistance training for children and adolescents. *Pediatrics*, *145*(6).

19) Wijaya, D. B., Wijono, W., & Widodo, A. (2020). Effect of Slam Waves Battle rope Exercise and Up down Waves Battle rope Exercise to Arm Strength And Arm Endurance (Study of boxing exstracurriculer at senior high school 3 Kediri). *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(2), 828–836.

20) Wiriawan, O. (2021). Pengaruh Model Latihan Squat Jump Dan Forward Hops Menggunakan Pembebanan Resistence Band Terhadap Power Pada Ektrakurikuler Sepakbola Smp Negeri 10 Surabaya. *Jurnal Prestasi Olahraga*, *4*(12), 147–153.

21) Yoon, D. H., Kang, D., Kim, H., Kim, J., Song, H. S., & Song, W. (2017). Effect of elastic band-based high-speed power training on cognitive function, physical performance and muscle strength in older women with mild cognitive impairment. *Geriatrics & Gerontology International*, *17*(5), 765–772.

22) Zonifa, G. (2020). A volleyball skills test instrument for advanced-level students. *Journal of Physical Education & Sport*, *20*

Investigating Stress-Strain Characteristics in Geopolymer Concrete with Recycled Aggregate

Vanadi Vinay kumar[1], V. Bhikshma[2]

[1]Research Scholar, Department of Civil Engineering, Osmania University, Hyderabad, Telangana, 500007, India.

[2]Professor, Department of Civil Engineering, Osmania University, Hyderabad, Telangana, 500007, India.

ABSTRACT: This paper focuses on the stress-strain behavior of 25% recycled coarse aggregate-based geopolymer concrete (RAGC). In this study, an 8-molarity concentration of NaOH and an alkaline liquid ratio of 2.5 was used. This study includes the stress-strain behavior along with the Modules of elasticity for the GRM20, GRM30, and GRM40 grades. Tests were carried out on 150 x 300 mm cylindrical RAGC specimens. The test results experimental to theoretical elastic modulus were in good correlation. Stress-strain relations of RAGC under ambient curing conditions were satisfactory.

KEYWORDS: Geopolymer concrete, Recycled coarse aggregate, Fly ash, GGBS, Stress-Strain.

I. INTRODUCTION

The use of recycled aggregate in geopolymer concrete has garnered significant attention in recent years due to its potential to enhance sustainability in the construction industry. Geopolymer concrete, a type of inorganic polymer composite, is produced by activating aluminosilicate materials with alkaline solutions, offering a promising alternative to traditional Portland cement concrete due to its lower carbon footprint (Davidovits, 1991; Van Deventer et al., 2010). Incorporating recycled aggregates, typically sourced from demolished concrete structures, further amplifies the environmental benefits by reducing landfill waste and the demand for natural aggregates (Kou and Poon, 2009). Recent studies have focused on the mechanical properties of recycled aggregate geopolymer concrete (RAGC), particularly its stress-strain behavior, which is critical for structural applications (Deb et al., 2014; Nath and Sarker, 2014). The unique microstructure of geopolymer binders can influence the interfacial transition zone between the recycled aggregates and the binder matrix, potentially affecting the overall mechanical performance (Sathonsaowaphak et al., 2009). This research aims to investigate the stress-strain characteristics of RAGC, evaluating factors such as the slump, modulus of elasticity, and failure modes under various loading conditions (Rajamane et al., 2012; Gunasekara et al., 2015). The outcomes of this study will contribute to a better understanding of the suitability of RAGC for structural use, addressing both mechanical performance and sustainability aspects (Zuhua et al., 2009; Zhang et al., 2010). By integrating recycled aggregates into geopolymer concrete, this research supports the development of greener construction materials that align with circular economy principles (Sarker et al., 2013; Gao et al., 2014).

II. RESEARCH SIGNIFICANCE

In analyzing the flexural behavior of reinforced concrete beams, the stress-strain characteristic plays a crucial role as a significant parameter. Stress-block parameters can be determined based on the characteristics of the stress block. Therefore, a comprehensive understanding of the complete stress-strain curves of concrete is essential from a structural perspective. However, the existing research on the stress-strain behavior of geopolymer concrete has not yet reached a definitive conclusion. This study is designed to address these gaps by introducing an analytical model for the stress-strain curve and validating its accuracy through rigorous testing and validation processes.

A   Materials

Alkaline binders used: For this experiment, dry fly ash from the Ramagundam thermal project was utilized. One batch of fly ash was purchased for the length of this study. Steel produces GGBS as a by-product. This experimental effort used GGBS,

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

which was created and manufactured in as per IS: 12089-1987. The chemical and physical properties of the fly ash and GGBS are listed in Tables 1 and 2.

Table 1. Chemical composition of Fly ash and GGBS

Sr. No	Description	Fly Ash	GGBS
1	Loss on ignition	1.91	Nil
2	Silicon dioxide (SiO_2)	50.14	34.81
3	Alumina (Al_2O_3)	35.18	17.92
4	Iron (Fe_2O_3)	4.21	0.66
5	Calcium (CaO)	2.60	37.63
6	Magnesium (MgO)	Nil	7.80
7	Titanium dioxide (TiO_2)	1.93	-
8	Sodium (Na_2O)	1.33	-
9	Sulphur trioxide (SO_3)	2.70	0.2

Table 2. Physical composition of Fly ash and GGBS

Sr. No	Description	Fly Ash	GGBS
1	Specific gravity	2.3	3.15
2	Fineness (m^2/kg)	370	420
3	Lime Reactivity	4.8	-
4	Soundness by Autoclave Test	0.035	-

Aggregate: Natural sand from the local sources has been used. Table 3 display the test results for various properties on fine aggregate. According to IS 383:2016, zone II status for the sand was verified. The study utilized 20 mm coarse aggregate which is locally accessible coarse aggregates. Table 4 displays the test results for various natural coarse aggregate (NCA) and Recycled coarse aggregate (RCA) qualities. Coarse aggregates obtained from the processing of demolished concrete previously utilized in laboratory settings are known as recycled aggregates. combined aggregate (Coarse and Fine aggregate) taken as 70% of total mass concrete. In total coarse aggregate Natural coarse aggregate 75% and Recycled coarse aggregate of 25%. Figure 1. Illustrates NCA and RCA.

Figure 1. NCA, RCA

Table 3. Properties of Fine Aggregate

Sr. No	Description	Values
1	Specific gravity	2.67
2	Water Absorption (%)	2.63
3	Bulk Density (kg/m^3)	
	a) Loose	1533
	b) Compacted	1700
4	Grading	Zone – II

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

Table 4. Physical Properties of NCA and RCA

Sr. No	Particulars	Values	
		Natural coarse aggregates (NCA)	Recycled coarse aggregates (RCA)
1	Specific gravity	2.76	2.63
2	Bulking density (kN/m^3)	1514	1353
3	Fineness(Sieving method)	7.21	7.43
4	Water absorption (%)	1.90	2.70
5	Shape	Round	Round
6	Crushing value (%)	20.52	22.73
7	Impact value (%)	17.64	20.39

Alkaline activators: The alkaline activator solutions (AAS) for all mixes developed in this project were made by mixing sodium hydroxide and sodium silicate. Based on previous research, the sodium silicate-to-sodium hydroxide ratio was set at 2.5, alkaline activator to binder (Fly ash + GGBS) ratio was kept constant 0.5. The material was received from a local supplier. A liter of 8M NaOH solution contained 8x40 = 320 grams of NaOH solids (in flake form). The physical and chemical properties are listed in Tables 5 and 6. Table 7 summarizes physical and chemical properties of Sodium Silicate (Na_2SiO_3). The mixture was prepared 24 hours before adding to the dry concrete.

Table 5. Physical Properties of Sodium Hydroxide (NaOH)

Sr. No	Description	Value
1	Appearance	Flakes
2	Colour	White
3	Specific gravity	1.47

Table 6. Chemical Properties of Sodium Hydroxide (NaOH)

Sr. No	Description	Mass (%)
1	Assay	97
2	Carbonate (Na_2CO_3)	2.80
3	Chloride (CL)	0.02
4	Sulphate (SO_2)	0.05
5	Silicates	0.002
6	Led (P_b)	0.001
7	Potassium (K)	0.08
8	Zinc (Z_n)	0.01
9	Iron (F_e)	0.002

Table 7. Physical and Chemical Properties of Sodium Silicate (Na2SiO3)

Sr. No	Description	Value
1	Appearance	Liquid (Gel)
2	Colour	Color Less
3	Specific Gravity	1.60
4	Na_2O	15.00%
5	SiO_2	30.40%
6	H_2O	54.60%

III. EXPERIMENTAL PROGRAMMEPAGE

In the present investigation recycled coarse aggregate based geopolymer concrete (RAGC) stress-strain and modules of elasticity properties are investigated for three different grades of concrete viz., GRM20, GRM30 and GRM40. Based on the previous studies, the percentage replacement of GGBS 9.5%, 21%, and 28%, were fixed and considered for the above concrete grades

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

respectively. The workability was measured by means of conventional slump test. Immediately after mixing, the fresh concrete was transferred into moulds. For each grade 3 No's standard cylinders (150mm diameter & 300mm long) have been considered in the present investigation. After 24 hours specimens were demoulded and kept under air dry at 27⁰C in a laboratory until the day of testing i.e., at 28 days. The cylinders are tested in a 1000 kN universal testing machine as per the provision laid in IS 516-1999. Loading and strain measurements were carefully controlled. Readings were obtained up to the failure state. The mix proportions for GRM20, GRM30, and GRM40 are shown in Table 8. The following mix proportions are based on the mix design guidelines proposed by B.V. Rangan, Curtain University, Australia. Finally, a standard design mix has been adopted in the present experimental work.

Table 8. Mix proportions

Sr. No	Grades	Fly Ash kg/m³	GGBS kg/m³	FA kg/m³	N.C.A kg/m³	R.C.A kg/m³	Alkaline Liquid kg/m³	Extra water kg/m³
1	GRM20	434.4	45.6	740.6	686.5	228.8	240	18
2	GRM30	379.2	100.8	749.7	696.1	231.6	240	18
3	GRM40	345.6	134.4	755.2	700.2	233.3	240	18

A. Preparation of RAGC Specimens

The concrete ingredients were weight batched according to the mix proportions given in Table 8. Initially, the coarse and fine aggregates were dry mixed in a concrete mixer for 3 minutes. Then the binder (fly ash and GGBS) was added to the aggregates and mixed for about 3 minutes; the prepared alkaline solution was added. The mixing continued for about 4 minutes until a homogeneous mixture was obtained. Before casting the specimens, the workability of the RAGC in terms of slump was measured. Then 3 cylinders were cast simultaneously. The specimens were demoulded after one day and cured under direct sunlight until the testing day (28 days). The casting and curing of the specimens is shown in Figure 2. The mix proportions and slump values are given in Table 9.

Figure 2. Casted cylinder specimens

B. Testing of RAGC Specimen

The modulus of elasticity of RAGC was determined as the initial tangent modulus measured at a stress level of approximately 40% of the average compressive strength of concrete cylinders. The table displays the experimental modulus of elasticity values. As expected, the modulus of elasticity increases with increasing compressive strength. The tests were conducted in accordance with IS: 516-1999. All of the prepared cylinder specimens were connected to an extensometer to measure any deformations at the specified loads. The tests were carried out on a Universal testing machine with a 1000 kN capacity. The test setup is depicted in Figure 2. The modulus of elasticity of the RAGC cylindrical specimen was determined.

Figure 3. Test setup.

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

Table 9. Test results of slump

Sr. No	Grades	GGBS (%)	Slump(mm)
1	GRM20	9.5	230
2	GRM30	21.0	126
3	GRM40	28.0	90

Table 10. Modules of elasticity of RAGC grades.

Sr. No	Grade of Concrete	Experimental (GPa)	Theoretical (GPa)
1	GRM20	24.46	22.36
2	GRM30	29.32	27.38
3	GRM40	35.39	31.62

Table 11. Experimental Stress Strain values for GRM20 Grade

Sr. No	Load (kN)	Stress, 'σ' (N/mm²)	Strain ($\epsilon \times 10^{-4}$)
1	0	0.00	0.00
2	5	1.41	0.63
3	10	2.82	1.25
4	15	4.23	1.88
5	20	5.64	2.50
6	25	7.05	3.13
7	30	8.74	3.88
8	35	10.15	4.50
9	40	11.56	5.47
10	45	12.97	6.97
11	49	14.38	8.87
12	54	15.79	11.30
13	59	17.20	14.39
14	64	18.61	18.33
15	69	20.02	23.34
16	74	21.43	29.72

Table 12. Experimental Stress Strain values for GRM30 Grade

Sr. No	Load (kN)	Stress, 'σ' (N/mm²)	Strain ($\epsilon \times 10^{-4}$)
1	0	0.00	0.00
2	25	1.41	0.53
3	49	2.82	1.06
4	74	4.23	1.59
5	98	5.64	2.12
6	123	7.05	2.65
7	152	8.74	3.28
8	177	10.15	3.81
9	201	11.56	4.34
10	226	12.97	4.87
11	250	14.38	5.40
12	275	15.79	6.19
13	299	17.20	7.31
14	324	18.61	8.64

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

15	348	20.02	10.20
16	373	21.43	12.05
17	402	23.12	14.72
18	427	24.53	17.39
19	451	25.94	20.54
20	476	27.35	24.26
21	500	28.76	28.66
22	510	29.33	30.63

Table 13. Experimental Stress Strain values for GRM40 Grade

Sr. No	Load (kN)	Stress, 'σ' (N/mm²)	Strain ($\epsilon \times 10^{-4}$)
1	0	0.00	0.00
2	25	1.41	0.48
3	49	2.82	0.96
4	74	4.23	1.44
5	98	5.64	1.92
6	123	7.05	2.39
7	152	8.74	2.97
8	177	10.15	3.45
9	201	11.56	3.93
10	226	12.97	4.41
11	250	14.38	4.89
12	275	15.79	5.36
13	299	17.20	5.84
14	324	18.61	6.32
15	348	20.02	6.92
16	373	21.43	7.80
17	402	23.12	8.99
18	427	24.53	10.12
19	451	25.94	11.39
20	476	27.35	12.83
21	500	28.76	14.44
22	525	30.17	16.26
23	549	31.58	18.30
24	574	32.99	20.61
25	603	34.69	23.76
26	623	35.81	26.12
27	652	37.51	30.11
28	667	38.35	32.33

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.
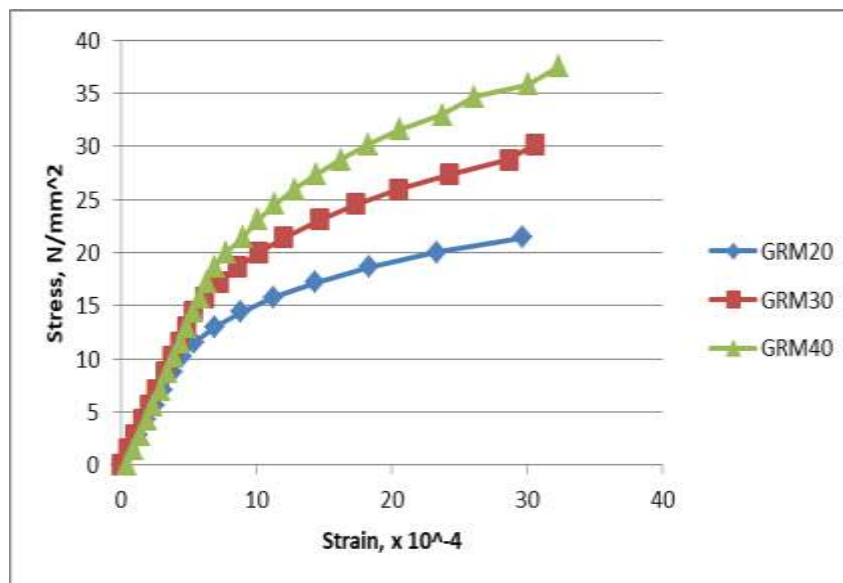

Figure 4. Stress - Strain curve of RAGC

IV. RESULTS AND DISCUSSION

A. Workability of RAGC

Table 9 shows the workability of RAGC concrete mixtures and demonstrates that GGBS content is indirectly proportional to workability. Higher GGBS content may promote faster polymerization, resulting in decreased workability.

B. Modulus of elasticity

The stress-strain curve for RAGC specimens evaluated under compression, while Table 10, displays the modulus of elasticity values. GRM20 is more ductile than GRM30 or GRM40. The GRM30 and GRM40 showed similar stress-strain behavior to some extent. The relationship specified in Indian Standard IS 456-2000 as 5000vfck of the characteristic compressive strength of concrete (fck) is consistent with values typically associated with conventional concrete mixes. The determined value is, approximately 2% greater than that of conventional concrete. This increase in value could be attributed to the GGBS content. Previous studies have noted similar results with increase of GGBS.

C. Stress Strain

The behavior of the cylinders under axial loads was similar to that of conventional concrete. RAGC cylinders fail in axial splitting parallel to the applied load. Also, the crack patterns of RAGC cylinders was observed to be similar to conventional concrete. Cracks are initiated through the aggregate by forming smoother cracked surfaces due to greater cement-matrix strength. The experimental values of stress and corresponding strains for each grade of concrete are shown in Table11, Table 12 and Table 13 for RAGC grades GRM20, GRM30 and GRM40.

V. CONCLUSIONS

1. Increasing the GGBS percentage in an RAGC mix leads to a reduction in its workability.
2. Substituting 25% of RCA with NCA is deemed appropriate with minimal variation compared to theoretical regular concrete.
3. The modulus of elasticity ranges from 24.46 GPa to 35.39 GPa for concrete grades GRM20 to GRM40, respectively. These values are slightly better, around 2% to 2.5%, than those of conventional concrete, indicating a negligible disparity.
4. As the compressive strength of concrete rises, the maximum strain diminishes, causing a transition from ductile to brittle failure in post-peak behavior.

REFERENCES

1) Davidovits, J. (1991). Geopolymers: inorganic polymeric new materials. Journal of Thermal Analysis and Calorimetry, 37(8), 1633-1656.
2) Van Deventer, J. S. J., Provis, J. L., & Duxson, P. (2010). Technical and commercial progress in the adoption of geopolymer cement. Minerals Engineering, 29(1), 89-104.
3) Kou, S. C., & Poon, C. S. (2009). Properties of self-compacting concrete prepared with coarse and fine recycled concrete aggregates. Cement and Concrete Composites, 31(9), 622-627.

Investigating Stress-Strain Characteristics in Geopolymer Concrete withRecycled Aggregate.

4) Deb, P. S., Nath, P., & Sarker, P. K. (2014). The effects of ground granulated blast-furnace slag blending with fly ash and activator content on the workability and strength properties of geopolymer concrete cured at ambient temperature. Materials and Design, 62, 32-39.

5) Nath, P., & Sarker, P. K. (2014). Effect of GGBS on setting, workability and early strength properties of fly ash geopolymer concrete cured in ambient condition. Construction and Building Materials, 66, 163-171.

6) Sathonsaowaphak, A., Chindaprasirt, P., & Pimraksa, K. (2009). Workability and strength of lignite bottom ash geopolymer mortar. Journal of Hazardous Materials, 168(1), 44-50.

7) Rajamane, N. P., Jeyalakshmi, R., & Nataraja, M. C. (2012). Quantities of sodium hydroxide solids and water to prepare sodium hydroxide solution of desired molarity for geopolymer concrete mixes. Indian Concrete Journal, 86(3), 57-60.

8) Gunasekara, C., Law, D. W., & Setunge, S. (2015). Long term permeation properties of different fly ash geopolymer concretes. Construction and Building Materials, 101, 287-293.

9) Zuhua, Z., Xiao, Y., & Huajun, Z. (2009). Role of water in the synthesis of calcined kaolin-based geopolymer. Applied Clay Science, 43(2), 218-223.

10) Zhang, Z., Provis, J. L., Reid, A., & Wang, H. (2010). Geopolymer foam concrete: An emerging material for sustainable construction. Construction and Building Materials, 56, 113-127.

11) Sarker, P. K., Haque, R., & Ramgolam, K. V. (2013). Fracture behaviour of heat cured fly ash based geopolymer concrete. Materials and Design, 44, 580-586.

12) Gao, X., Yu, Q. L., & Brouwers, H. J. H. (2014). Reaction kinetics, gel character and strength of ambient temperature cured alkali activated slag–fly ash blends. Construction and Building Materials, 80, 105-115.

13) IS:383-2016, "Specification for Coarse and Fine Aggregates From Natural Sources for Concrete", Bureau of Indian Standards. New Delhi, India, pp. 1–19, 2016

14) IS:1199-1959, (Reaffirmed 2004) "Indian Standard Methods of sampling and analysis of concrete," Bureau of Indian Standards. New Delhi, India, pp. 1–45, 2004.

15) IS : 516 - 1959 (Reaffirmed 2004), "Method of Tests for Strength of Concrete". Bureau of Indian Standards. New Delhi, India, 2004.

16) IS: 456-2000, "Plain and Reinforced concrete", Bureau of Indian Standards. New Delhi, India, 2000.

Strengthening Law Enforcement: The Urgency of Establishing Regulations on Electronic Evidence in Civil Evidence

Ardina Nur Amalia[1], Umaira Hayuning Anggayasti[2]

[1,2]Faculty of Law, Universitas Diponegoro, Jl. dr. Antonius Suroyo, Tembalang, Semarang, Indonesia

ABSTRACT: The evolution of information and communication technology (ICT) has significantly altered a number of spheres of life, including law. Another result of this growth is the creation of electronic evidence, a brand-new category of evidence. When evidence is produced, kept, and transferred through an electronic system, it is considered electronic evidence. The evolution of law in Indonesia has been significantly influenced by advances in science and technology. Due to technological advancements, new lawsuits are being filed. This study employed a normative legal research design as its methodology. Both a conceptual and a statutory approach are employed. Electronic evidence's introduction has led to a number of issues in the civil because the existence of electronic evidence in the process of establishing civil procedural law has not been explicitly and definitely accepted by the Indonesian legal system. From a formal legal perspective, papers and electronic data cannot yet be admitted into evidence in Indonesian civil evidentiary proceedings to resolve legal disputes. The civil evidence system has seen major changes as a result of the development of information and technology in many facets of society. Emails, instant messages, and other electronic data are just a few examples of the diverse electronic data that is used as civil evidence in court.

KEYWORDS: Law Enforcement, Regulations, Electronic Evidence, Civil Evidence,

I. INTRODUCTION

Developments in the fields of science and technology have had a major impact on the development of law in Indonesia. Technological advances have resulted in new legal actions being faced. Law is an instrument that will always develop following the times (Rahardjo, 2007). In resolving cases in court, the evidentiary process is an important stage in order to prove the truth of the occurrence of certain events or legal relationships. Proof is a stage that has an important role for the judge in making a decision.

Evidence can also be used as a basis for plaintiffs to file a lawsuit in court. It is said that the proof process must be accompanied by supporting evidence, namely evidence. According to the Civil Code's Article 164 HIR, Article 284 Rbg, and Article 1886, evidence is everything that can be used to prove a specific claim. Proof is crucial because the arguments made by the parties are put to the test in the evidentiary phase in order to determine which law will be applied in a certain situation (rechtoepasing) and which law will be found (rechstvinding).

The advancement of information and communication technology has significantly transformed multiple facets of society, particularly within the legal domain. This advancement also led to the emergence of a novel form of evidence, known as electronic evidence. Electronic evidence refers to information that is kept, produced, and sent through an electronic system. The presence of electronic evidence in civil legal matters, particularly in the domains of commercial law and banking law, has a significant impact on the advancement of civil procedural law, including the framework for presenting evidence in civil procedural law. The validity of using electronic evidence in court practice in Indonesia remain debatable.

From a legal perspective, the evidence laws in Indonesia already does not recognise electronic documents as legitimate proof, even though in practice society has used electronic evidence in many modern business transactions, such as electronic banking (Dotulong, 2014). During its development, Law Number 11 of 2008 jo. Law Number 19 of 2016 concerning Information and Electronic Transactions (ITE) which states that SMS and emails can be used as official evidence in trials. In the current era of digitalization, Legal experts agreed that laws must be adaptable and responsive to change. following developments over time. Law cannot be static, because it must continue to accommodate the needs and protect society.

Electronic evidence has several characteristics that are different from traditional evidence. The first fundamental characteristic is that electronic evidence is very easy to manipulate and/or fake. Second, electronic evidence is easily lost and/or

Strengthening Law Enforcement: The Urgency of Establishing Regulations on Electronic Evidence in Civil Evidence

damaged. Then thirdly, electronic evidence has eels across national borders. Some of these characteristics give rise to various problems in the civil evidence process, including the difficulty of judges determining The validity and conclusive value of digital evidence. In addition, legal systems have problems when verifying the authenticity and accuracy of electronic evidence. Judges encounter problems in having to apply civil procedural law, that is designed for traditional evidence, to electronic evidence. The problems that occur during the application of electronic evidence in civil proceedings highlight the necessity of implementing specific regulations that include electronic evidence within the context of civil evidence. Based on the background description, the problem formulation in this research is 1) What is the urgency of establishing regulations for electronic evidence in civil evidence? 2) What is the ideal form of electronic evidence regulation in civil evidence?

II. RESEARCH METHOD

The method of research used in this study is a normative legal research method. The method used consists of both a statutory approach and a conceptual one. The research data was collected from main legal resources and secondary legal resources. The primary legal resources consist of Law Number 11 of 2008, which relates to Information and Electronic Transactions, and Supreme Court Regulation Number 3 of 2016, which defines the procedures for evidence and electronic evidence in civil cases. Secondary legal materials include legal doctrine regarding electronic evidence as well as scientific journals regarding electronic evidence.

III. DISCUSSION

A. The Urgency of Establishing Regulations on Electronic Evidence in Civil Evidence

The advancement of information and communication technology (ICT) has resulted in significant changes in various fields, including the legal field. One of the changes is the emergence of electronic evidence which has different characteristics from traditional evidence. The emergence of electronic evidence has given rise to various problems in the civil evidence process because the legal system in Indonesia has not properly and decisively handled the use of electronic evidence in the civil procedural law process.

Through electronic trial efforts, it is hoped that the Supreme Court will be able to answer three legal issues, the main problems that have been faced by parties when litigating in court, namely delay, access and integrity (Pujoharsoyo, 2019) There are provisions in civil procedural law that are not accommodated by PERMA Number 1 of 2009 which has been amended by PERMA Number 7 of 2022, Traditional procedural law remains applicable to civil procedural practice, provided that it complies with the PERMA.

Regulations regarding electronic evidence in civil procedural law have not been accommodated in one statutory regulation. Matters relating to the regulation of electronic evidence are still spread across various statutory regulations such as the Information and Electronic Transactions Law (ITE), the Civil Code (KUHPerdata), and the Supreme Court Regulations (PERMA) to creates confusion and legal uncertainty for the litigants. The ITE Law recognizes the existence of electronic evidence as valid evidence. With this admission, there are still doubts regarding the validity and evidentiary strength of electronic evidence. To answer this problem, special regulations regarding electronic evidence are needed.

In carrying out one of its functions, namely the regulatory function, the Supreme Court has made several regulations to fill legal gaps, especially in matters of civil procedural law (Amran Suadi, 2020) With advances in technology, especially in the field of informatics, the Supreme Court accommodates this by issuing PERMA and various technical instructions that regulate procedural practices in civil cases. These PERMAs include PERMA Number 3 of 2018, PERMA Number 6 of 2022, PERMA Number 7 of 2022 which amends PERMA Number 1 of 2019 along with its technical guidelines in the form of Decree of the Chief Justice of the Supreme Court Number 363/KMA/SK/XII/2022 and SEMA Number 1 of 2023 concerning Procedures for Summons and Notifications by registered letter.

The passing of the ITE Law in Indonesia is a response to the requirement for a comprehensive set of rules governing legal procedures. In accordance with the requirements stated in Article 5, paragraphs (1) and (2) of Law Number 11 of 2008 concerning Electronic Information and Transactions, the Law acknowledges electronic information and/or electronic documents as legitimate proof. Article 5, paragraphs (1) and (2) of Law Number 19 of 2008 concerning Information and Technology requires:

a. Electronic information and/or documents are considered legally binding and valid evidence, providing certainty in legal matters pertaining to the functioning of electronic systems and transactions. This is particularly relevant in cases involving legal actions carried out through electronic systems.

b. Specifically, the collection of electronic information and/or electronic documents through methods such as interception or recording must be carried out inside the legal structure of law enforcement, into the request of the police, prosecutor's office, or other approved institutions regulated by law.

Strengthening Law Enforcement: The Urgency of Establishing Regulations on Electronic Evidence in Civil Evidence

Article 153 HIR validates the existence of Article 5 paragraph (1) of the ITE Law which states that there are evidence that can be used to obtain legal certainty regarding the truth of legal events that are disputed outside of statutory regulations, namely local examinations. Global human life, which is increasingly developing day by day, also influences human thought patterns and habits in everyday life, including in the civil justice system. Civil relations, which all took place conventionally, have changed over time to fairly modern practices with electronic systems such as the practice of buying and selling, renting and electronic agreements. Aspects of civil relations are currently heavily influenced by electronic media. As is the case with civil relations disputes which aim to seek and find formal truth which means truth based on law (Wirjono, 1992) The practice of civil proceedings is guided by the principle of *ius curia novit*, which means that judges are assumed to know the law.

This means that judges are not allowed to refuse to hear a case on the grounds that legal regulations do not yet exist or are not complete enough. However, the problem of the absence of statutory regulations governing electronic evidence will certainly make it difficult for judges to resolve legal problems that use electronic evidence. Civil relations carried out via electronic media, in the form of messages, photo documents, recordings of conversations or conversations, letters in the form of digital documents, as well as surveillance camera recordings are examples of evidence that can be used by the parties in the future. This electronic evidence can be printed in the form of a printout, or can be presented at trial in the form of a recording, so it requires valid and legal arrangements so that it can be recognized as valid evidence.

Electronic evidence can be converted and modified into many formats, including Compact Disc Read Only Memory (CD ROM) and Write On Read Many (WORM), to ensure the protection of document authenticity and security. (Dikdik, Gultom, 2005) The evidential procedure in civil disputes, which only acknowledges a restricted set of tools as outlined in article 164 HIR/284 RBg and article 1866 of the Civil Code, presents problems to the court's evidentiary process. The enactment of Law Number 11 of 2008, also known as the Electronic Information and Transactions (ITE) Law, signifies the initiation of legal reforms in the electronic sector, specifically to address the increasing number of electronic transactions. The law explains that the use of Information Technology and Electronic Transactions is conducted with the objective of ensuring a feeling of security, fairness, and legal assurance for both consumers and providers of Information Technology. (Retno, Iskandar, 2005).

Sudikno Mertokusumo believes that in the era of globalization and the development of modern technology and the emergence of cyber law, this does not rule out the possibility of the emergence of new evidence that has not yet been regulated (Sudikno, 2013). The purpose of evidence is essentially a way to give confidence to judges as to why an event is considered true. With evidence the judge can obtain certainty and confidence regarding an event, then it is sufficient for the judge to declare that the event really happened (Sudikno, 2013) The existence of electronic evidence in an evidentiary process, because it has not been clearly accommodated in the law, can be strengthened by instructions or the judge's guesses.

The judge's perceptive judgement in determining the law through logical and responsible reasoning is very important in this instance. Munir Fuady argues that the integration of electronic evidence into the evidential system should adhere to the values of legal certainty, benefit, prudence, good faith, and freedom to choose technology. (Fuady, 2006). Article 5, paragraph (2) of the ITE Law directs the use of legitimate electronic evidence in the evidential process. It defines that electronic information, electronic documents, or printouts, as defined in paragraph (1), can be regarded as an extension of electronic evidence. Legitimate evidence that complies with the relevant procedural law in Indonesia. Therefore, the expansion of this article confirms the legitimacy of electronic information and/or electronic documents as credible electronic evidence. According to the ITE Law, electronic evidence is given the same level of importance as paper documents. This implies that electronic records hold the same evidential weight as written or letter evidence in civil case proceedings.

B. The Ideal Form of Electronic Evidence Regulation In The Civil Evidence System In Indonesia

From a formal juridical perspective, civil evidentiary law in Indonesia the current judicial system does not yet accept documents or electronic material as valid evidence for settling disputes. The development of technology and information has brought major changes in various aspects of life, including changes in the civil evidence system. Various electronic data such as emails, instant messages and other electronic documents are an important part of civil evidence in court. The form of electronic evidence regulation in Indonesia is still not ideal when viewed from several points of view starting from the lack of legal certainty as can be seen in Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE) which does not strictly regulate electronic evidence, so it is prone to creating legal uncertainty in its application in court. Weaknesses of the law also include the lack of regulation regarding the terms and procedures for the use of electronic evidence, which of course makes it difficult for judges in the civil evidence process. Another problem is that the ITE Law does not clearly regulate the authentication and verification of electronic evidence, giving rise to doubts about the validity of the electronic evidence. Based on these problems, an ideal form of electronic evidence regulation is needed in accordance with the civil evidence system in Indonesia. The ideal indicators here can be expressed in the form:

Strengthening Law Enforcement: The Urgency of Establishing Regulations on Electronic Evidence in Civil Evidence

   a) Electronic evidence regulations must clearly define what is meant by electronic evidence.

b) Electronic evidence regulations must specifically regulate the terms and conditions for the use of electronic evidence, including terms and conditions relating to the authenticity, validity and evidentiary strength of electronic evidence.

c) Electronic evidence regulations must be flexible and able to adapt to developments in information technology.

d) Electronic evidence regulations must pay attention to and protect human rights starting from privacy and the right to freedom of expression.

e) The most important thing about the ideal form of electronic regulation is that regulation of electronic evidence must facilitate access to justice for all parties.

   The civil evidence system in Indonesia currently still adheres to the *Het Herziene Indonesia Reglement* (HIR) and the *Rechts Reglement Buitenwesten (RBg)* where legally recognized evidence is still limited to written evidence, witnesses, allegations, confessions and oaths. The rapid development of information technology (ICT) has given rise to various forms of electronic evidence that have not been accommodated by HIR or RBG, resulting in problems regarding legal uncertainty in the civil evidence process. Based on these problems, ideal regulations are needed to accommodate electronic evidence in the civil evidence system in Indonesia. The limitations regarding what regulations must be able to accommodate electronic evidence in the civil evidence system are described as follows:

a)   Define electronic evidence clearly and comprehensively

The definition of electronic evidence must include various forms of electronic data such as emails, SMS, conversation evidence, voice recordings, video recordings, digital images, and electronic documents.

b)   Determine the legal requirements for electronic evidence

Regarding the legal requirements for electronic evidence, aspects of authentication, integrity and non-repudiation must be considered. Determine the method of proving electronic evidence. Methods of proving electronic evidence must consider the special characteristics of electronic data such as the use of electronic certificates and electronic signatures.

c)   Regulates the evidentiary power of electronic evidence

The strength of electronic evidence must be determined based on the type of electronic data, how it was obtained, and its relevance to the case being filed.

d)   Ensure protection of personal data privacy

There are electronic evidence regulations that make provisions that guarantee the protection of privacy and personal data of the parties involved in the case.

e)   Facilitate access to electronic evidence

Electronic evidence regulations must facilitate parties' access to electronic evidence relevant to the case being filed.

f)   Establish a special institution to handle cases related to electronic evidence

This special institution is in the form of a special court or other institution that has the authority to resolve disputes related to electronic evidence.

g)   Increase education and training for judges and law enforcement officer

Judges and law enforcement officials need to be equipped with adequate knowledge and skills to handle cases involving electronic evidence.

h)   Strengthening information and communication technology infrastructure to support the civil evidence system

There is a need to strengthen information and communication technology infrastructure to support an electronic-based civil evidence system.

i)   Harmonize with other related regulations

Harmonization of electronic evidence regulations with other regulations such as the Information and Electronic Transactions Law (UU ITE) and the Civil Procedure Code (KUHAPer).

   Encouraging the realization of ideal electronic evidence regulations in the civil evidence system in Indonesia requires cooperation from various parties. This step can start from initiation and active collaboration between the Government, DPR, Supreme Court, professional organizations in the legal sector and society. Then proceed with taking a comprehensive approach by classifying all types of electronic evidence that must be accommodated by electronic evidence regulations, starting from emails, instant messages, electronic documents, audio and video recordings, as well as other digital evidence.

   The next step is to determine clear terms and procedures for the use of electronic evidence, followed by strengthening adequate technological infrastructure to support the use of electronic evidence in court, accompanied by increasing human resources through training and education for judges, court staff and law enforcement officers. others to understand and be able to apply electronic evidence regulations correctly. The most important part is ensuring that the regulations guarantee the protection of human rights including the right to privacy and the right to freedom of expression.

IV. CONCLUSION

The development of technology has had a major impact on the development of law in Indonesia, especially in relation to the evidentiary system in civil procedural law. The minimal evidence recognised in the evidential system in Indonesia is due to Indonesia's attachment to legal principles gained from the Dutch legal system, especially influenced by HIR and RBg. The current state of evidence in civil procedural law is reliant on the civil procedural law book, which has specific constraints when it involves electronic information, electronic documents, and printed results. Article 153 HIR/Article 180 RBg allow for the recognition of electronic evidence that is different from the evidence recognised by Article 164 HIR and Article 284 RBg. The passing of the ITE Law in Indonesia is a response to the necessity for a comprehensive procedural law. In accordance with the stipulations outlined in Article 5, paragraphs (1) and (2) of Law Number 11 of 2008 regarding Electronic Information and Transactions, the Law acknowledges electronic information and/or electronic documents as legally acceptable proof.

To encourage the implementation of optimal electronic evidence regulations in the civil evidence system in Indonesia, the collaboration of multiple stakeholders is necessary. This process can commence with the initiation and dynamic collaboration among the Government, DPR (House of Representatives), Supreme Court, professional organisations in the legal field, and society. Following that, establish an extensive plan by classifying all forms of electronic evidence that must be covered by legislation on electronic evidence. This includes emails, instant messaging, electronic documents, audio and video recordings, as well as other forms of digital evidence.

REFERENCES

1) Satjipto Rahardjo. 2007. *Biarkan Hukum Mengalir*. Jakarta: Kompas.
2) A.S. Pujoharsoyo. 2019. *Arah Kebijakan Tehnis Pemberlakuan Pengadilan Elektronik .* Jakarta.
3) Amran Suadi. 2020. *Pembaruan hukum acara perdata di Indonesia.* Jakarta: Kencana.
4) Wirjono Prodjodikoro, 1992. *Hukum Acara Perdata di Indonesia*. Bandung: Sumur Bandung.
5) Dikdik M. Arief Mansur dan Elisatris Gultom. 2005. *Cyber Law: Aspek Hukum teknologi Informasi*. Bandung: PT. Refika Aditama.
6) Retnowulan Sutantio dan Iskandar Oeripkartawinata. 2005. *Hukum Acara Perdata dalam Teori dan Praktek.* Bandung: Mandar Maju.
7) Sudikno Mertokusumo. 2013. *Hukum Acara Perdata*. Yogyakarta: Cahaya Atma Pustaka.
8) Munir Fuady, 2006. *Teori Pembuktian: Pidana dan Perdata.* Bandung: Citra Aditya Bakti.
9) Ahmad M. Ramli, Pager Gunung, dan Indra Priadi. 2005. *Menuju Kepastian Hukum di Bidang: Informasi dan Transaksi Elektronik*. Jakarta: Departemen Komunikasi dan Informatika Republik Indonesia.
10) M. Natsir Asnawi. 2013. *Hukum Pembuktian Perkara Perdata di Indonesia: Kajian Kontekstual mengenai Sistem, Asas, Prinsip, Pembebanan dan Standar Pembuktian*. Yogyakarta: UII Press.
11) Theofanny Dotulong. 2014. Keberadaan Alat Bukti Elektronik dalam Penyelesaian Sengketa Pe rdata. *Lex Privatum,* Vol. II. No. 3.
12) Trio Yusandy. 2019. *Kedudukan dan Kekuatan Alat Bukti Elektronik dalam Hukum Acara Perdata Indonesia*. Jurnal Pendidikan Sains dan Humaniora, Vol. 7 No.4.
13) Refly Aditia Mamitoho. 2014. *Penggunaan Alat Bukti Elektronik dalam Pemeriksaan Perkara Perdata*. Lex et Societatis. Vol II No. 1.

Support Mechanisms for Orphans' Academic Achievement in Tanzania

Josephine Ackim

The Local Government Training Institute, P.O. BOX 1125, Dodoma, Tanzania

ABSTRACT: Orphans access to education is still critical for most of developing countries and Tanzania specifically. There have been government efforts such as policy and progams development and implementation to ensure orphans access to education, but the situation is still alarming. Literature in Tanzania have not explored fully the support mechanisms for orphans to capitalize their access to education. This study contribute to the literature by focusing on this case. The study was conducted in Tanzania and specifically Dodoma district. Four primary schools were involved in the study. Mixed methods approach was applied in this study covering a sample of 133 respondents. Data were analysed using the thematic and descriptive approaches. The study found that support mechanisms for orphans include government mechanisms, civil society organizations (CSOs) mechanisms and community mechanisms. Although these categories have shown efforts towards improving the situation, more efforts are required to solve the problem. The study suggests that, for government, it should continue building schools, hostels and counseling sessions at schools. Again, CSOs should continue raising awareness to community members, providing necessary financial support and help to orphans so that they can be able to attend schools. Moreover, community support such as taking care of orphans and encouraging them is highly recommended. These will make mechanisms applied to help orphans meaningful and contribute towards attaining quality education for all goal of sustainable development goals.

KEYWORDS: Academic achievement, Orphans, Tanzania

1. INTRODUCTION

Education has been regarded as a fundamental human right and catalyst for human development (Okumu et al., 2012). Education is responsible for an individual, society or nation changes in terms of social revolution, economic, political and technical (Yahya, 2012). It shapes peoples way of living and thinking on the various life challenges include disease, poverty and hunger (Adekola, 2012). Ever since the United Nations Declaration of Universal Human Rights in 1948, there have been innumerable policy statements aiming to substantially improve basic education system for all children in the world (Young, 2016). The concept of education for all can be understood as the capacity within a network of primary schools to enroll all school-age children for a stipulated period of time without any barriers like family economic or social status (Pillay, 2014).

Similarly, in order to make sure that the child right to education is achieved, other conventions such as the Convention on Rights of the Children (2000) and African Charter on the Rights and Welfare of the Child (1990) were introduced (Fleming, 2015). For example, article 28 of the United Nations Convention on Rights of the Child, states that, all state parties shall recognize the right of the child to education (UNESCO, 1989). This means that every child should have access to education regardless his/her ethnicity, disability or economic status. Equally, Article 11 of the African Charter on the Rights and Welfare of the Child, also states that every child has the right to education.

Furthermore, Education for All (EFA) was introduced in 1990 by the international conference held in Jomtie-Thailand and later revised in 2000 in Dakar Senegal. According to Miles and Singal (2010), the EFA targets were on improving childhood care education, enrollment to basic education and retention, ensuring that by 2015 all children have access to and complete free and compulsory education, provision of quality basic education and eliminate gender disparities in primary and secondary education. EFA as a means towards inclusive and equitable society needs to take into account of diversity of learners such as orphans living in vulnerable situations.

Despite all the conventions, declarations and education being rights to all children, globally, not all have access or brief to education. UNESCO (2010) points out that among many groups being marginalized from education access orphans face a big

Support Mechanisms for Orphans' Academic Achievement in Tanzania

challenge. Some children have become vulnerable either because of the loss of parents, thereby living without adequate support or live outside of the family care all of which make them marginalized, stigmatized, socially and educationally discriminated (USAID, 2009). Thus, orphans present a social segment that if not well given an attention, their current and future life in the society becomes uncertain. In this study, orphan includes all children under the age of eighteen who are maternal, paternal or double orphans. In Tanzania an orphan is similarly defined under the two variables of age and parental loss; a child under the age of eighteen with at least one deceased parent is considered an orphan. Vulnerable children are those who belong to high-risk groups who lack access to basic social amenities or facilities (UNICEF 2002).

UNICEF reports that the main sources of vulnerability include HIV/AIDS and civil conflicts. With this contention it is better to note that not all orphan children are vulnerable. Some of the children may be orphans but not vulnerable and therefore vulnerable orphans are all children under the age of eighteen who are maternal, paternal or double orphans who are abused, neglected or at risk of neglect, hunger or homeless (MOHSS and UNICEF 1999). Because of vulnerability most of vulnerable orphans are taken care by foster parents who may be single parent left, grandfather/mother and other siblings or volunteering individuals who most have them face difficulties in sustaining their social and academic needs (Ladan, 2006).

As a result many people have lost their lives, being wounded and therefore leaving thousands of helpless dependents. Specifically, children have become vulnerable to social and economic hardships due to loss of parents, illness in the home, displacement and often involuntary neglect. UNICEF (2016), reveals that worldwide there is 171 million orphans who are either paternal or maternal orphan. Furthermore, UNICEF (2011) reports that 17,900,000 orphans have lost both parents and they are living in orphanages or streets and lack different social services such as education and health services. Therefore, they are at risk from diseases, malnutrition, and death.

The challenge of vulnerable orphans is globally alarming especially in the access to education and their academic achievements have also been threatened by the increasing poverty, over stretched extended families and insufficient mechanisms to provide quality education for all (UNICEF, 2013). This implies that, if this group is not proactively supported may lead to an escalated poverty, social unrest and related challenges.

This is also a concern in Africa (Pillay, 2014). Experiences show that traditionally vulnerable children particularly orphan have been cared by the aged grandparents, their brothers and sisters whom sometimes are also children and the extended family (Baxen, 2014). However, the elderly people fail to meet adequately the educational and personal needs of the orphans leading to low academic achievements of orphans. Despite of many children being enrolled in schools following the abolition of school fees in primary schools in most Sub Saharan Africa countries, still the children from poor family and orphans fail to adjust to education due to failure to meet educational needs such as uniform, exercise books, adequate and quality food and shelter (Williamson & Witzel, 2016). Even some of those who attending school have to undergo different coping mechanisms, such as attending to daily pay labor and begging to subsidize the educational material needed.

The situation in Tanzania is comparable to other parts of the world. According to the Tanzania's National Strategy on Inclusive Education (2018-2022) the schools must become more responsible to the needs of learners and teachers so as to enable all vulnerable learners to develop access to quality education. Despite the emphases on inclusive education in Tanzania, there are many children from poor family in primary schools who fail to meet the various costs of their education. UNICEF (2016) pointed out that, the major reasons for persistence of the problem of children from poor family is the lack of access to schooling, even when school fees are abolished, money must still be found to pay for things like uniforms and books. This lead to some children to either fail to attend to school or drop from school before completing standard seven as compulsory basic education.

The study by Mahanza et al. (2022) reveals that Tanzania is experiencing a big number of out of school orphans in rural and urban areas. Furthermore, it reported that orphans in the primary school age group (7-14 years), more single and double orphans are out of school than non-orphans, though the difference is not statistically significant compared to secondary school age (14-18) orphans. For instance, in (2014) the out-of-school rate was high for secondary school age children in general, in which 55 percent of single orphans were out of school compared with a significantly lower percentage of non-orphans (45 percent) in rural areas. In urban areas, within the secondary school age population, single orphans were approximately one and half times more likely to be out of school than non-orphans, and double orphans were almost twice as likely to be out of school as non-orphans. Thus, orphan hood appears to be a determinant of lower school attendance for older children, though not for younger children. Due to the abolition of school fees at the primary level, it may be that all primary-aged children gain access to schooling, while older orphans have a more difficult time than non-orphans in paying fees for secondary school or have other opportunity costs like earning a living.

Additionally, despite the fact that Tanzania has been working with International agencies and NGOs to eliminate illiteracy and improve livelihoods for all Tanzanians (Koda, 2015), a noticeable impact on both the quality and quantity of education for children from poor family has not been evaluated. Similarly, support mechanism adopted in Tanzania to support orphans and vulnerable

children to access education has not been fully explored in Tanzania specifically in primary education. Hence, the main question for this study is, what sufficient support mechanisms that can help orphans in enhancing their academic achievements in primary schools in Tanzania? This study aimed to contribute to the debate of access to education for all in Tanzania by exploring mechanisms that can be use used to help orphans to access education. Also, it contributes to sustainable development goal four which focuses on realizing quality education for all groups of the society.

2. LITERATURE REVIEW

Studies suggest different mechanisms in different parts of the world to support orphans access education. According to Reupert et al. (2013), stakeholders have significant role to play in the academic development of all pupils. Different nations have adopted several support mechanism to help orphans access and adjust to primary education well for their academic achievement as follows. Among the support mechanism adopted by many countries in Africa include abolition of school fees for compulsory education (Pillay, 2016). Further, Pillar (2016) argues that for many countries attainment of Education for all goals decided to adopt abolition of school fees as a general intervention for all children including orphan. Supporting this idea Oleke (2007), in Nigeria investigated on the initiatives done by the government in supporting the education of vulnerable children. In this study the findings revealed that abolition of school fees in primary education was a great initiative adopted by Nigerian government to serve children from poor families accessing education. The study further revealed that abolish of school fees help to increase enrolments in school especially to children that would face difficult in accessing primary education.

Different countries such as Uganda adopted Universal Primary Education (UPE) policy abolishing the payment of fees for the first four children in a family which increased enrolments of children from poor family and orphans within a year as compared to children from middle and high income (Tumushabe et al. 1999). Likewise, Malawi also abolished fees as a means of improving academic achievement of all pupils and experienced a rise in enrolment specifically children from poor family and orphans (Kadzamira et al., 1999). Supporting the idea the study by (Pillay 2014) on the effects of abolition of school fees in Indonesia, and Kenya revealed that, enrolment increased for about 40% substantially following abolition of primary school fees for all children of which most of the enrolled pupils included children from vulnerable conditions (Pillay, 2014). Therefore, abolition of tuition fees stands as a super support mechanism which helps most of children from poor family and orphans in access and adjustment to primary education in various countries and therefore reaching their academic plans.

Adato, Coady, and Ruel, (2000) argue that one of the most common supportive mechanisms used by government and Non-Governmental Organizations (NGOs) to overcome or reduce challenges facing orphanage children from poor family in accessing primary education is to reduce or eliminate some of school costs. The reduction interventions help orphanage children from poor family to cover the costs of books, stationery, and school clothing (uniform and shoes). They further argued that the best means is to send directly the needed materials to orphans and children from poor family, or to send direct to school. The materials to be sent include textbooks, uniforms, pens and other related materials. Apart from providing free materials to orphans, Adato, Coady, and Ruel, (2000) suggested that materials should also be made available through textbook rentals, or sold at subsidized rates

Globally there various countries which have been subsidizing school related costs in order to help orphanage children from poor family to access or adjust to primary education. For instance in Brazil, it was observed that school attendance of children from poor family increased when the *BolsaEscola* program was introduced. The program aimed at providing cash grants to poor families withchildren aged 7 to 14 who access primary school (Guilherme, et al., 2000). In Latin American countries, some local authorities provide school subsidies and fund for the education of children from poor family and orphans (Subbarao et al., 2001).

Another supportive mechanism that has been used to improve access and adjustment of orphan to primary education is to increase coverage so that schools are available to children living in areas outside the covered by the formal education system (Sumra, and Rajani, 2006). Community schools are established by local community members and sometimes supported by NGOs and churches. These schools do not charge fees, nor do they require children to wear uniforms, sometimes adjust their timetable to local needs and use volunteer teachers (Ntozi, Ahimbisibwe, Odwe, 1999). Community schools implement the same curriculum used in the public primary schools, though modified. This support is implemented in order to help orphans to access and adjust to primary education in easiest way. The report by World Bank, (2002) revealed that in Zambia, more than 200 community schools have been opened in faraway remote areas where there are no government schools and covered most of orphans. With this reason most of orphans have access to education in Zambia. Despite that this strategy served orphans attending school and adjusting to primary education needs well it was better to study and see whether the programme can serve the same purpose in Tanzania.

Palmer and Maramba, (2011) conducted a study in America investigating the situation of the schools admitting orphans to the highest level. In their study they revealed that, admitting orphans who are unable to accommodate school costs is always very difficult and very cost full to a school. Due to this reason they reported that schools fail to admit orphans and giving them some

---

required educational needs and therefore they face difficult in access to primary education as compared to nonorphans. In order to overcome the situation the study by Hepburn, (2001) in Zimbabwe reported that in an effort to improve accessibility and adjustment of primary education to orphans government and NGOs need to induce some projects which will attempt to overcome the challenge by donating materials needed by a school on condition that the school admits a certain number of orphans. In his study he revealed the supportive mechanisms adopted by Zimbabwe where by some school are guided to admit 20% of orphans and it is supported by the government and other NGOs in providing school materials to the admitted orphans such as school uniforms, exercise books, shoes and food. Further, the school receives fund which support in accommodating the needs of orphans when they are at school.

Tanzania is among the developing countries vested with higher number of orphan"s due to poverty in families and higher death rate of parents contributed to diseases such as HIV/AIDS and Malaria. Other factors that are noted as leading to vulnerability included break up of families, presence of obesity, and loss of skills (Ainsworth, Beegle, and Koda, 2002) consider orphans as biological orphans with an increase in the spread of HIV /AIDS, the number of orphans and other helpless children has also had been increasing drastically. In Tanzania, the Ministry of Education and Training policy 2014 as revised in 2023 and National Strategy on Inclusive Education 2009 – 2017 identified two goals which based on most vulnerable children, these goals are: Expanding and Improving Comprehensive Early Childhood Care and Education, especially for the Most Vulnerable and Disadvantaged Children. Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities have access to and complete free and compulsory primary education of good quality in order to meet the goals the government have taken several intervention and support as discussed below;

As observed from foreign counties Tanzania also has eliminated school fees in order to increase attendance of children attending primary education. But the extra costs of uniforms, supplies and special assessments still be substantial (Human Rights Watch, 2004). Some questions to ask orphan do without uniforms to ease up the stress of meeting school requirement? Are such uniforms a necessity or should government subsidize schools to make it easier for more orphan to attend school? What alternatives should exist to make it easier for orphan dropping out from schools to overcome the barrier?

According to Boyle (2002) the cost of education, both monetary and nonmonetary, continues to be a burden on households and a barrier to education. They argue that the barriers of uniforms as well as indirect costs in accessing education makes households opt not to send their children to school; as a result orphans are the most unlikely to be schooled. Further, it has been that orphaned children find it hard to attend school due to the extra costs of school uniforms, books and stationery, and because they are often left responsible for earning money or caring for younger siblings in some instances.

As observed from foreign reviews that school feeding program is among of support mechanism which exemplified from various countries, the government of Tanzania has also continued to expand the School Feeding Programme in order to promote attendance and retention of pupils in schools particularly vulnerable children. The Ministry of Education and Vocational Training in collaboration with the World Food Programme (WFP) expanded the School Feeding Project from 13 Councils of Bahi, Longido, Iramba, Manyoni, Kondoa, Chamwino, Karatu, Simanjiro, Kiteto, Ngorongoro, Mpwapwa, Singida (R) and Monduli (2000) to 16 Councils in 2011/12 to include Kishapu, Shinyanga and Meatu in the list. The feeding programme has so far reached 600,000 pupils in 1,000 schools in 16 drought-prone and pastoralist Councils located in 5 regions namely Singida, Dodoma, Manyara, and Arusha (Tanzania Ministry of Education and Vocational Training, 2013).

Addition to that, the Tanzania government's plan is to ensure that, school meals are provided to all schools throughout the school calendar. In that regard, the government has continued to sensitize parents and other stakeholders to contribute resources including grain to ensure sustainable provision of meals to children at school to promote attendance and retention. Nationally, until August 2010, out of a total of 16,331 schools, 5, 424 (34.2%) were providing school meals. Out of these 1,167 were supported by WFP (BEST, 2012).

Despite various efforts made by government in order to make easy access to primary education, orphan often face different challenges as the result lead to adoption of some strategies in access to primary education. This makes support mechanisms to be adopted by to help orphans to achieve their academic endeavors not to have been explored enough in Tanzania, a thing that this study contributes.

3. STUDY METHODOLOGY

Study Approach

This study employed a mixed research approach. On qualitative side of the study, a case study design was applied. Creswell (2009) informs that case study allows the enquirer to generate knowledge basing primarily on multiple meanings of individuals' experiences, which are socially and historically constructed for developing a theory or pattern. On the side of quantitative side of the study, a descriptive survey design was applied. Davies, (2007) states that, descriptive survey involves a small inclusive and

Support Mechanisms for Orphans' Academic Achievement in Tanzania

intensive study of individuals whereby an investigator employs his/her skills and methods so as to allow systematic gathering of enough information about a phenomenon to permit one's understanding on how it functions as a unit of society.

Location of the study and Sample Selection

This study was conducted in Tanzania mainland and specifically in Dodoma district. According to the Ministry of Education and Vocation Training (2011), Dodoma is the district with the highest number of orphan pupils in Tanzania, and most of these children are used by elders for begging and carrying people's luggage at the market places. Therefore, selection of Dodoma as a study area was based on the fact that it has a high number of orphans (MOEVT, 2011) Therefore, living on poor economic status and lager number of dependent in family. But also the study area is vested with lager number of baggers who work with children during begging which helped to come up with clear picture on how orphans cope with different challenges in adjusting maximally to primary education. The study involved four primary schools in Dodoma district which are Nzuguni Primary School, Mpunguzi Primary School, Mkonze Primary School, and Chamwino Primary School. In primary schools, the study selected head teachers, teachers and pupils. It also involved the collection of data from the city council of Dodoma department of education where the education officer was involved. The distribution of the sample is as indicated in Table 1.

Table 1: Sample Size and Respondents Categories

Educational Institution	Head Teachers	Teachers	Orphan pupils	Education Officer	Total
Department of Education Dodoma City Council				01	1
Nzuguni Primary School	01	8	24		33
Mpunguzi Primary School	01	8	24		33
Mkonze Primary School	01	8	24		33
Chamwino Primary School	01	8	24		33
Grand Total	**04**	**32**	**96**	**01**	**133**

Source: Author (2024)

As presented in Table 1 the sample size used in this study was 133 respondents in order to obtain information where by 96 orphans were pupils from 4 schools, because they were the primary source of information regarding the copping strategies. Further, 1 education officer from Dodoma Municipal Council, 32 teachers from 4 schools (2 urban, 2 rural) and 4 head teachers from respective primary schools were involved for objectivity of the study results. Orphan pupils were involved in the study because they were the main informants of the study. They are the ones living the situation and therefore were in the best position to explain their lived experiences. A total number of 96 orphanage pupils from different classes from Nzuguni, Mpunguzi, Mkonze and Chamwino primary schools participated in the study respecting gender sensitivity in selecting the category of respondents for the purpose of collecting adequate information. The selected orphanage pupils were expected to give information about the educational copping strategies adopted by them in enhancing their academic achievements.

Teachers were involved because of their roles within the schools. Apart from conducting the session, they also guide the pupils and entitled as academic advisors within the school. A total number of 32 teachers with different educational levels and experiences working with pupils in schools were involved. Head teachers were also selected to be among the key informants because of their position and responsibilities within the schools. The total number of 4 head teachers participated because they

had fundamental responsibilities for ensuring pupils wellbeing. Therefore, according to their roles and position they were expected to provide good information regarding educational coping strategies adopted by orphan pupils. Further, the District Education Officer (DEO) was also selected to participate in this study because of their position and responsibilities of supervising and guiding the schools and providing well-being of pupils in schools hence they have statistics regarding orphans pupils and support offered by the government. So in this case they were in the position to provide required information on the educational coping strategies adopted by orphan's pupils. The selected respondents in this category were expected to share their experience on the education coping strategies adopted by orphans in enhancing their academic achievements.

Data collection and Analysis

Data were collected through survey questionnaires from pupils and teachers category. Again, interviews was used to collect date from head teachers and city education officer. Moreover, documentary review was used to collect data from secondary materials. The thematic approach and descriptive approach was used in analyzing qualitative and quantitative data respectively. The thematic approach involved the data transcription, data cleaning, and developing codes, developing themes and sub-themes and writing up a report. Codes developed include "orphans" "mechanism" "academic" and "achievement" The quantitative data were analysed using descriptive approach. Frequencies and percentage were calculated through Statistical Package of Social Sciences (SPSS) software (version 20). Frequency distribution tables were used to describe and present the findings of the data collected.

4. RESULTS

Analysis of collected data through interviews, questionnaire and documentary review revealed that there is a need of collaborative efforts between the government, NGOs and the community in order to help orphans access their education needs. This could be evidenced through the teachers and pupil's assertion on the role of government, NGOs as well as the community as presented in Table 2 and Table 3.

Results from Pupils

The interview with pupils revealed several support mechanism that they thought if done could help orphans enhance their academic achievements very well. Pupil's suggestions were categorized into three main groups; support from the government support from NGOs and support from the community as presented in table 2.

Table 2: Interview on Support Mechanism with Pupils

Major Category	Sub-category	Freq	%
Government Support	Buying school materials	62	64.5
	Provision of food at school	51	53.1
NGOs	Provision of school materials	43	44.7
	Provision of home needs	59	61.4
Community Support	Taking care of young orphans	38	39.5
	Counseling	38	39.5
	Helping with home needs	43	44.7

Source: Field work

Government Support

Most of the interviewed orphans, (64.5%) were of the view that the government should take responsibility of helping them in accessing different school materials such as exercise books, school uniforms, pens and other materials such as school bag and shoes. Not only that but also pupils revealed that provision of food at school would help them focus on studies at school rather than focusing on many things at once. Orphans were of the view that if the government will reduce the burden they have on school materials and provision of food it will be easy for them to achieve their academic goals because lack of school related materials was the challenge rated highly by them.

One of the interviewed orphans had this to say:

Support Mechanisms for Orphans' Academic Achievement in Tanzania

> *The government should buy school uniforms and exercise books for us so that we may be like our fellow students. We feel inferior because we find ourselves different from our fellows (Interview with a female pupil from school D)*

The expression by the pupil reveals that orphans are of the views that if the government will help them with school materials are likely to learn like their fellow pupils. This means that they will be able to do the exercise given by teachers, submit the work done and receive feedback from teachers and therefore, there won't be any difference among them.

Non-Governmental Organizations (NGOs) Support

The interview with pupils revealed that, NGOs intervention is important for assisting orphan pupils access their education needs. Pupils argued that as advocates, NGOs should act as intermediaries between children and other social systems with a view to protecting the rights of the children. Pupils further argued that the support orphans receive from their neighbours does not sustain them for a long time therefore they live without help from neighbors and relatives most of the time. This is where NGOs are needed to bridge the gap by providing the support related to school materials as well as home requirements. Furthermore, pupils reported that NGOs should support them by staying with them, involving them in income-generating projects; involving them in a peer education support group; offering psychosocial support services; and material support, to mention but a few. For example, one orphan pupil from school

C stated that:

> *"NGOs should continue visiting and helping my grandmother with different needs such as food in order that we may be able to go to school because sometimes we don't go to school in order that we may find food for our own as well as our grandmother" (Interview with a female Orphan Pupils from school C).*

The excerpts indicate that these children, although they are heading the households on their own and taking care of their grandparents, still they needed outside support especially from NGOs.

Community Support

Most of the pupils (56%) perceived that people in their communities (especially neighbours and friends) had sympathy for the orphaned children. Pupils reported that they have often been supported with food and other educational material such as exercise books by neighbours and friends. This indicates that the community's response to the needs of orphaned children is not only promising but also reflects a level of acceptance of the children after the death of their parents. However, pupils reported that not all community members are ready to support them and therefore argued that it is important the society be educated on the importance of helping orphans in whatever way they can afford in order to help them reach their educational destination. The following excerpts by pupils indicate the desire to have support in the form of community or family intervention:

> *"I want one of my relatives to come stay with us especially when grandmother is too weak or sick so that we go on with studies because we can't go to school while our grandmother is sick at home. (Interview with female Orphan Pupils from school B).*

The above quotation indicates that orphan children wish to have support from their extended families. Some also wish that their family members would come to their aid in cases when the grandmother is terminally ill. This will help them get an opportunity to finish their studies otherwise they will become a dream which will never be fulfilled.

Furthermore, orphan pupils reported to have a good relationship with their neighbours. Some reported that they did not go to neighbours for material support while others reported to depend on their neighbours when they need help. The findings revealed that some neighbours are of assistance to orphan children as they are helping them with material and emotional support and play the role of the extended families that are unavailable while others not. The following interview lines with pupils indicate different forms of children's relationship with their neighbours:

> *It is good. Neighbours also help me with food*
> *It is good because they are the ones who always assist us*
> *My relationship with our neighbors is good even though they are busy with their lives (Interview with a male Orphan Pupil from school C).*

Another orphan pupil revealed that:

> *We don't go to them asking for food or anything because they will gossip us around. We just keep our problems to ourselves despite that we suffer a lot and we feel talking to them (Interview with female Orphan Pupil from school D).*

Support Mechanisms for Orphans' Academic Achievement in Tanzania

From the pupils" expressions it can be noted that, although the relationships between orphans and neighbours are good, some orphan pupils indicated that they do not go to their neighbours and ask for help for fear of being gossiped about or for reasons of pride. Some of the children indicated that their neighbours assist them with food, although not on a daily basis. The neighbours can be viewed as a support mechanism to the children since their extended families are not available to play this role. Therefore, neighbours should be advocated on the importance of helping the orphans around them. Additionally, the findings revealed through interview from pupils revealed that counseling is very necessary for helping orphan children cope with their daily life. This was evidenced by the orphan pupils who partook in this study, they were not happy with the situation they find themselves in and the researcher saw a need to offer them counseling, particularly to those who were very emotional during the research interviews. Some of the research questions opened up old wounds and the participants became emotional. Through counselling, orphans can be given an opportunity to explore and discover ways of living more fully, despite their challenges, as counselling assists them with addressing and solving these challenges and making an informed decision. Below extracts indicated the need for counseling for these orphans:

> *"Sometimes our neighbour only provides us with food and encourages us not to feel bad. He tells us that if we study hard we will live good life. We are happy today you are also encouraging us to study hard". (Interview with male orphan Pupil from school C).*

Another orphan pupil said that:

> *There are times I feel so down and I don't see my future. I ask myself why my parents died. This happens very much especially when I don't have food to eat home, lacking school materials or the time when I feel segregated by people around me. But I thank my church pastor provides me with advice at church and at home at times" (Interview with female Orphan Pupils from school D).*

From the contentions by pupils, it can be argued that, counseling as a coping tool can help orphans to manage their unresolved emotional problems more effectively and they may develop unused or underused opportunities to cope more effectively with psychological challenges that may affect their academic achievement. This is because it seems that some of the orphans need to be instilled hope on the way to handle their circumstances.

Results from Head teachers and DEO

Likewise the data collected through interview from head teachers as well as DEO showed the necessity of the Government, NGOs as well as the community to take part collaboratively in enhancing their academic achievement. All head teachers 4 (100%) reported that there is the need for the government to allocate more fund to orphans different from the fund allocated to no-orphans at school. They argued that if the government will allocate more budgets for orphans all schools can be ordered to provide school materials per term to each registered orphan at school. Among the mentioned materials that heads of schools mentioned involved exercise books and school uniforms to be provided per each term. Further head teachers said that this could reduce the risk of orphans" engagement in petty businesses which make them not attending school effectively. One of the head teachers reported that:

> *The capitation grant offered to a school is not enough to cater the needs of schools and orphans at the same time. This is because all of them receive the same share; therefore, it becomes difficult to get extra money to buy different materials to support them unless you use your own money (Interview with a female head teacher from school C)*

With this contention it can be argued that all teachers and pupils see the necessity of the government to provide support to orphan pupils. While pupils see that the government should buy for them directly, heads of schools view that each school should register the number of orphans present at school and the government should allocate budgets to school living with those orphans in order to buy school learning materials according to their needs.

On the other hand, the DEO also was of the view that different NGOs can help in supporting the needs by orphans in order that they may achieve their primary education. The DEO argued that the support to be provided may be in form of material support, such as buying school uniforms and stationery, providing food parcels and they can also advocate for exemption of school fees and being declared indigent by the municipality. He also argued that some organizations are running aftercare centres for orphans and vulnerable children, where these children are provided with meals, psychosocial support services and school work assistance while their elder siblings concentrate on their own school work. Therefore, if NGOs can be strengthened it is possible to help minimize the burden of orphans" access to school needs.

Furthermore, the findings revealed through interview from head teachers also revealed that counseling is very necessary for helping orphan children cope with their daily life. Head teachers argued that orphans at school are facing the challenges of

stigmatization, loneliness and inferiority. Further they are psychologically affected by the difficult situation they are living in. Therefore, they require counseling in order to help them develop self-knowledge, emotional acceptance, emotional growth and personal resources. Furthermore, the interview with head teachers revealed that a family is the first point of provision for socialization which is very important for growing children. Therefore, those remaining with orphans in families should make sure that they help them to develop good socialization and engage in socially acceptable behaviors and activities that may not result them to a worse situation.

The study findings from questionnaire to teachers also revealed similar findings as those from the interview from pupils and head teachers through pointing out that different groups including the government, school and the community should provide different support to help orphans in achieving their academic needs as presented in Table 3

Table 3: Suggested Support mechanism by Teachers

Main Category	Sub Category	Freq	%
Government	Buying school materials	29	90.6
	Educating the society	24	75
	Protection against segregation	13	40.6
	Building hostel	24	75
School	Provision of food	26	81.2
	Provision of school materials	28	87.5
	Showing respect	20	62.5
	Provision of counseling	22	68.8
Community	Taking care of orphans	26	81.2
	Being positive to orphans	12	37.5

Source: Field work

Presented in Table 3, the study findings revealed that provision of school materials (90.6%) and (87.5%) respectively whether at school or by the government was considered a major support mechanism by teachers for helping orphans access their education needs. Not only that but also the provision of food at school received a great attention (81.2%) compared to others. On the other hand being positive to orphans was the least support mechanism that was identified by teachers in helping orphans access their primary education. This implies that if the government plays a key role in providing the school learning materials as well as feeding programme to school there is a high possibility that orphans challenges in enhancing their academic achievements may be sustained.

5. DISCUSSION

The current study findings revealed several support mechanism that can be sufficient in helping orphans access their primary education very well as the government playing the central role of making sure that orphan children access their necessary school needs. Social work intervention, counseling, family and community support, provision of food at school and good relationship with neighbours were also reported as efficient support mechanisms that can be adopted in order to help orphan pupils have their school needs as required.

The joint efforts by the government, school and the community in general is essential in making sure that orphan pupils undertake their primary education efficiently. The findings suggest that without joint effort among different stakeholders it will be difficult for only one institution (government) to accommodate the needs of the orphans. Therefore, foster parents must play their parts, as well the school but on top the government. The findings revealed that the government should provide a separate budget for orphans to schools in order that they may buy necessary requirements for them. Furthermore, community members should provide assistance positively to orphans rather than negatively.

Adato, Coady, and Ruel, (2000) supports the findings by arguing that one of the most common supportive mechanisms used by government to overcome or reduce challenges facing orphanage children from poor family in accessing primary education is to

reduce or eliminate some of school costs. The reduction interventions help orphanage children from poor family to cover the costs of books, stationery, and school clothing (uniform and shoes).

As revealed in the current study Adato, Coady, and Ruel, (2000) further argued that the best means is to send directly the needed materials or requesting the schools to buy materials for orphans and children from poor family, or to send direct to school. Likewise, Subbarao, Mattimore, and Plangemann, (2001) research findings are in same line with the current study findings revealing that In Latin American countries, some local authorities provide school subsidies and fund for the education of children from poor family and orphans.

School feeding program is another supportive mechanism which was revealed by the current study findings as the mechanism that can help orphans in accessing their studies very well. When pupils are given food home they study well without thinking of lack of food at home which affect their attention in class and therefore, affecting their learning. Mwoma and Pillay, (2015) supports the study findings arguing that In situations where children have food scarcity and walk for long distances to school and food is not provided, the effect on cognition, short-term memory, verbal fluency, and ability to concentrate is negative. Therefore, the provision of food is an efficient mechanism. Furthermore, Janke, (2001) was of the view that the provision of food at school serves the purpose of reducing the dropout rates among orphans, but also as means to increase enrolment and attendance to orphans as means to access or adjust primary education.

For instance Miller, (2003) also reported that school feeding programs is notified as strategy used as support mechanism provided to orphans in several countries including Ethiopia Côte D'Ivoire and the northern regions of Ghana. It is reported that the program has a significant impact to primary education on enrolment, dropouts, and performance specifically to orphans. The programs have encouraged parents to send their children to school despite of poverty existence, and they may also result in improving health and performance at school to orphans (Mitchell, Irvine, 2008). These suggest that if this strategy is adopted in Tanzania can therefore help to serve the challenges facing orphans.

Additionally, participants who partook in this study reported that they were not happy with the situation they find themselves. They are very emotional, lonely, segregated and feeling inferior. Therefore, counseling is necessary in order to help them come into normality. Van Dyk, (2008) also revealed that through counselling, AIDS-orphans heading households are given an opportunity to explore and discover ways of living more fully, despite their challenges, as counselling assists them with addressing and solving these challenges and making an informed decision regarding their everyday encounters. Therefore, counselling as a coping tool, helped AIDSorphans to manage their unresolved emotional problems more effectively and they may develop unused or underused opportunities to cope more effectively.

Family support, community support as well as neighbours help were other support mechanisms that most of the participants agreed as the sufficient mechanisms that can help orphan pupils to enhance their academic achievements. People in communities (especially neighbours and friends) are to be sympathetic for the orphaned children. This should involve supporting them with food and other educational material such as exercise books. Such findings were also revealed by the study conducted by Woldeyohaness, (2010) who argued that the community"s response to the needs of orphaned children is very important since it helps the level of acceptance of the children after the death of their parents.

Further the study findings by Schor (2003) support the family, community and neighbours as the sufficient means reporting that the family and community around are the most central and enduring influence in the lives of children. Schor (2003) emphasizes that although schools provide formal education, families teach children how to become socially acceptable adults. The family is the first unit in society to teach children the difference between right and wrong. Due to the HIV and AIDS pandemic, family unity is disrupted and consequently so is the socialization process of the child (Dalen, 2009). As a result, children may develop behavior which is unwanted or different from what is expected in a particular society. Therefore, the family and the community around should ensure that they create good conditions for orphans access to education easily. In reference to the study findings as well as the findings from different literature it can be argued that most for effective schooling of orphans different agencies must work collaboratively. These include the government, different NGOs, school and community at large. Each group should play its active role on making sure that orphans get the required school materials as well as home needs in order that they should focus only in academics.

6. CONCLUSION AND RECOMMENDATIONS

Academic achievements for orphans is still critical in most of developing countries and Tanzania specifically. This study suggests that orphans should receive support from government, civil society organizations (CSOs) and community. Although these categories have shown efforts towards improving the situation, more efforts are required to solve the problem. This study suggests that the government should continue educating the society on significance of education to orphans, building schools, hostels and counseling sessions at schools. This will attract pupils to join schools. Again, CSOs should continue raising awareness to community

members, providing necessary financial support and help to orphans so that they can be able to attend schools. Moreover, community support such as taking care of orphans and encouraging them is highly recommended. To realize that, the study recommend that, the government should continue setting enough budget for orphans programs and increase enrollment. Again, community at large should work together to help orphans achieve their academic needs in primary education including foster parents, neighbours and all individuals should play parenting role on helping orphans access different needs being school materials or home needs in order to help them success very well with their primary education. Moreover, CSOs have to set budget and establish programs that will help orphans have equal access to education as non-orphans children.

REFERENCES

1) Adato, M., D. Coady, and M. Ruel. (2000), "An Operations Evaluation of Progresa from the Perspective of Beneficiaries, *Promotoras,* School Directors, and Health Staff". Final Report, International Food Policy Research Institute. Washington D.C.: International Food Policy Research Institute, 10 August.

2) Adekola,E. K. (2012), Targeting orphaned and vulnerable adolescents with services: Experience with adopting a multisectoral approach in Nigeria.

3) Ainsworth, M., K. Beegle, and G. Koda. (2002), "The Impact of Adult Mortality on Primary School Enrolment in Northwestern Tanzania." Africa Region Human Development, Working Paper Series. Washington, D.C. World Bank. (Also available at http://www.coregroup. org/resources/ schooling. pdf).

4) Baxen, J., Nsubuga, Y. & Botha, L. J. (2014), A capabilities perspective on education quality: Implications for foundation phase teacher education program design. Perspectives in Education, 32(4), 93-105. http://www.perspectives-ineducation.com/ViewPublication.aspx?PublicationID=26

5) Boyle, J. A. (2002). Using the human genome: A case study in education. *Bio chemistry and molecular biology*, 30(20), 368-371. https://doi.org/10.1002/bmb.2002.494030060134

6) Creswell, J.W. (2009), *Research Design; Qualitative and Quantitative and Mixed Methods Approaches*. London: Sage.

7) Davies, M. B (2007), *Doing a Successful Research Project: Using a qualitative or quantitative method*. London: Palgrave publishers.

8) Fleming, K. E. (2015), *Improving access to education for orphans or vulnerable children affected by HIV/AIDS*. Paper commissioned for the EFA Global Monitoring Report 2015, Education for All 2000-2015: achievements and challenges. UNESCO http://unesdoc.unesco. org/images/ 0023/ 002324/ 232423 e.pdf

9) Hepburn, A. 2001. "Primary Education in Eastern and Southern Africa: Increasing Access for Orphans and Vulnerable Children in AIDS-Affected Areas." Durham, N.C.: Terry Sanford Institute of Public Policy, Duke University, This report was prepared for a thesis project as a Master's candidate in the Terry Stanford Institute of Public Policy, Duke University. April. As of 20 June 2002, available at http://www.usaid.gov/pop_health/dcofwvf/reports/hepburn.html.

10) Human Rights Watch. (2004). World Report 2004. https://www.hrw.org/legacy/wr2k4/download.htm

11) Kadzamira, E.C., Chibwana, M.P., Chatsika, M., and Khozi, J.L. (1999), "*Gender and Primary Schooling in Malawi"*.Report sponsored by the Forum for AfricanWomen Educationalist, Ministry of Education, Malawi, and Institute ofDevelopment Studies, University of Sussex, Sussex, U.K.

12) Ladan, M. T. (2006), *Situation analysis and assessment of orphans and vulnerable children* (OVC).Routledge, London.

13) Mahanza, P., Chanila, D., Minga, R., Kaijage, T. & Mashalla, Y. (2022). Exploring Challenges Faced by Orphans in Primary Schools in Ludewa District: a Case of Ludewa Ward. *Global Scientific Journals*, 10(3), 1551-1567.

14) Miles, S., & Singal, N. (2010). The Education for All and inclusive education debate: conflict, contradiction or opportunity? *International Journal of Inclusive Education*, *14*(1), 1–15. https://doi.org/10.1080/13603110802265125

15) Ntozi, J.P.M., F.E. Ahimbisibwe, J.O. Odwe, et al. (1999), "Orphan Care: The Role of the Extended Family in Northern Uganda." *The Continuing African HIV/AIDS Epidemic*, 225–236.

16) Okumu, I. M., Nakajjo, A. and Isoke, D. (2012), Socio-Economic Determinants of Primary School Dropout: The Logistic Model Analysis. [http://mpra.ub.unimuenchen.de/7851/MPRA] site visited on 9/1/2018

17) Oleke C. (2007), "When the obvious brother is not there": Political and cultural contexts of the orphan challenge in northern Uganda. Social Science &Medicine.61(12):2628–2638.

18) Palmer, R. T., and Maramba, D. C. (2011), African American male achievement: Using a tenet of critical theory to explain the African American male achievement disparity. *Education*

19) Pillay, J. (2014), Advancement of children's rights in Africa: A social justice framework for school psychologists. *School Psychology International,* 35(3):225-240. doi: 10.1177/0143034313515990

Support Mechanisms for Orphans' Academic Achievement in Tanzania

20) Reupert AE, J Maybery D, Kowalenko NM. (2013). Children whose parents have a mental illness: prevalence, need and treatment. *Med J Aust*. Aug 5(199) (3 Suppl):S7-9. doi: 10.5694/mja11.11200. PMID: 25369850.

21) Subbarao, K., Mattimore, A. & Plangemann, K. (2001). Social Protection of Africaís Orphans and Other Vulnerable Children. Africa Region Human Development Working Paper Series.

22) Sumra, S., and Rajani, R. (2006), *Secondary education in Tanzania: Key policy challenges* (Hakielimu working paper no. 4). Retrieved fromhttp:// hakielimu. org/publication_ details.php?pub=34

23) Tumushabe, J., Barasa, C.A., Muhanguzi, C.A., and Otim-Nape, J.F..(1999), "*Gender and Primary Schooling in Uganda*". Report sponsored by the Forum for African Women Educationalist. Ministry of Education, Uganda, and Institute of Development Studies, University of Sussex, Sussex, U.K.

24) UNESCO. (1989). Convention on the right of the child

25) UNESCO. (2010). Education for all Global Monitoring Report 2010: Educational Marginalization in Northern Kenya. Nairobi, Kenya.

26) UNICEF (2002). The State of the World's Children 2002 *Turning commitments into actions that improve the lives of children and families. https://www.unicef.org/reports/state-worlds-children-2002*

27) UNICEF. (1999), *Girls, HIV/AIDS and education*. Retrieved from *Urban Society*, *43*(4), 431-450. doi:10.1177/0013124510380715   www.unicef.org/ publications/index_25047.html

28) UNICEF. (2016). Annual Report. New York, United States of America.

29) URT (2016), "*Education*". Retrieved from http://www.tanzania.go.tz/education.html

30) USAID (United States Agency for International Development) (2009), "USAID Project Profiles: Children Affected by HIV/AIDS." Report produced by the Synergy Project. Washington, D.C.

31) USAID. (2009). Orphans and Vulnerable Children Comprehensive Action Research (OVC-CARE) Task Order Year 2 Annual Report. October 1st 2009 to September 30th 2010

32) Williamson, Alexis and Witzel, Bradley Steven (2016). Instilling Resilience in Children of Poverty. *The Winthrop McNair Research Bulletin*: 2(13). Available at: https://digitalcommons.winthrop.edu/wmrb/vol2/iss1/13

33) World Bank (2002). Annual report: Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/379051468163155729/Main-report

34) Yahya,C. (2012), Challenges and complexity in human rights education, Education Inquiry, 4:1, 189-210, DOI: 10.3402/edui.v4i1.22068

35) Young, J. L. (2016). G. Stanley Hall, Child Study, and the American Public. *The Journal of Genetic Psychology*, *177*(6), 195–208. https://doi.org/10.1080/00221325.2016.1240000

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Russel D. Funtanilla

Narvacan National Central High School, Paratong, Narvacan, Ilocos Sur, Philippines, 2704

ABSTRACT: This study aimed to evaluate the utilization of Language Strategies in teaching Grade 10 Mathematics at Narvacan National Central High School during the 4th quarter of the SY 2022-2023. Specifically, it focused on the profile of the students, their level of performance in language strategies, and their mathematics performance. It further determined the relationship between the students' profile and the level of performance in language strategies, the students' profile and their level of participation, the students' performance in language strategies and their mathematics performance, and the problem encountered by the teachers in teaching mathematics using language strategies.

This study used a quantitative research approach employing the correlational research design. The research design is a combined description, evaluative and correlational design. This study made use of a questionnaire consisting of two parts, the performance of the students when using language strategies and the 4th quarter grades of the learners in Mathematics.

Hence, it is recommended students will participate in every activity or discussion related to the different language strategies. The performance of the students may be improved by sustaining the utilization of Language Strategies in Teaching Mathematics. Teachers and school heads are encouraged to innovate programs or activities that address issues related to low comprehension and low retention of students.

KEYWORDS: Teaching of Mathematics, Language Strategies, Student Performance

I. INTRODUCTION

Mathematics, in the words of William Paul Thurston, is not about numbers, equations, computations, or algorithms: it is about understanding (Dreyer, 2019). Mathematics is one of the most important subjects that a child will have to learn because it plays such an important role in their lives and education, as no matter what field of work they choose, some form of mathematics will be involved (International Mathematical Union, 2023).

Despite the benefits that Mathematics can provide, students claim that it is challenging. Its perplexity drags students down to the point where they lose interest in the subject. Furthermore, exposing students to numbers and all mathematical concepts is like transporting them to an unfathomable dimension. They regard mathematical formulas as abstract, only capable of being handled by gifted individuals. Furthermore, complex numbers and mind-boggling formulas cause students to focus on the difficulty of the problem rather than its essence and importance (Yeh et al., 2019).

A language strategy is a broad plan for a lesson that comprises organization, instructional objectives, and a list of tactics that will be used to carry out (Stone and Morris, in Issac, 2010 as cited by Saputra, et al. 2014).

Teaching mathematics using effective language strategies is essential for helping students grasp and understand mathematical concepts. In many content areas, including mathematics, vocabulary understanding is a major contributor to overall comprehension. Good reading skills, and English proficiency. and an understanding of mathematical vocabulary, language, and structure plays a critical role in the teaching and learning of mathematics word problems. It is an essential tool for enabling learners to create meaningful mental pictures necessary for solving mathematical problems (Moleko, 2021).

Moreover, PISA 2018 revealed that Filipino learners obtained lower points in Reading, Mathematics, and Science Literacy compared to the Organization for Economic Co-operation and Development (OECD) average points.

Researchers in the Philippines have identified factors that may lead to poor performance of the students in language and mathematics literacy. Some factors that can lead to poor language literacy are lack of vocabulary, difficulty in conveying and organizing ideas, students' perception and lack of motivation and interest (Saavedra & Barredo, 2020). In addressing the different

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

factors that lead to poor language literacy, researchers suggested strategies like Role, Audience, Format, Topic or RAFT strategy (Kabigting 2022), using eclectic reading model (Dizon, 2020) and establishing English corners in the school.

The Department of Science and Technology (DOST) Region 1 and Science Education Institute under the Science Teacher Academy for the Region (STAR) conducted a project entitled, "Strengthening and Enhancing the Learning Tools of the Math and Science Teachers in the Municipalities without Scholars and to DOST I CEST Communities". As part of the project, the training on Language Strategies in Teaching Science and Mathematics was provided to the identified teachers last April 20-23, 2022 at Vigan City, Ilocos Sur. The teachers undergo workshops on the different language strategies in teaching mathematics.

The different strategies in improving the performance of students in language and mathematics are found effective. However, the strategies for language literacy are for language literacy only. The same with the strategies used in mathematics, it is only intended for mathematics. There are still gaps in using effective teaching strategy that could help Filipino students improve their mathematics performance while also exercising their language performance.

. Though there are numerous researches on how to improve mathematics performance of the students, there are only few studies on the utilization of language strategies in teaching mathematics specially here in the Philippines

Language strategies in teaching Mathematics a new strategy introduced to the DepEd teachers of Division of Ilocos Sur. This is the reason why the researcher evaluated the said strategies and looked into the possible effects on the mathematics performance of students along with the other variables' profiles and class participation.

A. Objectives of the Study

This research aimed to evaluate the utilization of language strategies in teaching Mathematics at Narvacan National Central High School during the 4th quarter of the School Year 2022-2023.

Specifically, it sought to answer the following questions:

1. What is the profile of the student-respondents in terms of:

    a. age;

    b. sex;

    c. birth Order;

d. educational attainment of parents;

e. reading materials;

f. frequency of using gadgets a day; and

g. length of time in using gadgets?

2. What is the level of performance of the students in language strategies along:

a. vocabulary building;

b. composing with keywords;

c. metacognition;

d. defining format;

e. profile; and

f. frames?

3. What is the level of participation of the students in class discussion when using Language Strategies in Teaching Mathematics as perceived by the students themselves and the mathematics teachers?

4. What is the level of Mathematics Performance of the Grade 10 learners in the 4th quarter of Narvacan National Central High School?

5. Is there a significant relationship between the profile of the students and the level of performance in language strategies?

6. Is there a significant relationship between the profile and the level of participation of the students?

7. Is there a significant relationship between the level of performance of the students in language strategies and the level of Mathematics Performance of the Grade 10 learners in the 4th quarter?

8. Is there a significant relationship between the level of participation and level of performance of the students in the 4th quarter?

9. What are the problems encountered by the teachers in teaching Mathematics using language strategies?

II.   REVIEW OF LITERATURE

Profile of Respondents. Studies on student profiles can help educators develop educational techniques and policies, as well as improve faculty knowledge of learning challenges (Da Silva, 2010).

Age. Grade 10 is the final year of junior high school and the fourth year of high school in the Philippines. In Grade 10, students are typically between the ages of 15 and 16. According to Bation and Sabaldana (2018), 16 is the ideal age for grade 10.

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Sex. Studies could use the respondents' gender sex as a parameter to better understand how gender affects people's decisions (Voxco, 2023).

Birth Order. The firstborn could differ greatly from the second born and the lastborn. The expectations from parents may also have an impact on the student's academic performance. Since the family is the child's first experience with a group, the role that the child plays there may also have an impact on the child's personality (Baybay, 2017).

Educational attainment of parents. Having educated parents, working parents, and affluent families are strong indicators of how well students will develop (Kean et al. 2020). Khan et al. (2015) revealed that much higher parental education levels are associated with students' academic success.

Reading Materials. Numerous studies have been published that discuss how using physical or digital resources in the teaching of mathematics affects students' academic progress. It has been demonstrated that using resources in the classroom can improve student achievement, particularly in mathematics (Sherman & Bisanz, 2009).

Frequency of Using Gadgets a Day. Although the connection between gadget use and academic performance is complicated and influenced by many factors, it is possible that how frequently students use gadgets (such as cellphones, tablets, and computers) in a day will affect how well they score in math. Frequent gadget use may cause cognitive overload, as students' cognitive resources are divided among many tasks, which may hinder their ability to think deeply about mathematics (Wilmer et al. 2017).

Language Strategies in Teaching Mathematics. Mathematics has long been thought of as a subject with few language requirements. Math and language are inextricably linked; language facilitates mathematical reasoning (Dale & Cuevas, 1992 as cited by Jarrett, 1999). Mathematics has its own grammatical patterns, norms, and vocabulary. Students must acquire the special meanings that some English terms have in a mathematical context while learning English. According to Harris (2005), to understand mathematics, students must learn many content-specific vocabulary words, know the meaning of many complex phrases, understand that many common English words have unique meanings in mathematics, understand that prepositions, know the meaning of prefixes and suffixes, understand unique mathematical sentence constructions, understand statements and questions that are written in passive voice and know that mathematical operations are associated with many different words.

Vocabulary Building. Students need vocabulary building techniques to expand their expanding vocabulary. Teachers frequently advise students to read widely and conduct research. Building a vocabulary involves learning new words, studying their meanings, and storing them for use in the future.

Composing with Keywords. The keyword strategy improved the vocabulary achievement and retention of the students (Al-Zahrani, 2011). Also, when acquiring vocabulary in a second language, the keyword technique outperforms both rote memorization and semantic mapping (Sagarra & Alba 2006).

Metacognition. Metacognitive strategies are techniques that aid students in understanding how they learn. Utilizing metacognitive techniques stimulates one's thinking and can result in deeper learning and better performance, notably among difficult students (Anderson, 2022).

Defining Format. When emphasizing the significance of how information is structured and ordered within a document, presentation, or other form of communication, you are emphasizing format as a language strategy. To ensure that the material flows logically, this involves taking into account the arrangement of the content, headers, subheadings, and the general structure (Last 2019).

Frames. Frames refers to a cognitive and linguistic notion used as a language technique to change how information is perceived, evaluated, and understood in the context of language and communication. By framing, facts or messages, one can affect the perceptions, attitudes, and responses of others (Kaufman, Elliott & Shmueli 2020).

Profile. Profiling as a language strategy is the process of employing certain language and communication skills (Deutschmann & Steinvall 2020). Profiling offers organizing and summarizing advice information based on previously acquired knowledge (USC University of Southern California. (2023). It serves as text organizers and outlines to help students keep to the topic and follow a plan.

III.   METHODOLOGY

This presents the research design, population and locale of the study, the data gathering instrument and procedure, the statistical treatment, and the data categorization of data.

Research Design

This study used a quantitative research approach employing the correlational research design. The research design is a combined description, evaluative and correlational design where theories or concepts gathered were used to describe a certain phenomenon and were subjected to correlational strategy to see significant associations.

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Population and Locale of the Study

The researcher used purposive sampling with 249 student-respondents out of 1, 200 total population of Grade 10 students were taken as respondents from Narvacan National Central High School, Narvacan, Ilocos Sur. Slovin's formula was used in the selection of the student respondents. On the other hand, a total enumeration of 15 Mathematics teachers are taken as respondents, they are the ones who participated in the Language Strategies in Teaching Mathematics training. In total, there are 264 respondents in the study.

Data Gathering Instrument and Procedure

This study made use of a questionnaire consisting of two parts, the performance of the students when using language strategies and the 4th quarter grades of the learners in Mathematics.

The questionnaire was adapted from Gabatino (2020) with slight modifications to fit the purpose of the study. It is used as the main data-gathering tool for students and teachers.

Statistical Treatment of Data

To treat and analyze the data gathered, the following statistical tools were utilized:

Frequency counts and **percentages** were employed to describe the respondents' profile.

Weighted Mean ($\bar{x}$) was utilized to determine the level of participation of students when using Language Strategies in Teaching Mathematics and level of performance of students when using language strategies.

The Spearman rank correlation coefficient was used to look into the association between ordinal data like birth order, educational attainment of parents and frequency of using gadgets to the level of participation and level of performance in language strategies.

Point biserial was used to look into the association between sex and reading materials to level of participation and level of performance of the students in language strategies.

IV. RESULTS AND DISCUSSIONS

Table 1. Level of Performance of the Students in terms of the Different Dimensions of Language Strategies

Language Strategies	Student-respondents	
	Mean	DR
1. Vocabulary Building	89	VS
2. Composing with Keywords	86	VS
3. Profile	96	O
4. Metacognition	86	VS
5. Defining Format	93	O
6. Frames	98	O
Overall Mean	90	O

Table 1 reveals that the highest mean of 98 is described as Outstanding which is attained at "Frames'. It implies that students perform well when using text organizer that helps them keep to the topic and follow a plan. It is followed by the mean 96 which is also described as Outstanding by the item "Profile" which provides templates on which information can be inputted to explain a concept.

However, the item "Composing with Keywords" got the lowest mean of 86 and was described as Very Satisfactory. Students and teachers must work more on these language strategies. This implies that students are proficient in identifying and selecting relevant terms that capture the essence of the problem.

The overall mean is 90 and described as Outstanding. This means that even though this strategy is new, the students in Narvacan National Central High School are learning and performing well using this strategy.

The use of languages strategies is very important for tackling vocabulary issues in mathematics. Students typically do better on problem-solving tasks when they can accurately translate word problems into mathematical expressions and equations (Emanuel & Chamidah, 2021). Understanding, interpreting, and critically assessing mathematical material are all part of mathematical literacy. The development of language abilities is crucial for the acquisition of mathematical literacy. Students are better prepared to excel in mathematics if they can read and interpret mathematical texts and diagrams (Gal, 2002).

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Table 2. Level of Participation Perceived by the Students and Teachers

Items	Students		Teachers		As a Whole	
	x̄	DR	x	DR	WM	DR
1. Students are participating in identifying the different vocabulary words related to the lesson/ topic in Mathematics.	4.3	A	4.77	A	4.54	A
2. Students are religiously answering assessments using language strategies	3.9	O	4.77	A	4.34	A
3. Students have individual folders to compile their outputs	3.8	O	4.92	A	4.36	A
4. Students answer the assessment using language strategies	4.0	O	4.31	A	4.16	O
5. The students are involved in discovering all the possible vocabularies that can be used in the discussion	3.9	O	3.92	O	3.91	O
6. Students contribute to the preparation needed for the presentation of the output.	4.1	O	4.23	A	4.17	O
7. Students recite their answers using language strategies	3.8	O	4.69	A	4.25	A
8. Students show their eagerness to answer.	3.8	O	4.77	A	4.29	A
9. Students allow their free time to gather together to practice the different language strategies.	3.8	O	4.62	A	4.21	A
10. Students are contributing their ideas during class discussions using language strategies.	3.9	O	4.38	A	4.14	O
Overall Mean	3.95	O	4.54	O	4.25	A

Table 2 The highest mean score according to the student-respondents is 4.3, described as Always, garnered by the statement, "Students are participating in identifying the different vocabulary words related to the lesson/ topic in Mathematics." This is an indication that students are interested in using different language strategies in learning Mathematics because they are participating in identifying different vocabulary words related to their lessons.

Language strategies, such as providing sentence frames or encouraging students to use different vocabularies, boost students' confidence in expressing their ideas. When students feel encouraged to use language, they are more likely to participate (Gibbons 2015).

There are various reasons why effective language strategies tend to increase student participation in math lessons. Language techniques support the development of an inclusive and stimulating learning environment where students are inspired and confident to actively participate (Deignan 2022).

Students are given the means and encouragement to articulate their mathematical ideas through language strategies. Students are more likely to share their ideas and solutions in class as they grow more self-assured in their ability to communicate quantitatively. Students are more likely to actively participate in class discussions and ask questions to further their understanding when they can clearly express their ideas (Gibbons 2019).

Level of Mathematics Performance of the Grade 10 learners in the 4th quarter of Narvacan National Central High School

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Table 3. Level of Mathematics Performance of the Students

Numerical Ratings	f	%	Level of Performance
90 and above	128	51.41	Outstanding
85 – 89	69	27.71	Very Satisfactory
80 – 84	46	18.47	Satisfactory
75 – 79	6	2.41	Fairly Satisfactory
74 and below	0	0	Did Not Meet Expectations
TOTAL	249	100	

Table 3 Results reveal that the highest percentage of 51.41% of the students obtained a final grade of 90 and above which indicates that a great number of students have an Outstanding level of performance which is the highest level of performance that can be attained. The next level of performance attained is Very Satisfactory achieved by 27.71 percent of the total respondents, while there is no (0%) student who "Did Not Meet Expectations". Furthermore, the mean grade of the students is 90 which indicates an Outstanding level. This result suggests that Grade 10 students of the Narvacan National Central High School, in general, have an outstanding performance in Mathematics for the 4th quarter of the school year 2022-2023.

The result is similar to the study of Hebres (2023) where the performance of the Grade 10 student- respondents is outstanding. However, it negates by the study of Derrac (2019) where performance of the Grade 10 student- respondents is satisfactory. This implies that there is a difference mathematics performance in the different schools in the Philippines. The performance of the students in mathematics can be affected by the strategies used by the teachers. It can also be affected by the students socio-economic status, classroom setting, peers and other factors.

Table 4. Relationship Between the Profile of the Students and the Level of Performance of the Students Using Language Strategies

Profile	Level of Performance of the Students Using Language Strategies	
	Correlation Coefficient	p-value
Age	-0.025	0.693
Sex	0.125*	0.049
Birth order	-0.051	0.424
Education of Father	0.115	0.071
Education of Mother	0.041	0.525
Reading Materials Books E-books Newspaper	- 0.012 0.138*	- 0.855 0.030
Frequency of using gadget	-0.08	0.206
Length of time using gadget	-0.08	0.209

Table 4 revealed that there is a correlation between the sex of the respondents and their performance in mathematics using the different language strategies. It is supported by the computed correlation of 0.125 where the correlation is significant at 0.05 level. The positive correlation implies that female is performing better in Mathematics when using different language strategies. Hattie & Timperley (2007) suggested that teachers may provide specialized assistance and instruction to male students who may be having math difficulties. Assistance that is tailored to their unique needs can result in substantial advancements. Mention the practical uses of mathematics to male students. Showing students how math is used in relevant industries helps boost motivation and performance (Leshner & Moseley, 2018). Moreover, teachers may encourage male students to acquire reading materials like newspaper, books and e-books that could help them improve their mathematics performance when using language strategies.

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Table 4. Relationship Between the Profile of the students and the Level of Performance in Language Strategies

Profile	Level of Participation	
	Correlation Coefficient	p-value
Age	0.077	0.693
Sex	0.125*	0.048
Birth order	-0.039	0.536
Education of Father	-0.038	0.555
Education of Mother	0.038	0.553
Reading Materials		
Books	-0.086	0.178
E-books	-0.031	0.631
Newspaper		
Frequency of using gadget	-0.053	0.403
Length of time using gadget	-0.08	0.209

Table 5 revealed that there is a correlation between the sex of the respondents and the level of participation when using the language strategies. The computed r value is 0.0125 which implies that female respondents participate more in class when using language strategies.

This result is supported by the study of Bailey et al. (2020) which revealed that females participated more in classes. Study showed that females participate more than males and teachers place higher standards on females than on males in terms of participation and performance (Garcia 2008). Female students participate in mathematics classes for a variety of reasons, including enjoyment gained from studying mathematics, a desire to study mathematics, and curiosity in mathematics (Yarkwah 2020). However, these results were negated by the study of Martínez et .al (2020) which confirms that females tend to have fewer positive attitudes toward mathematics than their male classmates.

Relationship between the level of performance of the students in terms of the different dimensions in language strategies and the level of Mathematics Performance of the Grade 10 learners in the 4th quarter

Table 5. Correlation between Students' Performance in Language Strategies and Mathematics Performance

Language Strategies	Correlation Coefficient	p-value
Vocabulary Building	0.441**	0.000
Keywords	0.467**	470.000
Profile	0.262**	0.000
Metacognition	0.779**	0.000
Defining	0.515**	0.000
Frames	0.212**	0.001
Overall	0.823**	0.000

Table 6. Overall, it can be seen that there is a positive correlation between student performance and the different language strategies specifically Vocabulary Building, Keywords, Profile, Metacognition, Defining format, and Frames and the level of Mathematics Performance of the Grade 10 learners in the 4th quarter. This means that student performance in different language strategies may fully contribute to a better performance in Mathemtics. It is supported by the study of Peng (2020) which revealed that there is a ssrelation between language and mathematics found in 344 studies with 393 independent samples and more than 360,000 participants.

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

By encouraging students to express their thought processes, participate in reflective conversations, and relate abstract concepts to concrete situations, effective language tactics enable students to comprehend mathematical subject on a deeper level. Students strengthen their understanding and identify misconceptions by verbalizing their ideas and justifications. Discussions among students and teachers help to create a collaborative learning environment where different points of view help to create a deeper knowledge of mathematical ideas (Star & Rittle-Johnson 2009).

In addition, reading skills focusing on understanding the text are important in solving mathematical tasks at the end of compulsory school (Korhonen et al. 2020).

Relationship between level of participation and level of Mathematics performance
Table 6. Correlation between Students' Level of Participation and Level of Performance in the 4th Quarter

	Correlation Coefficient	p-value	Decision
Participation	0.033	0.600	ns

Table 7 revealed that there is no significant relationship between the level of participation and level of performance in the 4th quarter. A possible reason for this result is the different learning styles exist among students. While some students could gain a lot from participating actively in class and having conversations, others might understand subjects better through independent study or practical application (Lincoln Land Community College 2021). The dynamics of the class and its size can affect how participation is perceived. Due to the shorter interaction times in larger classes, it may be more difficult for individual engagement to have a significant effect on overall achievement (Wang & Calvano 2022).

However, Maamin, Maat & Iksan, Z. H. (2021) revealed that mathematical achievement is significantly correlated with affective engagement, and behavioral involvement. Understanding difficult arithmetic topics can be improved by actively participating in class discussions, asking questions, and working through problems together. Different modes of interaction with the subject might improve knowledge retention and application (Prodigy Education 2016).

FINDINGS
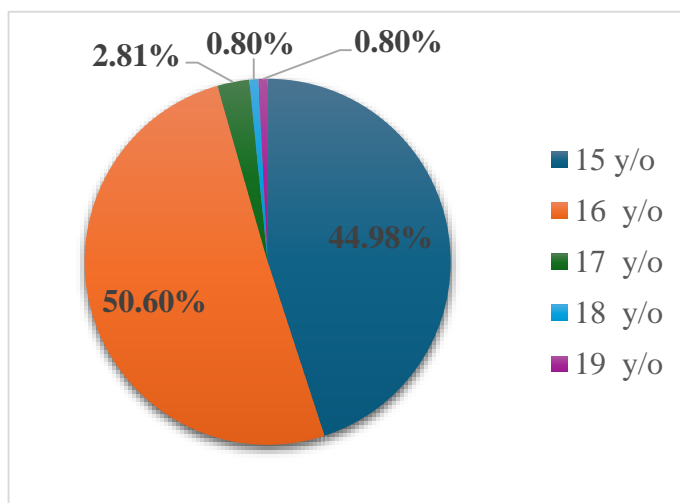
Figure 2. Distribution of Respondents by Age

Figure 2 shows that the majority of the student respondents are 16 years old with a total of 126 or 50.60% of the total respondents. It is followed by the student-respondents who are 15 years old with a total of 112 or 44.98% of the total respondents. There are only 2 or 0.80% of the respondents are 18 years old and 19 years old respectively.

To effectively design instructional strategies and interventions, educators and researchers must recognize how age affects a variety of educational characteristics. Understanding the link between age and student results can help educators create more specialized instructional strategies that cater to the various learning needs of students (Smith, 2017).
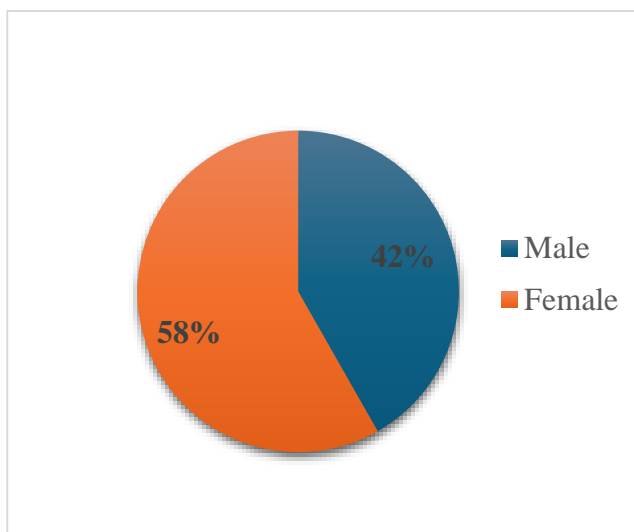
Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Figure 3. Distribution of Respondents by Sex

Figure 3 presents the distribution of respondents in terms of sex. Dominating the figure in terms of sex are the female respondents with 145 or 58% of the total. The male respondents, on the other hand, have 104 or 42%.

Traditional gender roles and conventions have historically given schooling for males a higher priority in many societies. However, societal attitudes are slowly changing to recognize the value of females' education, which may have contributed to a rise in female enrollment (Duflo, 2012). In addition, the global movement for women's empowerment and gender equality has raised awareness of the value of females' education. Higher enrolment rates are a result of initiatives and advertisements emphasizing the advantages of educating female (UNESCO, 2019). Moreover, Johnson (2017) revealed that compared to male students, female students demonstrated higher levels of intrinsic motivation and interest in attending class. In addition, females mainly emphasized the value of education and their desire to thrive academically when discussing their attitudes toward school (Smith & Brown 2018).
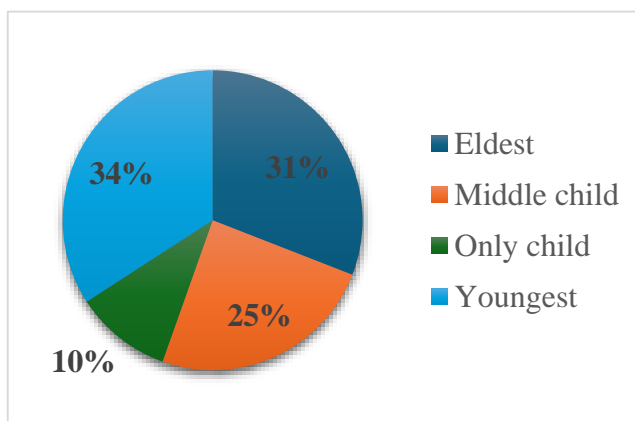
Figure 4. Distribution of Respondents by Birth Order

The youngest children in the family surfaced as the most numbered respondents comprising a total of 85 out of 249 or 34% of student respondents. Following are the eldest, middle children, and only child in the family, with 77 or 31%, 61 or 25%, and 26 or 10%, respectively.

Birth order is one of several factors in a child's life that might affect personality development. Researchers, psychologists, and scientists have been interested in the study of personality and its development for centuries (BetterHelp Editorial Team 2023). The educational experiences and results of a student can be influenced by their birth order. But it's crucial to remember that a students' development and academic success are influenced by a variety of factors, not only birth order (Sitel 2019).
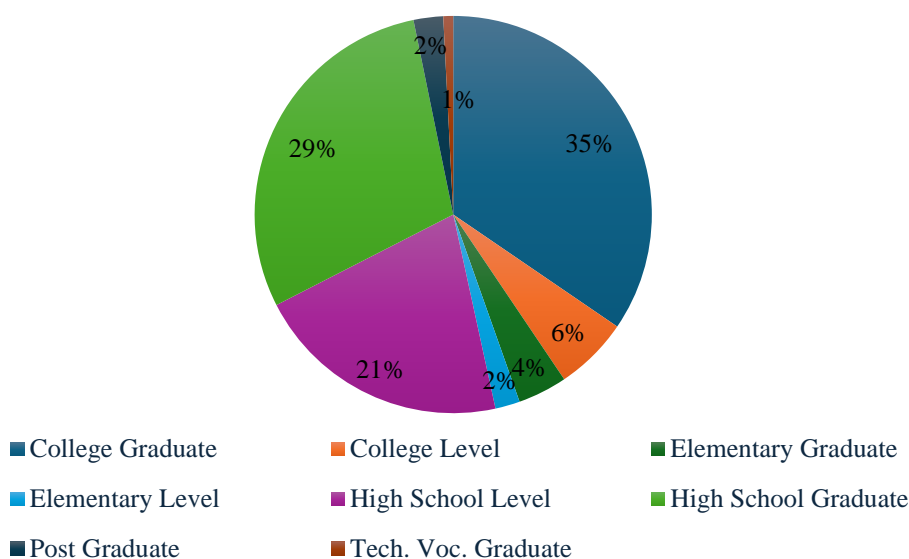
Figure 5. Distribution of Respondents by Educational Attainment of Father

The highest recorded count and percentage is 86 or 35% which belongs to the respondents whose fathers graduated from college. Moreover, those who completed their High School and those who were able to attend high school but did not finish ranked next with 73 or 29% and 52 or 21%, respectively. Those who took technical vocational courses have the least count with 2 or 1%.

Numerous studies have discovered a link between a father's educational background and his children's academic success. Higher educated fathers likely to have children who do better in school (Davis-Kean 2005). Higher-educated fathers frequently have greater expectations for their children's academic success. Children may be inspired to perform well in school by these expectations (Wahi 2023). Moreover, fathers who have completed their education might be good role models for their children. If children witness their fathers respecting and seeking education, they may be more likely to believe it is important (Flouri & Buchanan 2002).
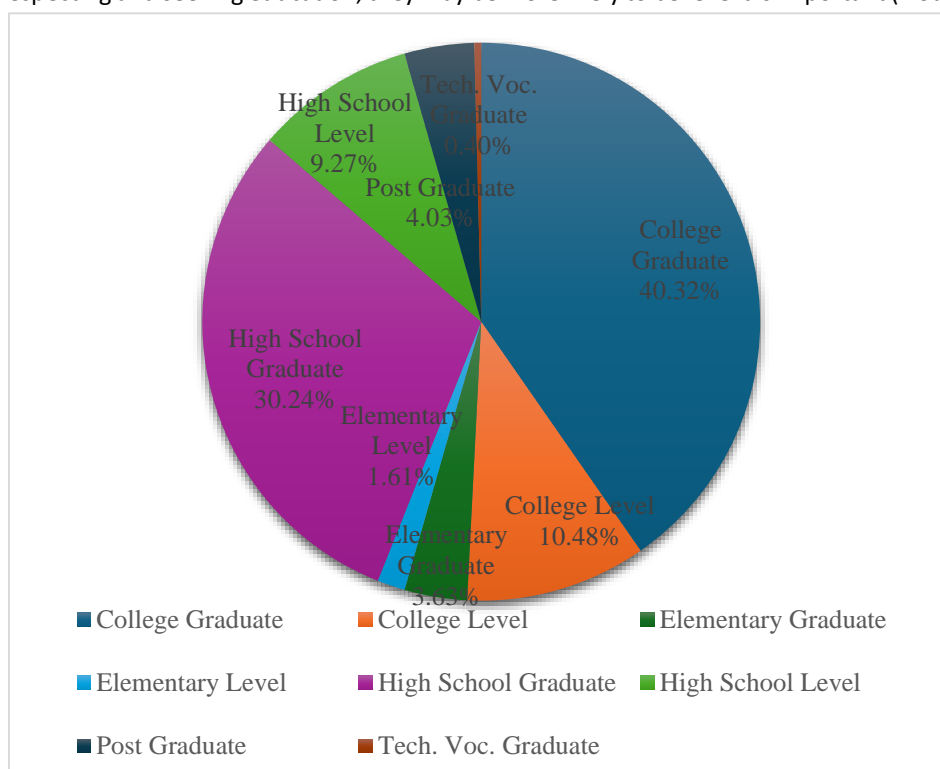
Figure 6. Distribution of Respondents by Educational Attainment of Mother

The highest recorded count and percentage is 40.32% or 100 of the population have mothers who graduated from college. Moreover, those who completed their High School and those who were able to attend college but did not finish ranked next with 75 or 30.24% and 26 or 10.48%, respectively. Those who took technical vocational courses have the least count with 1 or 0.4%.

According to an exploratory study, parents actively manage their child's academic life in ways that may directly affect their educational success. There may be common parental techniques based on the fact that mothers consistently offer the same amount and variety of schooling strategies. Even if the child's academic performance is within control, the tactics that are used do vary depending on the socioeconomic position of the mother. Mothers with at least a bachelor's degree are more aware of their child's academic success, interact with instructors more frequently, and are more inclined to control their child's academic performance. Regardless of their child's academic achievement, women with college degrees are more likely to take college-preparatory courses for their child (Baker & Stevenson, 1986 as cited by Barger, et al. 2019).
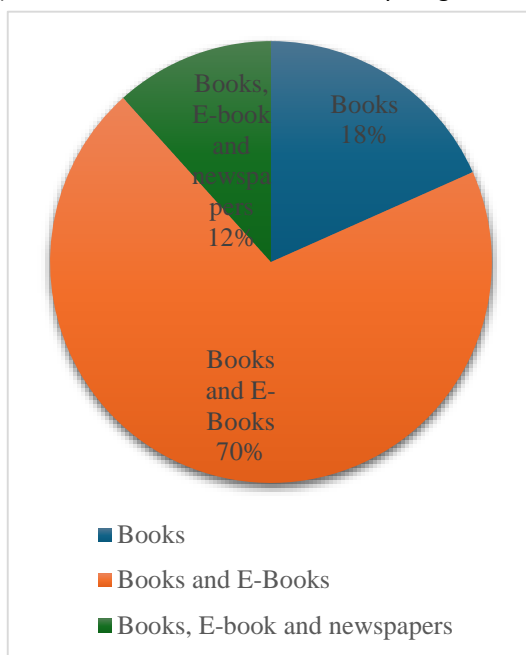
Figure 7. Reading Materials

Most of the student-respondents with a total of 168 or 70% uses books and e-books as their reading materials. There are also 44 or 18% of the respondents who do respondents are using books, e-books, and newspapers as their reading materials. have books as their reading materials. However, only 28 or 12% of the total respondents have all the three reading materials.

The academic performance of students who have access to a variety of reading resources, such as books, periodicals, and newspapers, is generally better. Reading and academic success can be encouraged by having a well-stocked home library or having access to a school or community library (Neuman & Celano 2001). The availability of digital reading materials like e-books and internet resources helps students' academic performance and reading abilities in the modern digital age (Leu et al. 2015).

Moreover, using mathematics e-books has a high effect on students' mathematics achievement (Wijaya et al. 2022). Furthermore, the success of students in mathematics in school is significantly influenced by textbooks (Van Den Ham & Heinze 2018).
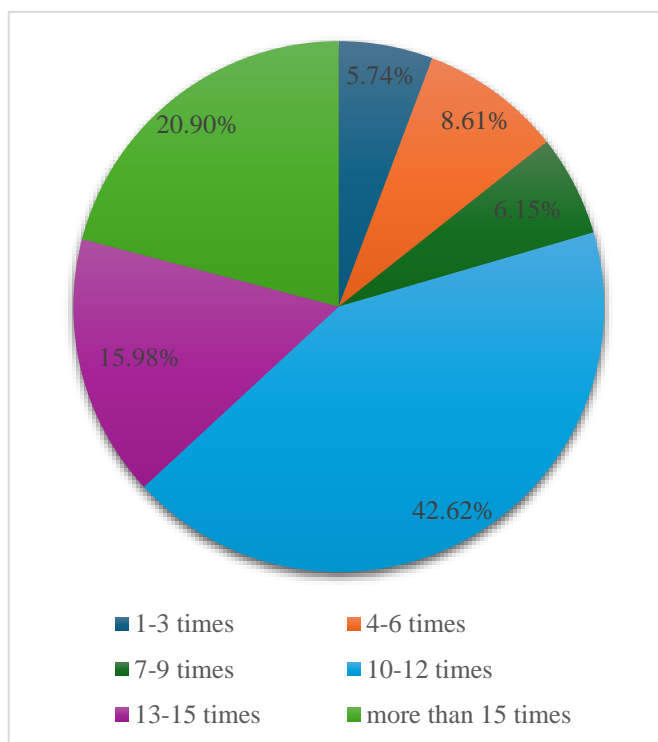
Figure 8. Frequency of Using Gadgets a Day

The highest recorded count and percentage is 109 or 42.62% which belongs to the respondents who use gadgets 10-12 times a day. It is followed by 51 or 20.9% of the respondents who uses gadgets more than 15 times a day. In addition, there is only 14 or 5.74% of the respondents use gadgets 1-2 times a day.

When students use technology for education, whether it's to access educational applications, online materials, or e-books, it can boost their learning and perhaps raise their grade point averages. Innovative educational technology can give students individualized learning opportunities and aid in their comprehension of difficult ideas (Hattie & Yates 2014). However, excessive use of technology for non-educational activities, particularly for social media and gaming, can result in distractions and less study time, which can have a negative impact on academic achievement. The cognitive capacity of students can also be impacted by screen addiction and sleep difficulties brought on by late-night technology use (Twenge 2017).

Based on general observations and limited studies, it is not uncommon for students to use gadgets for several hours a day, especially for educational purposes and social interactions. However, the exact frequency and duration can vary significantly among individuals and across different contexts (Rashid et al. 2021).
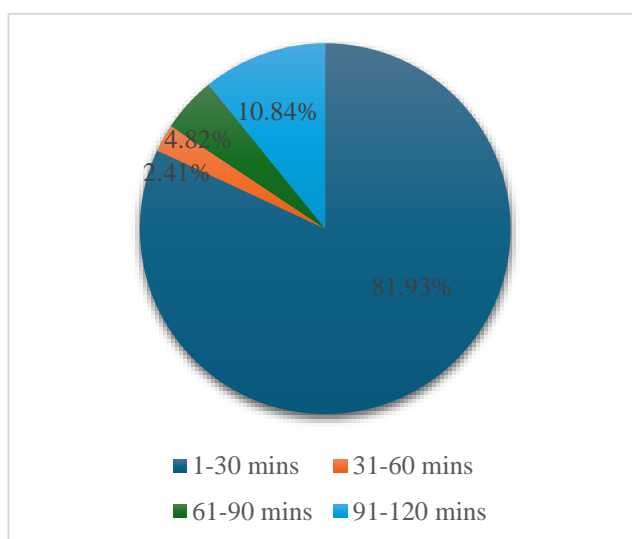

Figure 9. Length of Time in Using Gadgets

Utilization of Language Strategies in Teaching Grade 10 Mathematics of Narvacan National Central High School

Figure 9 revealed that 204 or 81.93% of the respondents use their gadgets 1-30mins peruse. This is because, in school, they are not allowed to use cell phones unless it was needed. There are only a few respondents who use their gadgets 31-60 mins peruse.

It is almost similar to the study of Wahyuni et al. (2019), where most of the student-respondents uses their gadgets less than 5 hours a week. They also advised parents and teachers is to limit the use of gadgets to children where the duration of playing gadgets should be less than 40 minutes/day and frequency less than 3 times/day and 1-3 days/week.

V. CONCLUSION

1. Majority of the student- respondents are female and aged 16 years old. In terms of the educational attainment of their parents, both father and mother were college graduates. Most of the student- respondents are youngest child in their family, have books, e-books, and newspapers as their reading materials and are using their gadgets 10-12 times a day for 1-30 minutes.
2. The students obtained an impressive performance in Mathematics using the different language strategies.
3. The level of participation of the students in class discussions when using Language Strategies in Teaching Mathematics is high.
4. The Grade 10 students of Narvacan National Central High School have an outstanding performance in Mathematics in the Fourth Quarter of the School Year 2022-2023.
5. Sex can be an indicator of the overall performance in mathematics using the different language strategies. Female students obtained a higher performance in language strategies.
6. There is a significant relationship between the sex of the respondents and the level of participation when using the language strategies.
7. There is a significant relationship between the level of performance of the students in terms of the different dimensions in language strategies and the level of Mathematics Performance of the Grade 10 learners in the 4th quarter.
8. Though language strategies is a helpful strategy in teaching mathematics, teachers still encountered problems when teaching mathematics using language strategies. There are some students in the class who have low comprehension and low retention.
9. There is no significant relationship between the level of participation and the level of performance in the 4th quarter.

VI. RECOMMENDATION

1. School heads may organize conferences, webinars, and training sessions related to language strategies in teaching mathematics so that more Mathematics teachers will adopt this strategy.
2. Trained teachers on language strategies shall mentor other mathematics teachers on the utilization of language strategies in teaching mathematics.
3. Teachers should continue using effective and varied teaching strategies like language strategies to improve students' Mathematics performance.
4. Teachers should give enrichment activities to the students to increase their mathematics performance.
5. Students are encouraged to participate actively to classroom discussions related to the different language strategies.
6. The performance of the students may be improved by sustaining the utilization of language strategies in teaching Mathematics by the teachers.
7. Teachers and school heads are encouraged to innovate programs or activities that address issues related to low comprehension and low retention of the students.
8. Mathematics teachers may adapt and implement the output of the study and revisions may be done when needed.
9. Future researcher/s may conduct further studies to verify the results of this current study. Additional variables may be included to enhance the scope.

REFERENCES

1) Aguilar, J. J. (2021). High School Students' Reasons for dislikingMathematics: The Intersection Between Teacher's Role and Student's Emotions, Belief and Self-efficacy. International Electronic Journal of Mathematics Education, 16(3), em0658. https://doi.org/10.29333/iejme/11294
2) Ahmadi, M. R., Ismail, H. N., & Kabilan, M. K. (2013). The importance of Metacognitive Reading Strategy Awareness in reading comprehension. English Language Teaching, 6(10). https://doi.org/10.5539/elt.v6n10p235Greenfader, C. M., Brouillette, L., & Farkas, G. (2014). Effect of a performing arts program on the oral language skills of young English learners. Reading Research Quarterly, 50(2), 185–203. https://doi.org/10.1002/rrq.90

3) Akbaşli, S., Şahin, M., & Yaykiran, Z. (2016). The effect of reading comprehension on the performance in science and mathematics. Journal of Education and Practice, 7(16), 108–121. http://files.eric.ed.gov/fulltext/EJ1108657.pdf

4) Al-Banna, J. B., & Aziz, M. S. A. (2014, June 5). TEACHING STRATEGIES. Retrieved June 21, 2023, from https://www.researchgate.net/publication/327433965_TEACHING_STRATEGIES

5) Al-Rahmi, W. M. (2013). The Impact of Social Media use on Academic Performance among university students: A Pilot Study. ResearchGate.
https://www.researchgate.net/publication/283723637_The_Impact_of_Social_Media_use_on_Academic_Performance _among_university_students_A_Pilot_Study

6) Al-Zahrani, M. A. B. (2011). The Effectiveness of Keyword-based Instruction in Enhancing English Vocabulary Achievement and Retention of Intermediate Stage Pupils with Different Working Memory Capacities. The Effectiveness of Keyword-based Instruction in Enhancing English Vocabulary Achievement and Retention of Intermediate Stage Pupils With Different Working Memory Capacities.

7) Allen, L., Kelly, B. B., Children, Y. B. O., & Families. (2015). Transforming the workforce for children birth through age 8. In National Academies Press eBooks. https://doi.org/10.17226/19401

8) Aureli, D. (2011). The keyword method: a study of v d method: a study of vocabular ocabulary acquisition in fifth y acquisition in fifth grade. https://rdw.rowan.edu/.

9) Arthur, C., Goldenberg, E., Moeller, P., McLeod, B., & Nikula, M. (2017). Strategies to Improve All Students' Mathematics Learning and Achievement. Retrieved June 21, 2022, from https://www.edc.org/strategies-improve-all-students-mathematics-learning-and-achievement

10) Baybay, M. (n.d.). The Relationship of Birth Order and Academic Achievement of PUP Santa Rosa Campus Second Year Students KnE Social Sciences. Retrieved April 2, 2023, from https://knepublishing.com/index.php/Kne-Social/article/view/2431/5340

11) Bailey, E. G., Greenall, R. F., Baek, D., Morris, C., Nelson, N. R., Quirante, T. M., Rice, N., Rose, S., & Williams, K. (2020). Female In-Class Participation and Performance Increase with More Female Peers and/or a Female Instructor in Life Sciences Courses. CBE- Life Sciences Education, 19(3), ar30. https://doi.org/10.1187/cbe.19-12-0266

12) Bation, M. L. A., & Sabaldana, C. (2018, March 19). Determining Grade 10 Students of Molugan National High School to Enroll in Accountancy, Business, and Management Based on National Career Assessment Examination and Academic Performance. Retrieved April 2, 2023, from https://www.researchgate.net/publication/323855517

13) Barger, M. M., Kim, E. M., Kuncel, N. R., & Pomerantz, E. M. (2019). The relation between parents' involvement in children's schooling and children's adjustment: A meta-analysis. Psychological Bulletin, 145(9), 855–890.

14) Bergdahl, N. (2022). Engagement and disengagement in online learning. Computers & Education, 188, 104561. https://doi.org/10.1016/j.compedu.2022.104561

15) Birth Order Theory: Insights into your Personality | BetterHelp. (n.d.). https://www.betterhelp.com/advice/family/birth-order-theory-insights-into-your-personality/

16) Carey, L., & Jacobson, L. (2020, January 23). Kennedy Krieger Institute. Retrieved June 16, 2022, from https://www.kennedykrieger.org/

17) Carter, M. J. (2013). The hermeneutics of frames and framing. SAGE Open, 3(2), 215824401348791. https://doi.org/10.1177/2158244013487915

18) Cheryan, S., Siy, J. O., Vichayapai, M., Drury, B. J., & Kim, S. (2011). Do female and male role models who embody STEM stereotypes hinder women's anticipated success in STEM? Social Psychological and Personality Science, 2(6), 656-664.

19) Chou, M. (2012). Implementing keyword and question generation approaches in teaching EFL summary writing. English Language Teaching, 5(12). https://doi.org/10.5539/elt.v5n12p36

20) Chu, H. (2019). Taking Mathematics Instruction to Task: Applying Second Language Acquisition Approaches to Analyze and Amplify Learning Opportunities for English Learners. Retrieved April 2, 2023, from https://www.semanticscholar.org/paper/Taking-Mathematics-Instruction-to-Task%3A-Applying-to-Chu-Hamburger/b9cbce0f381d2d708111cb57cd6f75570d701c23

21) Davis-Kean, P. E., Tighe, L. A., & Waters, N. (2020). The Role of Parent Educational Attainment in Parenting and Children's Development. Research Gate. Retrieved April 2, 2023, from https://doi.org/10.31234/osf.io/ndmxb

22) Davis-Kean, P. E. (2005). The Influence of Parent Education and Family Income on Child Achievement: The Indirect Role of Parental Expectations and the Home Environment. Journal of Family Psychology, 19(2), 294–304.

23) Da Silva, E. T., De Fátima Nunes, M., Santos, L. B., Queiroz, M. G., & Leles, C. R. (2012). Identifying student profiles and their impact on academic performance in a Brazilian undergraduate student sample. European Journal of Dental Education, 16(1), e27–e32. Retrieved June 21, 2022, from https://doi.org/10.1111/j.1600-0579.2010.00669.x

24) Deary, I. J., Strand, S., Smith, P., and Fernandes, C. (2007). Intelligence and educational achievement. Intelligence 35, 13–21. doi: 10.1016/j.intell.2006.02.001

25) Deignan, S. (2022). Inclusive Teaching: 5 Strategies & Examples. Mentimeter. Retrieved October 1, 2023, from https://www.mentimeter.com/blog/interactive-classrooms/inclusive-teaching-strategies

26) Dela Cruz, J.L. (2019). Entry Mathematics Performance of Industrial Technology Students in One State College. Asia Pacific Journal of Multidisciplinary Research, Vol. 1-4. Retrieved May 5, 2021 from https://shorturl.at/ijBN1

27) Deutschmann, M., & Steinvall, A. (2020). Combatting linguistic stereotyping and prejudice by evoking stereotypes. Open Linguistics, 6(1), 651–671. https://doi.org/10.1515/opli-2020-0036

28) Dimatacot Gladys, & B. Parangat, D. K. (2022). Effectiveness of Cooperative Learning On the Academic Performance in Mathematics of Junior High School Students in the Philippines. Effectiveness of Cooperative Learning on the Academic Performance in Mathematics of Junior High School Students in the Philippines.

29) Dizon, E. C. (2020, June 23). Improving select Grade 7 Filipino students' reading performance using the Eclectic model. Journal of World Englishes and Educational Practices -. https://al-kindipublisher.com/index.php/jweep/article/view/2005

30) Dogra, B. (2022, June 21). Powerful writing with precise language and visual imagery. Education. https://kidsmartapp.co.uk/content/english/precise-language-improve-writing/

31) Duflo, E. (2012). Women's Empowerment and Economic Development. Journal of Economic Literature, 50(4), 1051-1079.

32) Đurišić, M., & Bunijevac, M. (2017). Parental involvement as a important factor for successful education. CEPS Journal : Center for Educational Policy Studies Journal, 7(3), 137–153. https://doi.org/10.26529/cepsj.291

33) Emanuel, E., Kirana, A. R., & Chamidah, A. N. (2021). Enhancing students' ability to solve word problems in Mathematics. Journal of Physics, 1832(1), 012056. https://doi.org/10.1088/1742-6596/1832/1/012056

34) Feliciano, E. (2014). Mathematics Education in the Philippines: Challenges and Initiatives. International Journal for Mathematics Teaching and Learning, 15(3), 1-15.

35) Florentino, L. (2014). Integrating Local Literature in Teaching English to First Graders under K-12 Curriculum. Retrieved April 2, 2023, from https://www.academypublication.com/issues/past/tpls/vol04/07/05.pdf

36) Flouri, E., & Buchanan, A. (2002). The Role of Father Involvement in Children's Later Mental Health. Journal of Adolescence, 25(1), 63–78.

37) Frejd, P., & Österholm, M. (2019). Problem-Based Learning in Mathematics Education: A Case Study of Teachers' Views and Use. International Journal of Science and Mathematics Education, 17(6), 1159-1178.

38) Frommert, C. (2023). Using stories beyond word problems to teach math. Edutopia. https://www.edutopia.org/article/math-class-using-storytelling/

39) Gal, I. (2002). Adults' Statistical Literacy: Meanings, Components, Responsibilities. International Statistical Review, 70(1), 1–25.

40) Garcia, M. G. T. (2008). Gender and class participation: Cape Verdean reality in the efl classrooms. Core. Retrieved August 30, 2023, from http://www.portaldoconhecimento.gov.cv/bitstream/10961/2402/1/Monografia%20ISE%202008%2c%20M.%20Gorette%20T.%20Garcia.pdf

41) Gibbons, P. (2015). English Learners, Academic Literacy, and Thinking: Learning in the Challenge Zone. Heinemann.

42) Gibbons, P. (2009). English Learners Academic Literacy and Thinking: Learning in the Challenge Zone. Heinemann.

43) Haw, J. Y., King, R. B., & Trinidad, J. E. R. (2021). Need supportive teaching is associated with greater reading achievement: What the Philippines can learn from PISA 2018. International Journal of Educational Research, 110, Retrieved April 3, 2023, from 101864. https://doi.org/10.1016/j.ijer.2021.101864

44) Hattie, J., & Yates, G. C. R. (2014). Using Technology to Enhance Teaching and Learning. ACER Press.

45) Hattie, J., & Yates, G. (2014). Visible Learning and the Science of How We Learn. Routledge.

46) Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81-112.S

47) Hebres, R., (2023). Academic Performance and Numeracy Level of Grade 10 Students in Mathematics. https://www.ijsr.net/archive/v12i2/SR23123131547.pdf

48) Henry, D., Nistor, N., & Baltes, B. (2014). Examining the Relationship Between Math Scores and English Language Proficiency. Retrieved April 2, 2023, from https://files.eric.ed.gov/fulltext/EJ1118452.pdf

49) Howard, L. S. (2023, June 29). The art of data Storytelling - learning data - medium. Medium.

https://medium.com/learning-data/the-art-of-data-storytelling-d6807c4d565e

50) Iobidze, M. (2019). Effective metacognitive strategies to boost English as a foreign language reading comprehension. Journal of Education in Black Sea Region. https://doi.org/10.31578/jebs.v4i2.174

51) Jalmasco, N. (2014). Science education realities. Retrieved June 22, 2022, from https://www.pressreader.com/philippines/manila-times/20140529/281629598316736

52) Jones, S. A., Yeo, L. R-C., Yeo, K. K. J., Seilhamer, M. F., Loh, M. Y., & Ho, H. L. (2019). Language matters in mathematics: Singaporean primary classrooms booklet 1 [PDF file]. Singapore: National Institute of Education, Nanyang Technological University. Retrieved April 2, 2022, from: http://hdl.handle.net/10497/21426

53) Jourdain, L., & Sharma, S. (2016). Language challenges in mathematics education for English language learners: A literature review. Waikato Journal of Education, 21(2). https://doi.org/10.15663/wje.v21i2.269

54) Kabigting, R. (2022). Utilizing the RAFT Strategy: Its effects on the writing Performance of Filipino ESL learners. https://eric.ed.gov/?id=EJ1273037

55) Kaphesi, E. (2003). The influence of language policy in education on mathematics classroom discourse in Malawi: the teachers' perspective. Teacher Development, 7(2), 265–285. Retrieved June 16, 2022, from https://doi.org/10.1080/13664530300200190

56) Kaufman S., Elliott M. & Shmueli D. (2020, March 9). Frames, framing and reframing. Beyond Intractability. https://www.beyondintractability.org/essay/framing

57) Korhonen, J., Linnanmäki, K., & Aunio, P. (2012). Language and Mathematical Performance: a Comparison of Lower Secondary School Students with Different Level of Mathematical Skills. Scandinavian Journal of Educational Research, 56(3), 333–344. https://doi.org/10.1080/00313831.2011.599423

58) Kul, Ü., Çelik, S., & Aksu, Z. (2018). The Impact of educational material use on Mathematics Achievement: A Meta-Analysis. International Journal of Instruction, 11(4), 303–324. https://doi.org/10.12973/iji.2018.11420a

59) Last, S. (2019, January 1). 7.4 Technical descriptions and definitions. Pressbooks. https://pressbooks.bccampus.ca/technicalwriting/chapter/technicaldescriptions/

60) Learning and understanding. (2002). In National Academies Press eBooks. https://doi.org/10.17226/10129

61) Leshner, G., & Moseley, C. (2018). Improving math education in the U.S.: What has worked and what hasn't. Brookings Institution.

62) Leshner, G., & Moseley, C. (2018). Improving math education in the U.S.: What has worked and what hasn't. Brookings Institution

63) Leu, D. J., Forzani, E., Rhoads, C., Maykel, C., Kennedy, C., & Timbrell, N. (2015). The New Literacies of Online Reading Comprehension: Expanding the Literacy and Learning Curriculum. Journal of Adolescent & Adult Literacy, 58(2), 97–101.

64) Lincoln Land Community College. (2021). Characteristics of learning styles. https://www.llcc.edu/center-academic-success/helpful-resources/characteristics-learning-styles

65) Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender Gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. Frontiers in Education, 4. https://doi.org/10.3389/feduc.2019.00060

66) Maramag-Manalastas, A. K. E., & Batang, B. L. (2018). Medium of instruction on student achievement and confidence in English. TESOL International Journal, 13(3), 88–99. http://files.eric.ed.gov/fulltext/EJ1247328.pdf

67) Martínez, S. R., Regueiro, B., Piñeiro, I., Estévez, I., & Arias, A. V. (2020). Gender Differences in Mathematics Motivation: Differential effects on performance in Primary education. Frontiers in Psychology, 10. https://doi.org/10.3389/fpsyg.2019.03050

68) Mazana, M. Y., Montero, C. S., & Casmir, R. (2018). Investigating Students' Attitude towards Learning Mathematics. International Electronic Jsournal of Mathematics Education, 14(1). https://doi.org/10.29333/iejme/3997

69) Metacognitive strategies. (2023b, August 16). https://inclusiveschools.org/metacognitive-strategies/

70) Michael, I. (2015). Factors leading to poor performance in mathematics subjects in Kibaha secondary schools. Retrieved April 2, 2023, from https://core.ac.uk/download/pdf/44684738.pdf

71) Moyer-Packenham, P. S., & Westenskow, A. (2013). Effects of Virtual Manipulatives on Student Achievement and Mathematics Learning. International Journal of Virtual and Personal Learning Environments, 4(3), 35-50.

72) Moleko, M. M. (2021, October 5). Teachers' Perspectives on Addressing Linguistic Factors Affecting Visualisation of Mathematics Word Problems. Retrieved June 16, 2022, from https://www.ejmste.com/download/teachers-perspectives-on-addressing-linguistic-factors-affecting-visualisation-of-mathematics-word-11248.pdf

73) Moschkovich, J. (2006). Using Two Languages When Learning Mathematics. Educational Studies in Mathematics, 64(2), 121–144. Retrieved June 16, 2022, from https://doi.org/10.1007/s10649-005-9005-1

74) Mullis, I. V. S., Martin, M. O., and Loveless, T. (2016). Years of TIMSS: International Trends in Mathematics and Science Achievement, Curriculum, and Instruction. Vol. 20. Chestnut Hill, MA: IEA.

75) Nath, B. K. (2010). Major Language Theorists influencing Learning of Mathematics. Major Language Theorists Influencing Learning of Mathematics. http://files.eric.ed.gov/fulltext/ED512896.pdf

76) National Center for Women & Information Technology. (2018). Male Advocates and Allies: Promoting Gender Diversity in Technology Workplaces.

77) National Council of Teachers of Mathematics. (2014). Principles to Actions: Ensuring Mathematical Success for All. Reston, VA: National Council of Teachers of Mathematics

78) Neuman, S. B., & Celano, D. (2001). Access to Print in Low-Income and Middle-Income Communities: An Ecological Study of Four Neighborhoods. Reading Research Quarterly, 36(1), 8–26.

79) Ng, S. F., Hassan, N. S. I. C., Nor, N. H. M., & Malek, N. a. A. (2017). The Relationship between Smartphone Use and Academic Performance: A Case of Students in A Malaysian Tertiary Institution. Malaysian Online Journal of Educational Technology, 5(4), 58–70. http://files.eric.ed.gov/fulltext/EJ1156718.pdf

80) Peng, P., Lin, X., Ünal, Z. E., Lee, K., Namkung, J. M., Chow, J. C., & Sales, A. (2020). Examining the mutual relations between language and mathematics: A meta-analysis. Psychological Bulletin, 146(7), 595–634. https://doi.org/10.1037/bul0000231

81) Pina, V., Martella, D., Moscoso, S. C., Saracostti, M., & Fenollar-Cortés, J. (2021). Gender-Based Performance in Mathematical facts and Calculations in two elementary school samples from Chile and Spain: an exploratory study. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.703580

82) Plass, J. L., & Kaplan, U. (2016). Emotional design in digital media for learning. In D. Schunk & B. Zimmerman (Eds.), Handbook of Self-Regulation of Learning and Performance (2nd ed., pp. 390-405). Routledge.

83) Prochazkova, L. (2013). Mathematics for language, language for mathematics. Retrieved June 16, 2022, from https://files.eric.ed.gov/

84) Prodigy Education. (2016, December 14). 5 Advantages and Disadvantages of Problem-Based Learning [+ Activity design Steps]. Retrieved August 30, 2023, from https://www.prodigygame.com/main-en/blog/advantages-disadvantages-problem-based-learning/

85) Ramos, M. L. (2015). Parental Involvement in Children's Education: A Review Study About the Effect of Parental Involvement on Children's School Education with a Focus on the Position of Illiterate Parents. Procedia-Social and Behavioral Sciences, 186, 1041-1047.

86) Rashid, S. M., Mawah, J., Banik, E., Akter, Y., Deen, J. I., Jahan, A., Khan, N. M., Rahman, M. M., Lipi, N., Akter, F., Paul, A., & Mannan, A. (2021). Prevalence and impact of the use of electronic gadgets on the health of children in secondary schools in Bangladesh: A cross-sectional study. Health Science Reports, 4(4). https://doi.org/10.1002/hsr2.388

87) Reyes, J. D. C. (2019, January 25). MATHEMATICS ANXIETY AND SELF-EFFICACY: A PHENOMENOLOGICAL DIMENSION. https://mail.theshillonga.com/index.php/jhed/article/view/9

88) Reyes, J. (2016). Mathematics Anxiety in the Philippines: A Comparative Study of Public and Private High School Students. European Journal of Education Studies, 2(3), 10-27.

89) Reysio-Cruz, M. (2019, December 27). More women in HS, college than men in PH, says report | Inquirer News. Retrieved April 2, 2023, from https://newsinfo.inquirer.net/1206375/more-women-in-hs-college-than-men-in-ph-says-report

90) Rohrer, J. M., Egloff, B., & Schmukle, S. C. (2015b). Examining the effects of birth order on personality. Proceedings of the National Academy of Sciences of the United States of America, 112(46), 14224–14229. Retrieved April 2, 2023, from https://doi.org/10.1073/pnas.1506451112

91) Rondina, J. Q., & Roble, D. B. (2019). GAME-BASED DESIGN MATHEMATICS ACTIVITIES AND STUDENTS' LEARNING GAINS. Turkish Online Journal of Design, Art and Communication, 9(1), 1–7. https://doi.org/10.7456/10901100/001

92) Saavedra, A. D., & Barredo, C. (2020). Factors that Contribute to the Poor Writing Skills in Filipino and English of the Elementary Pupils. ResearchGate. https://www.researchgate.net/publication

93) Sagarra, N., & Alba, M. C. (2006). The key is in the keyword: L2 Vocabulary learning methods with beginning learners of Spanish. The Modern Language Journal, 90(2), 228–243. https://doi.org/10.1111/j.1540-4781.2006.00394.x

94) Sherman, J., & Bisanz, J. (2009). Equivalence in symbolic and nonsymbolic contexts: Benefits of solving problems with manipulatives. Journal of Educational Psychology, 101(1), 88–100. https://doi.org/10.1037/a0013156

95) Stiel, S. (2019). The Impact of Birth Order on a Child's Educational Experience/Meeting the Social-Emotional Needs of Students Through Implementation of Responsive Classroom Frame-working. The Impact of Birth Order on a Child's Educational Experience/Meeting the Social-Emotional Needs of Students Through Implementation of Responsive Classroom Frame-working. https://repository.stcloudstate.edu/cfs_etds/31/

96) SmartSurvey. (2022, November 1). Age Groups for Surveys - Demographic Questions - SmartSurvey. Retrieved April 2, 2023, from https://www.smartsurvey.co.uk/survey-questions/demographics/age-groups#:~:text=Have%20you%20ever%20wondered %20why,by%20his%20or%20her%20age.

97) Smith, W. (2008, June). Does Gender Influence Online Survey Participation?: A Record-linkage Analysis of University Faculty Online Survey Response Behavior. Retrieved April 2, 2023, from https://files.eric.ed.gov/fulltext/ED501717.pdf

98) Tannenbaum, C., Greaves, L., & Graham, I. D. (2016). Why sex and gender matter in implementation research. BMC Medical Research Methodology, 16(1). Retrieved April 2, 2023, from https://doi.org/10.1186/s12874-016-0247-7

99) The Office of English Language Acquisition, Language Enhancement. (2021). Integrating Language While Teaching Mathematics. Retrieved April 2, 2023, from https://ncela.ed.gov/resources/podcast-integrating-language-while-teaching-mathematics-december-2019

100) The role of mathematics in the overall curriculum | International Mathematical Union (IMU). (n.d.). Retrieved April 2, 2023, from https://www.mathunion.org/icmi/role-mathematics-overall-curriculum

101) Thomas, S. & U.S. DEPARTMENT OF EDUCATION. (2016). Future Ready Learning: Reimagining the Role of Technology in Education. 2016 National Education Technology Plan. Future Ready Learning: Reimagining the Role of Technology in Education. 2016 National Education Technology Plan. http://files.eric.ed.gov/fulltext/ED571884.pdf

102) Thompson, D. R., & Rubenstein, R. N. (2014). Literacy in Language and Mathematics. Journal of Adolescent & Adult Literacy. Retrieved June 16, 2022, from https://doi.org/10.1002/jaal.338

103) Topor, D. R., Keane, S. P., Shelton, T. L., & Calkins, S. D. (2010). Parent involvement and student Academic Performance: A Multiple Mediational analysis. Journal of Prevention & Intervention in the Community, 38(3), 183–197. https://doi.org/10.1080/10852352.2010.486297

104) Twenge, J. M. (2017). iGen: Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy—and Completely Unprepared for Adulthood. Atria Books.

105) UNESCO. (2019). Gender and Education for All: The Leap to Equality. UNESCO.

106) USC University of Southern California. (2023). Research Guides. USC Libraries. Retrieved September 29, 2023, from https://libguides.usc.edu/writingguide/literaturereview

107) file:///C:/Users/HP/Downloads/3688-Article%20Text-12395-1-10-20210421.pdf

108) Valderama, J., & Oligo, J. (2021). Learning retention in mathematics over consecutive weeks: Impact of motivated forgetting. International Journal of Evaluation and Research in Education (IJERE).

109) Van Den Ham, A., & Heinze, A. (2018). Does the textbook matter? Longitudinal effects of textbook choice on primary school students' achievement in mathematics. Studies in Educational Evaluation, 59, 133–140. https://doi.org/10.1016/j.stueduc.2018.07.005

110) Voyer, D., and Voyer, S. D. (2014). Gender differences in scholastic achievement: a meta-analysis. Psychol. Bull. 140, 1174–1204. doi: 10.1037/a0036620

111) Wahi, S. (2023, April 8). The impact of parental expectations on a child's career success. Mindler Blog. https://www.mindler.com/blog/impact-parental-expectations/

112) Wahyuni, A. S., Siahaan, F. B., Arfa, M., Alona, I., & Nerdy, N. (2019). The Relationship between the Duration of Playing Gadget and Mental Emotional State of Elementary School Students. Open Access Macedonian Journal of Medical Sciences, 7(1), 148–151. https://doi.org/10.3889/oamjms.2019.037

113) Wang, L., & Calvano, L. (2022). Class size, student behaviors and educational outcomes. Organization Management Journal, 19(4), 126–142. https://doi.org/10.1108/omj-01-2021-1139

114) Wegner, C., Minnaert, L., & Strehlke, F. (2013). The importance of learning strategies and how the project 'Kolumbus-Kids' promotes them successfully. Retrieved June 21, 2022, from https://files.eric.ed.gov/fulltext/EJ1108220.pdf

115) Weinburgh, M., Silva, C., Smith, K., Groulx, J., & Nettles, J. (2014). The Intersection of Inquiry-Based Science and Language: Preparing Teachers for ELL Classrooms. Journal of Science Teacher Education, 25(5), 519–541. Retrieved April 2, 2023, from https://doi.org/10.1007/s10972-014-9389-9

116) Wijaya, T. T., Cao, Y., Weinhandl, R., & Tamur, M. (2022). A meta-analysis of the effects of E-books on students' mathematics achievement. Heliyon, 8(6), e09432. https://doi.org/10.1016/j.heliyon.2022.e09432

117) William Thurston's quote? (n.d.). Retrieved April 2, 2023, from https://mathoverflow.net/q/323488

118) Wilmer, H. H., Sherman, L. E., & Chein, J. (2017). Smartphones and Cognition: A Review of Research Exploring the Links between Mobile Technology Habits and Cognitive Functioning. Frontiers in Psychology, 8. https://doi.org/10.3389/fpsyg.2017.00605

119) Wriston, J. M. (2015). The Importance of a Strong Mathematical Foundation. Idea Excahnge. https://ideaexchange.uakron.edu/cgi/viewcontent.cgi?article=1182&context=honors_research_projects

120) Yarkwah, C. (2020). FEMALE STUDENTS' PARTICIPATION IN MATHEMATICS EDUCATION AT THE UNIVERSITY LEVEL IN GHANA. ResearchGate.
https://www.researchgate.net/publication/340465229_FEMALE_STUDENTS'_PARTICIPATION_IN_MATHEMATICS_EDUCATION_AT_THE_UNIVERSITY_LEVEL_IN_GHANA

121) Yeh, C. S., Cheng, H. N., Chen, Z., Liao, C. C., & Chan, T. (2019). Enhancing achievement and interest in mathematics learning through Math-Island. Research and Practice in Technology Enhanced Learning, 14(1). Retrieved April 2, 2023, from https://doi.org/10.1186/s41039-019-0100-9Humanities and Social Science Invention (IJHSSI), 9(1), 10-18.

122) Verawati, A., Agustito, D., Pusporini, W., Utami, W. B., & Widodo, S. A. (2022). Designing Android learning media to improve problem-solving skills of ratio. Advances in Mobile Learning Educational Research, 2(1), 216-224.

123) Wahid, A. H., Rahman, K., Qodriyah, K., Bali, M. M. E. I., Baharun, H., & Muali, C. (2020, July). Effectiveness of Android-Based Mathematics Learning Media Application on Student Learning Achievement. In Journal of Physics Conference Series (Vol. 1594, No. 1, p. 012047).

124) Yunus, Y., & Fransisca, M. (2021, February). Four-D Models Method Validation Analysis of an Android-Based Learning Media. In Journal of Physics: Conference Series (Vol. 1779, No. 1, p. 012018). IOP Publishin

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics

Efren B. Cabotage

Narvacan National Central High School, Paratong, Narvacan, Ilocos Sur, Philippines, 2704

ABSTRACT: In this 21st century, students are more compelled towards the use of a mobile phone for every purpose. This study aimed to develop, validate, and test the effectiveness of an android-based learning material in Statistics. The technological profile, technology acceptance in terms of perceived use and perceived ease of use, relationship between the technological profile and technological acceptance, performance of respondents with or without the use, effectiveness, and validity of the android-based learning material were investigated in this study. The study utilized descriptive, developmental, and quasi-experimental research design. Two sections of Grade 10 were considered in the study; one section used the learning material, while the other section did not. Pre-test and post-test were conducted on the two groups. Data gathered were analyzed, tabulated, and presented using frequency count, percentage, mean, standard deviation, paired sample t-test, and simple correlational analysis. It was found out that all respondents have available gadgets; they "often" use technology and "advanced" in terms of technological skills; they strongly agree that the learning material is useful and easy to use; there is a positive relationship between the technology profile and the technology acceptance of the respondents; and the learning material was found to be effective and has very high validity. Hence, it is highly recommended to use the learning material in Statistics. Developing android-based learning material is recommended for other topics in mathematics, and students may be provided with other supplementary materials for greater retention.

KEYWORDS: Android-based learning material, technology profile, technology acceptance, perceived use, perceived ease of use

I. INTRODUCTION

Mathematics deals with logical reasoning, and its development contributed to the expansion of science and technology. It requires critical thinking skills that involve abstraction and analysis. Mathematics has been widely used to improve society through research. The role of mathematics is inevitable; hence, it must be mastered.

Many things must come together for learning to be effective. These elements often result from teachers, students, teaching and learning media or resources, and the learning environment. The development of advanced hardware, software, and other technologies in the computer industry has led to advancements that could be used to address the problem. The development of the student's practical and theoretical knowledge would be greatly enhanced by exploring the potent capabilities of multimedia and implementing it in teaching and learning processes by creating learning materials and products like e-books, Android learning applications, and computer-assisted instruction, among others.

In addition, electronic learning, or e-learning as it is more commonly called, includes mobile learning interaction with information, enabling effective learning without spatial constraints. A source that can be accessed from anywhere, mobile learning is a blend of cloud computing and online learning. Cell phones will make it simpler and more convenient for students to access educational resources without being restricted by time and space.

Mobile technology is an extremely fast-growing industry intrinsically tied to our work and daily life. In this 21st century, students are more compelled to use a mobile phone for every purpose. The world is at the fingertips, and a student can access any information from anywhere. A mobile phone, hence, can be used for several such purposes. Mobile applications make the information easily available. Every mobile app has a unique feature that offers its own set of services.

According to Raphael (2017), learning via mobile applications creates a more interesting, interactive experience for students. Students learn differently; not all can absorb and retain information by reading books. He added that hands-on tools such as videos and illustrations keep students engaged. They can utilize games, activities, and flashcards, helping them retain the information

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics

later. Learning via mobile apps allows teachers to gain immediate feedback on what a student is or is not understanding and can intervene quickly.

Students' success in all learning disciplines is important in generating the best quality of learners who can achieve and compete worldwide. Their performances could demonstrate the effectiveness of the curriculum, which encompasses every aspect of instruction, such as learning resources and teaching pedagogy.

Thus, this study aims to develop an interactive learning mobile application in Statistics. This provided learning resources in teaching and learning Statistics (Measures of Position – Ungrouped Data).

A. Objectives of the Study

This study aimed to develop an android-based learning material in Statistics.

Specifically, the study sought to answer the following:

1. What is the technology profile of the respondents in terms of:

•availability of gadget/s;

•level of technology use; and

•level of technological skills?

2. What is the level of technology acceptance of the developed Android-based learning material in terms of:

•perceived use; and

•perceived ease of use?

3. Is there a significant relationship between the technology profile of the respondents and the technology acceptance of the developed Android-based learning material in Statistics?

4. What is the level of performance of the two groups of respondents:

•with the use of Android-based learning material; and

•without the use of Android-based learning material?

5. Is there a significant difference between the group's performance with or without using Android-based learning material?

6. What is the level of validity of the developed android-based learning material in terms of:

•content quality;

•instructional quality; and

•technical quality?

II.   REVIEW OF LITERATURE

Technological Profile of the Respondents. According to Lai and Hong's (2015) research, while students spent a lot of time on digital technologies, the variety of digital technologies they employed could have been more extensive. This study also identified no practical generational differences in technology use patterns or learning characteristics. According to the findings of this study, generation is neither a determining factor in students' usage of digital tools for learning nor has it had a significant impact on the learning qualities of higher education students.

Availability of Gadgets. The availability of online gadgets significantly influences their functionality, showing that online facilitation thrives on online gadgets. As a result, the importance of online devices in guaranteeing successful online facilitation must be considered. Individual students participating in remote education must make the necessary efforts to acquire these critical online tools/gadgets, such as Android phones, laptops, and desktop computers, among others, to participate in online facilitation. This could be a problem for students because some distance learners need outside assistance to pay their school fees. Thus, the expense of acquiring internet gadgets has become a necessary supplementary cost to their education whether they choose or are compelled to participate in the intended fully online study. (Segbenya et al., 2022).

Technology Skills. Rodrigues et al., (2021) found that the respondents emphasized "adapt my searching strategy to find the most appropriate information and content in digital environments," "share information and content using a variety of digital tools," "manipulate information for easier organization, storage, and retrieval," and "use and select appropriate digital technologies to interact" as skills they felt they had developed more in higher education. Less developed technological skills were those related to security, such as "applying copyright and license rules," "using safety and security measures," "choosing solutions to protect the environment from the impact of digital technologies," and "solving problem situations in digital environments." In addition, the text editor, learning platforms, presentations, WhatsApp, and Instagram were the programs or software utilized by most respondents in their personal, social, academic/professional, and teaching/learning lives. "Search engine navigation and searches," "send messages and use email," "perform academic work," and "use social networks" were the most developed digital technology activities. Students generally saw technology abilities as critical in the future digital world and labor market. Technology is helpful at the organizational level for time management, knowledge dissemination and promotion, and problem-solving, and it allows for

increased efficiency, excellent connectivity and communication, information management, distance work, and adaptation to a constantly changing world.

Development and Validation of Android-based Material. Yunus and Francisco (2021) concluded that the learning media product—android-based learning media—was the basis for the validation analysis. Four-D models were used with research and development techniques to create the instructional materials. After the learning media was finished, the validation process was conducted. The average validity rating on the frequency distribution diagram is 96.8%, which is Very Valid. This conclusion was reached after evaluating five specialists, including media and content experts. The analysis and validation results support the usage of this android-based learning resource for entrepreneurship classes at the Padang Vocational School's Tourism Department.

Mathematics performance. The study by Peteros et al. (2019) finds that 52 or 28.42 percent of respondents had satisfactory performance in mathematics, whereas 97 or 53.01 percent of respondents had a performance that was fairly satisfactory. Only twenty, or 10.93%, had very satisfactory performance, while only thirteen, or 7.10%, had outstanding performance. Furthermore, the statistics indicate room for improvement in the respondents' performance. Learning difficulties in the topic must be addressed to improve students' performance, mainly because their work has already been graded for three grading periods.

III. METHODOLOGY

This study utilized descriptive and quasi-experimental research design employing correlational and developmental approaches to determine the validity, effectiveness, and technology acceptance of the android-based learning material. The descriptive research was chosen to determine the technological profile of the respondents in terms of availability of gadgets, level of technology use, level of technological skills, level of technology acceptance in terms of perceived use and perceived ease of use, level of performance, and level of validity of the learning material. Moreover, the study used correlational methods to determine the relationship between the technology profile and the technology acceptance of the learning material. Meanwhile, developmental research design was considered in developing the android-based learning material, which was validated by experts. The study was conducted among two sections of Grade 10 students of Narvacan National Central High School during the SY 2022-2023. One section used the android-based learning material, composed of 40 learners, and the other did not use the android-based learning material and, composed of 39 learners. The following flowchart was followed throughout the study.
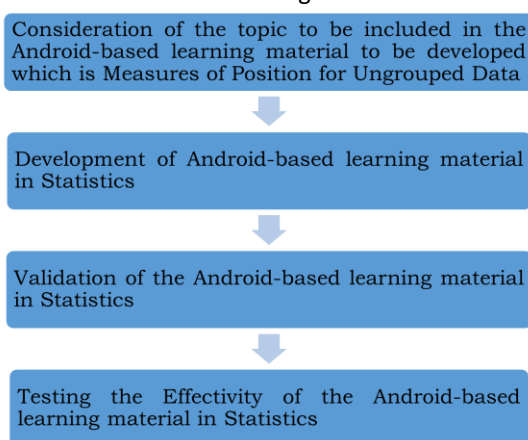

In developing the Android-based learning material, the activities and discussions were made using Lumi software and saved into HTML files. The graphics were made using Microsoft PowerPoint and Canva. Using Adobe XD, HTML files were exported into one folder. Also, the interface and prototype of the Android-based learning material were made using Adobe XD. Finally, using Website 2 APK Android App Builder, the HTML files were converted into an APK (Android Package Kit) format. The APK file was distributed to the students using Bluetooth, SHAREit, and Facebook Messenger and installed on their Android phones.

The process illustrates the development of the android-based learning material.

The figure below shows the interface of the android-based learning material.

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics
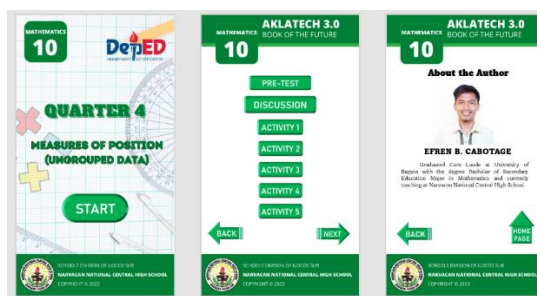
To treat and analyze the data gathered, the following statistical tools were utilized:

Frequency count and percentage were used to describe respondents' technology profile regarding gadgets' availability.

Mean was utilized to determine the level of technology use, level of technological skills, level of technology acceptance of the android-based learning application in Statistics, and level of validity of the android-based learning application. Mean and standard deviation were also used to determine the student's performance level with or without using Android-based learning material.

Simple correlation analysis was used to determine the significant relationship between the technology profile of the respondents and the level of technology acceptance of the android-based learning application in Statistics.

A paired sample T-test was used to determine the significant difference between the group's performance with or without using Android-based learning material.

IV. RESULTS AND DISCUSSIONS

Table 1. AVAILABLE GADGET/S of the RESPONDENTS

Gadget	f	%
Laptop	31	77.50
Desktop	4	10.00
Tablet/iPad	9	22.50
Smartphone	40	100.00

Table 1 shows all the respondents have smartphones, while only 4 (10%) have desktop computers. This means that all of them have available gadgets to use in learning. In the study of Asio et al. (2021), the smartphone ranks first on the list of learning devices available to learners. Because these devices are popular among students, they are among the greatest tools for educational institutions to use (AlTameemy, 2017).

Table 2. Level of Technology Use of the Respondents

Indicators	Mean	DR
1. I use technology while working in teams with other students.	3.95	Often
2. I learned how to use new technology tools this school year.	3.80	Often
3. I take quizzes or tests on the computer/ laptop/ smartphone.	3.88	Often
4. I use technology to search for information for school assignments.	4.23	Very Often
5. I use technology to create products for school (posters, presentations, projects, etc.)	4.23	Very Often
6. I use technology to present information to others (class presentations, demonstrations, etc.)	4.10	Often
7. I use technology to communicate with teachers or students at my school about schoolwork (email, instant message, Facebook/messenger, etc.)	4.38	Very Often
8. I use technology to solve complex, real-life situations and problems.	3.85	Often
OVERALL	4.05	Often

Table 2 indicates that the respondents use technology Very Often (mean=4.05) when they search for information for school assignments, create products for school (posters, presentations, projects, etc.), and communicate with teachers or students

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics

about schoolwork. In general, the respondents use technology Often in their learning process. It implies that the use of technology is helpful in the learning process of the respondents. According to the study by Thompson (2013), it is crucial for instructors to critically evaluate claims regarding digital natives' technological proficiency and to establish accurate assessments of their students' technological proficiency.

The study of Rashid et al. (2016) revealed that students' involvement and self-directed learning are directly related to their use of technology. However, there is no substantial direct association between technology use and academic performance. The results indicate a complicated linkage between student technology use, self-directed learning, and academic success.

Table 3. Level of Technological Skills of the Respondents

Indicators	Mean	DR
1. Create and format reports or documents (Microsoft Word, etc.).	3.78	Advanced
2. Create and format spreadsheets (Microsoft Excel, etc.).	4.20	Advanced
3. Create presentations (PowerPoint, etc.).	3.73	Advanced
4. Create multimedia products (combining pictures, sounds, writing, etc.).	4.03	Advanced
5. Create graphs and charts (Microsoft Excel, Microsoft Word, etc.).	3.65	Advanced
6. Solve mathematical problems using a graphing calculator or mathematical software.	3.80	Advanced
7. Upload and edit digital media (pictures, video, audio, etc.).	4.18	Advanced
8. Find information on the internet using search engines (Google, Microsoft Edge, Mozilla Firefox, etc.).	4.35	Expert
9. Send and receive email messages.	4.18	Advanced
10. Work with others online (Google Docs, wikis, discussion boards, etc.).	4.15	Advanced
OVERALL	4.00	Advanced

Table 3 shows the respondents' level of technological skills. The respondents are Experts (mean = 4.00) in finding information on the internet using search engines. In general, the respondents are advanced in their technological skills. It implies that the respondents can use technology in their learning process. In the study of Thompson (2013), if early technology immersion affects development and thinking in the way many famous press authors suggest, then this collection of "digital learner" qualities may be present in the subset of the digital native population that uses a wide range of technologies regularly.

Level of Technology Acceptance of the Developed Android-Based Learning Material in Statistics

Table 4. Level of Technology Acceptance in Terms of Perceived Use

Indicators	Mean	DR
1. Using the Android-based learning material would enable me to accomplish tasks more quickly.	4.53	Strongly Agree
2. Using the Android-based learning material would improve my academic performance.	4.43	Strongly Agree
3. Using the Android-based learning material increases my efficiency in studying statistics.	4.25	Strongly Agree
4. Using the Android-based learning material would enhance my effectiveness in studying statistics.	4.30	Strongly Agree
5. Using the Android-based learning material would make it easier to study statistics	4.30	Strongly Agree
6. I would find the Android-based learning material helpful in studying statistics	4.30	Strongly Agree
OVERALL	4.35	Strongly Agree

Table 4 reflects the respondents' level of technological acceptance of the Android-based learning material in terms of perceived usefulness. The respondents Strongly Agree (mean = 4.35) that the android-based learning material is perceived as useful in their learning process. This implies that the respondents perceived the android-based learning material useful in learning Statistics. In

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics

the study of Masrom (2007), according to the findings', perceived usefulness is more relevant than attitude toward utilizing in predicting intention to use. According to TAM, perceived usefulness significantly influences students' intention to use technology.

Table 4. Level of Technology Acceptance in Terms of Perceived Ease of Use

Indicators	Mean	DR
1. Learning to use the Android-based learning material would be easy for me.	4.50	Strongly Agree
2. I would find it easy to get the Android-based learning material to do what I want it to do.	4.33	Strongly Agree
3. My interaction with the Android-based learning material would be clear and understandable.	4.33	Strongly Agree
4. I would find the Android-based learning material clear and understandable.	4.28	Strongly Agree
5. It would be easy for me to become skillful at using the Android-based learning material.	4.30	Strongly Agree
6. I would find the Android-based learning material easy to use.	4.23	Strongly Agree
OVERALL	4.32	Strongly Agree

Table 5 reflects the respondents' level of technology acceptance regarding the perceived ease of use of the Android-based learning material. The respondents Strongly Agree (mean = 4.32) that the android-based learning material is perceived as easy to use and could help them learn. This implies that the Android-based learning material is easy to use and useful in mastering statistics skills. In the study conducted by Dart et al. (2020), one of the most common themes in student replies was that WEVs' (Worked Example Videos) vocal explanations improved their understanding of the subject. Students used this understanding to improve their course achievement. Previous studies have indicated this is a common belief among the student population, with about 90% believing that WEVs improve technical topic understanding.

Table 5. Relationship between the Level of Technology Use and Technology Acceptance

Level of Technology Use	Perceived Use		Perceived Ease of Use	
	Computed r	p-value	Computed r	p-value
1. I use technology while working in teams with other students.	-.153	.344	.049	.765
2. I learned how to use new technology tools this school year.	.143	.380	.064	.697
3. I take quizzes or tests on the computer/ laptop/ smartphone.	.243	.130	.245	.128
4. I use technology to search for information for school assignments.	.050	.758	.339[*]	.032
5. I use technology to create products for school (posters, presentations, projects, etc.)	.247	.125	.160	.325
6. I use technology to present information to others (class presentations, demonstrations, etc.)	.150	.356	.037	.822
7. I use technology to communicate with teachers or students at my school about schoolwork (email, instant message, Facebook/messenger, etc.)	.239	.138	.139	.392
8. I use technology to solve complex, real-life situations and problems.	.140	.388	.148	.363

*Correlation is significant at the 0.05 level (2-tailed).

Development, Validation, and Effectiveness of Android-Based Learning Material in Statistics

Table 6 shows a positive relationship between using technology to search for information for school assignments and the perceived ease of use of the Android-based learning material in statistics (r=.339, p-value=.032). Hussein (2017) found that perceived ease of use and usefulness were not significant indicators of E-learning intention to use. This could be because most students already know about E-learning and believe that the technology is convenient and has satisfied them.

Moreover, Hussein (2017) states that attitude is vital in motivating students to use E-learning. Subjective norm (SN), Experience (EXP), and Enjoyment (ENJOY) are found to have a positive and significant influence on students' perceived usefulness (PU) of e-learning.

Table 6. Relationship between the Level of Technological Skill and Technology Acceptance

Level of Technological Skills	Perceived Use		Perceived Ease of Use	
	Computed r	p-value	Computed r	p-value
1. Create and format reports or documents (Microsoft Word, etc.).	.104	.523	.031	.849
2. Create and format spreadsheets (Microsoft Excel, etc.).	-.100	.541	-.126	.439
3. Create presentations (PowerPoint, etc.).	.165	.310	.279	.081
4. Create multimedia products (combining pictures, sounds, writing, etc.).	.158	.329	.129	.428
5. Create graphs and charts (Microsoft Excel, Microsoft Word, etc.).	.115	.480	.068	.678
6. Solve mathematical problems using a graphing calculator or mathematical software.	.187	.248	.168	.299
7. Upload and edit digital media (pictures, video, audio, etc.).	.064	.696	.382 *	.015
8. Find information on the internet using search engines (Google, Microsoft Edge, Mozilla Firefox, etc.).	.132	.416	.327 *	.040
9. Send and receive email messages.	.112	.492	.419 **	.007
10. Work with others online (Google Docs, wikis, discussion boards, etc.).	.109	.505	.193	.232

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 7 shows a positive relationship between uploading and editing digital media and the perceived ease of use of the developed android-based learning material, r = .382, p-value = .015. In addition, there is also a positive relationship, r=.327, p-value = .040, between finding information on the internet using search engines such as Google, Microsoft Edge, and Mozilla Firefox and perceived ease of use of the developed Android-based learning material. Also, there is a relationship of 0.01 significance between sending and receiving email messages and the perceived ease of use of the developed Android-based learning material. It implies an association between the level of technological skill and technological acceptance of the android-based learning material. The positive relationship between uploading and editing digital media and the perceived ease of use of the developed Android-based learning material suggests that students who engage in multimedia creation and manipulation find the material more user-friendly. This alignment can enhance their learning experience by allowing them to interact with content in diverse ways. It indicates that students who are adept at online research may navigate the material more effectively. Access to relevant online resources can contribute to a smoother learning process.

According to Ajibade (2018), the ability of staff members to effectively use technology is influenced by their level of IT proficiency and experience. On the other hand, factors such as a company's rules, policies, and IT guidelines can influence an

individual's acceptance and intention to use technology in the workplace. Additionally, personal, or professional goals, as well as the desire for promotion, can also impact one's attitude towards using IT to perform better, which can subsequently increase their intention to use technology more effectively. Employees' effectiveness or self-efficacy has a positive effect on the ease of use and perceived usefulness of a system, Ding & Er (2018) as cited by Abijade (2018). The external variable that may influence the acceptance of technology has already been discussed, and not simply perceived ease of use as suggested by the TAM (Joo, So & Kim, 2018; le Roux & Bresshears, 2016).

Table 8. Performance of the Respondents with or without the use of Android-based learning material (ABLM)

	Mean Score	Standard Deviation	Descriptive Rating
With the Use of ABLM			
PRE-TEST	6.98	1.2547	Satisfactory
POST-TEST	13.63	0.7644	Outstanding
Without the Use of ABLM			
PRE-TEST	6.97	1.3679	Satisfactory
POST-TEST	10.77	0.9990	Very Satisfactory

Table 8 shows that the respondents who used and did not used the android-based learning material had a satisfactory performance with a mean score of 6.98 and 6.97, respectively, in the pre-test. It was shown that the respondents who used the ABLM had an Outstanding performance with a mean score of 13.63 in the post-test. Meanwhile, the students who did not use the ABLM had a Very Satisfactory performance with a mean score of 10.77. It implies that using ABLM as a supplementary material greatly affected the respondents' performance. The ABLM significantly contributes to student achievement, leading to outstanding post-test results.

In the study of Ghavifekr and Rosdy (2015), findings show that ICT integration is highly effective for both teachers and students. The findings show that teachers' well-preparedness with ICT tools and facilities is one of the most important variables in the effectiveness of technology-based teaching and learning.

Furthermore, Cabuquin and Abocejo (2023) conclude that mathematics performance and academic achievement are inextricably linked, and gender does not affect students' ability to excel in mathematics. Teachers must help students understand how to solve problems and think critically, expose them to real-world applications, and instill the confidence and motivation to succeed academically.

Table 9. Significant difference Between the Performance of the Respondents with or without the use of Android-based learning material

	Paired Differences							
			Std. Error Mean	95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation		Lower	Upper	t	df	
PRE-TEST	.02564	1.99324	.31917	-.62049	.67177	.080	38	.936
POST-TEST	-2.84615	1.20391	.19278	-3.23642	-2.45589	-14.764	38	.000

A total of 79 students were respondents in this study, using android-based learning material, n = 40, and without using android-based learning material, n = 39. As shown in Table 9, the pre-test of the respondents with or without the use of ABLM, t = .080, p-value = .936, has no significant difference, while the post-test of the respondents with or without the use of ABLM, t = -14.764, p-value=.000, has a significant difference. It implies that the android-based learning material is effective as a supplementary learning material in studying statistics. A similar study by Wahid (2020) found that android-based learning material affects student achievement in basic mathematical concepts. Moreover, Wahid (2020) found that using Android-based learning material about basic mathematical principles can result in feelings of pleasure and a rapid understanding of the subject matter.

Furthermore, using Android-based learning media increases students' enthusiasm for acquiring numeracy information in mathematics fundamental concepts courses. Android-based learning media, particularly math material, has improved student learning achievement. Finally, Sunarto et al. (2020) found that the difference in average pre-test and post-test scores in the MoLearn (Mobile Learning Application) class is more significant than in the non-MoLearn class. It suggests that adopting MoLearn (Mobile Learning Application) for learning has increased student achievement.

Table 10. Validity of the Developed Android-based Learning Material in Terms of Content Quality, Instructional Quality, and Technical Quality

Indicators	Mean	DR
CONTENT QUALITY		
1. Content is consistent with topics/skills found in the DepED Learning Competencies for the subject and grade/year level it was intended.	5.00	VHV
2. Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.	4.67	VHV
3. Content is accurate.	5.00	VHV
4. Content is up to date.	5.00	VHV
5. Content is logically developed and organized.	5.00	VHV
6. Content is free from cultural, gender, racial, or ethnic bias.	4.67	VHV
7. Content stimulates and promotes critical thinking.	5.00	VHV
8. Content is relevant to real-life situations.	5.00	VHV
9. Language (including vocabulary) is appropriate to the target user level.	4.67	VHV
10. Content promotes positive values that support formative growth.	4.67	VHV
MEAN SCORE	**4.87**	**VHV**
INSTRUCTIONAL QUALITY		
1. Purpose of the material is well defined.	4.33	VHV
2. Material achieves its defined purpose.	4.67	VHV
3. Learning objectives are clearly stated and measurable.	4.33	VHV
4. Level of difficulty is appropriate for the intended target user.	4.33	VHV
5. Graphics/colors/sounds are used for appropriate instructional reasons.	4.67	VHV
6. Material is enjoyable, stimulating, challenging, and engaging.	4.67	VHV
7. Material effectively stimulates creativity of target user.	4.67	VHV
8. Feedback on target user's responses is effectively employed.	4.67	VHV
9. Target users can control the presentation and review rate and sequence.	4.67	VHV
10. Instruction is integrated with target user's previous experience.	5.00	VHV
MEAN SCORE	**4.60**	**VHV**
TECHNICAL QUALITY		
1. Audio enhances understanding of the concept, if any.	4.00	HV
2. Speech and narration (correct pacing, intonation, and pronunciation) are clear and can be easily understood, if any.	4.00	HV
3. There is complete synchronization of audio with the visuals, if any.	4.00	HV
4. Music and sound effects are appropriate and effective for instructional purposes, if any.	4.00	HV
5. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.	4.00	HV
6. Visual presentations (non-text) are clear and easy to interpret.	4.33	VHV

7. Visuals sustain interest and do not distract the user's attention.	4.67	VHV
8. Visuals provide an accurate representation of the concept discussed.	4.67	VHV
9. The user support materials (if any) are effective.	4.33	VHV
10. The design allows the target user to navigate freely through the material.	4.67	VHV
11. The material can easily and independently be used.	4.67	VHV
12. The material will run using minimum system requirements.	4.67	VHV
13. The program is free from technical problems.	4.00	HV
MEAN SCORE	**4.31**	**VHV**
OVERALL	**4.59**	**VHV**

* VHV - Very Highly Valid, HV - Highly Valid

As shown in Table 10, the android-based learning material is Very Highly Valid with a mean of 4.87 in terms of Content Quality, Very Highly Valid with a mean of 4.60 in terms of Instructional Quality, and Very Highly Valid with a mean of 4.31 in terms of Technical Quality. Overall, the android-based learning material is Very Highly Valid with a mean of 4.59. The result of the validity implies that the android-based learning material is appropriate and valid. It also suggests that the material effectively covers relevant and valuable educational content. Furthermore, it implies that the instructional design and delivery contribute positively to the learning experience. This indicates that the technical aspects usability, functionality, and reliability are well-executed. In the study of Pantaleon (2022), the overall mean score of "Very Valid" implies that the generated Basic Calculus educational material can help students improve their Basic Calculus ability. Likewise, in Garcia's study (2022), the researcher-created strategic intervention material was assessed as highly valid and reliable in assisting students in developing proficiency in various learning abilities. Prasetyo's (2019) study concluded that the creation of Android-based mobile learning media products is suitable for use in Physical Education, Sports, and Health (PJOK) learning processes. The study also found that the developed product effectively enhanced students' learning outcomes.

V. CONCLUSION

The following are the conclusions reached after rigorous examination and interpretation of the findings.

1. All respondents have available gadgets such as smartphones. The respondents often use technology and Advanced regarding technological skills.

2. The respondents strongly Agree on the technological acceptance of the android-based learning material in terms of its perceived use and ease of use.

3. There is a positive relationship between the technology profile and the respondents' acceptance, specifically on the perceived ease of use of the Android-based learning material.

4. The respondents who used android-based learning material showed an outstanding performance; meanwhile, the respondents who did not use android-based learning material manifested a Very Satisfactory performance.

5. There is a significant difference in students' performance with or without using Android-based learning material.

6. The developed android-based learning material has a Very High Validity that can help students develop proficiency in the different learning competencies.

VI. RECOMMENDATION

Based on the conclusions made, the researcher as a result of this recommends the following:

1. Using the developed android-based learning material in Statistics is highly encouraged in teaching Measures of Position, as evident from the study.

2. Provision of learning gadgets such as tablets and smartphones for those who do not have access to technology from the DepEd Computerization Program.

3. The development of android-based learning material is recommended for other topics in mathematics to achieve greater retention among students.

4. Incorporate more interactive online and offline activities that could sustain the students' interest.

5. Students may be provided with other supplementary materials such as activity sheets, self-learning modules, and strategic intervention materials to achieve the desired learning competencies more significantly.

6. A further study along this line should be conducted to validate and strengthen the results and findings of this study and to consider the interactive aspect of the material they will produce.

REFERENCES

1) Ahmar, A., & Rahman, A. (2017). Development of teaching material using an Android. Global Journal of Engineering Education, 19(1).

2) Ajibade, P. (2018). Technology acceptance model limitations and criticisms: Exploring the practical applications and use in technology-related studies, mixed-method, and qualitative researches. Library Philosophy and Practice, 9.

3) Alcantara, E. C., Veriña, R. U., & Niem, M. M. (2020). Teaching and learning with technology: ramification of ICT integration in mathematics education. Teaching and Learning, 10(1).

4) AlTameemy, F. (2017). Mobile Phones for Teaching and Learning: Implementation and Students' and Teachers' Attitudes. Journal of Educational Technology Systems, 45(3), 436–451. https://doi.org/10.1177/0047239516659754

5) Almelhi, A. M. (2021). Effectiveness of the ADDIE Model within an E-Learning Environment in Developing Creative Writing in EFL Students. English Language Teaching, 14(2), 20-36.

6) Altawallbeh, M., Soon, F., Thiam, W., & Alshourah, S. (2015). Mediating Role of Attitude, Subjective Norm and Perceived Behavioural Control in the Relationships between Their Respective Salient Beliefs and Behavioural Intention to Adopt E-Learning among Instructors in Jordanian Universities. Journal of Education and Practice, 6(11), 152-159.

7) Andamon, J. C., & Tan, D. A. (2018). Conceptual understanding, attitude, and performance in mathematics of grade 7 students. International Journal of Scientific & Technology Research, 7(8), 96-105.

8) Asio, J. M. R., Gadia, E., Abarintos, E., Paguio, D., & Balce, M. (2021). Internet Connection and Learning Device Availability of College Students: Basis for Institutionalizing Flexible Learning in the New Normal. Studies in Humanities and Education, 2(1), 56–69. https://doi.org/10.48185/she.v2i1.224

9) Cabuquin, J. C., & Abocejo, F. T. (2023). Mathematics learners' performance and academic achievement at a public high school institution in Leyte, Philippines. Formatif: Jurnal Ilmiah Pendidikan MIPA, 13(2).

10) Casty, M. M., Ciriaka, M. G., & Peter, R. (2021). Mathematics anxiety, attitude, and performance among secondary school students in Kenya. Educational Research and Reviews, 16(6), 226-235.

11) Chang, C. T., Hajiyev, J., & Su, C. R. (2017). Examining the Students' Behavioral Intention to Use E-learning in Azerbaijan? The general extended technology acceptance model for the e-learning approach. Computers & Education, 111, 128-143.

12) Charness, N., & Boot, W. R. (2015). Technology, Gaming, and Social Networking. Handbook of the Psychology of Aging (Eighth Edition), 389-407. https://doi.org/10.1016/B978-0-12-411469-2.00020-0

13) Dart, S., Pickering, E., & Dawes, L. (2020). Worked example videos for blended learning in undergraduate engineering. AEE Journal, 8(2).

14) Dockendorff, M., & Solar, H. (2018). ICT integration in mathematics initial teacher training and its impact on visualization: the case of GeoGebra. International Journal of Mathematical Education in Science and Technology, 49(1), 66-84.

15) Dwitiyanti, N., Kumala, S. A., & Widiyatun, F. (2020). Using the ADDIE model in development of physics unit conversion application based on Android as learning media. Formatif: Jurnal Ilmiah Pendidikan MIPA, 10(2).

16) Eliza, F., Myori, D. E., & Fadli, R. (2019, November). Validity of Android-Based Learning Media in Subject Measurement and Instrumentation. In Journal of Physics: Conference Series (Vol. 1387, No. 1, p. 012028). IOP Publishing.

17) Garcia, M. T. T. (2022). Strategic Intervention Material to Improve the Performance of the College Freshmen Students. Journal of Learning and Educational Policy (JLEP) ISSN: 2799-1121, 2(03), 8-17.

18) Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. International journal of research in education and science, 1(2), 175-191.

19) Hakim, S. R., Kustijono, R., & Wiwin, E. (2019, February). The use of android-based teaching materials in the physics learning process at vocational high school. In Journal of Physics: Conference Series (Vol. 1171, No. 1, p. 012024). IOP Publishing.

20) Handoyono, N. A. (2020). Development of android-based learning application in EFI materials for vocational schools. In Journal of Physics: Conference Series (Vol. 1456, No. 1, p. 012050). IOP Publishing

21) Hussein, Z. (2017). Leading to intention: The role of attitude in relation to technology acceptance model in e-learning. Procedia Computer Science, 105, 159-164. https://doi.org/10.1016/j.procs.2017.01.196

22) Joo, Y. J., So, H. J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. Computers & Education, 122(1), 260-272.

23) Keong, C. C., Horani, S., & Daniel, J. (2005). A study on the use of ICT in mathematics teaching. Malaysian Online Journal of Instructional Technology, 2(3), 43-51.

24) Lai, K. W., & Hong, K. S. (2015). Technology use and learning characteristics of students in higher education: Do generational differences exist?. British Journal of Educational Technology, 46(4), 725-738.

25) Lisana, L., & Suciadi, M. F. (2021). The acceptance of mobile learning: a case study of 3D simulation android app for learning physics. International Journal of Interactive Mobile Technologies (iJIM), 15(17), 205-214.

26) Luckay, M., & Collier-Reed, B. (2012). Comparing the technological literacy of pre-service teachers and secondary school students in South Africa. In EDULEARN12 Proceedings (pp. 635-642). IATED.

27) Marikyan, D. & Papagiannidis, S. (2023). Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), TheoryHub Book. Available at http://open.ncl.ac.uk / ISBN: 9781739604400

28) Masrom, M. (2007). Technology acceptance model and e-learning. Technology, 21(24), 81.

29) Mavridis, A., Katmada, A., & Tsiatsos, T. (2017). Impact of online flexible games on students' attitude towards mathematics. Educational Technology Research and Development, 65(6), 1451-1470.

30) Obrial, J. T., & Lapinid, M. R. C. (2020). The Use of Statistical Investigation in Assessing Students' Performance in Statistics. Action Research and Innovation in Science Education, 3(2), 47–54. https://doi.org/10.51724/arise.36

31) Pantaleon, A. P. (2022). Development and Validation of Instructional Material in Basic Calculus. International Journal of Innovative Science and Research Technology, 7(5), 228-232.

32) Perienen, A. (2020). Frameworks for ICT integration in mathematics education teacher's perspective. Eurasia Journal of Mathematics, Science and Technology Education, 16(6), em1845.

33) Peteros, E., Gamboa, A., Etcuban, J. O., Dinauanao, A., Sitoy, R., & Arcadio, R. (2019). Factors affecting mathematics performance of junior high school students. International Electronic Journal of Mathematics Education, 15(1), em0556.

34) Prabowo, A., Rahmawati, U., & Anggoro, R. P. (2019). Android-based teaching material for statistics integrated with social media WhatsApp. International Journal on Emerging Mathematics Education, 3(1), 93-104.

35) Prasetyo, H., Kristiyanto, A., & Doewes, M. (2019). The development of Android-based mobile learning media in healthy lifestyle teaching materials for senior high school students. International Journal of Multicultural and Multireligious Understanding, 6(2), 188-194.

36) Pratama, Y., Muchtar, Z., & Darmana, A. (2021). Develop an Android-Based Learning Media Integrated with a Scientific Approach to the Colligative Solution's Nature. Budapest International Research and Critics in Linguistics and Education (BirLE) Journal, 4(1), 322-329.

37) Raphael, R. (2017). Mobile Apps in the Classroom. QuestionPro. https://www.questionpro.com/blog/mobile-apps-classroom/

38) Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement, and academic performance: Examining the interrelations. Computers in human behavior, pp. 63, 604–612.

39) Rodrigues, A. L., Cerdeira, L., Machado-Taylor, M. D. L., & Alves, H. (2021). Technological skills in higher education—Different needs and different uses. Education Sciences, 11(7), 326.

40) Segbenya, M., Bervell, B., Minadzi, V. M., & Somuah, B. A. (2022). Modeling the perspectives of distance education students towards online learning during the COVID-19 pandemic. Smart Learning Environments, 9(1), 13.

41) Siahaan, K. W. A., Manurung, H. M., & Siahaan, M. M. (2021). Android-Based Learning Media Development Strategies During Pandemic Times to Improve Student Science Literature. International Journal of Education and Humanities, 1(1), 34-42.

42) Sunarto, M. J., Hariadi, B., Sagirani, T., Amelia, T., & Lemantara, J. (2020). MoLearn is a Web-and Android-based learning Application as an Alternative for the Teaching-Learning Process in High Schools.

43) Susilo, S. V., Prasetyo, T. F., Abidin, Y., & Mulyati, T. (2020, March). Mobile learning Android-based teaching materials: efforts to provide Indonesian learning based on technology in elementary school. In Journal of Physics: Conference Series (Vol. 1477, No. 4, p. 042034). IOP Publishing.

44) Thompson, P. (2013). The digital natives as learners: Technology use patterns and approaches to learning. Computers & Education, pp. 65, 12-33

45) UNESCO. (2018). UNESCO ICT competency framework for teachers version 3. https://unesdoc.unesco.org/ark:/48223/pf0000265721

46) VaraidzaiMakondo, P., & Makondo, D. (2020). Causes of poor academic performance in mathematics at ordinary level: A case of Mavuzani High School, Zimbabwe. International Journal of Humanities and Social Science Invention (IJHSSI), 9(1), 10-18.

47) Verawati, A., Agustito, D., Pusporini, W., Utami, W. B., & Widodo, S. A. (2022). Designing Android learning media to improve problem-solving skills of ratio. Advances in Mobile Learning Educational Research, 2(1), 216-224.

48) Wahid, A. H., Rahman, K., Qodriyah, K., Bali, M. M. E. I., Baharun, H., & Muali, C. (2020, July). Effectiveness of Android-Based Mathematics Learning Media Application on Student Learning Achievement. In Journal of Physics Conference Series (Vol. 1594, No. 1, p. 012047).

49) Yunus, Y., & Fransisca, M. (2021, February). Four-D Models Method Validation Analysis of an Android-Based Learning Media. In Journal of Physics: Conference Series (Vol. 1779, No. 1, p. 012018). IOP Publishin

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

Christy U. Buquing

Burgos National High School, Burgos, Ilocos Sur

ABSTRACT: This study aimed to formulate valid supplementary statistic learning materials for Grade 7 learners to improve their attainment of the most essential learning competencies in statistics. It examined the demographic profile of the respondents, level of attainment of the MELCs in statistics, mastered and least mastered competencies, and significant relationship between their profile and their attainment of the MELCs in statistics.

Results revealed that the level of attainment of the MELCs in statistics for Grade 7 learners was Satisfactory. They showed less mastery on competencies involving posing problems, formulating simple statistical instruments, using appropriate graphs to represent organized data, calculating measures of variability, and drawing conclusions. The educational attainment of parents showed significant relationship with the attainment of the MELCs.

The researcher recommends that parents must involve themselves in the learner's education. Furthermore, supplementary learning activities can help poor performing students to help them improve their mathematical skills in statistics.

KEYWORDS: Supplementary Statistics Learning Materials, Most Essential Learning Competencies, achievement test, Least Mastered Competencies, level of attainment

1. INTRODUCTION

1.1 Background of the Study

The Philippine educational system had its major shift when the K to 12 Curriculum was implemented in 2012. Part of the curriculum change is the spiral progression approach which aims to ensure that learners acquire knowledge and skills that are essential, beneficial, and appropriate to their developmental stage with high retention and mastery through revisiting of previous knowledge (Gaylo & Masinading, 2022)[32].

Conversely, despite the curriculum enrichment along with the continuous development of different strategies in teaching mathematics in line with it, no significant development has been observed among Filipino learners through the years as they have performed poorly in mathematics based on national and international assessments. It is evident in the undesirable results of the Trends in International Mathematics and Science Study (TIMSS) in 2003 where the Philippines ranked 34th in mathematics among 38 participating countries. According to Villegas (2021), it even deteriorated in the TIMSS results in 2019 wherein the country obtained the lowest scores among 58 participating countries. The country's score in mathematics of 358 in 2003 down to 297 in 2019, a decrease of 61 points is very alarming. Another academic crisis has been reported by the Department of Education in their PISA 2018 Philippine National Report of the Philippines on their official website. The result of the PISA 2018 (Program for International Student Assessment) of the Organization for Economic Cooperation and Development (OECD) states that the country ranked lowest in mathematics, science, and reading among the 79 countries that participated where fifteen-year-old students garnered 353 points in mathematics which is 136 points lower than the OECD average of 489 points. Furthermore, in the report of de la Fuente (undated), the National Achievement Test (NAT) in the school year 2017-2018 results also reflected poor performance among Filipino learners as their mean percentage scores scaled low proficiency in mathematics.

In 2020, the Department of Education released the most essential learning competencies (MELCs) which help the teachers to focus on the most essential and needed learning competencies that our learners must acquire without compromising the quality of education. The MELCs were not only released as a response to the distance learning brought by the pandemic but as a long-term response to the Sustainable Development Goal 4 (SDG 4) which is to develop resilient education systems. For the current school year, 2022-2023, the full implementation of face-to-face classes was allowed from the previous years' modular distance learning

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

and the MELCs is in continuing use. Such factors were insufficient time to finish the desired learning tasks and too many activities incorporated in the modules.

The results of assessments among Filipino students in the field of mathematics, before and during the pandemic, from international to local settings is deteriorating amidst the enhancement of the curriculum. Several factors are to be considered why these worsening results happen. The non-attainment of mastery on the intended most essential learning competencies is one of the underlying factors of such adversity.

The different supplementary learning materials in improving students' academic performance like the use of strategic intervention materials have proven its effectiveness based on studies (Arpilleda, 2021[9], Hernandez et al.,2019, Mawi, 2019). It helped improve the academic performance of students in mathematics where the SIM provided a positive impact on the mastery of least learned competencies. This teaching approach helps the students to grasp learning more effectively because the teacher executes the lesson ensuring progress in the students' learning in a more interactive way of teaching the subject eliminating the stigma of mathematics being a boring and difficult subject.

However, the teaching and learning process is not merely done by the teachers along with their creative strategies just to keep retention and mastery among learners. Students' attitude towards learning the subject as well as their preferred learning style are very crucial in implementing such strategies. Hence, the teachers are greatly challenged on how to teach the subject more effectively to the students while enjoying the experience of learning.

Thus, this study aims to evaluate the attainment of the most essential learning competencies in statistics which will be a basis for the researcher to create supplementary statistics learning materials for Grade 7 learners. This is to offer opportunities to the teachers to teach mathematics in a creative way which would help the students in learning mathematics. It also aims to progressively eliminate the dilemma of some students perceiving mathematics as a subject that is boring and difficult to understand.

1.2 Framework of the Study

This study is anchored on the following theories and concepts about the use of strategic intervention material in attaining the most essential learning competencies in mathematics.

The Constructivism Theory is based on the cognitive theories of John Dewey (1916), Jean Piaget (1973), and Lev Vygotsky (1978). The theory deals with the construction of knowledge based on their experiences and ideas which contributes to the learners' behavior and social knowledge. In the article of Brau (2022)[17], Mascolo & Fischer stated that it is a learning theory whereby learning is best acquired through reflection and active construction of knowledge. The learners draw interpretations through processing their previous experiences and connect it to their personal ideas and their social and cultural background. In constructivism, the teacher is not the giver of information but a facilitator of learning. Teachers' task is to prepare the students for what to learn by organizing the environment and the materials needed for learners to construct knowledge (Vintere, 2018)[68]. Studies show that the constructivist approach in teaching and learning mathematics boosts competencies needed for sustainable development. In the meta-analysis of Ayaz & Sekerci (2015)[10], they found that 50 out of 53 studies show positive results on the use of constructivist learning approach on the students' academic achievement. Moreover, in this computer age, technology is highly used in classrooms and most students are exposed to such. In the constructivist learning environment, students are motivated and directed in learning on technology-assisted classroom and approaches that encourages collaboration and active involvement of learners while using their critical thinking skills.

This study is further supported by the Discovery Learning Theory of Jerome Bruner (1966) is an inquiry-based instruction which allows learners to build on previous knowledge and experiences then use it to develop new information and discover facts. Bruner believes that learners have a vital role in learning by finding their own knowledge. They are the key responsible in building new concepts by using prior knowledge through observation, exploration, discovery and problem-solving (Kamaluddin & Widjajanti, 2019)[38]. He also believed that students learn and remember the concepts better if they discover them on their own. It also encourages active participation from learners in supplementary learning activities like strategic interventions, stimulates motivation, improves creativity, and enhances their problem-solving skills (Bastida & Bastida, 2022)[12]. Discovery learning is process-oriented which means that it focuses on the new information acquired during the process of learning rather than the end-result. Moreover, there are more advantages discovery learning has to offer based on studies. In the article of Kamaluddin & Widjajanti (2019)[38], they have enumerated the following advantages: it encourages learners to be motivated to have active involvement and develop creativity , students can learn at their own pace, enhance their critical thinking skills (Yuliani & Saragih, 2015)[70] and their reasoning abilities (Purba et al., 2018)[53]. However, though discovery learning is about the students finding their own new knowledge, studies say that it is still important to have the guidance of teachers to ensure successful learning outcome and to minimize misconception (Mayer, 2004 [44], Prince & Felder, 2006 [52]).

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

The Experiential Learning Theory of David Kolb (1984) stresses the significance of experience and its role in the teaching and learning process. Learners acquire knowledge through transformation of their experiences. The learners engage themselves in the process through learning by doing and focused experience to gain more knowledge and acquire necessary skills. Studies have supported this premise wherein the success of improving the academic performance of learners can be attributed to experiential learning whereby it provides learners time and space in learning through engaging in real and modern situations and it provides relevant and useful information which expands learners' intellectual capabilities and retention (Prestholdt & Flecher, 2018 [51], Abu-Assab, 2015 [3], Rapaport, 2013 [55]). Furthermore, in the field of mathematics, studies have confirmed that experiential learning has contributed and positively influenced not only the cognitive aspect of the learners but also their creativity and attitude (Uyen et al., 2022 [66], Mutmainah et al., 2019 [46], Chesimet et al., 2016 [21]).

Furthermore, instructional decisions are crucial to teachers for a more effective and efficient teaching and learning process since they are the key resources for the success of the curriculum. Thus, teachers are conceptualizing different teaching strategies for learners to understand mathematics in a more creative and interactive manner for them to have confidence in the subject.

The use of supplementary learning materials is one of the approaches used to aid learning especially in the attainment of the most essential learning competencies. It is an approach intended for remediation and/or enrichment of learning among students who exhibited less mastery on a certain topic or competency. Generally, supplementary learning materials are used in developing the least mastered skills of the learners to aid learning gaps and to ensure successful learning among students. These carefully designed and conceptualized materials provide the learners the needed support to have meaningful progress in their studies. It provides an avenue to expand and explore various ideas and concepts to deepen and increase their understanding on a certain topic (Rodrigo, 2015)[60]. The basis in making the supplementary learning materials should be aligned in the Most Essential Learning Competencies (MELCs) provided by DepEd to ensure that the learners assimilate information and skills essential in enhancing the least mastered skills (Cordova et al., 2019).

Moreover, the planning and execution of the supplementary learning materials is greatly affected by students' diverse learning styles and is a result of learners' individual differences in perceiving, organizing, and processing information. Learning styles of the students play a significant role in the academic performance of students (Magulod, Jr., 2018)[43]. In the study of Rezaeinejad et al. (2015) [57], they stated that there is evidence wherein a mismatch between teachers' instructional strategies and students' learning styles can negatively affect the learning process. Hence, teachers are greatly challenged in planning instructional strategies for applicable supplementary learning materials needed to maximize learning opportunities.

The use of different effective teaching strategies along with continuous improvement and updating of such strategies patterning with the changing learning styles of students ensures successful learning outcomes. In the meta-analysis of Sugano & Nabua (2020) [62] on the effects of teaching methods on academic performance, the use of varied teaching strategies is affirmed to be effective. Studies show the effectiveness of using the supplementary learning materials in enhancing the mathematics skills of the learners and mastering the least learned competencies (Abdullah, 2020 [1], Jacob, et al., 2020 [37], Abdullah & Cerado, 2020 [2], and Skoglund, et. at, 2018). Hence, such strategy has proven its effectiveness through the years.
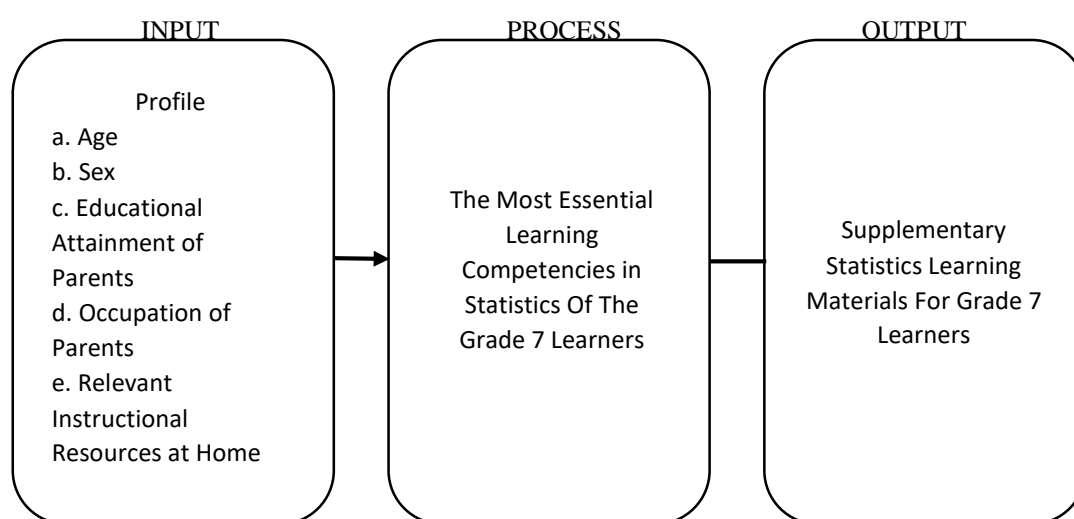

INPUT	PROCESS	OUTPUT
Profile a. Age b. Sex c. Educational Attainment of Parents d. Occupation of Parents e. Relevant Instructional Resources at Home	The Most Essential Learning Competencies in Statistics Of The Grade 7 Learners	Supplementary Statistics Learning Materials For Grade 7 Learners

Figure 1. The Research Paradigm

This present study follows the Input-Process-Output. The input variables include the demographic profile of the respondents while the process variable is the attainment of the most essential learning competencies in statistics and the output variable is the

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

formulation of supplementary statistics learning materials for Grade 7 learners. The researcher yearns to know if the level of attainment of the most essential learning competencies in statistics is affected by the demographic profile of the students and what valid Supplementary Statistics Learning Material for Grade 7 Learners can be proposed to improve student performance in statistics.

1.3 Statement of the Problem
1. What is the demographic profile of the respondents in terms of: a. age, b. sex, c. educational attainment of parents, d. occupation of parents, e. relevant instructional materials at home
2. What is the level of attainment of the most essential learning competencies in statistics?
3. What are the least attained learning competencies in statistics?
4. Is there a significant relationship between the demographic profile of the respondents and the level of attainment of the most essential learning competencies?
5. What valid supplementary statistics learning materials for Grade 7 learners can be proposed to improve student performance in statistics?

1.4 Hypothesis
1. There is a significant relationship between the demographic profile of the respondents and the level of attainment of the most essential learning competencies.

1.5 Scope and Limitation
This study focused on the formulation of supplementary statistics learning materials for Grade 7 learners to ensure the attainment of the most essential learning competencies in statistics of the respondents in Burgos National High School during the fourth quarter of the school year 2022-2023. The respondents were composed of 138 students from Grade 7.
The result of the achievement test has been the basis in formulating the MELC-based supplementary statistics learning materials for Grade 7 learners.

1.6 Importance of the Study
The results of this study were considered beneficial to the following:
Teachers. This research will help teachers understand further the importance of different teaching strategies, instructional materials and acknowledging learners' capabilities and needs. Furthermore, this is to provide them supplementary statistics learning materials for Grade 7 learners that they may use.
Students. It will provide them with learning opportunities that deepen their understanding of their learning capabilities and how they respond in learning can affect their performance in Mathematics. It will also help them learn mathematics in a fun way.
Other Stakeholders. This study will provide crucial information which can guide them in designing policies and strategies aiming to improve students' performance in Mathematics.
The researcher and future researchers. This study may serve as reference for the development of future related studies.

1.7 Definition of Terms
Profile of the Respondents. This refers to the characteristics of the respondents in terms of their:
Age. It refers to the time elapsed between the respondents' date of birth and the time the study is being conducted.
Sex. It refers to the biological attribute, whether the respondent is a male or a female.
Educational Attainment of Parents. It refers to the highest level of education that the parents of the respondents have successfully completed.
Occupation of Parents. It refers to the current job of the parents of the respondents.
Relevant Instructional Resources They Have At Home. It refers to the learning materials that are beneficial and relevant to the respondents in learning mathematics, specifically statistics.
Level of Attainment. It refers to the status of students' achievement in the given set of standards. In this paper, the MELCs for Grade 7 Mathematics for the Fourth Grading Period.
Most Essential Learning Competencies. It refers to the set of competencies that are relevant for the learners to attain and develop such skills that would equip them to be globally competitive.
Least Attained Learning Competencies. It refers to the competencies where the learners have exhibited difficulty and need intervention.
Supplementary Statistics Learning Material. It refers to the researcher-made and MELC-based material that aims to help learners master a competency in statistics that is found difficult.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

1.8 Review of Literature

1.8.1 Profile of the Respondents

There are different factors that might or might not affect students' academic performance. One of which is the demographic profile of the students in terms of their age, sex, educational attainment, occupation of parents and relevant instructional materials at home. In the systematic review of Wang, et. al (2023) [69], they have found that the age of the students has positive significance in the academic performance of students which means that the older the students, the higher their scores are. Furthermore, gender is also part of the demographic profiles of the students. According to Nguyen, et al. (2022) [48], there has been an established gap regarding gender in middle school when it comes to mathematics. They said that female students have been reported to exhibit higher anxiety and lower engagement that would eventually affect their academic performance. However, the study has found that the use of games in learning mathematics, which can be a strategic intervention material, can be an effective strategy in bridging gender gaps. Additionally, the socio-economic characteristics of students play a vital role in students' academic performance. This includes educational attainment and occupation of parents. Studies show that it has a significant effect on the students' academic performance in mathematics (Das & Sinha, 2017 [23], Bhat et al., 2016 [14], Udayakumar, 2022 [64]). And the last among the demographic profile of the students is the use of relevant instructional materials at home. These materials are said to be positively associated with the academic performance of the students, particularly with books. However, there is a negative or insignificant relationship among ICT availability and academic performance on students (Wang, et. al, 2023) [69].

Hence, it can be said that the demographic profile of the students may or may not contribute to attainment of most essential learning competencies.

1.8.2 Most Essential Learning Competencies

In 2020, the Philippine educational system was greatly affected by the pandemic, Covid-19, where schools were forced to close to mitigate the spread of the virus. It had a significant impact on the basic education system because there are about 1.5 billion learners or 87% of the student population globally were greatly affected by school closures (UNESCO, 2020). However, the Department of Education adheres to UNESCO's statement that "Education cannot wait. If learning stops, we will lose human capital", and hence, the education system went from face-to-face classes to distance learning. In line with this, DepEd provided the revised K to 12 curricula wherein the most essential learning competencies (MELCs) were released to develop resilient education systems, especially during emergencies like the pandemic. The new MELCs are similar to the pre-pandemic curriculum guide, but it has been compressed (Ravina & Mendoza, 2021) [56]. This was to enable the department to focus on the competencies that are deemed essential and indispensable for the learners to still have quality education despite the change in learning modality.

In terms of competence in mathematics, studies from other countries revealed that scores were slightly lower in 2020 as compared to the pre-pandemic years where there is a standard deviation of -0.03. The low achieving learners had significant learning loss during those times and hence, learning backlogs were earned that needs instructional attention (Schult, et al., 2022) [61]. Different teaching approaches are done in accordance with the most essential learning competencies to ensure that learners are given the essential and indispensable skills needed. According to Ravina & Mendoza (2021) [56], various teaching approaches have significant effect on the most essential learning competencies distribution in teaching science. It has been recommended that the identification of competencies that define the broader outcomes should be done, considering the learning strategy the students are most comfortable with.

However, Urbano (2020) [65] found the existing problem on the implementation of the learning competencies of the K to 12 program. That is, teachers failed to complete the given competencies on its required allotted time due to disruptions of classes though interventions were done to address the issue. Additionally, Gabriel, et al., (2022) [31] found that the most essential learning competencies were compromised because of the unmastered basic concepts which eventually affects students' learnings in the future since the curriculum design is spiral progression. The students need to learn and master basic concepts that are essential in learning other competencies at the higher level.

It is therefore necessary to continuously review and improve these competencies and look for ways for the students to attain mastery of such to ensure the realization of the aim of the department that the learners in the Philippines will be equipped with skills to be globally competitive. Moreover, as per DepEd order no. 34 s. 2022 or the School Calendar of Activities for School Year 2022-2023, the Most Essential Learning Competencies shall continue to be in use for the said school year.

1.8.3 Supplementary Statistics Learning Materials on the Least Learned Competencies

Teachers play a vital role in the success of the teaching and learning process. They are the key to ensuring that the students grasp the knowledge they need and further guide the students in discovering more. They are the ones who are accountable in selecting the best tool for students' learning considering their level of grasping information. According to Isa et al. (2020) [36], the extent

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

of the students' academic performances is greatly determined by teaching methods. In this case, teachers have the responsibility to apply appropriate teaching strategies in accordance with the competencies and specific objectives (Cardino et al.,2020) [20] following the level of understanding of the students (Arevalo et al., 2020) [8] to ensure successful transmission of knowledge among students. In the meta-analysis of Aytac & Kula (2020) [11], they found out that among the 104 studies between 1990 and 2020, the student-centered approaches are meaningful variables that positively affect the critical and creative thinking of the students. It requires greater collaboration, flexibility, and innovation for them to integrate an array of revolutionizing perspectives.

The kind of learning outcome is determined by the suitable knowledge given to the students using diverse pedagogies (Raba, 2017) [54]. Additionally, in the meta-analysis of Sugano & Nabua (2020) [62] on the effects of teaching methods on academic performance, the use of varied teaching strategies towards students' achievement is affirmed to be effective. Their review covering the period of 2005 – 2016 conducted in the Philippines revealed that incorporating other avenues of learning using various and innovative teaching strategies promotes academic gain.

The goal of every teacher in teaching mathematics is for the learners to understand and apply what they have learned in class. However, it would not be achieved if the learners find difficulty in understanding and mastering the lessons (Arpilleda, 2021) [9]. Any learner, both excelling and struggling may demand to have intervention in a certain competency/ies. In this regard, the teachers must be keen enough to recognize the grey areas of the students for immediate intervention according to Kautzman in Arpilleda (2021) [9]. Hence, supplementary activities are helpful tool in attaining such goal.

Supplementary learning materials are the teachers' aid in providing learners who require support with appropriate tools to ensure progress by deepening their knowledge, skills and understanding. These are instructional materials that aims to help learners in improving their academic performance across all subject areas while stimulating their active participation especially on the least mastered competencies (Dy, 2011) [27]. In the field of mathematics, students find difficulty on the basic concepts such as probability, problem solving and geometry. According to the study of Ereño & Benavides (2022) [28], students find it difficult to understand when these concepts are formally presented and without connecting its relevance to real life situations. To ensure students' experience more meaningful in studying mathematics, the teachers should consider their individual differences and encourage them to participate in every teaching and learning interactions (Abdullah, 2020) [2].

The supplemental learning materials are support aids made by the teachers to help the learners to achieve successful learning. Its effectiveness in improving the least learned competencies has been proven by recent researches (Abdullah, 2020 [2], Jacob, et al., 2020 [37], Abdullah & Cerado, 2020 [2], and Skoglund, et. at, 2018). Furthermore, the integration of innovative strategies as supplementary learning materials such as Information and Communications Technology integration has also been effective since it caters the 21st century skills of the learners and stir their attention and interest in the teaching and learning process (Aragon, 2022) [7]. Giving additional learning resources to students who are lagging and are struggling to attain the target competencies particularly in statistics will be of so much help since they will be given a chance to improve their mathematics skills and will be able to cope up with other learners.

Moreover, interactive and creative supplementary learning materials can help the learners to study their lesson more effectively and proficiently and eventually improve their mathematical performance. In the study of Vankus (2021) [67] found out that 84% showed positive influences of the game-based learning strategy, which can be supplementary learning materials, in terms of students' motivation, engagement, attitudes, enjoyment, state of flow, etc. The study stated that 54% of the articles considered the affective domain in the measurement of the effectivity of the strategy which signifies that it is a helpful tool suppress mathematics anxiety among students and view the subject as enjoyable and eventually increase their academic performance. Furthermore, it has been found that students learn best using various activities and intervention materials (Arpilleda, 2021) [9]. While using the supplementary statistics learning materials, the teachers can be mere facilitators of learning since they shall give less guidance. The teachers may provide activities and exercises as supplementary materials and let learners discover to make learning successful and more meaningful.

2. METHODOLOGY

This chapter presents the research design, population and locale of the study, research instrument, and treatment of data/data analysis that will be used in this study.

2.1 Research Design

Descriptive-Correlational research design has been utilized in order to investigate the relationship among the attainment of the most essential learning competencies and level of achievement among the students. Furthermore, the Developmental design was

---

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

also used since the researcher formulated Supplementary Statistics Learning Materials for Grade 7 Learners based on the result of the attainment of the MELCs.

2.2 Population and Locale of the Study

The study was conducted at Burgos National High School, Burgos, Ilocos Sur. The school has 167 Grade 7 students, and the study required a sample of 138 students from the five sections of Grade 7 for the school year 2022-2023 who serve as respondents of the study.

Table 1. Distribution of the Respondents

Sections	Population	Sample
Narra	41	38
Mahogany	36	30
Yakal	36	30
Tanguile	26	21
Acacia	28	23
TOTAL	**167**	**138**

2.3 Research Instrument

In this study, the researcher constructed an achievement test in statistics to the respondents for the school year 2022-2023 to identify the level of attainment of the most essential learning competencies. The test was a 50-item multiple choice test covering all the competencies in the statistics of Grade 7. It was guided by the Table of Specifications provided by the SDO – Ilocos Sur and has undergone validity and reliability testing. The reliability testing was administered to the Grade 7 students at Santa Maria National High School, Santa Maria, Ilocos Sur with a result of 0.77 and an interpretation of "good for classroom test" and was further validated by 5 experts in mathematics with a mean score of 4. 28 which made the instrument reliable and valid. Moreover, the results of the achievement test were used as a basis in formulating the Supplementary Statistics Learning Materials for Grade 7 Learners. The Supplementary Statistics Learning Materials contained the least mastered competencies with percentage range of 0 – 50.

2.4 Treatment of Data/Data Analysis

The collected data was analyzed using descriptive and inferential statistics.

2.4.1 Frequency count and **percentage** were used in identifying the demographic profile of the respondents.

2.4.2 Mean and **standard deviation** were used to identify the level of attainment of the most essential learning competencies and the least mastered competencies in statistics.

In determining the significant relationship between the profile of the students and their attainment of the most essential learning competencies, the following statistical treatments were used: **Pearson Correlation** for age of the students, **Chi-squared test** was used for sex, occupation of the parents and, relevant instructional resources at home, and **Spearman rank correlation coefficient** for the educational attainment of parents.

2.5 Data Categorization

The researcher used the following scales to interpret the gathered data:

A. Attainment of Learning Competency in Statistics

Range	Descriptive Rating
0.76 – 1.00	Highly Attained
0.51 – 0.75	Attained
0.26 – 0.50	Moderately Attained
0.00 – 0.25	Not Attained

B. Categorization of Least Mastered Competency

Range	Descriptive Rating
0.51 – 1.00	Mastered
0.00 – 0.50	Least Mastered

C. Level of Validity of the Supplementary Statistics Learning Material for Grade 7 Learners

Rating	Statistical Limit	Descriptive Rating	Overall Rating
5	4.21 – 5.00	Very Evident	Highly Valid
4	3.41 – 4.20	Evident	Valid
3	2.61 – 3.40	Moderately Evident	Moderately Valid
2	1.81 – 2.60	Less Evident	Fairly Valid
1	1.00 – 1.80	Least Evident	Not Valid

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

2.6 Ethical Considerations

Ethical practices were given consideration in the conduct of this study. The researcher requested for the full consent of the respondents and guaranteed the confidentiality of their participation in this study.

Moreover, it is ensured that this study was conducted with utmost respect for the respondents. Honesty and transparency were applied and there was no profiting, harm nor jeopardy happened to anyone, party or organization in the conduct of this study.

3. RESULTS AND DISCUSSION

This chapter presents the result and discussion of the data that were gathered in this study which includes the presentation, interpretation, and analysis of the significant findings. It also contains the conclusions and recommendations.

3.1 Findings

3.1.1 Demographic Profile of the Respondents

Table 2. Demographic Profile of the Respondents

Profile		F	Percentage %
Age			
12		43	31.16
13		91	65.94
14		4	2.90
	Total	138	100.00
Sex			
Male		75	54.35
Female		63	45.65
	Total	138	100.00
Educational Attainment of Parents			
Elementary Undergraduate		1	0.72
Elementary Graduate		4	2.90
High School Undergraduate		9	6.52
High School Graduate		54	39.13
College Undergraduate		17	12.32
College Graduate		47	34.06
Vocational Course Graduate		5	3.62
With Master's Units		0	0.00
Maste's Graduate		1	0.72
With Doctorate Units		0	0.00
Doctorate Graduate		0	0.00
	Total	138	100.00
Occupation of Parents			
Government		11	7.97
Business		3	2.17
Agriculture		71	51.45
Overseas Workers		31	22.46
Others		22	15.94
	Total	138	100.00
Relevant Instructional Materials at Home			
Books		90	27.11
Textbooks		15	4.52
Educational Magazine		13	3.92
Laptop		39	11.75
Educational Games		30	9.04
Workbooks		22	6.63
Mobile Phones		123	37.05
Others		0	0.00

Table 2 presents the demographic profile of the respondents which includes age, sex, educational attainment of parents, occupation of parents, and relevant instructional resources at home.

Age. The table shows that most of the respondents are 13 years old with a frequency of 91 or 65.94% of the total population. On the other hand, 4 of the respondents or 2.90% of them are 14 years old. The figure states that most of the respondents are of the common age of a Grade 7 student and it is the proper time and age to cultivate their study. This is strengthened by the study of Leander & Fabelle (2020) [40] where the Grade 7 learner-respondents are 12 – 13 years old. 14 – year old students are now quite matured being able to distinguish good and bad that would help them and the teachers (Dingal, 2019) [24].

Sex. The males with a total number of 75 or equivalent to 54.35% of the total population is higher that the female respondents who has 63 or 45.65%. This only means that males dominated the females in terms of their number which is parallel to the study of Millan (2018) [45] and Ajai & Imoko (2015) wherein males outnumbered the females. Conversely, this finding negates Duque, et al. (2021) [26] where females dominate the learners. Furthermore, Magbanua & Aplaon's (2017) [42] findings show that females have higher positivity in learning mathematics than male and Dizon, et al. (2023) [25] stated that females' domination may be attributed to the fact that males tend to stop attending school to help their parents.

Educational Attainment of Parents. Table 2 shows that most of the parents are high school graduates with a total of 54 which comprises the 39.13% of the total population. There were 47 or 34.06% of the parents who are college graduates and 17 or 12.32% college undergraduates. These results indicate that most of the parents of the Grade 7 students finished at least their high school which would mean that they are capable of guiding their children in their studies. This is parallel to the findings of Millan (2018)

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

[45], Leander & Fabella (2020) [40], and Dizon, et al. (2023) [25] that most of the parents are at least high school graduates. Furthermore, according to the data posted by the Philippine Statistics Authority in 2011, most of the Filipinos have at least graduated high school. However, it negates Duque, et. al's (2021) [26] findings that most of the parents have either finished elementary school or have no schooling completed at all.

Occupation of Parents. The data exhibits that the dominating occupation of the parents of the respondents are in the agricultural sector which comprises 71 or 51.45%. It was seconded by overseas workers with 31 or 22.46% and others which include manual laborers (construction & factory workers), security service providers, drivers and customer service providers were 22 or 15.94%. The finding in this study is parallel to Duque, et al. (2021) [26] where most of the head of the family is employed in a farm or in the agricultural sector. This is further supported by Bliznashka, et al. (2023) [15] wherein most of the parents, both mother and father are employed in the field of agriculture. This implies that most of the parents of the respondents are making the most out of the rich agricultural lands of the country. However, in the study of Tomul, et al. (2021) [63], they found that parents' occupation explained small amount of variance in students' mathematics achievement.

Number of Relevant Instructional Materials at Home. Table 2 presents that almost all the respondents have their mobile phones as an instructional material which has a total of 123 or 37.05%. It was followed by books which comprises of 90 or 27.11% of the total population. This means that students nowadays are exposed to digital learning resources such as mobile phones and the information needed are just one click away. In the study of Begum (2011) [13], her findings tell us that the use of mobile phones has a great potential as an instructional tool given that students are disciplined and eliminate the thought of it as a disturbing factor but rather an aid in their learning. Furthermore, Dizon, et al. (2023) [25] found that majority of the students have mobile phones which provides them additional instructional material and take advantage of its educational potential.

3.1.2 Level of Attainment of the Most Essential Learning Competencies in Statistics for Grade 7 Learners

Table 3. Level of Attainment of the Most Essential Learning Competencies in Statistics for Grade 7 Learners

Competencies	Item No.	Percentage Who Answered Correctly Per Item	Mean per Competency	SD	DR
Statistics					
1. poses problems that can be solved using Statistics.	46	40	0.40	0.49	MA
2. formulates simple statistical instruments	36 47 48	26 51 48	0.42	0.49	MA
3. gathers statistical data	1 16 26	57 61 44	0.54	0.50	A
4. organizes data in a frequency distribution table	2 17 18 49	61 79 58 41	0.60	0.49	A
5. uses appropriate graphs to represent organized data: pie chart, bar graph, line graph, histogram, and ogive	19 27 41 50	54 44 26 28	0.38	0.49	MA
6. illustrates the measures of central tendency (mean, median, and mode) of a statistical data.	3 20 28	65 67 57	0.63	0.48	A
7. calculates the measures of central tendency of ungrouped and grouped data.	4 5 6 21 29 30 31 42	72 52 75 49 42 51 31 32	0.51	0.50	A
8. illustrates the measures of variability (range, average deviation, variance, and standard deviation) of a statistical data	7 8 9 10 22 32 37 43	54 51 71 63 62 60 47 61	0.59	0.49	A
9. calculates the measures of variability of grouped and ungrouped data	11 12 23 33 34 35	45 49 49 38 47 38	0.44	0.50	MA
10. uses appropriate statistical measures in analyzing and interpreting statistical data.	13 14 15 24 38 44	58 68 64 45 41 55	0.55	0.50	A
11. draws conclusions from graphic and tabular data and measures of central tendency and variability	25 39 40 45	51 66 21 20	0.39	0.49	MA

Legend: 0.00 – 0.25 (NA)   0.26 – 0.50 (MA)   0.51 – 0.75 (A)   0.76 – 1.00 (HA)

Table 3 shows the level of attainment on the most essential learning competencies in statistics of the respondents in the achievement test given to them. The highest among the competencies is competency number 6 with a mean of 0.63 which is described as "Attained". Along with, are competency number 3 with a mean of 0.54, competency number 4 with a mean of 0.60, competency number 7 with a mean of 0.51, competency number 8 with a mean of 0.59 and competency number 10 with a mean of 0.55. The competency with the lowest mean is competency number 5 which is 0.38 described as "Moderately Attained". The other competencies with the same descriptive ratings are competency number 1 with a mean of 0.40, competency number 2 with a mean of 0.42, competency number 11 with a mean of 0.39 and competency number 9 with a mean of 0.44. Furthermore, one of the Moderately Attained competencies involves drawing conclusions, wherein the students failed to master various mathematical skills on how to simplify problems which leads to poor reasoning and making conclusions, which is similar to the study of Garcia (2022) [30]. Additionally, Botor (2019) [16] found that one of the least mastered competencies in statistics was calculating the measures of variability which further affirms the result of this study.

3.1.3 Overall Performance of the Grade 7 Learners
Table 4. Overall Performance of the Grade 7 Learners in Statistics

Competencies	Mean per Competency	DR
Statistics		
1. poses problems that can be solved using Statistics	0.40	MA
2. formulates simple statistical instruments	0.42	MA
3. gathers statistical data	0.54	A
4. organizes data in a frequency distribution table	0.60	A
5. uses appropriate graphs to represent organized data: pie chart, bar graph, line graph, histogram, and ogive	0.38	MA
6. illustrates the measures of central tendency (mean, median, andmode) of a statistical data.	0.63	A
7. calculates the measures of central tendency of ungrouped and grouped data.	0.51	A
8. illustrates the measures of variability (range, average deviation, variance, and standard deviation) of a statistical data	0.59	A
9. calculates the measures of variability of grouped and ungrouped data	0.44	MA
10. uses appropriate statistical measures in analyzing and interpreting statistical data.	0.55	A
11. draws conclusions from graphic and tabular data and measures of central tendency and variability.	0.39	MA
OVERALL	0.50	Moderately Attained
Legend:	*0.00 – 0.25 (NA)*	*0.26 – 0.50 (MA)*	*0.51 – 0.75 (A)*	*0.76 – 1.00 (HA)*

Table 4 presents the overall performance of the respondents in the attainment of the Most Essential Learning Competencies in Statistics. Among the eleven competencies, none of which are described as Not Attained, five competencies belonged to the descriptive rating Moderately Attained, six competencies were Attained and no competency was described as Highly Attained.

The overall result of the test has a mean of 0.50. This shows that the learners exhibited a fairly satisfactory performance because the competencies are 'moderately attained'. This implies that interventions are needed to enhance their performance and fill their remaining gaps in attaining the most essential learning competencies in statistics.

This finding is similar to Retutas & Rubio (2021) [58] which states that the level of students' performance in statistics is fairly satisfactory which means that students possess little knowledge, skills and understanding in statistics. Additionally, Calma, et al. (2022) [18] found that students have difficulties in learning lessons in statistics and probability especially on the fundamental/basic topics. However, the student-respondents obtained scores lower than the mean which implies unsatisfactory ratings in statistics and probability.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

3.1.4 Mastered and Least Mastered Competencies of the Respondents in Statistics

Table 5. Mastered and Least Mastered Competencies of the Respondents in Statistics

Competencies	Mean per Competency	SD	DR
Statistics			
1. poses problems that can be solved using Statistics.	0.40	0.49	LM
2. formulates simple statistical instruments	0.42	0.49	LM
3. gathers statistical data	0.54	0.50	M
4. organizes data in a frequency distribution table	0.60	0.49	M
5. uses appropriate graphs to represent organized data: pie chart, bar graph, line graph, histogram, and ogive	0.38	0.49	LM
6. illustrates the measures of central tendency (mean, median, and mode) of a statistical data.	0.63	0.48	M
7. calculates the measures of central tendency of ungrouped and grouped data.	0.51	0.50	M
8. illustrates the measures of variability (range, average deviation, variance, and standard deviation) of a statistical data	0.59	0.49	M
9. calculates the measures of variability of grouped and ungrouped data	0.44	0.50	LM
10. uses appropriate statistical measures in analyzing and interpreting statistical data.	0.55	0.50	M
11. draws conclusions from graphic and tabular data and measures of central tendency and variability.	0.39	0.49	LM

Legend: 0.00 – 0.50 (LM)   0.51 – 1.00 (M)

Table 5 reveals that in the eleven learning competencies, six of which are mastered, and the remaining five competencies are least mastered.

Among the mastered competencies, the students grasped how to gather statistical data and organize it, illustrate, and calculate measures of central tendency, illustrate measures of variability, and can use appropriate statistical measures in the analysis and interpretation of data. These are the learning competencies that reached the mean of 0.51 to 1.00. The findings verify that these six competencies are somehow easier than the other five competencies in statistics.

Furthermore, it can be seen in the table that posing problems that can be solved by statistics, formulating simple statistical instruments, using appropriate graphs to represent organized data, calculating measures of variability and drawing conclusions from statistical measures are where the respondents lag and needs support. These are the learning competencies in statistics which has a mean of 0.50 and lower. The findings are similar to the result of the study of Botor (2019) [16] wherein one of the least mastered competencies in statistics was calculating the measures of variability. Furthermore, it has been evident in the study of Garcia (2022) [30] that students failed to master various mathematical skills on how to simplify problems which leads to poor reasoning and making conclusions.

In overall, there are 5 out of 11 competencies that are least mastered by the learners which is equivalent to 45.45% of the total competencies. This means that the learners are struggling in statistics which coincides with the study of Llanes, et. al, (2018) [41], along with real numbers system, polynomials, and equations and inequalities. In addition, Calma, et al., (2022) [18] and Kandeel (2019) [39] also affirms to this claim that students find it difficult to study statistics and probability. This implies that students have gained limited knowledge in statistics and therefore, interventions such as supplementary statistics learning materials should target these learning competencies in statistics to aid in the enhancement of learning and meet the desired outcome.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

3.1.5 Significant Relationship between the Profile of the Respondents and the Attainment of the Most Essential Learning Competencies in Statistics

Table 6. Correlation between the Demographic Profile of the Respondents and the Attainment of the Most Essential Learning Competencies in Statistics

Profile	Computed r	p-value	Interpretation
Age	0.036	0.676	NS
Sex	0.147	0.086	NS
Educational Attainment Of Parents	0.198	0.020	S
Occupation of Parents	-0.045	0.601	NS
Number Relevant Instructional Materials at Home	0.109	0.204	NS

correlation is significant at 0.05 level (two-tailed)

It is evident in Table 6 that the scores of the respondents does not necessarily correlate with their demographic profile. There was a very minimal significant relationship between the variables. The only one that is significantly correlated are the scores of the respondents and the educational attainment of their parents with a computed r of 0.198 and a p-value of 0.020 which is less than 0.05 level of significance (p ≤ 0.05). The positive computed r indicates that the higher the educational attainment of the parents of the learners significantly contribute to the attainment of the most essential learning competencies in statistics. This implies that the educational attainment of parents has an impact to the academic achievement of learners in statistics. The age, sex, occupation of parents, and relevant instructional materials at home are not significantly related to the attainment of the most essential learning competencies in statistics of the grade 7 learners because all of their p-values are greater than 0.05 level of significance (p ≥ 0.05).

The result of the study confirms the study of Idris, et. al (2020) [35] and Leander & Fabella (2020) [40] wherein the high education of the parents positively contributes on their children's academic achievement. In the rapid literature review conducted in 2020 by Clearing House Technical Assistance Team, they found out that most of the literatures that they reviewed show that parent's educational levels strongly influence educational and economic opportunities of their children. Furthermore, Habungan (2021) [34], stated that parental involvement is significantly related to the attitude of the students towards mathematics yielding to a better performance on the subject. Gutierrez-de-Rozas, et. al (2022) [33] further stated that contextual variables like related to family may influence the academic achievement of the learners. It however, contrasted Nelson's (2009) [47] study which states that parent education mediates but generally does not directly influence student academic achievement.

3.4 Validity of the Supplementary Statistics Learning Materials

Table 7. Validity of the Supplementary Statistics Learning Materials for Grade 7 Learners

Indicators	Mean	Interpretation
1. The materials are consistent with the learning competencies for the subject and grade level it was intended for.	5	Very Evident
2. The materials can stimulate and promote critical thinking of the learners.	5	Very Evident
3. The materials are free from error in spelling and grammar	5	Very Evident
4. The materials are relevant to real – life situations that learners can relate to.	5	Very Evident
5. The materials are logically developed and organized to contribute to the enrichment, reinforcement and mastery of the identified learning objectives.	4.6	Very Evident
OVERALL	4.92	Highly Valid

Table 7 displays the result of the validation of the supplementary statistics learning materials for grade 7 learners.

The table indicates the result of the validation done by experts in the field of mathematics in terms of the contents of the materials. It shows that the overall mean of 4.92 which means that the indicators are very evident in the supplementary materials. Therefore, the researcher-made materials are highly valid.

It is apparent that the materials made are consistent with the learning competencies, can stimulate critical thinking, free from spelling and grammatical error, and is relevant to real-life situation, all with a mean of 5.

This confirms that the supplementary statistics learning materials for grade 7 learners can be used by teachers to aid in the enhancement of the skills of the students in the particular competencies. Supplementary materials can be in a form of strategic

intervention materials which can be used to address the needs of the learners in helping them improve their mathematical skills (Garcia, 2022) [30].

3.5 CONCLUSIONS

Based on the findings, the following conclusions are made:

1. Most of the respondents are 13 years old which are dominated by the male students and almost all of them has a mobile phone as their relevant instructional material at home. Most of their parents are high school graduates and have jobs related to agriculture.

2. The level of attainment of the most essential learning competencies in statistics for Grade 7 learner-respondents was Moderately Attained. Five competencies appear to be moderately attained and six competencies were attained.

3. The respondents showed less mastery and needs support on competencies which involves posing problems that can be solved by statistics, formulating simple statistical instruments, using appropriate graphs to represent organized data, calculating measures of variability and drawing conclusions.

4. The educational attainment of parents showed significant relationship with the attainment of the most essential learning competencies in statistics for Grade 7 students. The other variables under the profile of the students seems no effect on the attainment of the MELCs most especially the age of the respondents.

5. The researcher-made Supplementary Statistics Learning Materials in Statistics for Grade 7 Learners is Highly Valid. These materials can be used by the mathematics teachers to give support to the students who are lagging for them to attain mastery in the learning competencies.

3.6 RECOMMENDATIONS

Based on the conclusions of the study, the following recommendations are hereby made:

1. Students must learn how to focus on things relevant and worthwhile and see gadgets as an aid to achieve their goals and not as a distraction or any sort. Parents must and/or continue to give their children the needed support regardless of their educational attainment.

2. Teachers must continue to find ways on how to help the learners stay motivated and willing to learn mathematics and eventually enhance their mathematical ability. This can be done through interactive classroom discussions or learning materials, integrating information and communication technology in learning and relating the lessons to real-life situations to make learning more successful and meaningful.

3. Teachers must be vigilant in identifying the learners' needs to give the appropriate help for the learners. They should always intend to assist learners who are lagging and provide approaches to help them catch up and improve their mathematical skills most especially in statistics.

4. Parents must have academic involvement in their children's student life. They must recognize their children's emotional and academic needs. Their utmost support to the educational tasks of the learners has an impact to their academic achievement.

5. The Supplementary Statistics Learning Materials for Grade 7 Learners can be used as a tool in enhancing performance of learners in statistics especially to learners who exhibits poor mastery on the competencies.

6. Further related studies may be conducted to intensify the results of this present study. Modifications in terms of variables can be done to enhance the study.

REFERENCES

1) S. Abdullah (2020). Practical Work Approach Using Supplemental Learning Materials For Effective Teaching In Statistics And Probability. International Journal of Science, Engineering and Management Vol. 5 Issue 5.

2) S. Abdullah & E. Cerado (2020). Use of Supplemental Learning Materials In Improving Students' Achievement And Attitudes In Pre-Calculus. Instabright e-gazette Publication Journal, Vol. 1 Issue 4.

3) N. S. A. A. Abu-Assab (2015). The Effect Of Experiential Learning On Improving The Performance Of EFL Students As Perceived By Teachers Of English in the Northern Governorates of Palestine (Doctoral dissertation). Retrieved from https://scholar.najah.edu/sites/default/files/Noor%20Saber%20Abd%20Alkareem%20Abu-Assab_0.pdf

4) A. Abude (2021). The Effectiveness of Modular Distance Learning Modality to the Academic Performance of Students: A Literature Review. Himalayan Journal of Education and Literature. DOI: 10.47310/Hjel.2021.v02i06.008

5) E. Afari (2012). Teaching mathematics in game learning environment. International Review of Contemporary Learning Research. 1. 33-45. 10.12785/irclr/010104.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

6) C. M. Amar, R. Nomus & L. M. Soriano (2020). Mathematics Quarter 4 – Module 1 Real-Life Problems that can be Solved by Statistics.

7) B. R. Aragon (2022). Supplementary Materials For Least Mastered Competencies in Teaching Biology 10. International Journal of Research Publications.

8) F. Arevalo, P. M. Fumar, A. M. Jamin, N. K. Pequit, D. J. Suyman, & D. M. Edillor (2020). Teaching Strategies and Its Influence on Academic Performance of Grade 12 HUMSS Students. Ascendens Asia Singapore – Bestlink College of the Philippines Journal of Multidisciplinary Research, 2(1). Retrieved from https://ojs.aaresearchindex.com/index.php/aasgbcpjmra/article/view/2478

9) A. Arpilleda (2021). Strategic intervention material: A tool in enhancing grade nine students' mathematical performance. International Journal of Research Studies in Education. 10. 10.5861/ijrse.2021.5051.

10) M. Ayaz & H. Şekerci (2015). The Effects of the Constructivist Learning Approach on Student's Academic Achievement: A Meta-Analysis Study. Turkish Online Journal of Educational Technology.

11) T. Aytaç & S. S. Kula (2020). The effect of student-centered approaches on students' creative thinking skills: A meta-analysis study. International Journal of Contemporary Educational Research, 7(2), 62-80. DOI: https://doi.org/10.33200/ijcer.723894

12) R. Bastida & G. Bastida (2022). Effectiveness Of Strategic Intervention Material On The Learning Outcomes Of Students. European Journal of Social Sciences Studies, 7(4). doi:http://dx.doi.org/10.46827/ejsss.v7i4.1249

13) R. Begum (2011). Prospect for Cell Phones as Instructional Tools in the EFL Classroom: A Case Study of Jahangirnagar University, Bangladesh. Canadian Center of Science and Education. Retrieved from https://eric.ed.gov/?id=EJ1080334

14) M. Bhat, J. Joshi & I. Wani (2016). Effect of Socio Economic Status on Academic Performance of Secondary School Students. International Journal of Indian Psychology. Retrieved from https://oaji.net/articles/2016/1170-1468259814.pdf .

15) L. Bliznashka, J. Jeong & L. Jaacks (2023). Maternal and paternal employment in agriculture and early childhood development: A cross-sectional analysis of Demographic and Health Survey data. PLOS Global Public Health. Retrieved at https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0001116

16) L. Botor (2019). Improving the Competency of Teachers on the Least-Mastered Skills in Mathematics 7 Using the Lesson Study Approach. Ascendens Asia Journal of Multidisciplinary Research Abstracts.

17) B. Brau (2022). Constructivism. In R. Kimmons (Ed.), Education Research. EdTech Books. https://edtechbooks.org/education_research/constructivismy

18) J. Calma, I. G. Salvador, & A. Supan (2022). Knowledge and Attitude towards Statistics and Probability of Senior High School Students. Asia Pacific Journal of Educational Perspective, Vol. 9, No. 1.

19) M. A. Caras (2020). Mathematics Quarter 4 – Module 3 Presentation of Data.

20) J. M. Cardino Jr., R. A. & Ortega-Dela Cruz (2020). Understanding of learning styles and teaching strategies towards improving the teaching and learning of mathematics. LUMAT: International Journal on Math, Science and Technology Education, 8(1), 19–43. https://doi.org/10.31129/LUMAT.8.1.1348

21) M. C. Chesimet, B. N. Githua, & J. K. Ng'eno (2016). Effects of Experiential Learning Approach on Students' Mathematical Creativity among Secondary School Students of Kericho East Sub-County, Kenya. Journal of Education and Practice, 7(23), 51-57.

22) Clearinghouse for Military Family Readiness at Penn State. (2020). Parents' educational levels influence on child educational outcomes: Rapid literature review. [Literature Review]. University Park, PA: Author.

23) G. Das & S. Sinha (2017). Effect of Socioeconomic status on performance in Mathematics among students of secondary schools of Guwahati city. IOSR Journal of Mathematics. 13. 26-33. 10.9790/5728-1301012633.

24) A. Dingal (2019). Performance of Grade 7 Students. Retrieved from https://www.scribd.com/document/434317759/The-Academic-Performance-of-Grade-7-Students.

25) J. Dizon, M. E. Leoveras, E. David & R. Dela Rosa (2023). Descriptive Analysis of Socio-Demographic Profile, Family Structure, and Parental Involvement During the Modular Distance Education on the Student's Academic Achievement in Science. International Journal of Sciences: Basic and Applied Research (IJSBAR). ISSN 2307-4531.

26) N. Duque, L. Rosario & D. D. Dacles (2021). Demographic Profile and Academic Performance of a Philippine Rural Public Elementary School: Basis for Assistance Program. American Journal of Educational Research.

27) S. Dy(2011). Instructional Materials in Teaching Science: recent British experience, Journal of Classroom Teaching, 33, 5, 29-44.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

28) R. E. Ereño & N. G. Benavides (2022). "Reflections on the Least Learned Competencies in Mathematics", United International Journal for Research & Technology UIJRT, Volume 3, Issue 08, 2022.

29) K. G. Estimoso, O. Serano Jr. & M. J. Puedan (2020) Mathematics Quarter 4 – Module 6: Analysis and Interpretation of Statistical Data.

30) M. T. Garcia (2022). Strategic Intervention Material to Improve the Performance of College Freshmen Students. Journal of Learning and Education Policy. ISSN : 2799-1121, 2(03), 8–17. https://doi.org/10.55529/jlep.23.8.17

31) B. Gabriel, J. Nepomuceno, M. Kadusale, J. Taneo & C. Cabello (2022). The Compromised Most Essential Learning Competencies: A Qualitative Inquiry. 4. 943-952. 10.5281/zenodo.7162134.

32) D. Gaylo & Z. Masinading (2022). Differentiated Scaffolding Strategies in Triangle Congruence: Their Effects on Learners' Academic Performance and Confidence in Mathematics. International Journal of Education and Literacy Studies. 10. 10.7575/aiac.ijels.v.10n.2p.131.

33) B. Gutierrez-de-Rozas,E. Martin, & E. Molina (2022). Defining the Profile of Students with Low Academic Achievement: A Cross-Country Analysis Through PISA 2018 Data. Frontiers In Education Journal.

34) G. Habungan (2021). Mediating Effect of Parental Involvement on the Attitude Towards Mathematics and Performance of the Students. A Master's Thesis, ISPSC Sta. Maria, Ilocos Sur.

35) M. Idris, S. Hussain, N. Ahmad (2020). Relationship Between Parents' Education and Their Children's Academic Achievement. Journal of Arts and Social Sciences (JASS). DOI:10.46662/jass-vol7-iss2-2020(82-92)

36) S. Isa & M. Mammam, & Y. Bala & Badar, Yusuf. (2022). The Impact Of Teaching Methods On Academic Performance Of Secondary School Students In Nigeria. 10.37118/ijdr.18223.07.2020.

37) R. Jacob, A. Erickson, & S. Mattera (2019). Evaluating the Impact of Small Group Supplemental Math Enrichment in Kindergarten. Journal of Research on Educational Effectiveness.

38) M. Kamaluddin & D. Widjajanti (2019). The Impact of Discovery Learning on Students' Mathematics Learning Outcomes. Journal of Physics: Conference Series. 1320. 012038. 10.1088/1742-6596/1320/1/012038.

39) R. Kandeel (2019). Students' Academic Difficulties in Learning a Statistics and Probability Course: The Instructors' View. Journal of Education and Practice.

40) J. V. Leander, F. E. Fabella (2020). Parental Involvement and Academic Performances of Grade 7 Students (June 18, 2020). Available at SSRN: https://ssrn.com/abstract=3630178 or http://dx.doi.org/10.2139/ssrn.3630178

41) C. F. Llanes, A. Mano, L. J. Mariano, L. Salvador & A. Dejarlo (2018). Least Mastered Competencies of Grade 7 Learners in Geometry. Online Public Access Catalog. Retrieved from http://opac.urs.edu.ph/cgi-bin/koha/opac-detail.pl?biblionumber=1202

42) M. Magbanua & Z. Aplaon, Z. (2017). Sex-Role in Mathematical Dichotomy Among Grade 7 Students in Bongabong South. Cebu International Conference on Studies in Business, Management, Education and Law. DOI:10.17758/URUAE.DIR0117526

43) G. C. Magulod Jr. (2019). Learning styles, study habits and academic performance of Filipino university students in applied science courses: Implications for instruction. Journal of Technology and Science Education, 9(2), 184-198. https://doi.org/10.3926/jotse.504

44) R. E. Mayer (2004). Should There Be a Three-Strikes Rule against Pure Discovery Learning? The Case for Guided Methods of Instruction. American Psychologist, 59, 14-19.

45) R. Millan(2018). Remediation Activities in Mathematics for Grade 9 Students. A Master's Thesis, ISPSC Sta. Maria, Ilocos Sur.

46) M. Mutmainah, R. Rukayah, R. & M. Indriayu, M. (2019). Effectiveness of experiential learning-based teaching material in Mathematics. International Journal of Evaluation and Research in Education (IJERE). 8. 57. 10.11591/ijere.v8i1.15903.

47) J. Nelson (2009). Impact of Parent Education on Student Success. Retrieved from https://files.eric.ed.gov/fulltext/ED507263.pdf.

48) H. A. Nguyen, X. Hou, J. E. Richey, & B. M. McLaren (2022). The Impact of Gender in Learning With Games: A Consistent Effect in a Math Learning Game. International Journal of Game-Based Learning (IJGBL), 12(1), 1-29. http://doi.org/10.4018/IJGBL.309128

49) R. Orim & C. Ekwueme (2011). The roles of games in teaching and learning of mathematics in junior secondary schools. Global Journal of Educational Research, 10, 121-124.

50) A. F. Patag (2021). Effectiveness Of Using Online Games In Teaching Mathematics. Global Scientific Journal. ISSN 2320-9186.

51) [51] T. Prestholdt & V. Fletcher (2018). The value of experiential learning: A case study with an interdisciplinary study abroad course. Bioscene. 44. 17-23.

52) J. M. Prince & M. R. Felder (2006) Inductive Teaching and Learning Methods: Definitions, Comparisons, and Research Bases. Journal of Engineering Education, 95, 123-138. http://dx.doi.org/10.1002/j.2168-9830.2006.tb00884.x

53) G. I. Purba, E. Surya, M. Manullang & A. Asmin (2018). The Effect of Students' Worksheet in the Model of Discovery Learning Against the Students' Ability of Reasoning and Mathematical Communication in the Faculty of Mathematics and Natural Science of State University of Medan. International Journal of Sciences: Basic and Applied Research (IJSBAR), 37(3), 70–82. Retrieved from https://www.gssrr.org/index.php/JournalOfBasicAndApplied/article/view/8690

54) A. Raba (2017). The Impact Of Effective Teaching Strategies On Producing Fast And Good Learning Outcomes. International Journal Of Research. 5. 43-58. 10.5281/Zenodo.259563.

55) Rapaport, David. (2013). Experiential Learning: A Case Study Approach. 10.13140/RG.2.1.3195.2809.

56) J. P. Ravina & J. R. Mendoza (2021). Teaching Approach In Science, Their Use And Effectiveness On Most Essential Learning Competencies (Melcs) Distribution. EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal. DOI: 10.36713/epra2013

57) M. Rezaeinejad, A. Azizifar & H. Gowhary (2015) The Study of Learning Styles and Its Relationship with Educational Achievement among Iranian High School Students. Procedia—Social and Behavioral Sciences, 199, 218-224. https://doi.org/10.1016/j.sbspro.2015.07.509

58) M. Retutas, M. Rubio (2021). Multivariate Analysis On Performance In Statistics, Self-Efficacy And Attitudes Of Senior High School Students. Journal of Research and Advances in Mathematics Education.

59) K. K. Robles, J. Somogod & R. Prenio (2020). Mathematics Quarter 4 – Module 5: Measures of Variability.

60) R. Rodrigo (2015). Importance of Strategic Intervention Materials. Retrieved from http://udyong.gov.ph/index.php?option=com_content&view=article&id=6925:importance-of-strategic-interventionmaterials&catid=90&Itemid=1267

61) J. Schult, N. Mahler, B. Fauth & M. Lindner (2022). Did Students Learn Less During the COVID-19 Pandemic? Reading and Mathematics Competencies Before and After the First Pandemic Wave. 10.31234/osf.io/pqtgf.

62) [62] S. Sugano & E. Nabua (2020). Meta-Analysis on the Effects of Teaching Methods on Academic Performance in Chemistry. International Journal of Instruction. 13. 881-894. 10.29333/iji.2020.13259a.

63) E. Tomul, E. Onder & E. Taslidere (2021). The Relative Effect Of Student, Family And School-Related Factors On Math Achievement By Location Of The School. Large-scale Assess Educ 9. https://doi.org/10.1186/s40536-021-00117-1

64) K. Udayakumar, S. Rajendran & A. Rani (2022). Socio-economic status impact on academic performance of higher secondary students – a regression analysis. Journal of Positive School Psychology. Retrieved from https://journalppw.com/index.php/jpsp/article/view/8456/5525

65) D. P. Urbano (2020). The Implementation of K to 12 Mathematics Curriculum in the Philippines: Alignment of Learning Competencies, Instruction and Assessment: A Basis for Curriculum Implementation Monitoring Plan. Retrieved from https://www.elivapress.com/en/book/book-2862278032/

66) [66] B. P. Uyen, D. H. Tong & N. B. Lien (2022). The Effectiveness of Experiential Learning in Teaching Arithmetic and Geometry in Sixth Grade. Frontiers in Education. https://doi.org/10.3389/feduc.2022.858631

67) P. Vankúš (2021). Influence of Game-Based Learning in Mathematics Education on Students' Affective Domain: A Systematic Review. Mathematics, 9(9), 986. https://doi.org/10.3390/math9090986

68) A. Vintere (2018). A Constructivist Approach to the Teaching of Mathematics to Boost Competences Needed for Sustainable Development. Rural Sustainability Research. 39. 1-7. 10.2478/plua-2018-0001.

69) X. S. Wang, L. Perry, A. Malpique, T. Ide (2023). Factors Depicting Mathematics Achievement in PISA: A systematic Review. International Educational Research Institute Journal

70) K. Yuliani & S. Saragih (2015). The Development of Learning Devices Based Guided Discovery Model to Improve Understanding Concept and Critical Thinking Mathematically Ability of Students at Islamic Junior High School of Medan.

REFERENCES FOR THE SSLM

1) C. M. Amar, R. Nomus, L. M. Soriano (2020). Mathematics – Grade 7, Alternative Delivery Mode, Quarter 4 – Module 1: Real-Life Problems that can be Solved by Statistics.

2) M. A. Caras (2020). Mathematics – Grade 7, Alternative Delivery Mode, Quarter 4 – Module 3: Presentation of Data.

3) K. G. Estimoso, O. Serrano Jr. & M. J. Puedan (2020). Mathematics – Grade 7, Alternative Delivery Mode, Quarter 4 – Module 6: Analysis and Interpretation of Statistical Data.

The Most Essential Learning Competencies in Statistics of the Grade 7 Learners

4) K. K. Robles, J. Somogod & R. Prenio (2020). Mathematics – Grade 7, Alternative Delivery Mode, Quarter 4 – Module 5: Measures of Variability.

Implementation of Special Mathematics Education in Narvacan National Central High School

Luis C. Ronquillo III

Ilocos Sur Polytechnic State College Sta. Maria, Ilocos Sur, Philippines

ABSTRACT: The study assessed the implementation of Special Mathematics Education (SME) at Narvacan National Central High School, focusing on teacher profiles, policy, instructional materials, and performance, identifying challenges and relationships among variables. The study utilized a mixed method and explanatory sequential research design, involving 15 teachers and 128 learners, and collected data through a survey questionnaire and one-on-one interviews, analyzing frequency, percentage, mean, and correlation. The study found that most respondents were female mathematics teachers aged 26-30, with a master's degree and school-based training. Most students received outstanding grades for the 2022-2023 school year. The Special Mathematics Education curriculum was highly implemented, and teachers' profiles showed a significant relationship with instructional materials and learners' performance. Solutions included technology integration, Open Education Resources, active learning techniques, and personalized learning plans. Teachers should pursue postgraduate education, enhance student performance through materials, sustain special mathematics education, enrich their knowledge through LAC sessions, seminars, and trainings, identify and solve teaching problems, and continue to provide meaningful and productive activities for learners, ensuring outstanding performance and continuous improvement.

KEYWORDS: Profile, Instructional Materials, Implementation, Curriculum

I. INTRODUCTION

Students in the United States outperformed the OECD average in reading and science, but below in mathematics, with a nearly 4 percentage point increase in reading performance between 2009 and 2018.

In the Philippines, Department of Education (DepEd) is working to enhance the literacy and numeracy skills of Filipino learners through various policies, including DepEd Order No. 55 s 2010 and DepEd Order No. 46 s 2012, which focus on science and mathematics education at the secondary level. Malipot (2022) reports that the Department of Education plans to launch a national initiative to enhance numeracy and mathematics achievement in schools through a Steering Committee and Technical Working Group.

Policies have allowed schools to implement Special Science and Mathematics Classes, like those at Narvacan National Central High School in Ilocos Sur. However, their implementation status remains unassessed, requiring a study. The Special Mathematics Education (SME) curriculum was introduced to strengthen mathematics programs in the Philippines.

The purpose of issuing this Order is to encourage schools to strengthen Science and Mathematics Education at the secondary level in the country. Under this Order, the Department offered funding allocation for both types of A and B schools as reflected in an enclosure. Such initiative is really made to encourage schools to offer Special Science and Mathematics Education. As an effect, many schools submitted pertinent documents for validation and approval.

The Order requires schools offering Special Science and Math Classes to meet specific requirements before approval, allowing schools to operate. However, these schools continue to offer these classes for improved student performance.

The implementation of Special Science and Mathematics Education is still in effect. Thus, with the abovementioned scenarios and policies, there is really a need to investigate the present status of implementation of the Special Mathematics Classes in the Schools Division of Ilocos Sur which is the focus of this study. This could lead to the better understanding on the implementation of the program especially on instruction.

Implementation of Special Mathematics Education in Narvacan National Central High School

II. FRAMEWORK OF THE STUDY

To provide a clearer understanding, the following concepts and theories which are closely related to the subject of the study are highlighted.

The K-12 curriculum uses various educational learning theories. In fact, the curriculum framework establishes a clear picture on the relationship between content standard and performance standard. Thus, teachers should be fully aware of these theories so that they will be guide as they prepare and execute their lessons.

To see a clearer view of how the study was conducted, the research paradigm is shown below.
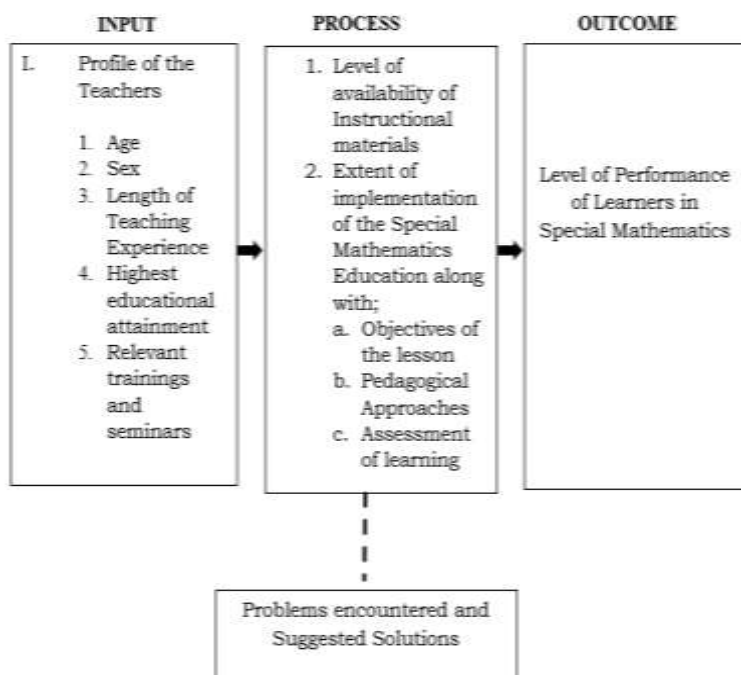
Figure 1. The Research Paradigm

Implementation of Special Mathematics Education in Narvacan National Central High School

The paradigm of the study as shown in Figure 1 presents the Input-Process-Outcome model.

The input encapsulates the profile of the respondents such as age, sex, length of teaching service, educational attainment, relevant trainings and seminars.

The process emphasizes the level of availability of instructional materials, the extent of implementation of the Special Mathematics Education along objectives of the lessons, teaching pedagogies, and assessment of learning. The problems encountered by the respondents and the suggested solutions are also presented. The outcome of the study includes the performance of learners in Special Mathematics Education.

III. METHODOLOGY

A. Research Design

This study used a mixed method design. Bhandari (2020) defined quantitative research as the process of collecting and analyzing numerical data and can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

This study uses a correlational research design to examine the relationship between respondents' profile and the implementation of the Special Mathematics Program.

The study utilized a qualitative research method to identify respondents' problems, utilizing non-numerical data to gain in-depth insights and generate new research ideas.

B. Population and Locale of the Study

This study was conducted at Narvacan National Central High School, Paratong, Narvacan, Ilocos Sur for school year 2022 – 2023.

The study employed purposive sampling, a non-probability method where units are chosen based on their necessary characteristics for the sample.

More specifically, this study utilized total population sampling. Total population sampling is a type of **purposive sampling technique** that involves examining the **entire population** (i.e., the **total population**) that have a particular set of **characteristics** (e.g., specific attributes/traits, experience, knowledge, skills, exposure to an event, etc.) *(Ibid.).*

The researcher utilized the fifteen (15) teachers who are handling mathematics at Narvacan National Central High School. Additionally, one hundred twenty-eight (128) learners in Grades 7-10 were also utilized.

IV. RESULTS AND DISCUSSIONS

Profile of the Respondents

The following figure present the profile of the teacher-respondents along age, sex, length of service, educational attainment and relevant trainings and seminars attended.
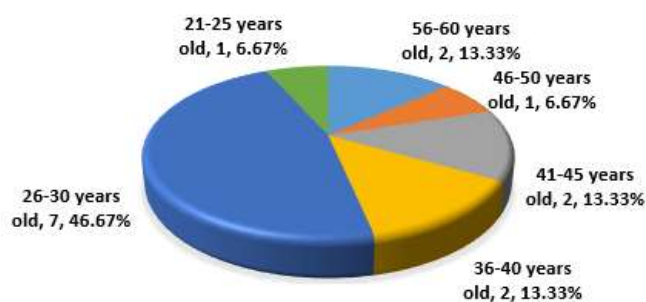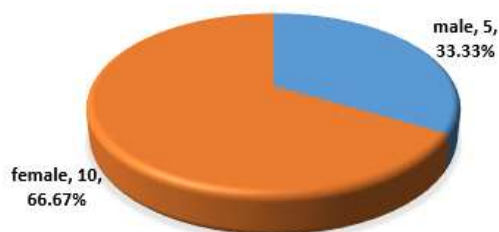

Figure 2.

Distribution of the Profile of Respondents in terms of Age

Figure 2 shows that the majority (46.67%) of the respondents were 26-30 years old. Six of them shared a total of 39.99% with ages 36-40 years old, 41-45 years old, and 56-60 years old respectively. Two of them shared a total of 13.34% with ages 21-25 years old, and 46-50 years old. The result further means that the teaching force of the Math department was dominated by teachers who have been trained or equipped with 21st-century teaching skills. The findings of the study are similar to that of Funtanilla (2022) where majority of the respondents were under the ages of 26-30.

Implementation of Special Mathematics Education in Narvacan National Central High School

Moreover, according to Alufohai and Ibhafidon (2015), students' academic achievement is significantly influenced by teachers' age. Relatively, the findings of the study of Russo et. al (2023) suggested that teacher enjoyment of teaching mathematics in the early primary years has important implications for both the quality and quantity of mathematics instruction students receive.
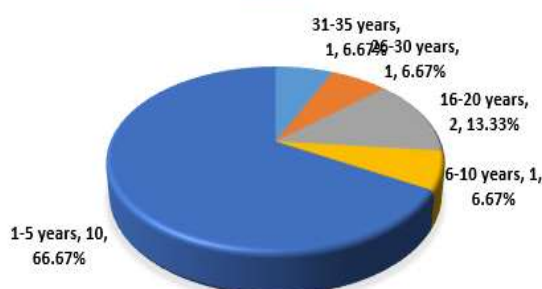

Figure 3.

Distribution of the Profile of the Respondents in terms of Sex

Figure 3 shows that the majority (66.67%) of the respondents were females, followed by males at 33.33%. The result further shows that the teaching force of the mathematics department of the school was dominated by female teachers.

Sex plays a vital role in different job performance whether in offices, teaching, or in field works. Various researches provided results how males and females vary in terms of their performance. Women were found to score higher than men on the interpersonal dimension (Stone et. al.,2009). These findings support this study that there are more female teachers than male teachers.

Figure 4. Distribution of the Profile of the Respondents in terms of

Length of Service

Figure 4 shows that the majority (66.67%) of the respondents started teaching between 1-5 years. Two or 13.33% of them have a length of service between 16-20 years in the government service, and three of them shared a total of 20.01% with a length of service of 6-10 years, 26-30 years, and 31-35 years respectively. The result means that the teaching force of the Mathematics Department of the school was dominated by newer and younger teachers.

According to Kini and Podolsky (2016), they found that more experienced teachers confer benefits to their colleagues, their students, and to the school as a whole.
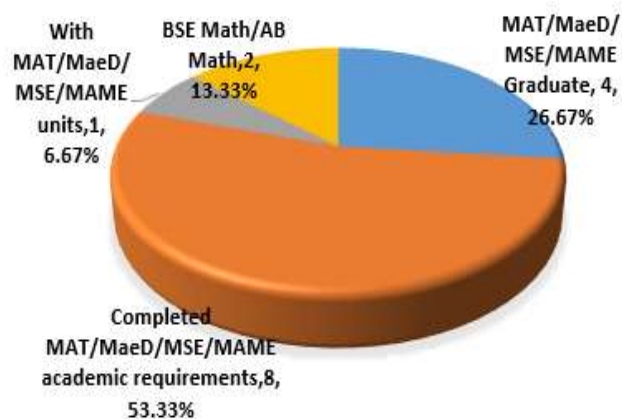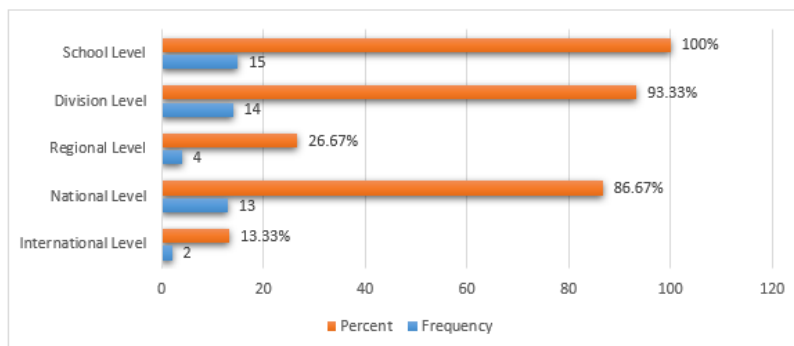

Figure 5. Distribution of the Profile of the Respondents in terms of Educational Attainment

Implementation of Special Mathematics Education in Narvacan National Central High School

The majority of respondents (53.33%) have completed academic requirements for a Master's degree, with 26.67% graduating with a Master of Arts in Teaching, Education, Science, or Mathematics Education. The data reveals a positive trend in the educational landscape, with graduates actively pursuing advanced degrees, demonstrating commitment to lifelong learning and staying updated with the latest methodologies and research in the education sector.

The result is in line with the study of Ferrer (2017), with the advent of globalization and competition, this young generation of teachers is more aware of the need to grow professionally, thus, they pursue graduate studies.

Figure 6. Distribution of the Profile of the Respondents in terms of Seminars and Training Attended

The study reveals that all respondents have attended school-based mathematics training and seminars, with 93.33% participating in sponsored training. The majority of teachers have adequate knowledge and skills through various levels of training and seminars. Nabayra & Nabayra (2021) revealed that mathematics teachers personified the culture of excellence in mathematics education by integrating different strategies in teaching mathematics, being passionate and dedicated, and by pursuing continuous professional growth.

Availability of Instructional Materials in Teaching Special Mathematics Education in Narvacan National Central High School
Table 1. shows the level of availability of instructional materials.

Available Materials	Mean	SD	DESCRIPTIVE RATING
1. Pictures	4.33	1.23	VMA
2. Diagrams	4.33	1.23	VMA
3. Illustrations	4.47	0.99	VMA
4. Charts	4.47	0.99	VMA
5. Real objects (realia)	4.33	0.98	VMA
6. Recordings (audio and video)	4.00	0.93	*MA*
7. Videos	4.07	0.88	*MA*
8. Slides	4.27	1.03	VMA
9. Interactive Materials	3.80	0.94	*MA*
10. Graphic materials	3.93	0.96	*MA*
11. Printed materials (books, periodicals etc.)	4.67	0.82	VMA
12. Flashcards	3.87	0.92	*MA*
13. Interventions/Enrichment Materials	4.13	0.74	*MA*
14. e-references	4.13	1.06	*MA*
15. posters	3.47	1.25	*MA*
16. Simulations	3.67	0.62	*MA*
17. Games	4.07	0.96	*MA*
OVERALL MEAN	**4.12**	*0.97*	*MA*

Specifically, on the one hand, printed materials (4.67) such as books and periodicals among others, illustrations (4.47) and charts (4.47), pictures (4.33), diagrams (4.33) and real objects (4.33), and slides (4.27) are described "very much available". On the other hand, interventions, or enrichment materials (4.13) and e-references (4.13), videos (4.07), games (4.07), recordings (4.00), graphic materials (3.93), flashcards (3.87), interactive materials (3.80), simulations (3.67), and posters (3.47) are described "much available".

Implementation of Special Mathematics Education in Narvacan National Central High School

The extent of use of available materials has an overall mean of 4.12 which is described as "much available". Thus, the result means that the instructional materials to be used by teachers in implementing Special Mathematics Education (SME) in school are available.

Extent of Implementation of Special Mathematics Education (SME) in Narvacan National Central High School
Table 2. shows the Special Mathematics Education (SME) extent of implementation along objective of the lesson, pedagogical approaches and assessment of learning.

Extent of Implementation of Special Mathematics Education	Mean	SD	DR
Objectives of the lessons			
1. The Learning Objectives (LOs) are aligned with the standards of the K to 12 curriculum.	4.80	0.41	VHI
2. The LOs are specific, measurable, attainable, relevant, and time-bound (SMART).	4.60	0.83	VHI
3. The LOs provide varied learning tasks and activities.	4.80	0.41	VHI
4. The LOs integrate knowledge, skills, and attitude (KSA).	4.73	0.46	VHI
5. The LOs provide available instructional materials to be used.	4.60	0.51	VHI
SUB MEAN	**4.71**	**0.52**	**VHI**
Pedagogical Approaches			
1. Learners are actively involved in the learning process, creating their own meaning and knowledge of the material (constructivist).	4.33	0.90	VHI
2. Multiple learners work together, like in small group instruction, and they all contribute and help each other learn (collaborative).	4.53	0.52	VHI
3. Students address real-world problems, like in project-based learning, by asking questions and doing further research (inquiry-based).	4.27	0.96	VHI
4. Learners engage with cross-curricular material using multiple academic disciplines and common language (integrative).	4.33	0.72	VHI
5. Both teachers and learners reflect on lessons, projects, and assessments to see how to improve them in the future (reflective).	4.40	0.74	VHI
SUB MEAN	**4.37**	**0.77**	**VHI**
Assessment of learning			
1. The assessment tools (ATs) are appropriate to meet the objectives of the desired skills.	4.53	0.64	VHI
2. The ATs contain varied activities to assess different learning skills.	4.53	0.64	VHI
3. The directions in the assessment tool (ATs) are clearly stated.	4.47	0.74	VHI
4. The test questions in the ATs are free from conceptual or content errors.	4.47	0.52	VHI
5. The ATs are suitable for learners' level of understanding.	4.67	0.49	VHI
SUB MEAN	**4.53**	**0.61**	**VHI**
OVERALL MEAN	**4.53**	**0.64**	**VHI**

The Special Mathematics Education (SME) curriculum is categorized into objectives of the lesson, pedagogical approaches, and assessment of learning. Respondents rated the objectives as aligned with K to 12 standards, specific, measurable, attainable, relevant, time-bound, integrating knowledge, skills, and attitude.

The respondents rated pedagogical approaches as highly implemented, including multiple learners working together, reflection on lessons, active participation in the learning process, cross-curricular engagement, and real-world problem-solving through project-based learning, as well as the use of multiple academic disciplines and common language.

The respondents rated the Assessment Tools (ATs) as suitable for learners' understanding, meeting desired skill objectives, having varied activities, clearly stated directions, and free from conceptual errors, indicating that Special Mathematics Education (SME) is highly implemented in schools, ensuring its continuation in accordance with existing policies.

Elsayed and Nasef (2020) found that there are statistically significant differences between the scores of the academic achievement motivation and the creative thinking in favor of the post- applications at (0.01) level and this showed that the program has positive

effects in developing the academic achievement motivation and the creative thinking in Mathematics among Prince Sattam Bin Abdulaziz University Students.

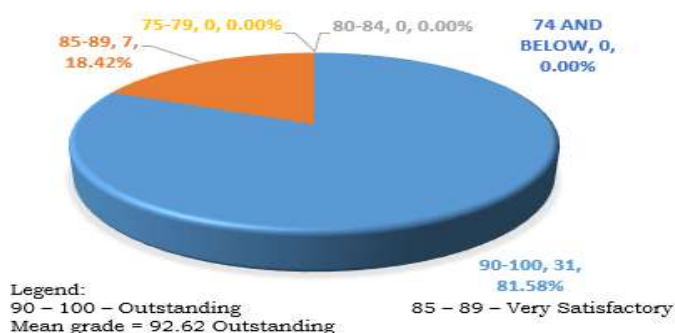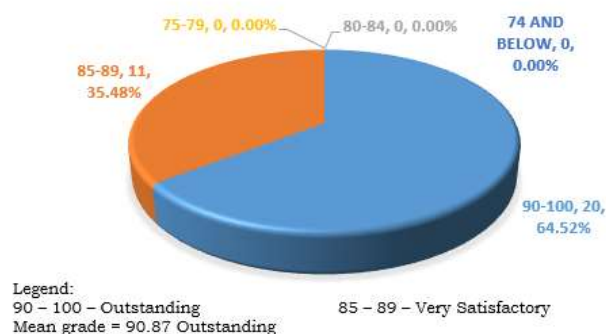Level of Mathematics Performance of the Learners in Narvacan National Central High School
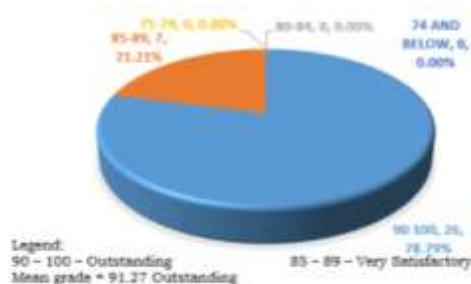
Figure 7.

Performance of the Grade 7 Learners in Mathematics

Figure 7 shows the performance of the Grade 7 learners in Mathematics for the school year 2022-2023. More specifically, twenty-six or 78.79% obtained a grade ranging from 90-100 (outstanding), and seven or 21.21% obtained a grade ranging from 85-89 (very satisfactory). The result means that the learners excel in the subjects offered in this grade level.

The findings of the study are similar to Guro (2018) in her study where student's self-efficacy was rated very well. This means that they have the capability to do homework, schoolwork, as well as to study their algebra and pass the test.
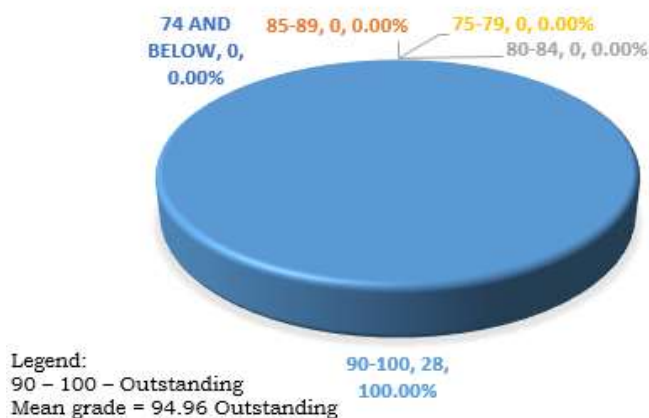

Figure 8.

Performance of the Grade 8 Learners in Mathematics

Figure 8 shows the performance of the Grade 8 learners in Mathematics for the school year 2022-2023. More specifically, thirty-one or 81.58% obtained a grade ranging from 90-100 (outstanding), and seven or 18.42% obtained a grade ranging from 85-89 (very satisfactory). The result means that the learners excel in the subjects offered in this grade level.

Teachers try to explore the educational research which expended time and energy trying to unravel the possible. Although the goal of Intervention is not necessarily to make Mathematics fun, by varying the learning tasks and making the instruction engaging the intervention teacher has the opportunity to reach more students and build success (Sundling, 2012)

Figure 9.

Performance of the Grade 9 Learners in Mathematics

Implementation of Special Mathematics Education in Narvacan National Central High School

Figure 9 shows the performance of the Grade 9 learners in Mathematics for the school year 2022-2023. More specifically, twenty, or 64.52% obtained a grade ranging from 90-100 (outstanding), and eleven, or 35.48% obtained a grade ranging from 85-89 (very satisfactory). The result means that the learners excel in the subjects offered in this grade level.

The findings of the study of Ngcobo (2021), revealed that the development programme for teachers must be continuous, to ensure that they are up to date with the current status of mathematics, so that they will implement the current knowledge for teaching.

Legend:
90 – 100 – Outstanding
Mean grade = 94.96 Outstanding

Figure 10.

Performance of the Grade 10 Learners in Mathematics

Figure 10 shows the performance of the Grade 10 learners in Mathematics for the school year 2022-2023. More specifically, twenty-eight or 100% obtained a grade ranging from 90-100 (outstanding), The result means that the learners excel in the subjects offered in this grade level.

The findings of this study negate and in fact, surpassed the results of the study of Hebres (2022) where the students belonged to satisfactory performance meaning their performance is not bad but average performance. Derrac (2019), academic performance is greatly affected by Mathematics self-concept. This means that students who perform well in academic performance also possess high self-concept in Mathematics and vice versa. This only shows that to become a good performer in Mathematics, one must be able to improve his or her Mathematics self-concept since they are significantly correlated.
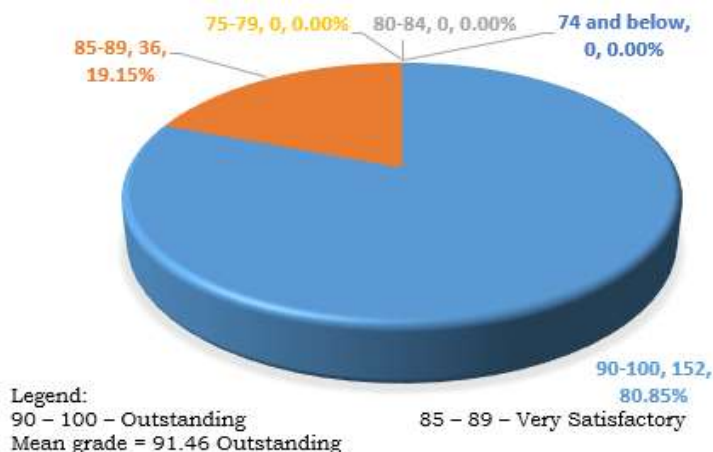

Legend:
90 – 100 – Outstanding   85 – 89 – Very Satisfactory
Mean grade = 91.46 Outstanding

Figure 11.

Overall Performance of the Learners in Mathematics

Figure 11 shows the overall performance of the learners from grades 7-10.

As shown in the chart, one hundred fifty-two, or 80.85% attained a grade ranging from 90-100 (outstanding), and thirty-six, or 19.15% attained a grade ranging from 85-89 (very satisfactory). Thus, the result means that the learners are excelling in mathematics.

The finding of the study is similar to Guinocor et al. (2020) where they found out that there is a significant positive high correlation between the study orientations of the students considering their academic performance in terms of their Graded Point Average (GPA) in Mathematics subjects.

Implementation of Special Mathematics Education in Narvacan National Central High School

Relationship between the Profile of the Respondents and the Level of Use of Available Instructional Materials
Table 3. presents the profile of the teacher-respondents and the use of available instructional materials.

Profile Of Teachers	Use of Available Instructional Materials	
	Computed r	p-value
1. Age	0.165	0.557
2. Sex	-0.230	0.410
3. Length of Service	0.011	0.970
4.Educational Attainment	-0.112	0.691
5.International Level	0.592*	0.020
6. National Level	0.501	0.057
7. Regional Level	0.350	0.201
8. Division Level	0.501	0.057
9. School Level	0.435	0.106

It can be seen in Table 4 that the profile of the respondents such as age, sex, length of service, educational attainment, and seminars and training attended at regional levels, division level, and school level post no relationship. This implies that they do not affect their instruction in Mathematics.

Considering the fact that teachers are aware of the significance of providing their learners accurate information about what they teach, they enrich themselves by attending seminars and trainings at different levels. Kapur (2022) stressed in his study that Seminars and workshops are organized with the primary aim of imparting information in terms of a particular subject or concept. Furthermore, the students are provided with the opportunities to present their papers and hone communication, presentation and public-speaking skills. These are useful in augmenting knowledge, competencies and abilities among students.

The study found a significant relationship between respondents' participation in international seminars and trainings and their use of available instructional materials, indicating that these activities have enriched their skills and knowledge.

Cempron (2021) concluded in his study that despite being categorized as traditional and common respectively, whiteboard, text and workbooks, newspapers, and computers are frequently utilized and quite perceived as essential instructional materials in the teaching of Social Studies correlating to the nature of its content that is expected to be transferred well to the learners no less that almost everything is already embedded in the computer e.g. virtual whiteboard, even in the time of online classes.

Relationship between the Profile of the Respondents and the Extent of Implementation of Special Mathematics Education (SME)

Table 4 presents the profile of the teacher-respondents and the implementation of Special Mathematics Education (SME).

Profile of Teachers	Objectives of the Lesson		Pedagogical Approaches		Assessment of learning	
	Computed r	P-value	Computed r	P-value	Computed r	P-value
1. Age	-0.164	0.558	-0.315	0.252	-0.222	0.426
2. Sex	0.227	0.415	0.401	0.138	0.272	0.327
3. Length of Service	0.035	0.901	-0.110	0.697	-0.302	0.275
4. Educational Attainment	0.126	0.655	0.138	0.624	0.229	0.412
5. International Level	0.388	0.153	0.464	0.082	0.424	0.115
6. National Level	-0.121	0.667	-0.093	0.742	0.118	0.676
7. Regional Level	0.093	0.741	0.321	0.244	0.253	0.362
8. Division Level	-0.121	0.667	-0.093	0.742	0.118	0.676
9. School Level	-0.265	0.341	-0.316	0.251	0.449	0.093

As revealed in Table 5, the profile of the respondents and the implementation of Special Mathematics Education along three core areas such as the objectives of the lesson, pedagogical approaches, and assessment of learning post no relationship. This implies that the teachers are capable of teaching mathematics regardless of the variables in their profile considering that they are qualified. Thus, the null hypothesis is accepted.

Implementation of Special Mathematics Education in Narvacan National Central High School

However, Kaufman et. al (2019) emphasized that, it has been documented in numerous studies, use of rigorous, standards-aligned curricula is challenging for teachers and for students, which might result in more-variable use of standards-aligned curricula, even compared with other curricula. In addition, states and school systems might have been focused primarily on adopting standards-aligned curricula over the past several decades, and further suggested that states and districts must now work to support teachers' use of curriculum.

Relationship between the Level of Use of Available Materials and Learners' Performance

Table 5 presents the relationship between the use of available instructional materials and learners' performance.

Relationship between the Level of use of Available Materials and Learners' Performance	Computed r	p-value
1. Pictures	0.11	0.14
2. Diagrams	0.11	0.14
3. Illustrations	0.11	0.12
4. Charts	0.11	0.14
5. Real objects (realia)	0.08	0.26
6. Recordings	-0.463**	0.00
7. Videos	-0.418**	0.00
8. Slides	0.08	0.26
9. Interactive materials	0.253**	0.00
10. Graphic materials	0.351**	0.00
11. Printed Materials (books, periodicals etc.)	0.11	0.12
12. Flashcards	0.08	0.26
13. Interventions/Enrichment Materials	0.11	0.14
14. E-reference	0.11	0.14
15. Posters	0.387**	0.00
16. Simulations	0.418**	0.00
17. Games	-0.1	0.19
Mean of the Extent of Available Materials	**0.190****	**0.009**

**. Correlation is significant at the 0.01 level (2-tailed).

The study found no significant relationship between variables like pictures, diagrams, illustrations, charts, real objects, slides, printed materials, flashcards, and games with learners' performance. Traditional teaching methods, such as personal interactions and communication, can enhance students' learning experiences and social skills, as they help build interpersonal relationships with teachers and peers.

The study found a significant relationship between audio-visual materials, such as recordings, videos, interactive materials, graphic materials, interventions/enrichment materials, and e-references, and students' performance.

Relationship between the Learners' Performance and the Extent of Implementation of Special Mathematics Education (SME)

Table 6 shows the relationship between the extent of implementation of Special Mathematics Education (SME) and the Learners' Performance.

Relationship between the Extent of implementation and Learners Performance	Computed r	P-value
Objectives of the lessons		
The Learning Objectives (LOs) are aligned with the standards of the K to 12 curriculum.	0.351**	0.000
The LOs are specific, measurable, attainable, relevant, and time-bound (SMART).	0.351**	0.000
The LOs provide varied learning tasks and activities.	0.418**	0.000
The LOs integrate knowledge, skills, and attitude (KSA).	0.050	0.540
The LOs provide available instructional materials to be used.	0.418**	0.000

Mean of objective of the lesson	**0.425**[**]	**0.000**
Pedagogical Approaches		
Learners are actively involved in the learning process, creating their own meaning and knowledge of the material (constructivist).	0.463[**]	0.000
Multiple learners work together, like in small group instruction, and they all contribute and help each other learn (collaborative).	0.418[**]	0.000
Students address real-world problems, like in project-based learning, by asking questions and doing further research (inquiry-based).	0.401[**]	0.000
Learners engage with cross-curricular material using multiple academic disciplines and common language (integrative).	0.351[**]	0.000
Both teachers and learners reflect on lessons, projects, and assessments to see how to improve them in the future (reflective).	0.418[**]	0.000
Mean of Pedagogical Approaches	**0.476**[**]	**0.000**
Assessment of learning		
The assessment tools (ATs) are appropriate to meet the objectives of the desired skills.	0.418[**]	0.000
The ATs contain varied activities to assess different learning skills.	0.418[**]	0.000
The directions in the assessment tool (ATs) are clearly stated.	0.401[**]	0.000
The test questions in the AT's are free from conceptual or content errors.	.[b]	
The ATs are suitable for learners' level of understanding.	.[b]	
Mean of Assessment of Learning	**0.476**[**]	**0.000**

[**]. Correlation is significant at the 0.01 level (2-tailed).

[b]. Cannot be computed because at least one of the variables is constant.

As observed in table 6, the variable 4 under objectives of the lessons which is "the learning objectives integrate knowledge, skills and attitude (KSA)" (r=0.050, p-value=0.540) has no significant relationship with the learners' performance. The result implies that the learners are unique and therefore, have different levels of understanding toward the mathematics subject offered to them.

The learning objectives of lessons, including alignment with K to 12 curriculum standards, specificity, measurableness, relevance, and time-boundness, varied tasks, and available instructional materials, significantly impact learners' performance, indicating that teacher construction affects learning outcomes.

The study by Kissi et al. (2023) found that the way teachers construct tests directly affects learners' performance. Factors such as active learning, collaboration, real-world problem-solving, cross-curricular use, and reflection on lessons and assessments are significantly related to learners' performance. Teachers perceived more competence in ensuring content validity, test item assembling, and handling options. The study provides unique evidence on teachers' perceived test construction competence.

The assessment of learning is influenced by factors such as appropriate tools, varied activities, and clearly stated directions. Teachers are well aware of the Special Mathematics Education (SME) curriculum, but students have a negative attitude towards mathematics and an ineffective curriculum in secondary schools. Primary school teachers lack potential and competence, leading to poor performance. Secondary school teachers are positive, good quality, performing, and fully qualified in teaching mathematics.

Problems Encountered by the Respondents in the Implementation of Special Mathematics Education

Table 7. Thematic Analysis on Problems Encountered by the Respondents in the Implementation of Special Mathematics Education

Domain	Category/Sub-category	Frequency Label
Resources	Inadequate Learning Materials for Learners	General
Reinforcement	Low Learning Retention	General

Implementation of Special Mathematics Education in Narvacan National Central High School

Resources

One of the core challenges by the respondents in the implementation of Special Mathematics Education at present is resources. Respondents identified 1) Inadequate learning materials for learners.

Inadequate Learning Materials for Learners

The Department of Education's learning materials are insufficient for the country's enrollment, and some are outdated and unsuitable for use. Despite this, teachers are resourceful enough to provide necessary materials for their students.

An inadequate number of learning materials prevailed as one of the problems that they encounter during instruction. Participant 4 said, "*Lack of useful material and gadgets by both teachers and learners*". Similarly, participant 10 identified and said, "*lack of learning materials*". Also, participant 11 responded, "inadequate learning materials". Thus, this seemingly being a problem must be addressed.

This problem affects students and teachers, which in turn can affect the parents of the children. The lack of resources in classrooms can cause extreme distress to the students and teachers. Not only are the students and teachers in distress, but they are unable to learn to their fullest potential because they are not being given the proper resources. Once we realize these problems, we then can investigate solutions for this wicked problem (Mafea, 2020).

Lyons (2012) highlights the complex nature of learning, involving student motivation, physical facilities, teaching resources, and curriculum demands. The availability of TLR enhances school effectiveness, promoting good academic performance through necessary resources.

Reinforcement

Respondents identified reinforcement as one of the fundamental problems in the implementation of Special Mathematics Education at present is resources, thus, low learning retention was identified by the respondents as a factor under this category.

Low Learning Retention

Learning retention is the ability to store new information in one's long-term memory so a person can easily recall it and put that knowledge to use in the future. If the information is not retained, it will remain in the short-term memory and drop out after a certain period (Colman, 2022).

Learners are very unique. They are entirely different in terms of learning styles. Since they are individually different, they cannot be expected nor assumed to have similar ways of understanding each Mathematics lesson to be taught in class. Moreover, their grades differ from each other. As a consequence, they vary in terms of performance.

Low retention of the lessons is one of the problems the respondents experienced during instruction. Participant 3 said, "*Students have low retention of the discussed competencies*". Supporting the same response, participant 12 said, "*Retention is low, and connection to real life and application is difficult*". Even participant 14 said, "*Low retention, special math class has 9 to t10 subjects, and learners are overloaded*". Thus, this must also be given attention.

In order to achieve school's goal, schools need to work with each one of these students. Special education students deserve to develop to their maximum potential in mathematics, especially since it is one of the main focuses in the school curriculum. On a larger scale, the education system needs to be working towards creating a better educated and prepared generation in numeracy, so it can function efficiently and effectively in the future. Very few careers do not require basic mathematics skills, and the job market has ever-increasing demand for technical skills (Noel-Levitz, 2015).

Suggested Solutions to Address the Problems

Table 8. Thematic Analysis on Suggested Solutions by the Respondents in the Implementation of Special Mathematics Education

Domain	Category/Sub-category	Frequency Label
	Technology Integration	General
	Open Education Resources (OER)	General
Resources	Active Learning Techniques	
		General
Reinforcement	Personalized Learning Plans	Genaral

Resources

According to the respondents, they often suggest resources as one of the solutions to address the problems in the implementation of special mathematics education. Hence, respondents identified two factors: 1) technology integration, and 2) open education resources.

Implementation of Special Mathematics Education in Narvacan National Central High School

Technology Integration

This refers to the incorporation of various technological tools and resources to enhance the teaching and learning of mathematics. The integration of technology aims to make math more engaging, accessible, and relevant to students, fostering a deeper understanding of mathematical concepts. As technology continues to advance, educations have the opportunity to leverage a wide range of tools to create dynamic and interactive learning experiences in the math classroom. Participant 3 stated that, *"Investing in educational technology and software that supports diverse learning needs. Ensure that teachers are trained to effectively integrate technology intro their teaching methods, providing students with interactive and engaging learning materials."* Added by participant 5, *"It is with great help to the learners having the E- tulay in tv broadcasting as one of the sources of their learning."* E- tulay is a free online tutorial platform for learners given by excellent and inspiring educators, who assume the role of a facilitator and guide the students to another level of learning experience.

In the study of Eshet (2014), the tasks required in a context include for example reading instructions from graphical displays in user interfaces; utilizing digital reproduction to create new, meaningful materials from existing ones; constructing knowledge from a nonlinear, hypertextual navigation; evaluating the quality and validity of information; and have a mature and realistic understanding of the rules that prevail in the cyberspace. The newly emerging concept of technological literacy may be utilized as a measure of the quality of learners' work in technological environments, and provide scholars and developers with a more effective means of communication in designing better user-oriented environments.

Open Education Resources (OER)

This is to freely access, openly licensed educational materials that can be used for teaching, learning, and research. These resources are made available to the public with the intention of removing barriers to education, promoting collaboration, and fostering the sharing of knowledge. OER can include a wide range of materials such as textbooks, lesson plans, multimedia content, and interactive tools. Participant 2 said that, *"it is time to promote the use and creation of Open Education Resources, which are freely accessible, adaptable, and shareable. Encouraging educators to share resources can help alleviate the shortage of learning materials."*

OER offers accessible, adaptable, and collaborative learning materials, potentially democratizing education and fostering global collaboration. Despite challenges, its benefits include cost savings, customization, and global collaboration.

Reinforcement

Under this category, respondents identified two factors as a possible solution in the implementation of special mathematics education, 1) active learning techniques, and 2) personalized learning plans.

Active Learning Techniques

Active learning techniques engages students in the learning process through activities, discussions, and problem-solving, as opposed to traditional passive learning methods like lectures. Active learning techniques encourage students to think critically, apply knowledge, and participate actively in their own learning. These techniques can be applied across various disciplines and educational levels to enhance understanding and retention. Participant 10 and 12 stated that *"We need to incorporate active learning methods such as group discussions, case studies, hands-on activities, and interactive simulations."* These approaches engage learners actively, making the learning experience more memorable. In this way, students engage with the mathematics in ways that allow them to construct their own understanding of concepts and procedures. There are a variety of instructional practices that MTEs can use to engage PTs with the mathematics and promote an active learning environment.

As stated by Litster et al. (2020) active learning mathematics classrooms incorporate meaningful activities that emphasize reasoning, thinking and active interaction with mathematics. Current mathematics standards and curricula recommend that Mathematics Teacher Educators (MTEs) use elements of active learning in their mathematics content courses specifically designed for Prospective Teachers (PTs) as they prepare PTs to learn and teach mathematics. However, it can be very difficult for PTs to shift their pedagogical dispositions towards instruction associated with active learning because they typically have not experienced mathematics taught in this way.

Active learning strategies that simultaneously integrate intellectual, social and physical engagement are most likely to provide a more pleasant experience for students, while working on important contents that they need to learn (Edwards, 2015). In this sense, the adoption of an active learning approach tends to increase students' performance and interest in STEM disciplines (Vale & Barbosa, 2020a), raising their expectations/motivations regarding learning (of mathematics). To better understand principles underlying the intellectual, social and physical dimensions we will discuss each strand individually.

It is part of the teacher's role to ensure that students become intellectually engaged with the contents to address, showing intrinsic motivation to establish relationships, develop conceptual understanding and use critical thinking, which allow them to go beyond memorization or the acquisition of a more limited comprehension (Edwards, 2015). In the particular case of mathematics, it is

through problem-solving tasks, which foster reasoning and communication, that the teacher is able to challenge students, helping them establish connections and reach a deeper understanding (Edwards, 2015; Vale & Barbosa, 2020a).

Personalized Learning Plans

Personalized Learning Plans (PLPs) are student-centered educational strategies involving collaboration between students, educators, and parents, aiming to prepare students for success in an evolving world.

Participant 9, said that *"tailor learning experiences to individual needs. Recognize that learners have different strengths and weaknesses, and provide resources or activities that cater to their specific requirements."*

Even though many educators had heard the term personalized learning and thought they understood what it meant, this term has often become confused with other, similar concepts such as differentiation, individualization, blended learning, and project-based learning. School districts are transitioning to personalized learning classrooms, incorporating different concepts such as differentiation, individualization, blended learning, and project-based learning. Differentiation involves students choosing from a predesigned curriculum based on individual needs, while individualization involves students choosing from a predesigned curriculum. Blended learning allows students to learn online with some control over time, place, path, and pace. It allows for various projects and technology to support practice and target weak areas. Project-based learning allows students to explore real-world problems and build 21st-century skills. These projects can be completed by individual students, small groups, or whole grade levels, allowing students to be involved in all aspects of development, research, and decision-making.

V. CONCLUSIONS

Based on the findings, the following conclusions were drawn.

1. Majority of the respondents were 26 – 30 years old, females, started teaching between 1 to 5 years, completed academic requirements in a Master's Degree, and had attended school based-trainings and seminars.

2. The use of available instructional materials was "much available" to support the implementation of Special Mathematics Education.

3. The level of implementation of Special Mathematics Education along with objectives of lesson, pedagogical approaches, and assessment of learning was "very highly implemented" as it indicates a commendable degree of success and effectiveness in incorporating these elements into the educational context.

4. The level of Mathematics performance of the Special Mathematics Classes in Narvacan National Central High School was "outstanding". This shows a very high level of accomplishment and subject-matter expertise.

5. The trainings and seminars attended by the respondents at the international level are significantly related to the availability of instructional materials. The level of availability of instructional materials was significantly related to the learners' performance. Furthermore, the extent of implementation of Special Mathematics Education was significantly related to leaners' performance.

6. Inadequate learning materials for learners under resources category and low learning retention under reinforcement category emerged to have been the problems encountered by the respondents.

7. Learning can be reinforced through technology integration, Open Education Resources as active learning techniques and personalized learning plans.

VI. RECOMMENDATIONS

Based on the conclusions, the following recommendations are hereby offered.

1. The teachers are encouraged to pursue the post graduate education leading to the completion of a master's degree. Encouraging teachers to pursue postgraduate education leading to the completion of a master's degree is a strategic initiative that can yield significant benefits for both educators and the educational institution.

2. The teachers shall actively augment existing materials, educational institutions foster a culture of innovation, adaptability, and student-centered learning. This approach acknowledges the dynamic nature of education and recognizes the pivotal role teachers play in shaping the educational experience for their students.

3. Teachers shall sustain the implementation of Special Mathematics Class by maintaining and continually improving special math instruction, teachers play a pivotal role in creating an inclusive and supportive learning environment where every student can thrive in their mathematical learning journey.

4. The teachers should continue to support students' great achievement by providing them with relevant and constructive activities. By continuing to support students' great achievement through relevant and constructive activities, teachers contribute to a vibrant and dynamic learning environment that prepares students not only for academic success but also for the challenges of the ever-changing world beyond the classroom.

5. Teachers shall participate in LAC sessions, seminars, and training programs at regional and international levels is an investment in the continuous improvement of education. It empowers educators to stay current, share experiences, and contribute to a global community of practice, ultimately benefiting both teachers and their students.

6. The teachers should regularly gather feedback from both learners and educators, and be open to adjusting based on the evolving needs of the educational community.

7. The teachers should provide solutions to existing problems in teaching mathematics. Educational institutions can create a more dynamic and responsive learning environment that harness the power of technology and adapts to the unique needs of each learner. This approach lays the foundation for a more inclusive and effective educational experience.

REFERENCES

1) Adawi, S. (2017). Exploring the effectiveness of implementing seminars as a teaching and an assessment method in a children's literature course. Retrieved on August 11, 2023 from https://files.eric.ed.gov/fulltext/EJ1157953.pdf

2) Alufohai, P. & Ibhafidon, H. (2015). Influence of teachers' age, marital status and gender on students' academic achievement. Retrieved on August 10, 2023 from http://www.multidisciplinaryjournals.com/wp-content/uploads/2015/07/paper-INFLUENCE-OF-TEACHERS%E2%80%99-AGE-MARITAL-STATUS.pdf

3) Bhandari, P. (2020). What is quantitative research? Definition, uses and methods. Retrieved on March 16, 2023 from https://www.scribbr.com/methodology/quantitative-research/

4) Cempron, D. (2021). An inquiry on the underlying instructional materials in social studies. Retrieved on August 11, 2023 from https://files.eric.ed.gov/fulltext/ED616127.pdf

5) Chand, S. et al. (2021). Perceived causes of students' poor performance in mathematics: a case study at Ba and Tavua secondary schools. Retrieved on August 11, 2023 from https://www.frontiersin.org/articles/10.3389/fams.2021.614408/full

6) Colman, H. (2022). Learning Retention – How To Make Information Stick. Retrieve on August 11, 2023 from https://www.ispringsolutions.com/blog/learning-retention

7) Derrac, N. (2019). Mathematics self-concept and academic performance of grade 10 students: basis for school improvement program. Ascendents Asia Journal of Multidisciplinary Research. Vol. 3 No. 2N.

8) Edwards, S. (2015). Active learning in the middle grades. Middle School Journal, 46, 26-32. https://doi.org/10.1080/00940771.2015.11461922

9) Elsayed, S. & Nasef, H. (2020). The Effectiveness of a Mathematics Learning Program Based on the Mind Habits in Developing Academic Achievement Motivation and Creative Thinking among Prince Sattam Bin Abdulaziz University Students. Retrieved on August 11, 2023 from https://files.eric.ed.gov/fulltext/EJ1286056.pdf

10) Eshet, Y. (2014). Digital Literacy: A Conceptual Framework for Survival Skills in the Digital era. *Journal of Educational Multimedia and Hypermedia, 13*(1), 93-106. Norfolk, VA: Association for the Advancement of Computing in Education (AACE).

11) Fairbank, B. (2021). 5 educational learning theories and how to apply them. University of Phoenix. Retrieved on March 16, 2023 from https://www.phoenix.edu/blog/educational-learning-theories.html#:~:text=There%20are%20five%20primary%20educational,transformative%2C%20social%2C%20and%20experiential

12) Ferrer, I.M. (2017). Competency level of Grade 10 mathematics teachers in Pangasinan, Philippines. PSU JEMSS. 1(1):12-15

13) Funtanilla, Clarissa Mae M. (2021). "Teaching Mathematics in the New Normal" A Master's Thesis, Ilocos Sur Polytechnic State College

14) Graphy (2022). What is the traditional method of teaching? | Definition and characteristics. Retrieved on August 25, 2023 from https://graphy.com/blog/traditional-method-of-teaching/#:~:text=Traditional%20learning%20develops%20the%20student's,the%20ways%20of%20the%20world.

15) Guinocor, M. et al. (2020). Mathematics Performance of Students in a Philippine State University. Retrieved on August 21, 2023 from https://www.researchgate.net/publication/340254879_Mathematics_Performance_of_Students_in_a_Philippine_State_University

16) Guro, Analyn P. (2018). Self-efficacy and performance of grade 7. Retrieved on August 21, 2023 from https://www.atlantis-press.com/proceedings/coema-18/25903247

17) Hebres, R. B. (2022). Academic Performance and Numeracy Level of Grade 10 Students in Mathematics. Retrieved on August 21, 2023 from https://www.ijsr.net/archive/v12i2/SR23123131547.pdf

18) Kapur, R. (2022). Understanding the significance of seminars and workshops in educational institutions. Retrieved on August 25, 2023 from https://www.researchgate.net/publication/362067804_Understanding_the_Significance_of_Seminars_and_Workshops_in_Educational_Institutions

19) Kaufman, J. et al. (2019). How instructional materials are used and supported in U.S. K-12 classrooms. Retrieved on August 11, 2023 from https://www.rand.org/content/dam/rand/pubs/research_reports/RRA100/RRA134-1/RAND_RRA134-1.pdf

20) Khan, S. (2022). Learner-centered curriculum. Education Awareness and Research. Retrieved on March 16, 2023 from https://research-education-edu.blogspot.com/2020/01/learner-centered-curriculum.html

21) Kini, T. & Podolsky, A. (2016). Does teaching experience increase teacher effectiveness? A review of the research. Retrieved on August 10, 2023 from https://learningpolicyinstitute.org/product/brief-does-teaching-experience-increase-teacher-effectiveness-review-research

22) Kissi, R. et al. (2023). Teachers' test construction competencies in examination-oriented educational system: Exploring teachers' multiple-choice test construction competence. Retrieved on August 25, 2023 from https://www.frontiersin.org/articles/10.3389/feduc.2023.1154592/ful

23) Litster, K., MacDonald B., and Shumway, J. (2020). Experiencing active mathematics learning: meeting the expectations for teaching and learning in mathematics classrooms. The Mathematics Enthusiast. Vol. 17, Nos. 2 &3, pp. 616-640

24) Lyons, E. J. (2012). Role of Higher Education in Promoting Inclusive Education: Kenyan Perspective. Journal of Emerging Trends in Educational Research and Policy Studies, 2(3): 144-149; 2011.

25) Mafea, J. (2020). Lack of Resources in Classrooms. Retrieved on August 11, 2023 from https://research.library.kutztown.edu/cgi/viewcontent.cgi?article=1003&context=wickedproblems#:~:text=The%20lack%20of%20resources%20in%20classrooms%20can%20cause%20extreme%20distress,being%20given%20the%20proper%20resources.

26) Malipot, M. (2022). DepEd to develop a national mathematics program. Retrieved on March 16, 2023 from https://mb.com.ph/2022/11/18/deped-to-develop-national-mathematics-program

27) Nabayra, J. & Nabayra L. (2021). Exploring how culture of excellence is personified by mathematics teachers in the public schools. Retrieved on August 11, 2023 from file:///C:/Users/Lenovo%20Demo%2011/Downloads/Paper+13+(2021.1.1)+Exploring+How+Culture+of+Excellence+is+Personified+by+Mathematics+Teachers+in+the+Public+Schools.pdf

28) Ngcobo, E. S. (2021). Exploring Grade 9 mathematics learner performance in schools that participated in the 1+9 programme. Retrieved on August 21, 2023 from https://ukzn-dspace.ukzn.ac.za/bitstream/handle/10413/20963/Ngcobo_Edward_Sazi_2021.pdf?sequence=3&isAllowed=y

29) Noel-Levitz. (2015). Student success in developmental math strategies to overcome primary barrier to retention. Denver, CO: Higher Education Consultants.

30) Prodigy. (2021). Why is math so hard for some students? Retrieved on March 13, 2023 from https://www.prodigygame.com/main-en/blog/math-is-hard/#:~:text=Because%20math%20involves%20using%20plenty,them%20become%20impatient%20with%20math.

31) Russo, J. et. al (2023). Exploring the relationship between teacher enjoyment of mathematics, their attitudes towards student struggle and instructional time amongst early years primary teachers. Retrieved on August 10, 2023 from https://www.sciencedirect.com/science/article/pii/S0742051X18315130

32) Stone-Romero, E. F., Alvarez, K., & Thompson, L. F. (2009). The construct validity of conceptual and operational definitions of contextual performance and related constructs. HumanResource Management Review, 19, 104- 116

33) Vale, I., & Barbosa, A. (2020a). Gallery Walk: Uma estratégia ativa para resolver problemas com múltiplas soluções [Gallery Walk: An active strategy to solve problems with multiple solutions]. Revista da Sociedade Brasileira de Educação Matemática, 17, 1-19. https://doi.org/10.37001/remat25269062v17id260

The Mathematics Performance and the Track Preference of Grade 10 Students

Rowena C. Baucas

Ilocos Sur Polytechnic State College Philippines

ABSTRACT: This research paper focused on investigating the mathematical performance of grade 10 students and its role in determining their Senior High School (SHS) track/strand. The aim of the study is to explore the attitudes, beliefs, and opinions of the students towards mathematics and how it influences their decision-making process in choosing their SHS track/strand. Additionally, the study aims to examine the factors that affect students' performance in mathematics in relation to their chosen SHS track/strand. The research design utilized in this study is a survey questionnaire, which was administered to grade 10 students at Narvacan National Central High School. The participants of the study are primarily grade 10 students, with a majority being 16 years old. There are more female respondents than male, and a significant percentage of the respondents' parents have blue-collar jobs. Additionally, most of the parents are college graduates. The findings of the study indicate that the level of mathematics performance among grade 10 students at Narvacan National Central High School is considered "Fair." Furthermore, the students' preferred track for SHS is Humanities and Social Sciences (HUMSS). The study also reveals a significant relationship between mathematics performance and the profile of the respondents. Additionally, there is a significant relationship between mathematics performance and STEM, HUMSS, and TVL track/strands. However, there is no relationship between mathematics performance and the preferred strand of students who chose ABM. The implications of this research highlight the importance of mathematics in the decision-making process of students when choosing their SHS track/strand.

KEYWORDS: mathematics performance, grade 10 students, Senior High School track/strand, preferred track.

I. INTRODUCTION

Mathematics is a subject that is required at all stages of schooling. It is defined as knowledge, skills, understandings, and procedures that require an individual to interpret mathematical content of patterns such as number and space (Animasaun, 2021). Curriculum documents both internationally and locally recognize the importance of mathematics for teaching and the need to acquire mathematical thinking processes. The incorporation of mathematical thinking as a theme in curriculum documents, on the other hand, differs.

The choice of track/strand in senior high school is a critical decision that can significantly impact the future of students. Therefore, it is important for students to understand the role of mathematics in determining their track/strand. However, there is limited research on the performance of grade 10 students on the role of mathematics in determining their track/strand. Understanding the performance of students regarding the role of mathematics in their career path can help educators develop better strategies to help students make informed decisions about their future.

This research investigated the mathematical performance of grade 10 students of Narvacan National Central High School on the role of mathematics in determining their Senior High School track/strand. The study aimed to explore the attitudes, beliefs, and opinions of grade 10 students towards mathematics, and how it influences their decision-making process in choosing their track/strand. The study also examined the factors that affect the performance of students towards mathematics in relation to their Senior High School track/strand.

Choosing a track is crucial for a student to become extremely proficient in the field to which his or her selected track is related, particularly if the student desires to work soon after graduating from Senior High School. According to most educators, a mismatch between the track and the student's personality and interest might result in a poorly knowledgeable graduate who will struggle to compete in the job market or stay up with other students when he or she enters college.

The Mathematics Performance and the Track Preference of Grade 10 Students

II. FRAMEWORK OF THE STUDY

A. *Theories on the negative impact of mathematics*

Critical Theory is a philosophical method that involves a moral critique of culture. In this sense, a "critical" theory is one that aims to reject or invalidate a widely accepted or influential notion or way of thinking in society. Thus, critical race theorists and critical gender theorists challenge standard and hidden assumptions about race and gender. Critical theorists may employ critical thinking methods, but their subject matter is separate, and they may also provide critical assessments of critical thinking.

The so-called deficit theory, Dénes Szűcs (2019) states that poor arithmetic performance leads to math anxiety. In other words, students would predict or anticipate doing poorly on arithmetic examinations because they would expect themselves to score poorly on them. It would then become a self-fulfilling prophecy, causing anxiety. The important point is that only kids who score poorly in arithmetic will experience math anxiety.

John Dewey's Learning by Doing Theory (1916) is integrated when employing Rich Assessment Tasks Environment. By giving students worthwhile and meaningful tasks where they can use what they have learned in practical contexts, teachers can help students feel more in control of their education.

Problem solving, according to behaviorists, is a process that evolves through positive and negative reinforcement mechanisms. Problem resolution, according to cognitive psychologists, is a process that incorporates introspection, observation, and the formation of heuristics. The information-processing perspective on issue solving is founded on generic problem-solving abilities and artificial intelligence (Hardin, 2003).

In addition, according to Norman and Gagne's theories of cognitive learning, knowledge is organized hierarchically in schemata. According to the idea, facts come together to form conceptions, concepts come together to make rules, and rules come together to form problem-solving structures. These findings also lend support to Norman's (1982) theory that expert performance in procedural knowledge is distinguished by smoothness, automaticity, and less mental effort as compared to beginner performance.

B. Scope and Delimitation of the Study

The purpose of this quantitative study was to investigate the mathematical performance of Grade 10 students at Narvacan National Central High School in relation to the function of mathematics in determining their senior high school track/strand. The study investigated the students' understanding of the value of mathematics in relation to their future jobs, as well as the elements that influence their choice of senior high school track/ strand. It also investigated how their mathematics proficiency affects their academic performance in their chosen track/strand, their performance on the importance of mathematics in their future careers and daily lives, and their recommendations on how to improve their understanding and appreciation of mathematics when deciding on a senior high school track/strand. The study was limited to grade 10 students at Narvacan National Central High School, and the main data gathering instrument was a questionnaire.

III. REVIEW OF LITERATURE

A. Profile of the Respondents

In research respondents' profile plays a very significant role. The personal characteristics of respondents based on either voluntary or involuntary participation forms the backbone of the scientific explanation (Glaser, 2012). Respondents' cooperation has been a concern of survey and opinion researchers since at least the latter part of the twentieth century both because of its implications for data quality, as well as its reflection upon research methods and the resulting ethical and regulatory considerations.

Moreover, student profile is a snapshot of a student's learning journey. Students' basic information, descriptions of themselves, education, career goals, courses taken, and work experience are all included in their student profiles. It also has a section for listing hobbies, abilities, badges obtained, accomplishments, and memberships. Student profiles bring to life the breadth and depth of a student's academic life. Student profiles show a history of a student's learning journey and growth throughout their school/ college career (https://www.mysphere.net/articles/why-is-your-student-profile-important/, May 2022).

Age

In Kalla's (2006) research claimed that diversity studies, on the other hand, have primarily focused on issues such as gender, race, and ethnicity, citing age as one of the aspects influencing how we view identities, capacities, and differences.

According to Heaven & Ciarrochi (2012). The adolescent years are a critical era of life, and knowing the role that individual differences play in predicting youth academic performance is critical. For example, it is well proven that people who complete high school have better financial outcomes than those who do not (Ceci & Williams, 1997). Countries are currently ranked based

The Mathematics Performance and the Track Preference of Grade 10 Students

on student accomplishment in reading, math, and science (Organisation for Economic Cooperation and Development, 2011). Maximizing young people's academic achievement may be of significant national importance in a globalized economy.

Moreover, in the study of (Thoren, 2016), the age of a students in relation to the age of her or his peers (relative age) has been discovered to be an impact determinant on academic achievement, particularly but not only at the start of formal schooling. Also, student age has a statistically significant impact on students' academic achievement (Voyles, 2011).

In addition, Zubković (2021) also revealed that older students valued mathematics less than younger students, had a less positive mathematics self-concept, used learning strategies less frequently, and performed lower in mathematics.

Sex

Sex disparities in mathematical problem solving, which are thought to be a key element in gender inequalities in mathematics achievement, have received considerable attention from scholars in recent decades (Zhu, 2007).

Hidayati et al. (2019) concluded that female students' problem-solving abilities outperform male students in guided exploration learning models. However, it negates the study of Fatimah et al. (2018) which revealed that sex has no substantial influence on students' mathematical problem-solving abilities.

In general, Benbow, (1992) discovered in his study that female students performed better in the classroom, as evidenced by grades and academic awards. Male students, on the other hand, tended to participate more in math/science areas, do better on standardized math/science achievement tests, and have higher educational goals (cf. Lubinski & Humphreys, 1990).

Parents Educational Attainment

These differences could result in unequal opportunities for children to acquire math, varying levels of cognitive stimulation in their learning contexts, and different access to resources (Davis-Kean et al., 2020). The relationship between home learning activities and children's outcomes in numeracy may therefore alter depending on SES, as may academic expectations and home learning activities.

Moreover, studies on parents' educational status undertaken in established and developing nations found many types of correlations and impacts on students' academic attainment. According to research findings, different educational levels of parents had different effects on students' academic achievement, and the findings revealed diverse nutrition practices of parents at home. According to Hanafi (2008), illiterate parents approach their children with additional care, but unstable academic conditions at home for children's education, and they have great expectations from their children. These tactics contribute to pupils' academic progress being unequal and unclear.

On the contrary, Journal of Arts and Social Sciences 7(2), 2020 85 primary pass parents employ relatively neglected and unrealistic academic methods from their children since they have great expectations from children with low investments, sometimes traditional reward, and punishment concepts, as well as corporal punishment. Parents with a higher educational status, on the other hand, are more practical and systematic when it comes to setting educational goals for their children. The current and adoptive parents are highly educated. Academic environments for their children at home (Hanafi, 2008).

Parent's Occupation

In terms of parent occupation, according to Pilarta (2010) and Barcelona (2017), there is a significant association between pupils' Mathematics performance and parent occupation. Gabriel (2012), as noted by Milan (2018), found a substantial link between these variables. Furthermore, as mentioned by Milan (2018), Imam and Singh (2014) offered a complete result. It was discovered that father's occupation was associated with math academic achievement. It has been reported that the kind of the father's employment is essential for the math achievement of their children. Children of engineers, doctors, businessmen, and other professional fathers outperformed all other professional groups in math. Children of engineers, doctors, businessmen, and other professional fathers outperformed all other professional groups in math. Children of businessmen performed better in math than the other two groups, but not as well as children of professionals.

Furthermore, they discovered that mothers' occupation was unrelated to scholastic ability in math. Children of housewives and working mothers performed equally well in math. The study implies that adult education programs aimed at young mothers and fathers could be one method to improving youngsters' mathematics proficiency.

Thus, parental occupation has tremendous potential to impact the educational performance of children. Since research has established that the parental occupation is an important factor that has a strong bearing on academic performance. Parental occupation is the most important determining factor of creating cash, which influences the total development of young wards, particularly their academic development and progress (Omar, M Hussain,2021).

B. Preferred Senior High School Track/ Strand

The senior high school program in the Philippines offers various tracks/strands that students can choose from, depending on their interests and career goals (Department of Education, 2016).

The Mathematics Performance and the Track Preference of Grade 10 Students

According to Malaguial et al., 2022, choosing a senior high school strand is one of the most difficult decisions that junior high students will undertake. The problem solving and critical thinking skills sought to assist students in deciding on their future senior high school strand by understanding the components' levels of effect and their link with their decision.

In the study of Villa et al., (2017), it has shown that mathematics plays a critical role in preparing students for specific senior high school tracks/strands. For example, students who are interested in pursuing STEM-related tracks/strands will require a strong foundation in mathematics. Additionally, students who are interested in pursuing business-related tracks/strands will need a solid understanding of mathematical concepts such as statistics and financial analysis (Nguyen & Abbott, 2017).

Science, Technology, Engineering, and mathematics (STEM) Strand

Science, Technology, Engineering, and Mathematics (STEM) is one of the most sought-after strands in senior high school, which focuses on preparing students for careers in the fields of science, technology, engineering, and mathematics. Mathematics plays a crucial role in the STEM strand, as it provides a foundation for understanding scientific concepts and principles.

According to a study by Alinsunurin, Leano, and Aguila (2018), students who took advanced mathematics courses in junior high school performed better in STEM-related courses in senior high school. Furthermore, mathematics serves as a tool for problem-solving and critical thinking in STEM-related courses, making it essential for students pursuing this strand.

However, according to Langdon et al. (2013), a STEM career in this study is one that involves scientific research and the application of any combination of science, mathematics, engineering, and technology disciplines to the production of scientific and technological products that contribute to the country's economic development.

Furthermore, Mamolo, (2019). The STEM strand demonstrated significantly different capability than the other strands in the academic track. This could be reinforced by the notions offered in Sison et al [14]'s study, which underlined the concentration of each strand of the academic route. It was stated that the Science, Technology, Engineering, and Math (STEM) strand provides students with the knowledge and abilities to solve difficult issues, analyze evidence, and make sense of available information to create solutions through invention and discovery to enhance people's lives.

Finally, the STEM strand in the Philippines is a critical educational route for the country's economic growth and development. Its curriculum is meant to provide students with the skills, knowledge, and experience they need to succeed in fields linked to science, technology, engineering, and mathematics. While its implementation is fraught with difficulties, the government and educators must collaborate to overcome these obstacles and promote STEM education in the country.

Accountancy, Business, and Management (ABM) Strand:

The Accountancy, Business, and Management (ABM) strand is another popular senior high school strand that focuses on preparing students for careers in business, finance, and accounting. Mathematics is a critical component of the ABM strand, as it provides the necessary skills for understanding and analyzing financial and economic data. According to a study by Arceo and Paragas (2020), mathematics performance in junior high school is positively related to academic performance in the ABM strand.

Furthermore, mathematics provides a foundation for courses such as calculus and statistics, which are essential in the ABM strand. ABM is related to the field of mathematics, which requires in-depth learning and analysis.

In the study of Gepila, Emijidio et al. (2022), stated that most of the respondents acquired low level thinking skills in Anderson and Krathwohl Taxonomy. It was also concluded that there was no significant relationship between the level of thinking skills of the respondents and their demographic profile.

Humanities and Social Sciences (HUMSS) Strand

The Humanities and Social Sciences (HUMSS) strand is a senior high school strand that prepares students for careers in the fields of humanities, social sciences, and communication. Although mathematics is not the primary focus of the HUMSS strand, it still plays a vital role in the strand. According to a study by Baring and Solis (2020), mathematics proficiency is positively related to academic performance in HUMSS-related courses such as statistics, research, and social sciences.

Furthermore, HUMSS strand is ideal for students who want to work in the social sciences and humanities. It gives them a solid basis in these subjects and helps them to pursue careers in law, education, psychology, sociology, and other fields.

Lastly, Mamolo, (2019)) stated that the Humanities and Social Sciences (HUMSS) strand focuses on developing a strong liberal arts background, exploring theoretical elements of their chosen subject, and gaining practical professional experience.

Technology – Vocational – Livelihood (TVL) Track

According to a study by Lopez and Morada (2019), mathematics proficiency is positively related to academic performance in TVL-related courses such as computer hardware servicing and automotive servicing.

The Mathematics Performance and the Track Preference of Grade 10 Students

Moreover, Agri-Fishery Arts, Home Economics (HE), Information and Communication Technology (ICT), and Industrial Arts are the four strands of the SHS program's Technical-Vocational-Livelihood (TVL) Track. These correspond to Technology and Livelihood Education (TLE) in Grades 7–10. Each TVL strand provides a variety of specialties that may or may not have a TESDA National Certificate (NC) equivalent. The time allocation per strand specialization is based on TESDA Training Regulations-Based Courses. In addition, the Technical-Vocational-Livelihood (TVL) track is a senior high school strand that focuses on preparing students for careers in technical and vocational fields. Mathematics plays a crucial role in the TVL strand, as it provides the necessary skills for understanding and applying technical concepts.

In the study of Ramos (2018), the findings stated that the necessity for infusing and developing critical thinking skills of students as they progress through the levels and face the 21st Century Skills and Outcomes-Based Education in the Senior High School Level; Development of comprehensive teaching and instructional materials such as multi-media contents materials including simulators and video tutorials, modules, and assessments. Textbook that can help GAS and Tech-Voc students in the SHS level develop their analytical, logical, and problem-solving capabilities, as well as decision-making abilities.

Finally, Lebosana, et. al (2019) on the other hand, said that to help students' families support their studies, a livelihood program should be developed. Schools should introduce and encourage kids to learn about various fields such as agriculture and industrial arts. PTA (Parents Teachers Association) meetings for Moving Up pupils should include Career Guidance counseling because they have a large influence on their students' choices.

C. Mathematics Performance

In the study of Pagtulon-an & Tan (2018) stated that the phrase "Assessment tool should match with the performance objective" appears as one of the Assessment of Learning's guiding principles. Your instruction will be valid and reasonable if the assessment instruments are accurately matched to the intended objectives. As a result, achieving the lesson's objectives will result in successful learning for the students as well as valuable instruction and learning.

According to research in the field (Voskoglou and Buckley 2012), issue resolution may be defined as the successful outcome of the cognitive engagement process and subconscious thinking toward a barrier. Peter Henderson (National Research Council 2011) defined CT as "generalized problem solving with constraints" (p.95) and aptly articulated the relationship of problem solving with computational thinking, elaborating that problem solving predominantly engages some form of computation to achieve a solution. Barr and Stephenson (2011) emphasized the importance of technology education further, claiming that computational thinking is problem solving that can be conducted on a computing device.

Furthermore, Salimaco (2020) cited that there have been various factors that contribute to learners' scientific capacity, such as family foundation and financial status (Suhas and Pandya, 2016; Spybrook, 2008), the impact of nearby friends (Kupari,2006), sex-related differences (Else-Quest, et al., 2010; Guiso et al., 2008), and their personal and habitual attributes (Campbell, 2016). Emmanuel et al. (2014) also stated that it is critical to direct investigations relating to senior high school academic endeavors because it is the transitional stage prior to upper postsecondary education.

Finally, Alcantara, et.al (2017) stated that, given the findings of previous studies on mathematics performance, problem solving ability, and critical thinking skills, as well as the researchers' concern about the quality of mathematics instruction in secondary schools, the current study was deemed necessary. Most students nowadays are completely reliant on how the internet answers their questions, oblivious to the fact that their mathematical abilities have been affected as a result.

Problem-solving Skills

According to Garcia and Dela Rosa (2021), problem solving abilities are one of the main points in studying mathematics since it is a process of finding a route around a difficulty around an obstacle and finding a solution to an unknown problem (The K to 12 Mathematics Curriculum Guide, 2013). The word "problem solving" refers to mathematical problems that can present intellectual difficulties for developing students' mathematical understanding and development. It is significant in mathematics and should be emphasized in the mathematics education of K-12 pupils. However, knowing how to include problem solving effectively into the mathematics curriculum is not always evident to Mathematics teachers (Brown & Nanny, 2003).

In the problem-solving process, the perception of students' problem-solving talents is crucial (Wismath et al., 2014). It entails compiling and synthesizing a diverse set of skills, beliefs, attitudes, perceptions, information, and prior accomplishments (Orsel and Yavuz, 2017).

Problem solving is just one form of thinking skill that teachers employ to teach pupils how to think. Problem-based learning, critical thinking abilities, creative thinking skills, decision making, conceptualizing, and information processing are some other ways to develop thinking skills (Ellis, 2005).

Critical Thinking Skills

One of the primary goals of education is critical thinking. Then, it is critical to determine cognitive characteristics that aid kids' critical thinking (Magno, 2010). Problem solving skills and critical thinking have similar traits. Like the issue, critical thinking

The Mathematics Performance and the Track Preference of Grade 10 Students

is a type of thinking that incorporates cognitive processes such as reasoning, analyzing, assessing, etc. Critical thinking is an intellectual capacity that is essential in both educational and social life of an individual (Akin, Hamedolu, Arslan, Akn, elik, Kaya, & Arslan, 2015). The critical thinking process can be viewed as a problem-solving strategy (McPeck, 2004). 1983). Although there are numerous definitions of critical thinking, most of them include Making decisions and problem solving are common themes. (Halpern, 1998). Problem solving could improve one's critical thinking skills (Buku, Corebima, & Rohman, 2004). 2016).

According to Ubarre (2016) as stated by Garcia and Rosa (2021), "critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action." It may include inductive and logical reasoning, analysis, and problem solving, as well as creative, innovative, and complicated methods to problem solving. Based on these considerations, the ability to critically review and analyze emerges as vital for enjoying a high quality of life (The University of the West Indies, n.d.).

Also, Butterworth & Thwaites (2013), stated that independent critical thinking is required. Listening to others, respecting their thoughts and perspectives, learning from teachers, obtaining information from books and/or online sources are all acceptable. But, to think critically, you must be willing to take the initiative and ask your own questions and draw your own conclusions.

However, to successfully apply critical thinking skills in teaching and learning, several fundamental notions must be instilled in an individual. The ability to comprehend, analyze, make inferences, assess, explain, and self-regulate are among the notions (Facione, 2006, 2015). These ideas are like those expressed by Paul and Elder (2005). They both agree that critical thinking is a way used by an individual to try to improve his thinking talents to the highest level possible by developing new ideas and thoughts using a variety of skills, competencies, and intellectual standards that he already possesses. Meanwhile, problem definition, systematic observation, brainstorming, beginning of problem solution, defining short-term goals, argumentation based on qualitative indicators, feedback, and self-assessment are all components of critical thinking skills in education today (Plotnikova & Strukov, 2019).

Furthermore, critical thinking skills can be caused by a range of cognitive and intellectual abilities that an individual possesses. Identifying issues, arbitrating an idea, avoiding any biased considerations, devising tactics to support a cause, making intelligent decisions, and addressing needs are examples of these talents (Birgili, 2015). Critical thinking skills is also connected with different levels of skill based on a person's aptitude and wisdom to reason, determine, and solve problems (Mahanal et al., 2019). Meanwhile, Vaughter (2016) expounded on the concept of critical thinking, stating that every high-quality critical thinking outcome should be transformed into real-world action.

III. METHODOLOGY

A quantitative research strategy was applied in this work, along with correlational development methodologies. Evaluative and correlational approaches were used in the study design, with ideas used to characterize students' performance in mathematics of a given occurrence.

A correlational method was used to uncover meaningful correlations. This study described the respondent profile as well as their mathematics performance in their future track or strand.

A. Population and Locale of the Study

A total of 247 respondents out of 640 total population were taken as respondents. Simple random sampling technique was used in the selection of the respondents.

The sample size required to produce a statistical power of at least 0.90 with the specified alpha of 0.05 and a correlation p of 0.2 as medium size was revealed by the G*power analysis for the one-tailed correlated t-test.

IV. RESULTS AND DISCUSSION

Table 1 Mathematics Performance of Grade 10 Students

Level of Mathematics Performance of Grade 10 Students

Score	Frequency	%	Level
41-50	0	0.00	O
31-40	37	14.98%	VS
21-30	60	24.29%	S
11-20	147	59.51%	F
1-10	3	1.21%	P
Total	**247**	**100.00**	

The Mathematics Performance and the Track Preference of Grade 10 Students

     Mean = 20.80   SD = 4.85

Based on the result, there were 37 students who got a score ranging from 31-40 out of 50 item tests or 14.98% of the respondents belongs to very satisfactory level of mathematical abilities. However, there were 147 students or 59.51% who got scores ranging from 11 - 20 which indicates that their level of performance in mathematics is fair. The composite mean of the scores is 20.80 with the standard deviation 4.85 indicates that the Grade 10 students of Narvacan National Central High School performed fairly in Mathematics.

Table 1 also implies that the students can't well interpret data, answers questions and statements, can't well examine ideas and detecting argument working and arriving at the answers on their own thinking and can't well evaluate questions to arrive answers. However, most of the Grade 10 students got a satisfactory level of performance in Mathematics. The Table reveals that 60 out of 247 respondents or 24.29 % got the score of 21 -30. This signifies that the students have a good understanding in verbal description of problem situations and can give some numerical answer to a stated question by making relationship between quantities.

Table 2 Preferred senior high school track/strand.

Frequency and Percentage Distribution of the Respondents' Preferred Senior High School Track/Strand

PREFERRED TRACK/STRAND	f	%
STEM	94	38.06%
ABM	8	3.24%
HUMSS	112	45.34%
TVL	33	13.36%
Total	**247**	**100.00**

As shown in table 2, the Humanities and Social Sciences (HUMSS) strand has the highest frequency among the preferred strands with 112 or 45.34% strands followed by Science, Technology, Engineering, and Mathematics (STEM) the strand with a frequency of 94 or 38.6 percent. While the Accountancy, Business, and Management strand has a frequency of 8 or 3.24 percent. This implies that HUMSS are the best fit for the respondents because of their interests, talents, and personality. "Public Awareness" is demonstrated to be the most efficient technique for students to become acquainted with the consequences of HUMSS students' Mathematical abilities on their academic self-esteem.

Table 4 Relationship between the Profile of the students along with their Mathematics Performance.

Pearson's Correlation Between the Profile of the Students and their Mathematics Performance

Students' Profile	Computed r	P-values
Age	0.1135	0.0750*
Sex	0.0515	0.4204*
Parents' Educational Attainment		
Mother	0.1949	0.0021*
Father	0.1485	0.0195*
Parents' Occupation		
Mother	0.3380	<0.00001**
Father	0.1567	0.0137*

    **significant @ 0.01
   *significant @0.05

Table 3 shows that there is a significant relationship between the father's occupation of the respondent and the mathematics performance of the respondents at a 0.05 level of significance.

The result also presents a highly significant relationship between the mother's occupation of the respondent and the mathematics performance of the respondents at 0.01 levels of significance.

The Mathematics Performance and the Track Preference of Grade 10 Students

Table 3 implies that parents with low or high occupational status can have an impact on students' mathematical performance. Students' mathematical abilities are influenced by their parents' work. This is explained by the fact that most parents of blue-collar workers have limited free time and are unable to continue guiding their children.

Table 4. Relationship Between the Students' Mathematics Performance and Their Preferred Track/Strand
Pearson's Correlation Between the Mathematical Performance and their Preferred Track/strand

PREFERRED TRACK/STRAND	Computed r	P-values
STEM	.386**	.000
ABM	0.096	.134
HUMSS	-.291**	.000
TVL	-.167**	.009

**significant @0.01
*significant @0.05

Based on Table 4, the computed *r* of 0.386 with a *p*-value of 0.000 (<0.01) indicates a significant relationship between mathematics performance and STEM, HUMSS and TVL tracks/strands. STEM is chosen by students who have good mathematics skills. The result reveals the lower their arithmetic proficiency, the higher they prefer HUMSS, and the greater their math performance, the higher they choose STEM strand. This means that if their mathematics skill is poor, they choose HUMSS.

However, the result shows no significant relationship between the mathematics performance and ABM strand with a computed *r* of 0.096. This implies that ABM strands seeks to strengthen mathematical abilities, decision-making, and time management skills, in addition to familiarizing students with business management ideas.

Figure 2. Age of the Respondents

Presents the age of the respondents.
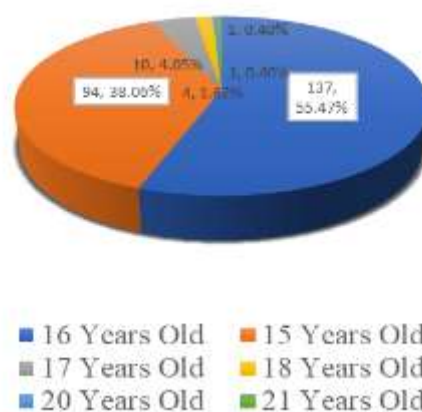
The pie chart shows that most respondents are 16 years old, with 137 registered or 55.47% of the total population, while 1 or 0.40% are 20 and 21 years old.

This implies that the respondents are of the typical Senior High School entry age. It also signifies that most of them are of school-age. Those who are older than the other students, on the other hand, may experience the consequences of attending a school that is older than their peers.

Figure 3. Distribution of Sex of the Respondents
*Reflects the sex of the respondents.*
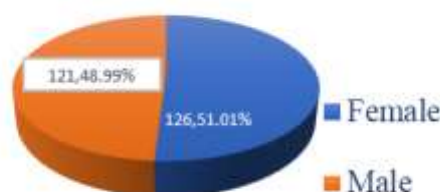
The Mathematics Performance and the Track Preference of Grade 10 Students

The pie chart plainly shows that females outnumbered males, 126 to 121, or 51.01% of the overall population. This could be linked to the fact that girls are more interested in going to school than boys. This is supported by the studies of Escalona (2015) and Barcelona (2017), as indicated by Garcia (2020), in which females outnumber males.

Furthermore, Dela Cruz (2018) mentioned in his summary of Philippine education that there are more females than males in higher education. However, the findings of Milan (2018) contradict the result of the past study where there are more boys than girls.

Figure 4.1 Father's Educational attainment
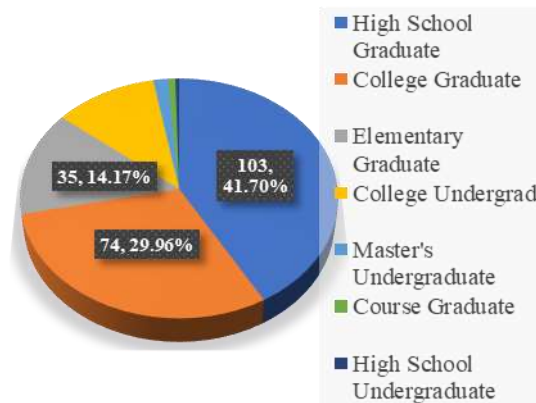
Furthermore, the data shows that only a few fathers were unable to complete formal schooling. This means that fathers can help their children with homework and projects at home.

On the other hand, Idris, Hussain, & Ahmad, (2020) stated that fathers' education and profession have an impact on children's academic achievements. The father's career and education have a direct impact on the revenue for the family that has a direct and strong relationship with the facilities available for children at home, which has an impact on their academic achievement. A father's education enhances a child's odds of pursuing higher education, but the influence of mother education is far deeper and more significant than the function of an educated father in children's academic performance.

Additionally, a father's engagement had a positive effect on a child's achievement independent of the child's gender, race, school year age, or home income. With this, it is indicated that early poverty had a considerable negative impact on educational performance (The Guardian society September 20,2023).

**Figure 4.2 Mother's Educational Attainment**
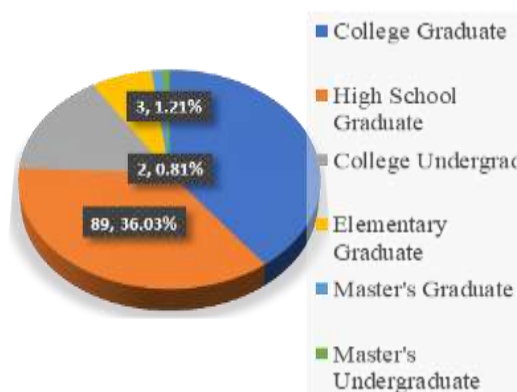
As reflected from the graph, most mothers (39.68%) are college graduates. The item high school graduate received the second largest proportion of 36.03, and only a few (0.81%) have started their master's degree. This could imply that mothers can assist their children in their education.

The Mathematics Performance and the Track Preference of Grade 10 Students

Figure 5.1 Father's Occupation
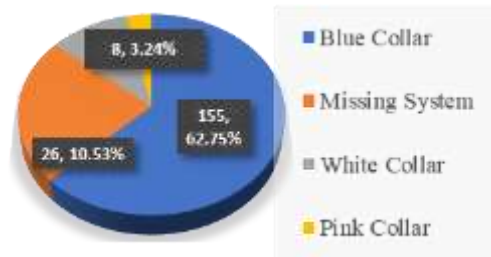
The figure also shows that 3.24% of fathers work in the service industry-waiters, retail clerks, salespersons, certain unlicensed assistive employees, and many other employments involving human relations. This finding supports the study of Barcelona (2018), which was highlighted by Garcia (2020), who discovered that the parents of her study were semi-skilled - farmers, fisherman, housekeepers, laborers, and other non-professional occupations.

Figure 5.2 Mother's Occupation

According to the data, 68.83% or 170 mothers work in blue collared jobs, which are members of the working class who perform manual labor and are paid an hourly wage or a piece rate for the quantity of work done. This could imply that the mother is preoccupied with how to serve the family. White collar positions with clerical, administrative, and management functions have the third largest number (10.53%). This statistic implies that mothers can earn a living by working alongside their husbands. This result confirms the study of Garcia (2020) who discovered that mothers chose to work alongside their husbands to earn a living.

V. CONCLUSION

Majority of the respondents are of the age of a typical senior high school. Most respondents are female students. A great percentage of occupations of the respondents' parent are blue collared jobs. Most mothers of the respondents are college graduates while most fathers are high school graduates. Students in Grade 10 perform fairly in mathematical. The Grade 10 students preferred Humanities and Social Sciences (HUMSS) as their preferred track for Senior High School. The respondents' parents' occupation is a predictor of their mathematics performance. Math proficiency among pupils and the STEM, HUMSS, and TVL tracks/strands are significantly correlated. Their preferred strand, Accountancy and Business Management (ABM), and their ability in mathematics do not correlate.

VI. RECOMMENDATION

Students of all ages should prioritize education with the best assistance from their parents.
Using e-books in mathematics learning could allow students to gain more easily from the technical advantages of mathematics learning over technology-free ways, enhancing students' learning and enjoyment while also improving mathematics education overall. Teacher should guide and assist their students in choosing the proper and acceptable path for them, and they must be open minded for the students who wish to contact them in moments of doubt and difficulty in decision-making for their career paths. With gender inequalities in mathematics, the inferior gender's learning will be impacted, and comparable consequences may occur in their counterparts.

The Mathematics Performance and the Track Preference of Grade 10 Students

As a result, teachers can encourage healthy competition based on individual skills and abilities rather than groups. One method of delivering great education is to give equitable educational opportunities for students regardless of gender, ethnicity, race, religion, or other factors. Teachers should encourage students' mathematical abilities to increase their academic achievement in mathematics, and with the help of parents, rigorous career counselling can be given and implemented in school through the school head's mandate.

REFERENCES

1) Alcantara, E. C., Bacsa, J. M. P., & City, B. (2017). Critical thinking and problem solving skills in mathematics of grade-7 public secondary students. *Asia Pacific Journal of Multidisciplinary Research*, *5*(4), 21-27.

2) Alvarez, Y. (2022). Factors Affecting Senior High School Track Preferences of Grade 10 Students in the District of Morong, Division of Rizal. *Psychology and Education: A Multidisciplinary Journal*, *6*(6), 535-540.

3) Ahmed, S. F., Tang, S., Waters, N. E., & Davis-Kean, P. E. (2019). Executive function and academic achievement: Longitudinal relations from early childhood to adolescence.

4) Benbow, C. P. (1992). Academic achievement in mathematics and science of students between ages 13 and 23: Are there differences among students in the top one percent of mathematical ability? *Journal of Educational Psychology*, *84*(1), 51.

5) Butterworth, J., & Thwaites, G. (2013). *Thinking skills: Critical thinking and problem solving*. Cambridge University Press.

6) Carson, J. (2007). A problem with problem solving: Teaching thinking without teaching knowledge. *The mathematics educator*, *17*(2).

7) Cm, O., & Yavuz, F. (2017b). A Comparative study on English language teaching to young learners around the world. *Contemporary Educational Researches Journal*, *7*(3), 114–118.

8) Davis-Kean, P. E., Tighe, L. A., & Waters, N. E. (2021). The role of parent educational attainment in parenting and children's development. *Current Directions in Psychological Science*, *30*(2), 186-192.

9) F., N., Ahmad, H., F., & Ali, P. M. (2019). Effect of Motivation and Gender on Problem-solving in Student Mathematics. *Proceedings of the 1st International Conference on Advanced Multidisciplinary Research (ICAMR 2018)*.

10) Garcia, M. T. T., & Rosa, M. T. P. D. (2021). Implementation of the Junior High School Mathematics Curriculum. *Asia Pacific Journal on Curriculum Studies*, *4*(1).

11) Gepila JR, E. C., Agulto, P. S., Fetalcorin, K. F., & Elgario, S. E. (2022). Thinking Skills of ABM Senior High School Students of Philippine State University. *European Online Journal of Natural and Social Sciences*, *11*(3), pp-494.

12) Guinocor, M., Almerino, P., Mamites, I., Lumayag, C., Villaganas, M. A., & Capuyan, M. (2020). Mathematics performance of students in a Philippine State University. *International Electronic Journal of Mathematics Education*, *15*(3), em0586.

13) Hassan, A., & Abdulkareem, H. (2021). *ASEAN Journal of Educational Research and Technology*.

14) Heaven, P. C., & Ciarrochi, J. (2012). When IQ is not everything: Intelligence, personality and academic performance at school. *Personality and Individual Differences*, *53*(4), 518-522.

15) Hidayati, Y. A., Rosidi, I., & Hadi, W. P. (2019). The Identification Problem-Solving Abilities Based on Gender: Implementation Teaching Science Trough Guided Discovery Model's in Bangkalan District. *Journal of Physics*, *1227*, 012039.

16) Hoque, M. M., Khanam, S. T., & Nobi, M. N. (2017). The effects of mothers' profession on their children's academic performance: An econometric analysis. *Global Journal of Human-Social Science*, *17*(2), 01-08.

17) Idris, M., Hussain, S., & Ahmad, N. (2020). Relationship between parents' education and their children's academic achievement. *Journal of Arts & Social Sciences*, *7*(2), 82-92.

18) Ismail, S. N., Muhammad, S., Omar, M. N., & Shanmugam, K. S. (2022). THE PRACTICE OF CRITICAL THINKING SKILLS IN TEACHING MATHEMATICS: TEACHERS'PERCEPTION AND READINESS. *Malaysian Journal of Learning and Instruction*, *19*(1), 1-30

19) Journal of Educational Psychology, 111(3), 446–458. https://doi.org/10.1037/edu0000296

20) Kalla, K. (2006). Understanding the concept of age: When determining the capabilities of leaders in post-modern Organisations. *IEICE Trans. Fundam. Electron. Commun. Comput. Sci*, *79*, 1601-1607.

21) Lebosana, A. G., Balmores, R. A. B., Jebone, I. M. N., Monticalvo, J. M. V., & Picardal, M. E. M. (2019). Factors Affecting the Track Preference of Grade 10 Students at Cielito Zamora High School Academic Year 2018-2019. *Ascendens Asia Singapore–Bestlink College of the Philippines Journal of Multidisciplinary Research*, *1*(1).

22) Ling, A. N. B., & Mahmud, M. S. (2023). Challenges of teachers when teaching sentence-based mathematics problem-solving skills. *Frontiers in Psychology*, *13*, 1074202.

23) Malaguial, P. A. (2023). *Senior High School Strands: Factors Affecting the Students' Preference*. Malaguial | ASEAN Journal of Educational Research and Technology.

24) Mamolo, L. (2019). Analysis of senior high school students' competency in general mathematics. *Universal Journal of Educational Research*, *7*(9), 1938-1944.

25) Moneva, J. C., & Malbas, M. H. (2019). Preferences in Senior High School Tracks of the Grade 10 Students. *IRA International Journal of Education and Multidisciplinary Studies*.

26) Moneva, J. C., Rozada, G. G., & Sollano, A. M. (2020). Parents Occupation and Students Self-Esteem. *Int J Res-Granthaalayah*, *7*(12), 315-24.

27) Mullis, et al. (2000). Third International mathematics and science study (TIMSS) 1999 International mathematics report. Boston College, USA International Study Center Lynch School of Education.

28) Omar, S. S., & Hussain, M. (2021). Parental occupation and its effect on the academic performance of children. *Journal of Emerging Technologies and Innovative Research (JETIR)*, *8*(8), e576-e583.

29) Pagtulon-an, E., & Tan, D. (2018). Students' mathematics performance and self-efficacy beliefs in a rich assessment tasks environment. Asian Academic Research Journal of Multidisciplinary, 5(2), 54-64.

30) Peteros, E., Gamboa, A., Etcuban, J. O., Dinauanao, A., Sitoy, R., & Arcadio, R. (2019). Factors affecting mathematics performance of junior high school students. *International Electronic Journal of Mathematics Education*, *15*(1), em0556.

31) Polit, D.F., & Beck, C.T. (2004). *Nursing research: Appraising evidence for nursing practice* (7th Edition). Philadelphia: Wolters Klower/Lippincott Williams & Wilkins.

32) Polit, D.F., & Beck, C.T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Research in Nursing and Health*, 29(5), 489- 97. DOI: 10.1002/nur.20147

33) Ramos, J. J. R. (2018). Critical thinking skills among senior high school students and its effect in their academic performance. *International Journal of Social Sciences & Humanities*, *3*(2), 60-72.

34) Salimaco, R. J. (2020). Mathematics achievement of senior high school students: Impact of study habits and anxiety. *International Journal of English and Education*, *9*(3), 202-213.

35) Siahaan, E. Y. S., Muhammad, I., Dasari, D., & Maharani, S. (2023). Research on critical thinking of pre-service mathematics education teachers in Indonesia (2015-2023): A bibliometric review. *Jurnal Math Educator Nusantara: Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika*, *9*(1).

36) Soros, P., Ponkham, K., & Ekkapim, S. (2018, January). The results of STEM education methods for enhancing critical thinking and problem solving skill in physics the 10th grade level. In *AIP Conference Proceedings* (Vol. 1923, No. 1). AIP Publishing.

37) Sturm, N., & Bohndick, C. (2021). *The Influence of Attitudes and Beliefs on the Problem-Solving Performance*.

38) Thoren, K., Heinig, E., & Brunner, M. (2016, May 16). *Relative Age Effects in Mathematics and Reading: Investigating the Generalizability across Students, Time and Classes*. www.frontiersin.org.

39) Tighe, L. A., & Davis-Kean, P. E. (in press). The influence of college education on children and parents from low-income families. Merrill-Palmer Quarterly.

40) Utami, C. T. P. (2019, March). Profile of students' mathematical representation ability in solving geometry problems. In *IOP Conference Series: Earth and Environmental Science* (Vol. 243, No. 1, p. 012123). IOP Publishing.

41) Voyles, M. J. (2011). *Student academic success as related to student age and gender*. UTC Scholar.

42) Wega, G.B (2016). Mathematics Problem Solving Skills of Grade 10 Students in Jimma Zone.

43) Wismath, S. (2014). *View of Student Perception of Problem Solving Skills*.

44) Zubković, B. R., Pahljina-Reinić, R., & Kolić-Vehovec, S. (2021). Age and gender differences in mathematics learning during school transition. *International Journal of School and Educational Psychology*, *11*(1), 20–33.

45) Zhu, Z. (n.d.). *Gender Differences in Mathematical Problem Solving Patterns: A Review of Literature*

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

M. Sandoval-Hernandez[1,2], N. Carrillo-Ramon[3], S. E. Torreblanca-Bouchan[1], A. de J. Mota-Hernandez[1], G. J. Morales-Alarcon[4] , A. R. Escobar-Flores[3], J. Farias-Uscanga[5] , J. E Perez-Jacome-Friscione[3], U. A. Filobello-Nino[3], H. Vazquez-Leal[3], S. Y. Campos-Dominguez[6], S. Ocaña-Pimentel[6]

[1]Centro de Bachillerato Tecnológico industrial y de servicios No. 190, Av. 15 Col. Venustiano Carranza 2da Sección, Boca del Río, 94297, Veracruz, México.

[2]Escuela de Ingeniería, Universidad de Xalapa, Carretera Xalapa-Veracruz Km 2 No. 341,91190 Xalapa,Veracruz, México

[3]Facultad de Instrumentación Electrónica, Universidad Veracruzana, Circuito Gonzalo Aguirre Beltrán S/N, Xalapa, 91090, Veracruz, México.

[4]Instituto de Psicología y Educación, Universidad Veracruzana, Agustín Melgar 2, col. 21 de Marzo, Xalapa, 91010 Veracruz, México.

[5]Centro de Bachillerato Tecnológico industrial y de servicios No. 268, Av. La Bamba, Geovillas del Puerto, 91777, Veracruz, Veracruz, México.

[6]Facultad de Arquitectura, Universidad Veracruzana, Circuito Gonzalo Aguirre Beltrán S/N, Xalapa, 91090, Veracruz, México

ABSTRACT: The aim of this paper is to show the application of the method of weighted residuals through subdomains to offer a solution to the steady-state one-dimensional heat conduction problem in a slab with thermal conductivity linearly dependent on temperature. The proposed solution is a fourth-degree polynomial, derived using three subdomains. Despite its simplicity, the solution demonstrates good accuracy, as evidenced by an RMS error of $\mathbf{0.0009689460673930}$. However, if greater accuracy is required, the Method of Weighted Residuals allows for the use of more subdomains with a higher-degree polynomial.

KEYWORDS- Nonlinear differential equations, boundary value problems, heat problems.

I. INTRODUCTION

Thermodynamics, nestled within the domain of physics, is dedicated to scrutinizing heat-related phenomena. Its focal point revolves around elucidating the transformation of various energy forms and the intricate nexus between these transformations and temperature. Historically, the development of thermodynamics paralleled endeavors aimed at enhancing machine efficiency, striving to minimize energy dissipation in the form of heat [1, 2].

The foundational pillars of thermodynamics comprise a suite of laws delineating energy behavior. Foremost among them is the principle of conservation of energy, which mandates that energy can neither be created nor destroyed but can only undergo transmutation into another form. Thus, heat emerges as merely one facet of energy, stemming from other forms such as work. The second law of thermodynamics delineates the presence of escalating entropy within a closed system, wherein entropy represents a trajectory toward disorder rendering energy less usable. Lastly, the third law of thermodynamics posits the insurmountable barrier to attaining absolute zero temperature within a system through a finite number of steps [1, 2].

In addition to the aforementioned laws, the zero principle postulates that disparate thermal systems will attain equilibrium when in some form of contact. Thus, if system A interacts with system B, and system B interfaces with system C, eventual equilibrium ensues, characterized by identical temperatures among them. This principle intimates that the universe had a genesis and remains dynamic, as its failure to reach equilibrium implies ongoing processes of energy exchange and transformation [1, 2].

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

Heat transfer exhibits both directionality and magnitude. The rate of heat conduction in a specific direction is directly proportional to the temperature gradient, which represents the rate of temperature change per unit distance along that direction. Generally, heat conduction within a medium occurs in three dimensions and is time-dependent. Thus, the temperature within a medium varies not only with time but also with spatial coordinates, denoted as $T = T(x, y, z, t)$. Heat conduction within a medium is termed steady when the temperature remains constant over time, and unsteady or transient when it fluctuates. It is considered one-dimensional when conduction primarily occurs along a single dimension, with negligible conduction along the other two primary dimensions. Similarly, it is termed two-dimensional when conduction along the third dimension is insignificant, and three-dimensional when significant conduction exists in all dimensions [1, 2].

The primary objective of this article is to develop a convenient analytical approximate solution for the boundary value problem associated with the steady-state one-dimensional conduction of heat within a slab. Notably, the thermal conductivity of this slab is assumed to exhibit a linear dependence on temperature. Given the fundamental significance of heat transfer phenomena, both in theoretical contexts and practical applications involving the design and operation of equipment, there exists a critical need to explore analytical approximate solutions for the equations governing these phenomena. This pursuit aligns with the broader research context and underscores the importance of developing efficient methods for addressing heat transfer problems.

There are several alternative semi-analytical methods to solve nonlinear differential equations, for example, power extender series method (PSEM) [3], Homotopy perturbation method (HPM) [4], homotopy analysis method (HAM) [5], Adomian's decomposition method [6], modified Taylor series method (MTM) [7-10], perturbation method (PM)[11], the methods of weighted residuals (MWR) [12,13,14], among many others. In this study, we assume that the exact solution for case study on one-dimensional (1-D) steady-state heat conduction is solved using Maple2021. Additionally, one of the metrics we will use to evaluate the precision of the proposed approximations is the root-mean-squared (RMS) error.

This paper is organized as follows. Section II introduces the bases of the weighted residuals method. Section III presents a case study, Section IV presents the discussion, and section V presents the conclusions.

II. WEIGHTED RESIDUALS METHOD

To set the stage for MWR, consider a general boundary value problem whose governing differential equation is given by

$$Lu(\mathbf{x}) = 0, \qquad \mathbf{x} \in \Omega,$$
$$u(\mathbf{x}) = g(\mathbf{x}), \qquad \mathbf{x} \in \Gamma,$$

(1)

where L represents a differential operator, $u = u(x)$ denotes the dependent variable defined within a region Ω with boundary Γ, and x denotes spatial coordinates. In the Method of Weighted Residuals (MWR), the aim is to approximate the solution $u(x)$ of Equation (1) using a trial solution $u_n(x)$, which is selected in a particular manner. However, this trial solution typically doesn't satisfy the governing differential equation. Therefore, substituting the trial solution into the governing differential equation yields a residual, denoted by R [12-14]. To obtain the "best" solution, efforts are made to distribute this residual throughout the region Ω by minimizing the integral of the residual across Ω. This can be expressed as:

$$\text{Minimize} = \int_\Omega R d\Omega.$$

(2)

The scope of opportunities to achieve this objective can be expanded by ensuring that a weighted value of the residual is minimized across the entire region of interest. By using a weighting function, it is possible to achieve a minimum value of zero for the weighted integral. Letting the weighting functions be represented by w, the required objective of the MWR is then defined as follows:

$$\int_\Omega w R d\Omega = 0.$$

(3)

The concept of approximating the solution $u(x)$ of a differential equation using trial solutions is well-established. However, the proper selection of the trial solution is essential for the success MWR. This selection is powerful because it allows the incorporation of known information about the problem into the trial solution. In lower-order approximations (i.e., for small n in $u_n(x)$), this choice can significantly affect the accuracy of the results. In higher-order approximations, it can influence the convergence of the method [12-14].

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

Of all the trial solutions employed by several people, perhaps the polynomial series such as

$$u_n(\mathbf{x}) = \sum_{i=1}^{n} c_i N(\mathbf{x}) = \sum_{i=1}^{n} c_i x^i.$$

(4)

Polynomials are the most popular choice for this purpose. In equation (4), c_i are arbitrary constants that need to be determined during the minimization process described in equation (3). The functions $N(x)$ are preselected and are known as trial functions or shape functions. The widespread preference for polynomials is primarily due to their ease of manipulation. Furthermore, the weighting functions can be selected in various ways, with each choice corresponding to a different MWR criterion [12-14].

Subdomain method. In this process, the Ω domain is divided into m small subdomains of $\Omega_j, j = 1,2, \cdots, m$, which are not necessary disjoint. The weights are chosen as

$$w_j = \begin{cases} 1, & \mathbf{x} \in \Omega_j, \\ 0, & \mathbf{x} \notin \Omega_j, \end{cases}$$

(5)

and

$$\int_{\Omega_j} R d\Omega_j = 0, \qquad j = 1,2, \cdots m.$$

(6)

Indeed, as m increases, the differential equation integrated over each subdomain tends toward zero. Consequently, the equation is satisfied, on average, in smaller and smaller domains, ultimately approaching zero across the entire domain [12-14].

Colocation Method. In this method, the weighting functions w_j are chosen to be the displaced Dirac Delta functions

$$w_j = \delta_j = \delta(\mathbf{x} - \mathbf{x}_j).$$

(7)

Now (2) is given by

$$\int_{\Omega_j} w_j R d\Omega = \int \delta_j R d\Omega = R_j = 0, \qquad j = 1,2, \cdots m,$$

(8)

where R_j represents the value of R evaluated at the point $\mathbf{x}_j$. Consequently, the residual is enforced to vanish at m specified collocation points, $x_j = 1,2, \cdots m$. As m increases, the residual vanishes at more and more points, presumably approaching zero-every-where.

Least Squares Method. In this method, the weighting functions w_j are choosen to be

$$w_j = \frac{\partial R}{\partial c_j}.$$

(9)

Now Eq. (2) is given by

$$\frac{\partial}{\partial c_j} \int_{\Omega} R^2 d\Omega = 2 \int_{\Omega} \frac{\partial R}{\partial c_j} R d\Omega = 0, j = 1,2, \cdots n.$$

(10)

The integral of the square of the residual is minimized with respect to the undetermined parameters to provide N simultaneous equations for the $c_j's$.

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

Method of moments. In this method, the weighting functions w_j are choosen to be

$$w_j = P_j(\mathbf{x}).$$

(11)

Where $P_j(x)$ are orthogonal polynomials defined over the domain Ω. This procedure is particularly advantageous in one-dimensional problems, where the theory of orthogonal polynomials is well-established. In such problems, the widespread use of weighting functions, denoted by $w(x)$, leads to the following:

$$\int_\Omega x^j R d\Omega = 0.$$

(12)

The structure of Equation (12) gave rise to the term "method of moments". It's worth noting, however, that the set $\{w_j\} = \{x^j\} = \{1, x, x^2, \cdots\}$ is not orthogonal over the interval $0 \le x \le 1$, and typically, better results can be achieved by orthogonalizing them before application [12-14].

Galerkin method. In this method, the weighting functions w_j are choosen to be identical to the shape functions N_j themselves, that is,

$$w_j = N_j(\mathbf{x}), \qquad j = 1, 2, \cdots, m.$$

(14)

Therefore, Eq. (3) is given by

$$\int_\Omega N_j(\mathbf{x}) R d\Omega = 0, \quad j = 1, 2, \cdots, m.$$

(15)

In vector-matrix notation, we have

$$\int_\Omega N R d\Omega = 0,$$

(15)

where $\boldsymbol{N} = (N_1, N_2, \cdots, N_m)^T$. Utilizing the well-established fact that a continuous function is zero if it is orthogonal to every member of a set, it becomes apparent that the Galerkin method enforces the residual to be zero by ensuring its orthogonality to each member of a complete set of basis functions [12-14].

III. STUDY CASE

This article presents a case study on one-dimensional (1-D) steady-state heat conduction in a slab with linearly temperature-dependent thermal conductivity [9]; see Fig. 1.
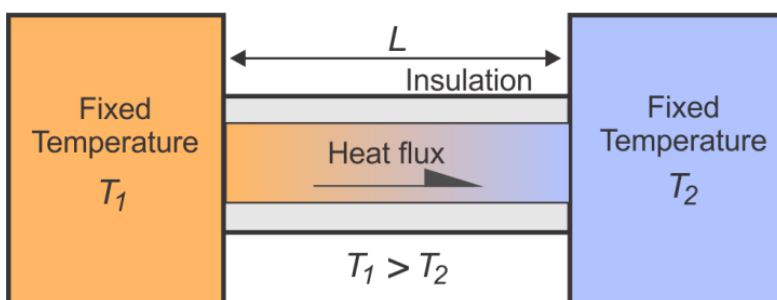

Figure 1. The 1-D conduction of heat through an insulated slab.

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

The non-dimensionalization process for this problem was presented in [9]. Additionally, [9] provided an approximate solution using the MTSM. In this work, we will determine the approximate solution using the MWR, specifically the method of moments. The differential equation for this case study is given by

$$\frac{d^2y}{dz^2} + \varepsilon y\frac{d^2}{dz^2} + \varepsilon\left(\frac{dy}{dz}\right)^2 = 0,$$

(16)

with boundary conditions given by

$$y(0) = 1, \quad y(1) = 0.$$

(17)

In the case of $\varepsilon = 1$, the exact solution obtained with Maple 2021 becomes

$$y_E = -1 + \sqrt{-3x + 4}.$$

(18)

Applying the subdomain method, we have the subdomains $\Omega_1 = [0,0.33], \Omega_2 = [0.33,0.67], \Omega_3 = [0.67,1]$. Furthermore, the proposed solution is a polynomial of degree 4 given by

$$y = ex^4 + dx^3 + cx^2 + bx + a.$$

(19)

Substituting the boundary conditions in (19) we have

$$y = ex^4 + dx^3 + cx^2 - (1 + c + d + e)x + 1.$$

(20)

Equation (20) is substituted in (16) to obtain the residue R. Applying (6) to integrate R in the ohms subdomains, we obtain three equations, where c, d, e, must be determined with a numerical algorithm such as Newton-Raphson [15,16].

$$0.00170473771908e^2 + 0.009040275783de + 0.0234812358ce + 0.0117406179d^2 +$$
$$0.05929605cd + 0.05929605e(-1 - c - d - e) + 0.071874c^2 + 0.143748d(-1 - c - d$$
$$-e) + 0.287496e + 0.3267c(-1 - c - d - e) + 0.6534d + 1.320c + 0.330(-1 - c - d - e)^2 = 0,$$

$$0.24072372649384e^2 + 0.6241683994de + 0.7865938284ce + 0.3932969142d^2 + 0.94826cd$$
$$+ 0.94826e(-1. - c - d - e) + 0.529652c^2 + 1.059304d(-1. - c - d - e) + 2.118608e$$
$$+ 1.020c(-1. - c - d - e) + 2.040d + 1.360c + 0.340(-1. - c - d - e)^2 = 0,$$

$$3.75757153578708e^2 + 6.366791324817de + 5.1899249358ce + 2.5949624679d^2 +$$
$$3.99244395cd + 3.992443950e(-1. - c - d - e) + 1.398474c^2 + 2.796948d(-1. - c - d$$
$$- e) + 5.593896e + 1.6533c(-1. - c - d - e) + 3.3066d + 1.320c + 0.330(-1. - c - d - ef)^2 = 0.$$

(21)

Solving equation system (21), the solutions are $c = -0.201853053750679, d = 0.141480597362956, e = -0.192072645639957$. Substituting the numerical values found in Eq.(19) the solution becomes

$$y_s = 1 - 0.747554897972x - 0.20185305375x^2 +$$
$$0.141480597363x^3 - 019207264564x^4.$$

(22)

The solution obtained with MTSM [19] is given by

$$y_T(z) = 1 - 0.768425x - 0.147619245x^2 -$$
$$0.056717159x^3 - 0.027239301x^4.$$

(23)

Figure 2 presents a comparison between the exact solution (18), MWR (22) and MTSM (23). Note that solution (22) presents better performance.

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions
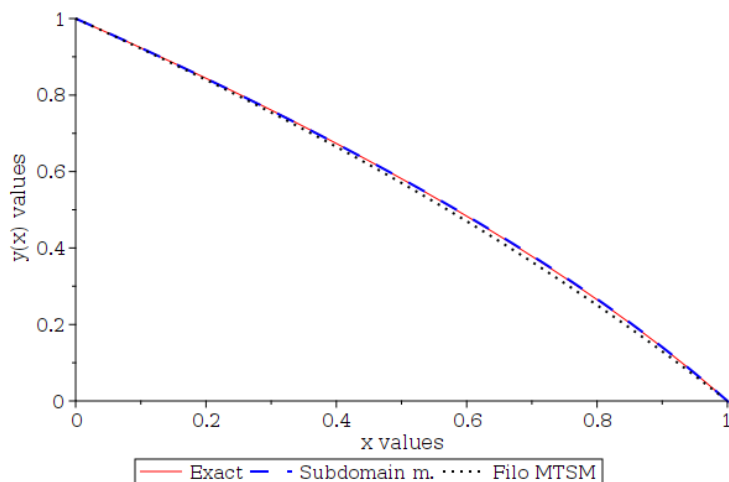

Figure 2. Comparison of exact solutions, subdomain methods and MTSM.

IV. DISCUSSION

To solve equation (16), three subdomains were employed. The resulting solution, equation (22), is a fourth-degree polynomial. Figure 2 compares the absolute errors of equations (22) and (23). The absolute error of solution (23), obtained using the MWR, is notably smaller. Notably, equation (23) is also a fourth-degree polynomial, determined using the MTSM [9].
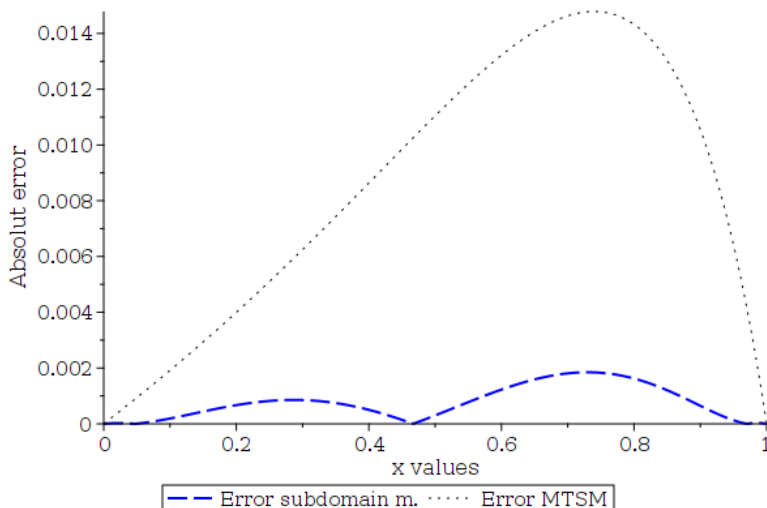
Figure 2. Absolute error for equations (21) and (22).

To measure the RMS error in the interval defined by the boundary conditions, we will use the formula

$$E_{rms} = \sqrt{\frac{1}{b-a}\int_a^b (E(t))^2 dt}.$$

(24)

Table 1 presents the RMS error for different values of ε, along with the approximate solutions obtained for each ε. As ε increases, the RMS error in the approximations also increases. Specifically, when $\varepsilon = 1$, the RMS error is 0.0009689460673930. In contrast, the RMS error obtained in equation (22) is 0.00980864863178778. This indicates that the RMS error using MWR is 10.123 times lower than that obtained using the MTSM [9]. Consequently, the solution obtained with MWR has greater accuracy than the solution obtained with MTSM.

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

Table 1: RMS error for different ε.

Value ε	Error RMS	Polynomial equation obtained
0.5	0.0001147954053900	$y_s = 1 - 0.8329973795x - 124982871724x^2$ $- 0.00154604869x^3 - 0.0404737x^4$
1	0.0009689460673930	$y_s = 1 - 0.7475548797x - 0.20185305375x^2$ $- 0.14148059736x^3 - 0.19207264564x^4$
1.5	0.0028905555956655	$y_s = 1 - 0.69340869794x - 0.3003555942x^2$ $- 0.41445902701x^3 - 0.42069473490622x^4$

If greater accuracy is desired, then more subdomains must be considered in the solution process [12-14].

V. CONCLUSIONS

The article employs the method of subdomains to derive a polynomial solution for the steady-state one-dimensional heat conduction problem in a slab with a thermal conductivity linearly dependent on temperature, under Dirichlet boundary conditions. This method entails utilizing a trial function integrated across subdomains following a prescribed methodology. The resultant system of equations is expressed in terms of constants that require determination through numerical algorithms like Newton-Raphson. Despite using three subdomains, the resulting polynomial solution is of fourth degree, indicating improved accuracy. A comparison with other methods, such as MTSM from existing literature, underscores the effectiveness of employing MWR as a practical tool for achieving accurate solutions to boundary value problems, avoiding the need for more complex and cumbersome procedures.

DECLARATION OF INTERESTS STATEMENT

The authors declare that there are no conflicts of interest regarding the publication of this paper.

ACKNOWLEDGMENT

REFERENCES

1) Çengel, Y. A. Boles, Michael A. 2019. Termodinámica. McGrawHill
2) Lewis, G. N., Randall, M., Pitzer, K. S., and Brewer, L., 2020, *Thermodynamics*. Courier Dover Publications.
3) Sandoval-Hernandez, M. A., Vazquez-Leal, H., Filobello-Nino, U., and Hernandez-Martinez, L., 2019. New handy and accurate approximation for the Gaussian integrals with applications to science and engineering. *Open Mathematics*, *17*(1), 1774-1793. https://doi.org/10.1515/math-2019-0131
4) Vázquez-Leal, H., Filobello-Nino, U., Sarmiento-Reyes, A., Sandoval-Hernández, M., Pérez-Sesma, J. A. A., Pérez-Sesma, A., V. M. Jimenez-Fernandez, Huerta-Chua, J., Castro-Gonzalez, F. J., Sanchez-Orea, j., Hernández Machuca, S. F., Cuellar-Hernández, L., Pretelin Canela, J. E., Gasca-Herrera, A. E., Sampieri-Gonzalez, C. E., Palma-Graye, B. E., Contreras-Hernandez, A. D. , Alvarez-Gasca, O. and González-Martínez, F. J., 2017. Application of HPM to Solve Unsteady Squeezing Flow of a Second-Grade Fluid between Circular Plates. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, *27*(1), 161-178.
 https://asrjetsjournal.org/index.php/American_Scientific_Journal/article/view/1421
5) Patel, T., M.N. Mehta and Pradhan V.H., 2012. The numerical solution of Burger's equation arising into the irradiation of tumour tissue inbiological diffusing system by homotopy analysis method. Asian Journal of Applied Sciences, 5: 60-66. https://doi.org/10.3923/ajaps.2012.60.66
6) Adomian, G., and Rach, R. (1985). On the solution of algebraic equations by the decomposition method. *Journal of mathematical analysis and applications*, *105*(1), 141-166. https://doi.org/10.1016/0022-247X(85)90102-7
7) Filobello-Nino, U., Sandoval-Hernandez, M. A., Alvarez-Gasca, O., Vazquez-Leal, H., Contreras-Hernandez, A. D., Hoyos-Reyes, C., Carrillo-Ramon, N., Bagatella-Flores, N., Sanchez-Orea, J., Cuellar-Hernandez, L., Mendez-Perez, J. M., Jimenez-Fernandez, V. M., Mota-Hernandez, A. J., Morales-Alarcon, G. J., S.F. Hernandez-Machuca, Martinez-Barrios, F. and Garcia-Lozano, M., 2022, Analytical Exact and Approximate Solutions for Certain Diffusion Reactions, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 11, Issue 11 (November 2022). https://www.ijert.org/analytical-exact-and-approximate-solutions-for-certain-diffusion-reactions

A Handy Analytical Approximate Solution for a Heat Transfer Problem Using the Method of Subdomains with Boundary Conditions

8) Sandoval-Hernandez, M. A., Filobello-Nino, U. A., Vazquez-Leal, H., Huerta-Chua, J., Castaneda-Sheissa, R., Diaz-Arango, G. U., Callejas-Molina R.A, Torreblanca-Bouchan, S.E, Chong-Duran, J., and Pablo-Lopez, B., 2021a, Taylor Series Method Coupled with Shooting Technique for Solving Boundary Value Problems, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 10, Issue 10 (October 2021). https://www.ijert.org/taylor-series-method-coupled-with-shooting-technique-for-solving-boundary-value-problems

9) Filobello-Nino, U., Alvarez-Gasca, O., Contreras-Hernandez, A. D., Palma-Grayeb, B. E., Cuellar-Hernandez, L., Hoyos-Reyes, C., J. M. Mendez-Perez, Jimenez-Fernandez, V. M., Sandoval-Hernandez, M. A., Callejas-Molina, R. A. Hernandez-Machuca, S. F., Pretelin-Canela, J. E., Cervantes-Perez, J., Vazquez-Aguirre, J. L., Varela-Lara, L. J., Bagatella-Flores, N., Vazquez-Leal, H., 2021, A Handy Analytical Approximate Solution for A Heat Transfer Problem by using A Version of Taylor Method with Boundary Conditions, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 10, Issue 02 (February 2021). https://www.ijert.org/a-handy-analytical-approximate-solution-for-a-heat-transfer-problem-by-using-a-version-of-taylor-method-with-boundary-conditions

10) Vazquez-Leal, H., Sandoval-Hernandez, M., Castaneda-Sheissa, R., Filobello-Nino, U., and Sarmiento-Reyes, A. 2015, Modified Taylor solution of equation of oxygen diffusion in a spherical cell with Michaelis-Menten uptake kinetics. International Journal of Applied Mathematical Research, 4(2), 253-258. https://doi.org/10.14419/ijamr.v4i2.4273

11) Sandoval-Hernandez, M., Vazquez-Leal, H., Filobello-Nino, U., De-Leo-Baquero, E., Bielma-Perez, A. C., Vichi-Mendoza, J. C., Alvarez-Gasca, O., Contreras-Hernandez, A. D., Bagatella-Flores, N., Palma-Grayeb, B. E., Sanchez-Orea, J. Cuellar-Hernandez, L., 2021b. The Quadratic Equation and its Numerical Roots. *International Journal of Engineering Research y Technology*, *10*(6), 301-305. https://www.ijert.org/the-quadratic-equation-and-its-numerical-roots

12) Villadsen, J., and Michelsen, M. L. 1978. Solution of differential equation models by polynomial approximation, Prentice-Hall

13) Finlayson, B. A. 1980. *Nonlinear analysis in chemical engineering, McGraw-Hill*

14) Vemuri, V. R., and Karplus, W. J., 1981. *Digital computer treatment of partial differential equations*. Prentice Hall Professional Technical Reference.

15) Faires, J. D., and Burden, R. L. 2012. *Numerical methods, 4th*. Cengage Learning.

16) Chapra, S. C., Canale, R. P., Ruiz, R. S. G., Mercado, V. H. I., Díaz, E. M., and Benites, G. E. 2011. *Métodos numéricos para ingenieros* New York, NY, USA: McGraw-Hill.

The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China

Zhongguo Huang, MPH[1,2*], Tao Liu, PhD[1,2*], Yan Shi, PhD[3*], Yanfei Guo, PhD[3], Guanhao He PhD[1,2], JianXiong Hu, PhD[1,2], Xiaomei Dong, PhD[1,2], Jianpeng Xiao, PhD[5], Ziqiang Lin, PhD[1,2], Fan Wu, PhD[6*], Wenjun Ma, PhD.[1,2*]

[1]Department of Public Health and Preventive Medicine, School of Medicine, Jinan University, Guangzhou, 510632, China

[2]China Greater Bay Area Research Center of Environmental Health, School of Medicine, Jinan University, Guangzhou, 510632, China

[3]Shanghai Municipal Centre for Disease Control and Prevention, Shanghai, 200336, China

[4]Guangdong Provincial Institute of Public Health, Guangdong Provincial Center for Disease Control and Prevention, Guangzhou, 511430, China

[5]Shanghai Medical College, Fudan University, Shanghai, 200032, China

[6]Shanghai Medical College, Fudan University, 130 Dong-An Road, Xuhui District, Shanghai

Corresponding Authors: Fan Wu, Wenjun Ma

ABSTRACT:

Background: Few previous studies have examined the joint effect of long-term exposure to temperature and relative humidity (RH) on asthma. This study endeavors to explore the combined association between long-term co-exposure to temperature and RH and asthma in China.

Methods: The individual data of asthma were collected from the wave 1 to wave 3 (2007-2019) of the Study on global AGEing and adult health in China. Meteorological factors data were obtained from the European Center for Medium-range Weather Forecasts Reanalysis 5 (ERA5) and extracted from the corresponding interpolated grid according to individual residential latitude, longitude and survey time. Individual and joint association of long-term exposure to annual mean temperature and RH with asthma were estimated using Cox regression model and Quantile-Based g-Computation model (Qgcomp), respectively. Then, the joint effects of different temperature-RH compound events were further estimated.

Results: We observed negative association between both temperature and RH with asthma. In individual effect analysis, for 1°C or 1% decrease in 3-year average temperature and RH, asthma increased 4.44% (95%CI:1.76-7.05) and 6.45% (95%CI:2.79-9.98), respectively. The joint effect of long-term exposure to temperature and RH on asthma was also negative. For each percentile decreasing of both temperature and RH, asthma decreased 1.50% (95%CI: 0.85%-2.15%) in total population. People <60 years old and female were more susceptible to mixture exposure to low temperature and low RH. We also observed a higher risk of asthma in dry-cold event (HR=2.44, 95%CI: 1.67-3.55) than wet-cold, wet-hot and dry-hot events.

Conclusion: Long-term exposure to temperature and RH may jointly associate with asthma, and low RH and cold may have higher risk on asthma onset.

KEYWORDS: Asthma; Temperature; RH; Quantile-Based g-Computation model, Joint effect;

The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China

1. INTRODUCTION

Asthma is a major chronic respiratory disease affecting both children and adults with most related deaths in low- and middle-income countries[1]. According to the results of 2019 Global Burden of Disease (GBD) study, a total of 0.46 million deaths and 21.5 million disability adjusted life years (DALY) could be attributed to asthma globally[2]. In China, asthma ranked the 8th out of the DALYs' burden of 369 diseases[3]. Moreover, the prevalence of asthma in China was 4.2%, which represents 45.7 million Chinese suffering from asthma[4]. Thus, the prevention and control of asthma wields immense public health advantages.

There are many risk factors involving in asthma onset. Out of them, environmental factors such as weather conditions, aeroallergens (pollen, mold) and air pollutants play important roles in asthma onset[5-8]. With climate change, several studies have investigated the associations between asthma and weather factors[9]. For example, Xu et.al conducted a systematic review and reported that there was significant association between temperature and childhood asthma[10]. A review reported that each 1 °C decrement in temperature increased 15% asthma risk[11]. Several studies also examined the association between RH and asthma[12-14]. A study reported that every 1% rise in RH (lag 0–12 days) was associated with a 1.89% rise in asthma admissions in hot season[14]. However, all of those studies focused on short-term effect of temperature or RH on asthma, there was no study on the joint effect of long-term exposure to temperature or RH on asthma. Therefore, further investigation was necessary to comprehensively understand the impact of prolonged exposure to temperature and RH on asthma.

The joint health effects of environmental factors have raised great concern, and recently several previous studies have examined the joint effects of multiple environmental factors using advanced statistical methods like weighted quantile sum (WQS) regression, Bayesian kernel machine regression (BKMR) models and Quantile-Based g-Computation (Qgcomp)[15, 16]. The WQS requires the effects of exposures on health outcome should be in the same direction and linear[17]. Nevertheless, previous studies reported that the effects of meteorological factors on asthma were commonly non-liner[14]. In addition, BKMR was limited applicable to large dataset for running slowly[16, 18]. The Qgcomp approach could be employed in large dataset without linear hypothesis. Therefore, it was an ideal model framework in the assessment of joint effects of multiple weather factors exposure on health[19].

To fill the knowledge gaps, this study first examined the individual effects of long-term exposure to temperature and RH on asthma based on a prospective study on global AGEing and adult health (SAGE) in China. Then, the joint effects of temperature and RH on asthma were estimated using Qgcomp model. Finally, we estimated the joint effects of different temperature-RH compound events on asthma. Our findings may help understand the risk of long-term exposure to multiple meteorological factors on asthma, which will provide useful information for asthma clinical management and prevention in the context of climate change.

2. MATERIAL AND METHOD

2.1 Study Population

The data from wave 1 to wave 3 (2007-2019) of the World Health Organization's SAGE(WHO-SAGE) in China was used in this analysis. SAGE is a longitudinal study in six low- and middle-income countries (China, Ghana, India, Mexico, Russia and South Africa) with nationally representative samples of persons aged 50+ years[20]. Stratified random sampling strategy was carried out in all countries and then the sampling unites were stratified by region and location[21]. In China, 8 provinces were selected including Guangdong, Yunnan, Hubei, Shanxi, Shanghai, Shandong, Zhejiang and Jilin Province (Fig.S1). Information of participants were collected by face-to-face interview using structured household and individual questionnaires[22].

A total of 18,361 participants aged 50 years or older was included in the WHO-SAGE study in China. The exclusion criteria in this study were as follows: People who had asthma before the first wave (901 participants); loss to follow-up (7530 participants); missing asthma information (127 participants); missing information on age and sex (133 participants); abnormal information of address (23 participants) and missing data on follow-up years (138 participants). Finally, this study based on data of 9509 participants with three times follow-ups for 8184 participants and twice follow-ups for 1325participants (Fig.S2) after excluding participants who meet the exclusion criteria above.

2.2 Environmental data

As a long-term developing chronic respiratory disease, asthma have been estimated the effect of long-term exposure to air pollution using 3-year averages in previous study[23]. Therefore, for understanding the effect of long-term exposure to temperature and RH on asthma, three-year averages of temperature and RH was regarded as indicator. In current analysis,

The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China

temperature, RH, windy speed, pressure and precipitation from 2007 to 2019 were collected from the ERA5 which was the fifth generation European Center for Medium-range Weather Forecasts (ECMWF) atmospheric reanalysis of the global climate and have been validated and employed in previous studies[24-26]. PM₂.₅ and O₃ were collected from National air quality forecast information release system in China, and they were covariates when fitting the association of temperature and RH with asthma[23]. Temperature, RH, windy speed, pressure, precipitation, PM₂.₅ and O₃ (Fig.S3 shown the correlation of environmental factors) were extracted from the corresponding interpolated grid according to individual residential latitude, longitude and survey time.

2.2 Outcome variable definition and Covariates

The questions of asthma status in questionnaire were "have you ever been diagnosed with asthma (an allergic respiratory disease)?" and "have you been taking any medications or other treatment for asthma?". If the answer was "Yes" for anyone of the two questions, the participant was diagnosed as asthma by a doctor or taking asthma-related therapies within the past 12 months, then we defined the participant as asthma case which was consistent with previous SAGE studies[27].

Covariates included the following variables: wind speed, air pressure, precipitation, O₃, PM₂.₅, sex (male or female), age (<60 years old, 60– years old), region (urban, rural), marital status (currently married, other), household income (high income, low income), body mass index (<18.5, 18.5-, 24- and 28- kg/m^2), smoking status (yes, no), alcohol use (yes, no), household fuel (clean, unclean).

2.3 Statistical analysis

2.3.1 Descriptive analyses

We conducted descriptive analyses on the asthma, environmental factors, and socio-demographic characteristics of participants with means and standardized deviation for continuous variables and proportion for categorical variables. The chi-square test was used to test the difference between subgroups of age, sex and etc.

2.3.2 Modelling the individual effects of temperature and RH on asthma.

In the follow-up survey, the variables will change over time, thus time-varying covariance occurs. In order to identify both internal variation and external variation of variables, Cox regression model was employed in our analysis, which was consistent with previous studies[28]. The model formula was as follow [29]:

$$f = \beta_{\text{TRH}} ns(X_{\text{TRH}}, df) + \beta_{cov} X_{cov}$$
$$h(t, asthma) = h_0(t)\exp(f)$$

Asthma is a categorical variable (yes=1, no=0). The $h_0(t)$ is the baseline hazard function and β_{TRH} is the regression coefficient of temperature or RH. Other covariates are wind speed, air pressure and precipitation, O₃, PM₂.₅, sex, age, region, marital status, body mass index, smoking, drinking and household fuel[4] (model choice in Table S2). ns is the natural cubic spline function; df is the degree of freedom, and we used 2 as the degree of freedom for temperature and RH according to minimum AIC, and the sensitive analysis of different df of temperature or RH also shown in Fig. S4.

2.3.3 Modelling the joint effect of temperature and RH with asthma

To reduce the influence of collinearity, Quantile-Based g-Computation model had been employed to explore the association of temperature and RH with asthma, and Qgcomp have been used in studies about environmental exposure with health[30, 31]. In this study, we fitted a linear model as follows[19]:

$$Y_i = \beta_0 + \psi \sum_{i=1}^{n} w_i X_i^q + Z + \varepsilon_0$$

$$Y_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_{ij}^q + Z + \varepsilon_j$$

In this model, the quantile format X_i^q coded from 1 to 100. The $\sum_{i=1}^{n} \beta_i$ means the change in all meteorological factors for a one-percent change in mixture exposures of them. Z is the confounders and ε_j is the error term. When assuming directional homogeneity, ψ is given as $\sum_{i=1}^{n} \beta_i$ which is the sum of the regression coefficients of all exposures and w_i is each exposure weight which is given as $w_i = \beta_i / \sum_{i=1}^{n} \beta_i$ (all the weights are from 0 to 1 positively or negatively). As the directional homogeneity on the outcomes are not hold, the weights will be redefined to be negative and positive weights. And then ψ is become a parameter of a marginal structural model estimated using g-computation and variance also can be calculated via nonparametric bootstrap which have proved in previous study[32]. Then this approach is extended to Cox proportional hazards model to estimate

survival outcomes[19].

2.3.4 Modelling joint effects of different temperature-RH compound events on asthma.

In order to explore the different joint effects of temperature and RH on asthma in real world, we further estimated the different temperature-RH compound events on asthma. The 50% percentile of temperature or RH was used to distinguish low temperature/high temperature, low RH/high RH. If a day with high temperature and high RH, we defined that day as wet-hot day; a day with high temperature and low RH was classified as dry-hot day; a day with low temperature and low RH was defined as dry-cold day; and a day with low temperature and high RH was defined as wet-cold day. The joint effect of low RH and cold on asthma was estimated based on Cox regression model using wet-hot day as a reference[33].We further conducted subgroup analysis by sex (male, female) and age (<60 years old, 60- years old).

2.4 Sensitivity analysis

To assess the robustness of our results, we carried out the effects from different long-term exposure (current year, 2-year average and 4-year average) to temperature and RH. Additionally, effects of the different df of temperature, RH, $PM_{2.5}$ or O_3 also were reported. More details have shown in Table S3, Fig.S4, S5 and S6 in supplementary material.

All the statistical analyses were conducted using R4.1.0 (https://www.r-project.org/). R packages of "survminer", "survival"and "qgcomp" were used to explore individual and joint effects.

3. RESULTS

3.1Descriptive analysis

Table 1 shows the characteristics of asthma incidence and environmental factors. There were 9509 participants with 509 asthma cases. The prevalence for people aged below 60 years old (4.03%) was lower than that for the elderly ≥60 years old (6.72%). Female (5.39%) had similar prevalence to that for male (5.32%). The 3-year averages of temperature, RH, wind speed, air pressure, precipitation, $PM_{2.5}$ and O_3 were 14.55℃, 71.03%, 0.74 m/s, 96.31 kpa, 3.05 mm, 46.83μg/m³ and 51.69μg/m³, respectively (Table S1).

Table 1. The characteristics of asthma incidence in Chinese participants of SAGE study

Groups		Asthma		Incidence (%)	P-value
		Yes	No		
Total	All	509	9000	5.35	
Age(year)	<60	195	4644	4.03	<0.01
	60–	314	4356	6.72	
Sex	Female	268	4707	5.39	0.91
	Male	241	4293	5.32	
BMI (kg/m²)	28-	64	1019	5.91	0.81
	24-	164	2955	5.26	
	18.5-	257	4577	5.32	
	<18.5	20	394	4.83	
Region	Rural	231	5152	4.29	<0.01
	Urban	278	3848	6.74	
Marital Status	Yes	421	7834	5.10	0.01
	Other	88	1165	7.02	
Smoking	No	335	6037	5.26	0.58
	Yes	174	2960	5.55	
Drinking	No	348	5942	5.53	0.58
	Yes	157	2846	5.23	
Household income	High	244	4486	5.16	0.27
	Low	256	4235	5.70	

Household fuel	Clean	289	4989	5.48	0.59
	Unclean	219	3990	5.20	

Note: the chi-square test was used to test the difference between subgroups of age, sex and etc.

3.2 The individual effects of long-term exposure to temperature and RH on BP

Figure 2 shows the estimated effects of three-year average temperature (Fig. 2 A) and RH (Fig. 2 B) on asthma. Generally, there was negative association of temperature with asthma, but U-shaped association of RH with asthma. Subgroup analysis by sex (male, female) and age (<60 years old, 60- years old) were shown in Fig. S7 and S8.
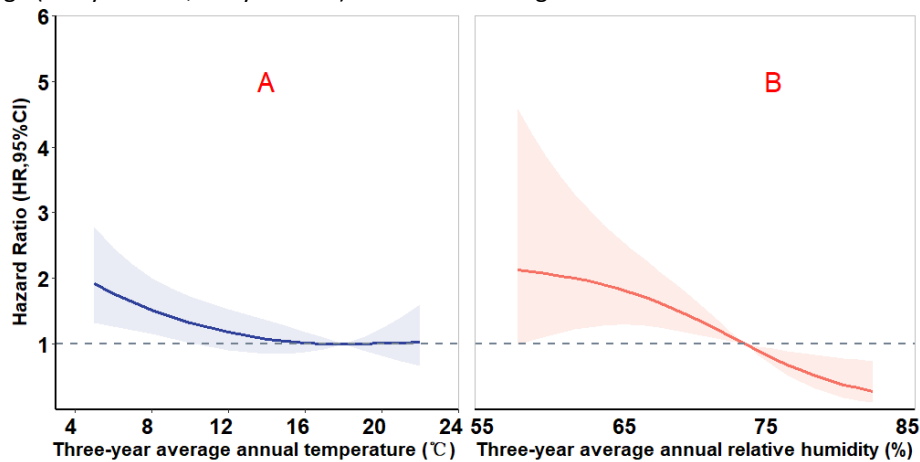

Fig.1 The individual association of 3-year average annual temperature or RH with asthma after adjusting for covariates (wind speed and precipitation, O₃, PM₂.₅, sex, age, region, marital status, body mass index, smoking, drinking and household fuel).

We further quantified the excess risk (ER) of temperature and RH on asthma after linearization. For 1°C,1% decreasing in three-year average annual temperature or RH, asthma increased 4.44%(95%CI:1.76%-7.05%) and 6.45% (95%CI:2.79%-9.98%), and people ≤60 years old (For temperature: ER=5.06%, 95%CI: 1.22%-8.75%; For RH: ER=9.33%, 95%CI: 3.61%-14.71%) and female (For temperature: ER=6.56%, 95%CI: 2.98%-10.01%; For RH: ER=9.28%, 95%CI: 4.12%-14.15%) had a higher risk than their counterparts with statistically insignificant difference.
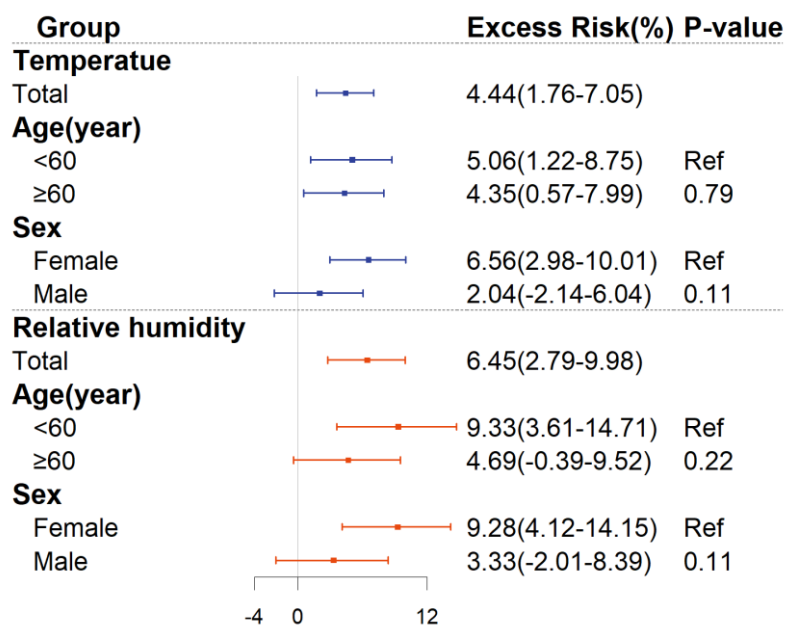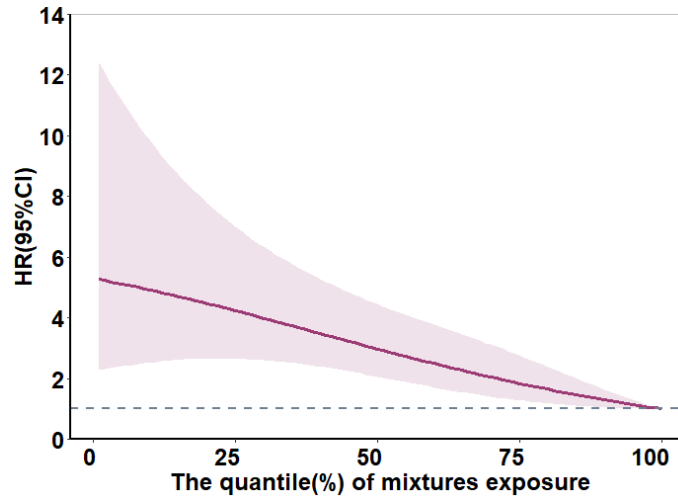

Fig.2 The excess risk (%) for 1°C decrement of temperature or 1% decrement of RH on asthma after adjusting for covariates (wind speed, pressure and precipitation, O₃, PM₂.₅, sex, age, region, marital status, body mass index, smoking, drinking and household fuel). Two-sample z test was used to estimate the difference between subgroups by age, sex.

The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China

3.3 The joint effects of long-term exposure to temperature and RH on asthma

The joint effects of temperature and RH on asthma in total population were estimated by Qgcomp model. We observed that there was negative association of exposure to temperature and RH with asthma (Fig.3). For 1% percentile decreasing in three-year average annual temperature and RH, asthma increased 1.50% (95%CI: 0.85%-2.15%) (for 1% percentile decreasing in temperature, ER=0.82%, 95%CI: 0.37%-1.27%; for RH, ER=1.47%, 95%CI: 0.85%-2.09%). Subgroup analysis by sex and age were presented in Fig. S9.

Fig.3 The joint effect of exposure to temperature and RH on asthma after adjusting covariates (wind speed, pressure and precipitation, O₃, PM₂.₅, sex, age, region, marital status, body mass index, smoking, drinking and household fuel).

3.4 The joint effects of different temperature-RH compound events on asthma

We observed that dry-cold event (HR=2.44, 95%CI: 1.67-3.55) had a higher risk than wet-cold event (HR=1.64,95%CI:1.10-2.46), dry-hot event (HR=1.87, 95%CI:1.13-3.09) compared with wet-hot event. In stratified analyses by sex or age, we observed similar results for all age groups and female. While for male, dry-hot event was at the highest risk than other events.

Table 2. The joint effects of different temperature-RH compound events on asthma

Groups		HR (95%CI)
Total	Wet-hot	Ref
	Wet-cold	1.64(1.10-2.46)
	Dry -hot	1.87(1.13-3.09)
	Dry-cold	2.44(1.67-3.55)
Age(year)		
<60	Wet-hot	Ref
	Wet-cold	2.49(1.5-4.12)
	Dry-hot	2.36(1.27-4.37)
	Dry-cold	2.68(1.71-4.2)
60-	Wet-hot	Ref
	Wet-cold	0.94(0.47-1.88)
	Dry-hot	1.37(0.64-2.95)
	Dry-cold	2.22(1.33-3.72)
Sex		
Male	Wet-hot	Ref
	Wet-cold	1.98(1.19-3.28)
	Dry-hot	2.63(1.45-4.76)
	Dry-cold	2.01(1.2-3.35)

Female	Wet-hot	Ref
	Wet-cold	1.33(0.69-2.53)
	Dry-hot	1.56(0.8-3.04)
	Dry-cold	2.42(1.55-3.78)

3.5 Sensitivity analysis

Sensitivity analyses showed that our findings were generally stable when changing the freedom of degree and periods of long-term exposure to temperature and RH, and changing freedom of degree of $PM_{2.5}$ and O_3. (Table S3, Fig.S4, S5 and S6 in supplementary material).

4. DISCUSSION

In the present study, we investigated the long-term association of temperature and RH with asthma in China. Both individual effect of temperature and RH on asthma were negative, and the joint effect of the two weather factors on asthma was also negative. Moreover, dry-cold event might have a higher risk on asthma onset than their counterparts. Our findings provided new insights on the health effects of long-term exposure to temperature and RH, which might be useful for developing adaptation measures to extreme weather events in the future.

In the context of global warming, the association of weather with asthma has attracted increasing interest[34]. In the current study, we observed an inverse association between long-term exposure to temperature and asthma, which was consistent with a previous study on the effect of short-term exposure to temperature on asthma onset [11]. However, several other studies reported that both short-term exposure to heat and cold increased asthma risk [10, 35]. We did not find any studies on the effects of long-term exposure to temperature, and the possible mechanism for the association observed in our study was also unclear. Possibly, when long-term exposure to cold, airway cooling in cold days could exacerbate inflammation leading to a narrowing of airways[36], which might increase the occurrence of asthma. The same relationship between long-term exposure to RH and asthma was observed. For low RH, a previous study reported that it might dry the mucosal membrane along the airway and induced asthma[34], and another study also presented increased sneezing in allergic rhinitis model when researchers kept mice in dry weather condition[37].

Although several studies have investigated the association between individual meteorological factor and asthma, no study has examined the joint effect of multiple meteorological factors on asthma. However, people usually expose to weather factors at the same time in a real world[19]. Therefore, it is very necessary to understand the joint effects of simultaneous exposure to temperature and RH. In the study, we first reported that there was a negative joint effect of temperature and RH on asthma. Although we did not find literature on the joint effects of the two weather factors, there were studies reporting the joint effects of ambient air pollutants on pediatric asthma exacerbations[38, 39]. The joint effects of temperature and RH on asthma might attribute to complex interaction of temperature and RH. Koskela et.al reported that the long-term airway responses might develop in condition with repeated and long-standing cooling and drying of the airways, usually in endurance athletes[40].

We further explored the joint effects of different temperature-RH compound events no asthma. The results showed that dry-cold event had higher risk on asthma onset compared with wet-hot event. Chu et.al reported that long-term exposure to dry-cold weather represented a significant environmental stress to the airways which causes inflammation and remodeling in peripheral airway[41]. Our finding might explain higher asthma prevalence in northern China (6.8% in Shandong, Shaanxi and Jilin provinces in the study) than that in southern China (4.6% in Guangdong, Hubei, Shanghai, Yunnan and Zhejiang provinces in current study), because northern China usually had cold and dry weather in winter (in this study, the mean 3-year average temperature and RH in northern regions was 10.3℃ and 10.3%, respectively; the corresponding temperature and RH in southern regions was 17.1℃ and 40.1%, respectively)[41]. On the other hand, a study reported that heating the air to increase body temperature and simultaneously saturated air could completely prevent airway obstruction from occurring[42], which may explain our findings that lower risk on asthma for wet-hot weather.

In the stratified analysis, female had a greater risk on asthma than male, which was consistent with previous studies[43], and it might be attributable to bronchial hyper-responsiveness which was more prevalent in women than in men[44]. We also

observed that younger population were more susceptible than the elderly, which confirms the result of a time series study conducted in Hong Kong[34]. Younger population were more vulnerable to weather factors as they were working population and likely had more outdoor activities than the elderly, which might increase their exposure to environmental triggers leading to the onset of asthma[34].

To the best of our knowledge, this is the first study to demonstrate the association of long-term exposure to temperature and RH on asthma in China based on a prospective cohort study. In addition, we also first estimated the joint effect of temperature and RH on asthma. There are also several limitations. First, the individual exposure of temperature and RH was unavailable, and we used the values from weather monitoring stations as exposures, which may lead to exposure misclassification bias. Second, the participants in our study were ≥50, which will be cautious when extrapolating our results to the general population. Thirdly, despite controlling for several covariates, there were still unmeasured confounders including genetic component, pest allergens, mold and endotoxin, which may bias our analyses.

In the context of climate change, people were likely to suffer more from extreme weather events. With rising in temperature and a decrease in summer precipitation, the frequency, severity and intensity of people long-term exposure to droughts would increase and also cold spells were projected to increase, which might increase asthma risk[45]. This study explored the joint effects of long-term exposure to temperature and humidity on asthma onset and provided information for the public to take measures preventing asthma in nonoptimal weather conditions.

5. CONCLUSION

In summary, we observed that long-term exposure to temperature and RH were significantly associated with asthma, and dry-cold event might have higher risk. Our findings will inform useful information for effectively adapting to ambient weather condition in the context of climate change.

Conflicts of Interest: The authors declare that there are not competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Abbreviations:

RH: Relative humidity

ERA5: European Center for Medium-range Weather Forecasts Reanalysis 5

Qgcomp: Quantile-Based g-Computation model

GBD: Global Burden of Disease

DALY: Disability adjusted life years

WQS: Weighted quantile sum regression

BKMR: Bayesian kernel machine regression

SAGE: Study on global AGEing and adult health

ECMWF: European Center for Medium-range Weather Forecasts

The Combined Effects of Long-Term Mixture Exposure to Temperature and Relative Humidity on Asthma in China

REFERENCES

1) World Health Organization. Asthma Key Fact.: World Health Organization; 2022 [15 Feb 2023]; Available from: https://www.who.int/en/news-room/fact-sheets/detail/asthma.

2) Institute for Health Metrics and Evaluation. GBD Result. Institute for Health Metrics and Evaluation; 2019 [15 Feb 2023]; Available from: https://vizhub.healthdata.org/gbd-results/.

3) Liu M, Gan H, Lin Y, Lin R, Xue M, Zhang T, et al. Prevalence and Disability-Adjusted Life Year Rates of Asthma in China: Findings from the GBD Study 2019 of the G20. Int J Environ Res Public Health. 2022 Nov 8;19(22). PMID: 36429381. doi: 10.3390/ijerph192214663.

4) Huang K, Yang T, Xu J, Yang L, Zhao J, Zhang X, et al. Prevalence, risk factors, and management of asthma in China: a national cross-sectional study. Lancet. 2019 Aug 3;394(10196):407-18. PMID: 31230828. doi: 10.1016/s0140-6736(19)31147-x.

5) Abe T, Tokuda Y, Ohde S, Ishimatsu S, Nakamura T, Birrer RB. The relationship of short-term air pollution and weather to ED visits for asthma in Japan. The American Journal of Emergency Medicine. 2009 2009/02/01/;27(2):153-9. doi: https://doi.org/10.1016/j.ajem.2008.01.013.

6) Hashimoto M, Fukuda T, Shimizu T, Watanabe S, Watanuki S, Eto Y, et al. Influence of climate factors on emergency visits for childhood asthma attack. Pediatr Int. 2004 Feb;46(1):48-52. PMID: 15043664. doi: 10.1111/j.1442-200X.2004.01835.x.

7) Garty BZ, Kosman E, Ganor E, Berger V, Garty L, Wietzen T, et al. Emergency room visits of asthmatic children, relation to air pollution, weather, and airborne allergens. Ann Allergy Asthma Immunol. 1998;81(6):563-70. doi: 10.1016/S1081-1206(10)62707-X.

8) Strauss RH, McFadden ER, Ingram RH, Jaeger JJ, Stearns DR. Enhancement of Exercise-Induced Asthma by Cold Air. New England Journal of Medicine. 1977;297(14):743-7. PMID: 895804. doi: 10.1056/nejm197710062971402.

9) Lam HCY, Hajat S, Chan EYY, Goggins WB. Different sensitivities to ambient temperature between first- and re-admission childhood asthma cases in Hong Kong – A time series study. Environmental Research. 2019 2019/03/01/;170:487-92. doi: https://doi.org/10.1016/j.envres.2018.12.002.

10) Xu Z, Crooks JL, Davies JM, Khan AF, Hu W, Tong S. The association between ambient temperature and childhood asthma: a systematic review. International Journal of Biometeorology. 2018 2018/03/01;62(3):471-81. doi: 10.1007/s00484-017-1455-5.

11) Cong X, Xu X, Zhang Y, Wang Q, Xu L, Huo X. Temperature drop and the risk of asthma: a systematic review and meta-analysis. Environmental Science and Pollution Research. 2017 2017/10/01;24(28):22535-46. doi: 10.1007/s11356-017-9914-4.

12) Deng R, Ma P, Li B, Wu Y, Yang X. Development of allergic asthma and changes of intestinal microbiota in mice under high humidity and/or carbon black nanoparticles. Ecotoxicology and Environmental Safety. 2022 2022/08/01/;241:113786. doi: https://doi.org/10.1016/j.ecoenv.2022.113786.

13) Wang M, Deng R. Effects of carbon black nanoparticles and high humidity on the lung metabolome in Balb/c mice with established allergic asthma. Environmental Science and Pollution Research. 2022 2022/09/01;29(43):65100-11. doi: 10.1007/s11356-022-20349-0.

14) Lam HC-y, Li AM, Chan EY-y, Goggins WB. The short-term association between asthma hospitalisations, ambient temperature, other meteorological factors and air pollutants in Hong Kong: a time-series study. Thorax. 2016;71(12):1097-109. doi: 10.1136/thoraxjnl-2015-208054.

15) Zhang Y, Dong T, Hu W, Wang X, Xu B, Lin Z, et al. Association between exposure to a mixture of phenols, pesticides, and phthalates and obesity: Comparison of three statistical models. Environment International. 2019 2019/02/01/;123:325-36. doi: https://doi.org/10.1016/j.envint.2018.11.076.

16) Yu G, Jin M, Huang Y, Aimuzi R, Zheng T, Nian M, et al. Environmental exposure to perfluoroalkyl substances in early pregnancy, maternal glucose homeostasis and the risk of gestational diabetes: A prospective cohort study. Environment International. 2021 2021/11/01/;156:106621. doi: https://doi.org/10.1016/j.envint.2021.106621.

17) Gennings C, Curtin P, Bello G, Wright R, Arora M, Austin C. Lagged WQS regression for mixtures with many components. Environ Res. 2020 Jul;186:109529. PMID: 32371274. doi: 10.1016/j.envres.2020.109529.

18) Chen L, Sun Q, Peng S, Tan T, Mei G, Chen H, et al. Associations of blood and urinary heavy metals with rheumatoid arthritis risk among adults in NHANES, 1999–2018. Chemosphere. 2022 2022/02/01/;289:133147. doi: https://doi.org/10.1016/j.chemosphere.2021.133147.

19) Keil AP, Buckley JP, O'Brien KM, Ferguson KK, Zhao S, White AJ. A Quantile-Based g-Computation Approach to Addressing the Effects of Exposure Mixtures. Environ Health Perspect. 2020 Apr;128(4):47004. PMID: 32255670. doi: 10.1289/ehp5838.

20) Kowal P, Chatterji S, Naidoo N, Biritwum R, Fan W, Lopez Ridaura R, et al. Data resource profile: the World Health Organization Study on global AGEing and adult health (SAGE). Int J Epidemiol. 2012 Dec;41(6):1639-49. PMID: 23283715. doi: 10.1093/ije/dys210.

21) Luo M, Ding D, Bauman A, Negin J, Phongsavan P. Social engagement pattern, health behaviors and subjective well-being of older adults: an international perspective using WHO-SAGE survey data. BMC Public Health. 2020 Jan 23;20(1):99. PMID: 31973695. doi: 10.1186/s12889-019-7841-7.

22) Kailembo A, Preet R, Stewart Williams J. Common risk factors and edentulism in adults, aged 50 years and over, in China, Ghana, India and South Africa: results from the WHO Study on global AGEing and adult health (SAGE). BMC Oral Health. 2016 Jul 27;17(1):29. PMID: 27465011. doi: 10.1186/s12903-016-0256-2.

23) Shin S, Bai L, Burnett RT, Kwong JC, Hystad P, van Donkelaar A, et al. Air Pollution as a Risk Factor for Incident Chronic Obstructive Pulmonary Disease and Asthma. A 15-Year Population-based Cohort Study. Am J Respir Crit Care Med. 2021 May 1;203(9):1138-48. PMID: 33147059. doi: 10.1164/rccm.201909-1744OC.

24) Oses N, Azpiroz I, Marchi S, Guidotti D, Quartulli M, I GO. Analysis of Copernicus' ERA5 Climate Reanalysis Data as a Replacement for Weather Station Temperature Measurements in Machine Learning Models for Olive Phenology Phase Prediction. Sensors (Basel). 2020 Nov 9;20(21). PMID: 33182272. doi: 10.3390/s20216381.

25) European Center for Medium-range Weather Forecasts. ERA5-Land hourly data from 1950 to present. ECMWF; 2019 [February 26, 2023]; Available from: https://cds.climate.copernicus.eu/cdsapp#!/dataset/10.24381/cds.e2161bac?tab=overview.

26) Yilmaz M. Accuracy assessment of temperature trends from ERA5 and ERA5-Land. Science of The Total Environment. 2023 2023/01/15/;856:159182. doi: https://doi.org/10.1016/j.scitotenv.2022.159182.

27) Aheto JMK, Udofia EA, Kallson E, Mensah G, Nadia M, Nirmala N, et al. Prevalence, socio-demographic and environmental determinants of asthma in 4621 Ghanaian adults: Evidence from Wave 2 of the World Health Organization's study on global AGEing and adult health. PLoS One. 2020;15(12):e0243642. PMID: 33296442. doi: 10.1371/journal.pone.0243642.

28) Ren M, Wang Q, Zhao W, Ren Z, Zhang H, Jalaludin B, et al. Effects of extreme temperature on the risk of preterm birth in China: A population-based multi-center cohort study. Lancet Reg Health West Pac. 2022 Jul;24:100496. PMID: 35899090. doi: 10.1016/j.lanwpc.2022.100496.

29) Zhang Z, Reinikainen J, Adeleke KA, Pieterse ME, Groothuis-Oudshoorn CGM. Time-varying covariates and coefficients in Cox regression models. Ann Transl Med. 2018 Apr;6(7):121. PMID: 29955581. doi: 10.21037/atm.2018.02.12.

30) Li G, Liu J, Lu H, Hu W, Hu M, He J, et al. Multiple environmental exposures and obesity in eastern China: An individual exposure evaluation model. Chemosphere. 2022 2022/07/01/;298:134316. doi: https://doi.org/10.1016/j.chemosphere.2022.134316.

31) Letellier N, Zamora S, Yang JA, Sears DD, Jankowska MM, Benmarhnia T. How do environmental characteristics jointly contribute to cardiometabolic health? A quantile g-computation mixture analysis. Prev Med Rep. 2022 Dec;30:102005. PMID: 36245803. doi: 10.1016/j.pmedr.2022.102005.

32) Snowden JM, Rose S, Mortimer KM. Implementation of G-computation on a simulated data set: demonstration of a causal inference technique. Am J Epidemiol. 2011 Apr 1;173(7):731-8. PMID: 21415029. doi: 10.1093/aje/kwq472.

33) Hu Y, Zhang Z, Hua B, Tao L, Chen W, Gao Y, et al. The interaction of temperature and relative humidity affects the main aromatic components in postharvest Torreya grandis nuts. Food Chemistry. 2022 2022/01/30/;368:130836. doi: https://doi.org/10.1016/j.foodchem.2021.130836.

34) Lam HC, Li AM, Chan EY, Goggins WB, 3rd. The short-term association between asthma hospitalisations, ambient temperature, other meteorological factors and air pollutants in Hong Kong: a time-series study. Thorax. 2016

Dec;71(12):1097-109. PMID: 27343213. doi: 10.1136/thoraxjnl-2015-208054.

35) Son J-Y, Bell ML, Lee J-T. The impact of heat, cold, and heat waves on hospital admissions in eight cities in Korea. International Journal of Biometeorology. 2014 2014/11/01;58(9):1893-903. doi: 10.1007/s00484-014-0791-y.

36) Kaminsky DA BJ, Irvin CG. Effects of cool, dry air stimulation on peripheral lung mechanics in asthma. Am J Respir Crit Care Med. 2000;162(1):179-86. doi: 10.1164/ajrccm.162.1.9806079.

37) Yonghua S, Mehrabi Nasab E, Y. L. Effect of Temperature and Humidity on the Allegro-inflammatory Factors and Allergic Rhinitis-related Behavior. Iran J Allergy Asthma Immunol. 2022;21(6):704-710. doi: 10.18502/ijaai.v21i6.11531.

38) Puvvula J, Poole JA, Gonzalez S, Rogan EG, Gwon Y, Rorie AC, et al. Joint association between ambient air pollutant mixture and pediatric asthma exacerbations. Environ Epidemiol. 2022 Oct;6(5):e225. PMID: 36249268. doi: 10.1097/ee9.0000000000000225.

39) Liu T, Jiang Y, Hu J, Li Z, Li X, Xiao J, et al. Joint Associations of Short-Term Exposure to Ambient Air Pollutants with Hospital Admission of Ischemic Stroke. Epidemiology. 2023;34(2):282-292. doi: 10.1097/EDE.0000000000001581.

40) HO K. Cold air-provoked respiratory symptoms: the mechanisms and management. Int J Circumpolar Health. Int J Circumpolar Health. 2007 66(2):91-100. doi: 10.3402/ijch.v66i2.18237.

41) Sue-Chu M. Winter sports athletes: long-term effects of cold air exposure. British Journal of Sports Medicine. 2012;46(6):397-401. doi: 10.1136/bjsports-2011-090822.

42) Strauss RH, McFadden ER, Jr., Ingram RH, Jr., Deal EC, Jr., Jaeger JJ. Influence of heat and humidity on the airway obstruction induced by exercise in asthma. J Clin Invest. 1978 Feb;61(2):433-40. PMID: 621282. doi: 10.1172/jci108954.

43) Toskala E, Kennedy DW. Asthma risk factors. Int Forum Allergy Rhinol. 2015 Sep;5 Suppl 1(Suppl 1):S11-6. PMID: 26335830. doi: 10.1002/alr.21557.

44) Pignataro FS, Bonini M, Forgione A, Melandri S, Usmani OS. Asthma and gender: The female lung. Pharmacological Research. 2017 2017/05/01/;119:384-90. doi: https://doi.org/10.1016/j.phrs.2017.02.017.

45) Weilnhammer V, Schmid J, Mittermeier I, Schreiber F, Jiang L, Pastuhovic V, et al. Extreme weather events in europe and their health consequences - A systematic review. International journal of hygiene and environmental health. 2021 Apr;233:113688. PMID: 33530011. doi: 10.1016/j.ijheh.2021.113688.

Effect of Plyometrics Hexagonal Drill and Zig-Zag Drill with Muscle Strength towards Leg Muscle Power and Vo2max of the Volleyball Extracurricular Members of SMA Negeri 5 Kota Magelang

Riris Aji Prasetiyo[1], Ahmad Nasrulloh[2]

[1,2] Departement of Sport Science, Faculty of Sport and Health Science, Yogyakarta State University, Yogyakarta, Indonesia

ABSTRACT: This research aims to determine: (1) the effect of hexagonal plyometrics and zig-zag drill training towards leg muscle power and vo2max, (2) the difference in the effect between high and low leg muscle strength towards leg muscle power and vo2max, and (3) the interaction between hexagon plyometrics training and zig-zag drill as well as leg muscle strength (high and low) towards leg muscle power and vo2max.This research method was an experiment with a 2x2 factorial design. In this research, the number of samples was for about 20 students who were selected by using purposive sampling. To measure leg muscle power, the researcher used the vertical jump instrument, for vo2max, used the bleep test (multi stage), and for leg muscle strength, used a leg dynamometer. The data analysis used a two-way ANOVA test with a significance level of 0.05. The results of this research are: (1) there is a significant difference in the effect of plyometrics hexagonal drill and zig-zag drill training towards leg muscle power and Vo2max of the volleyball extracurricular members, (2) there is a significant difference in the effect between low muscle strength and high muscle strength towards leg muscle power and Vo2max of the volleyball extracurricular members with a value < 0.05, and (3) there is no significant interaction between plyometrics training and leg muscle strength (high and low) towards leg muscle power and Vo2max of the volleyball extracurricular members with a value > 0.05.

KEYWORD: hexagonal drill, zig-zag drill, leg muscle strength, leg muscle power, vo2max, volleyball

I. INTRODUCTION

Volleyball is a sport played by everyone, men and women, of all ages. Volleyball is played by teams consisting of six players on each team, the ball is played in the air by passing through the net, each team can only play the ball three times (Munasifah 2009). Basic volleyball techniques include serve, passing, smash, and, block (Hangar, D., & Divine 2018). The goal of volleyball is to achieve victory in a competition by scoring more points than the opponent (Ugrinowitsch et al. 2014). At this time, volleyball clubs should start training the sport of volleyball that has been practiced. Sports coaching should be carried out in stages, starting from the multilateral stage to the specialist stage. To achieve high achievement in sports, one must train with a systematically programmed and structured exercise process that repeats and increases the training load day after day according to the principle of exercise.

Hidayat (2020) stated that training is an activity to provide treatment to individuals to improve talents, skills, physical and emotional conditions in the sports they pursue. The training method is a scientific way by providing programmatic treatment to improve the athlete's talent, athlete's skills and the athlete's physical condition in accordance with the sport performed. Volleyball players certainly need high-intensity exercises that vary and alternate followed by low intensity such as standing and walking. Volleyball requires high physical abilities such as leg strength and arm muscle strength. The power of the limbs is used to perform high jumps in volleyball. While arm muscle strength is used to make punches in volleyball.

Harsono (2015) states that power is a product of strength and speed. Power is the ability of muscles to direct maximum strength in a very short time. In a volleyball game, every time you hit a smash, players must make a high jump so that the ball can be hit hard until it passes through the net. Reinforced by another study that jumps when smashing, volleyball players need good leg muscle power (Munizar, et al, 2016). Players need to develop leg muscle power by doing speed and acceleration movements then with specific movements in sports (McGuigan, 2017: 113).

Effect of Plyometrics Hexagonal Drill and Zig-Zag Drill with Muscle Strength towards Leg Muscle Power and Vo2max of the Volleyball Extracurricular Members of SMA Negeri 5 Kota Magelang

In addition to developing speed and power, of course, strength endurance needs to be developed (Vassil, K., & Bazanovk n.d.). The physical component related to endurance is the VO2Max component of a good performer. VO2Max is very important in volleyball games to maintain endurance and stamina possessed by a volleyball player. VO2Max can be interpreted as a term for maximal oxygen consumption or maximum oxygen volume. A volleyball player must have a good VO2Max so that the volleyball game can last a long time.

Exercises that can increase leg muscle power in volleyball games one of them is plyometrics exercises. Plyometrics exercise is a form of exercise that can be used to improve a player's biomotor fitness, including strength and speed that has very wide applications in sports activities (Arafat et al., 2018). Training with the plyometrics method is used to train and develop physical abilities such as strength, speed, and power (Asadi et al., 2016). According to Donnald A. Chu & Gregory Myer, (2013). Plyometrics exercises are a popular form of exercise used to improve the performance of athletes, these exercises involve lengthening and shortening muscle units. Examples of plyometrics exercises that can increase leg muscle power and vo2max are plyometrics hexagon drill and zig-zag drill. Plyometrics hexagon drill is an exercise with jumping movements across a hexagon-shaped line and returning centered on the same line then continued by circling each side of the hexagon. Plyometrics zig-zag drill is a jumping exercise using a tool in the form of two parallel straight lines with a width of 60-105 cm and a length of 10 meters, in its implementation using one foot above the line, then jumping forward 4 from one line to another continuously as far as 10 meters (Donnald A. Chu & Gregory Myer, 2013).

Observations made by the author in July 2023 at SMA Negeri 5 Magelang City found that the physical level of children who are still lacking is leg muscle power and vo2max endurance levels in students. This can be seen from the students' jumping ability when doing smashes is still not good and less than optimal. And there are some students at the time of playing still easily tired and lack enthusiasm. Another problem found during observation is the lack of a dose of exercise where there are some children who do not follow the exercise at all times. There needs to be programmed and structured exercises to train the level of physical strength of children, especially at the level of leg muscle strength and vo2max. Based on this, researchers intend to conduct a study to determine the effect of plyometrics hexagon drill and zigzag drill exercises with muscle strength on leg muscle power and vo2max in volleyball extracurricular participants of SMA Negeri 5 Magelang City.

II. METHOD

This study used an experimental method using a factorial design with a 2x2 factorial design. The experiment in this study used a factorial design with a 2x2 factorial design. This research model used four different sample groups with each group given different treatment. Before being given treatment, samples are measured using pretest instruments to obtain initial data on samepl. After obtaining preliminary data, the samples were grouped into four groups and given treatment as many as 18 meetings. The instruments in this study used three measuring instruments, namely vertical jump, bleep test, and leg dynamometer. At the end of the study, a study was carried out using a posttest instrument to obtain the final data results on each sample. After getting the next pretest and posttest data, the data is calculated using the help of the SPSS application to get the final results of the study. The results of the research data are then used as a discussion into a good research result.

III. RESULT AND DISCUSSION
RESULT

The results of the study were divided into three factors, namely 1) the difference in the effect of plyometrics hexagon drill and zig zag drill exercises on leg muscle power and vo2max, 2) the difference in the influence of high and low muscle strength on leg muscle power and vo2max, 3) is there an interaction between plyometrics exercises and muscle strength on leg power and vo2max. The results of such studies are presented in the table:

Table 1. Differences in the effect of plyometrics training on leg muscle power and vo2max

Source	*Type III Sum Of Squares*	df	Mean Square	f	Sig
Muscle power	5,000	1	5,000	10,526	,005
Vo2max	5,832	1	5,832	4,938	,041

Based on the results of the data above, it can be presented that there is a difference in the effect between hexagonal plyometric exercise and plyometrics zig-zag drill on leg muscle power and vo2max.

Effect of Plyometrics Hexagonal Drill and Zig-Zag Drill with Muscle Strength towards Leg Muscle Power and Vo2max of the Volleyball Extracurricular Members of SMA Negeri 5 Kota Magelang

Table 2. The effect of high and low muscle strength on leg muscle power and vo2max

Source	*Type III Sum Of Squares*	df	Mean Square	f	Sig
Muscle power	5,000	1	5,000	10,526	,005
Vo2max	2,592	1	2,592	2,195	,158

Based on the results of the data above, it can be presented that there is a significant difference between high muscle strength and low muscle strength on leg muscle power and vo2max.

Table 3. Interaction between plyometrics training and muscle strength to leg muscle power and vo2max

Source	*Type III Sum Of Squares*	df	Mean Square	f	Sig
Muscle power	,200	1	,200	,421	,526
Vo2max	,338	1	,338	,286	,600

From the results of the data analysis above, it can be presented that there is no interaction between plyometrics exercise and muscle strength on leg muscle power.

DISCUSSION

Effect of plyometrics hexagonal dril and zig-zag drill on limb muscle power and Vo2max in extracurricular volleyball students

In this study, it was proven by the conclusion that there was a significant difference in the effect of plyometrics hexagonal dril and zig-zag drill exercises on leg muscle power and Vo2max in volleyball extracurricular students. With the results of data analysis on leg muscle power produces an F value of 10.526 with a significance value of 0.005 < 0.05. While vo2max produces an F value of 4.938 with a significance value of 0.041 < 0.05. Elsayed, (2012) revealed pliometrics training is a training technique used by observable athletes and plyometrics training can also be performed on all types of sports to increase strength, explosive power that is safe and effective for children and adolescents. Vadivelan, K., & Sudhakar, (2015) state "Plyometrics is a type of training methodology known as "Exercise" that can increase muscle explosive power".

The difference in the effect between high muscle strength and low muscle strength on leg muscle power and Vo2max in volleyball extracurricular students

This study also showed that there was a significant difference in the effect between high muscle strength and low muscle strength on leg muscle power in volleyball extracurricular students. The results of data analysis on muscle power showed that the F value was 10.526 and the significance value was 0.005 < 0.05. While vo2max shows that the F value is 2.195 and the significance value is 0.158 > 0.05. Strength is a resistance due to a load received. Harsono (2015: 177) stated that strength is a very important component to improve overall physical condition. Strength can be increased by exercises that pose resistance, for example, pushing, pulling and lifting (Keller, K., & Engelhardt, 2013).

Interaction between plyometrics exercises and leg muscle strength on leg muscle power and Vo2max in volleyball extracurricular students

This study showed that there was no significant interaction between plyometrics exercise and leg muscle strength (high and low) on leg muscle power and Vo2max in volleyball extracurricular students. The results of the hypothesis test measurement on leg muscle power get an F value of 0.421 and a significance value of 0.526 > 0.05. While vo2max shows results where the F value is 0.286 and the significance value is 0.600 > 0.05, it can be implied that H0 is accepted. From these results, it can be concluded that there is no interaction between plyometrics exercises with leg muscle strength to leg muscle power and vo2max because the two methods of plyometrics hexagon drill and zig-zag drill prove that both exercises are good for increasing power and vo2max in volleyball extracurricular students.

IV. CONCLUSIONS

The conclusion in this study is divided into three parts, namely that:
1. There is a significant difference in the effect of plyometrics hexagonal dril and zig-zag drill exercises on leg muscle power and Vo2max in extracurricular volleyball students of SMA Negeri 5 Kota Magelang.

Effect of Plyometrics Hexagonal Drill and Zig-Zag Drill with Muscle Strength towards Leg Muscle Power and Vo2max of the Volleyball Extracurricular Members of SMA Negeri 5 Kota Magelang

2. There is a significant difference in the effect between high muscle strength and low muscle strength on leg muscle power in volleyball extracurricular students of SMA Negeri 5 Kota Magelang.
3. There was no significant interaction between plyometrics training and leg muscle strength on leg muscle power and Vo2max in volleyball extracurricular students of SMA Negeri 5 Kota Magelang.

REFERENCES

1) Arafat, R. T., E. Mintarto, and N. W. Kusnanik. 2018. "The Exercise Effect of Front Cone Hops and Zig-Zag Cone Hops Due to Agility and Speed." *International Journal of Scientific and Research Publications* 8(2):250–55.
2) Asadi, A., & Ramírez-Campillo, R. 2016. "Effects of Cluster vs. Traditional Plyometric Training Sets on Maximal-Intensity Exercise Performance." *Medicina* 52(1):41–45.
3) Donnald A. Chu, and Gregory Myer. 2013. *Plyometrics*. USA: Human Kinetics.
4) Elsayed, Mohammed. 2012. "Efect of Plyometric Training on Specific Physical Abilities in Long Jump Athletes." *Faculty of Physical Education for Boys, Zagazig University, Egypt* 7 (2):105–8.
5) Hanggara, D., & Ilahi, B. R. 2018. "Implementasi Ekstrakurikuler Bola Voli Di SMAN 1, 2, Dan 3 Bengkulu Tengah." *Jurnal Ilmiah Pendidikan Jasmani* 2(1):16–22.
6) Harsono. 2015. *Kepelatihan Olahraga. (Teori Dan Metodologi).* Bandung: Remaja Rosdakarya.
7) Hidayat, S. 2020. "Pengaruh Latihan Double Leg Speed Hop Dan Single Leg Speed Hop Terhadap Power Otot Tungkai Atlet Karate." *Universitas Negeri Gorontalo* 1(3493).
8) Keller, K., & Engelhardt, M. 2013. "Strength and Muscle Mass Loss with Aging Process. Age and Strength Loss." *Muscles, Ligaments and Tendons Journal* 3(4):346.
9) McGuigan, Mike. 2017. "Developing Power." USA: Human Kinetics.
10) Munasifah. 2009. "Bermain Bola Voli." Semarang: Aneka Ilmu.
11) Munizar, M., Razali, R., & Ifwandi, I. 2016. "Kontribusi Power Otot Tungkai Dan Power Otot Lengan Terhadap Pukulan Smash Pada Pemain Bola Voli Club Himadirga FKIP Unsyiah." *Pendidikan Jasmani, Kesehatan, Dan Rekreasi* 2(1).
12) Ugrinowitsch, H., G. M. Lage, S. P. D. Santos-Naves, L. N. Dutra, M. F. S. Carvalho, A. A. C. Ugrinowitsch, and R. N. Benda. 2014. "Transition I Efficiency and Victory in Volleyball Matches." *Motriz: Revista de Educação Física* 20:42–46.
13) Vadivelan, K., & Sudhakar, S. 2015. "To Compare the Effects of Sprint and Plyometric Training Program on Anaerobic Power and Agility in Collegiate Male Football Players." *International Journal of Physiotherapy* 2(3):543.
    Vassil, K., & Bazanovk, B. n.d. "The Effect of Plyometric Training Program on Young Volleyball Players in Their Usual Training Period." *Journal of Human Sport and Exercise* 7(1):S34–40.

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

Khalliyma Dara Efda[1], Rachmah Laksmi Ambardini[2]

[1,2] Department of Sport Science, Yogyakarta State University, Yogyakarta Indonesia

ABSTRACT: The first objective of this research is to investigate the effectiveness of sport massage and cold water immersion in the post-exercise fatigue recovery of the PPLP sprinter athletes. Second, to determine the effectiveness of sports massage and cold water immersion in reducing post-exercise stress levels of the PPLP sprinter athletes. This research used an experimental method with a pretest-posttest-control group design. The research population was PPLP Bogor 100m sprint athletes, totaling 30 athletes and they were divided into 3 treatment groups: Sport Massage, Cold Water Immersion, and Control. The sampling technique was random sampling with certain criteria. The three groups received an exercise simulation with a duration of 60 minutes divided into 10 minutes of warm up, 45 minutes of exercise, and 5 minutes of cooling down. Before and after the treatment, pretest and posttest were conducted including the level of fatigue recovery (pulse rate, RPE, FAS) and post exercise stress level (Daily Wellness Questionnaire). The normality test used Shapiro Wilks and the data homogeneity test referred to the Levene test. Testing the effectiveness used one way ANOVA for normally distributed data and for the data that was not normally distributed using the Kruskal Wallis test. The data was then processed by using the statistical program SPSS 22. The results show that (1) there are differences in the effectiveness of sport massage and cold water immersion towards the level of post-exercise fatigue of PPLP sprinters. There are differences in treatment effectiveness between the three groups ($p < 0.05$) for pulse and RPE variables. In the Tukey post hoc test it is found that there is a difference in effectiveness between sport massage and the control group ($p < 0.05$) and between cold water immersion and the control group ($p < 0.05$). However, between sports massage and cold water immersion there is no significant difference in recovering fatigue levels. (2) There is no difference in the effectiveness of sport massage and cold water immersion towards the level of post-exercise stress reduction of PPLP sprinters with a significance value ($p > 0.05$). Hence, in recovering post-exercise fatigue, sports massage or cold water immersion recovery techniques can be used according to the needs of athletes compared to passive rest.

KEYWORDS: *Sport Massage, Cold Water Immersion, Recovery Rate, Stress Level*

INTRODUCTION

The race numbers in sports such as fast walking, running, throwing and jumping are called track and field means that the race is carried out on a running track which is divided based on the medium of the race. Running numbers are held on the track such as sprinting, middle distance, long distance running, fast walking, hurdling and steeplechase. Field numbers have a special area for each number according to the needs and activities of the sport. Derived from the word "athlon" into athletics which has the meaning of a race. Athletics is an activity that involves physical or physical exercise consisting of basic natural and logical movements in accordance with what is done in everyday life. Activities such as walking, running, jumping and throwing (Sukirno, 2011).

Training in sprinters is usually intense and physically demanding, as it requires high levels of speed and strength. The intensity of sprinter training varies depending on the athlete's goals, experience and fitness level. Training for sprinters there are types of exercises that are divided into two and commonly used in sports, namely anaerobic and aerobic. Anaerobic exercises include weightlifting, sprints, pull-ups, push-ups and some kinds of jumps. Anaerobic exercise is a form of physical activity with high intensity as one of the exercises. This type of exercise requires energy that at its source must be provided precisely and quickly in

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

a very short time. The 100-meter sprint exercise in less than 30 seconds uses the ATP-PC energy system. Sprinter training is classified as high-intensity training. Sprinters' training is classified as strenuous because sprint-specific power, technique and endurance are considered the main determinants underlying 100m sprint performance. The intensity of sprint training is determined by a series of components such as sprint training mode, strength training, plyometric training, duration, intensity, rest duration, rhythm of the training session, shoe surface.

Several factors explain why sprinters' training is heavy. One of them is Speed Development which explains that maximum training speed can be divided into three training principles; endurance development, endurance training and sprinting. According to (Jalilvand, 2016) sprint-specific endurance refers to the deceleration phase of the sprint. A decrease in speed is usually accompanied by a decrease in stride rate. Sprint-related fatigue is linked to disturbances in the central nervous system and peripheral factors in skeletal muscles.

Based on one of the factors above, training for sprinters is classified as heavy and high-intensity training. According to Margono (2006), athletes who participate in sprints are very at risk of injury. Many studies have been conducted to find the cause, not only one cause but also various risk factors. Fatigue is one of the factors causing muscle overheat in sprinters in addition to inadequate warm-up, poor flexibility, overtraining, muscle imbalance, mineral deficiency, structural abnormalities, incorrect training methods, injury, and lack of a proper endurance program. Sprint-related fatigue is associated with disturbances in the central nervous system and peripheral factors in skeletal muscle. Available research suggests that leg stiffness affects elastic energy storage, which is critical for sprint-specific endurance, requiring rapid recovery.

Fatigue in athletes is a condition of decreased ability when performing a physical activity. Fatigue can result in increased stress levels for athletes. The main focus of athletes such as fatigue and injury factors and the risk of overtraining that must be avoided so that the goals of training can be carried out as well as possible. Fatigue is divided into two parts, namely fatigue which means central which occurs in the nerves due to the influence of central nervous system activity and fatigue which means peripheral which occurs in the muscles and affects the nervous system to contraction. Routine training with increased form and training load can be a cause of mental and physical fatigue. There is a gap between the definition of fatigue and the reality on the field, this is because the items that coaches typically measure for aspects of fatigue are often objective such as heart rate and lactic acidosis. However, there are items that require more attention and are subjective, such as mood, stress, and perceived exertion. This is supported by the theory that determining an athlete's fatigue level requires both objective and subjective factors. Sprint competitions put the sprinter's body under pressure. All of these components in a sprint race cause sprinters to experience stress. Recovery is important and very beneficial if done in the right way, so that the athlete's condition does not experience acute fatigue. The system of returning the body to its original condition is important in avoiding the very high risk of fatigue. The importance of recovery is to restore the condition of the body before the match begins, and also athletes and coaches who have an understanding of a program in training consisting of balanced training and rest in order to get the best results or achievements. Post-training recovery is an important component of the overall sports training paradigm, and is essential for high performance in athletes. If recovery rates are appropriate, then higher training volumes and intensities are possible without the detrimental effects of overtraining. Therefore, it is important for health and fitness professionals to understand the physiological concepts of recovery.

Opinions presented in research by (Haugen et al, 2019) The strategy for restoring an athlete's performance capacity depends on the optimal balance between training and recovery. While sleep and nutrition are fundamental to daily life recovery and the recovery process after physical exercise, several recovery strategies have been explored to improve recovery in athletes. In the community of leading sprinters, so-called tempo runs of 100-300 m with short recoveries and intensities of 60-70% of maximal running speed are commonly used between high-intensive training days to relax stiff muscles and improve cardiovascular fitness. A number of passive recovery modalities have also been applied by practitioners over the years, including massage, stretching, compression garments, cold water or contrast water immersion, cryotherapy, hyperbaric oxygen therapy, and electrostimulation. Recovery is needed after carrying out a training program with the aim of restoring the athlete's body condition. There are two types of recovery methods that are commonly known. Active recovery is light, low-intensity exercise. Active recovery refers to recovery from low-intensity activity training aimed at recovery. There are many different ways and techniques used in recovery. In (Parwata, 2015) so that athletes can use physiotherapy recovery techniques to help the recovery process, there are several recovery techniques or mechanisms of recovery techniques that can be applied in the field, including massage can be carried out for about 15 to 20 minutes before exercise, then continued with a general warm-up, 8 to 10 minutes post-exercise, 20 to 30 minutes after sauna or hot bath, or more. Hot sauna or heat therapy works through the endocrine system and nervous system, affecting local organs and tissues in the muscles. At 36^0 Celsius, warming up and then taking a hot shower or steam bath with a duration of 8 to 10 minutes relaxes the muscles. Cold or cryotherapy is a technique of immersion in cold water or bathing with

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

ice. Recovery is an important method of muscle recovery. During exercise the body experiences stress and muscle damage despite the fact that it helps build muscles. However, the body needs time to recover and grow stronger so we need fast and effective recovery methods. Recovery techniques commonly used in athletics are hydrotherapy, compression and massage.

Cold Water Immersion, a recovery technique and widely used by athletes in recovery using water media or commonly referred to as hydrotheraphy where the human body responds to immersion with changes in heart, peripheral resistance, and blood flow, as well as changes in skin, core and muscle temperature (Wilcock et al., 2006). Changes in blood flow and temperature can affect inflammation, immune function, muscle pain and feelings of fatigue. Research into the potential regenerative effects of immersion, recovery and performance is growing. The most common form of water immersion that is widely used is cold water immersion (CWI). Twelve minutes of CWI also increased total sprint work and peak power. The effectiveness of CWI in restoring simulated performance in running sports evaluated over a 48-hour period (Ingram et al., 2009). Cold Water Immersion is a method by means of soaking using cold temperature water with a vertical body position. (Tsafiq, 2018). Cold water immersion or commonly known as cold therapy is a recovery method that has a function in replacing nitrogen as a role in the use as anesthetic and analgesia in providing a mild effect on pain and reducing symptoms of inflammation that arise in the muscles.

Sport Massage is another recovery technique, a widely used recovery strategy among athletes. Sport massage can help lower pulse rate, RPE, and reduce stress levels through various physiological and relaxation mechanisms that can improve performance and overall health. In addition to the perceived benefits of massage on muscle soreness, several studies have shown positive effects on performance in repetitive sports. Moreover, increased blood flow is one of the main mechanisms proposed to enhance recovery. However, many studies have reported no increase in blood flow or lactate output during massage (Monedero & Donne, 2000). As recovery is a relatively new field of scientific research, athletes are encouraged to experiment with various recovery techniques to identify individualized recovery strategies that are beneficial. The opinion by Bambang Priyonoadi in Nopriansyah (2015) explains that sport massage is a therapy in the form of massage which is specifically recommended for sports players with a healthy body condition. Sport massage is one type of massage that can be used for a sportsman and has a purpose in maintaining fitness for the body, minimizing the risk of injury and handling after injury (Tsaqif, Muchammad, 2018). Sport massage is a method of massage and sequencing carried out on certain parts using methods with hands or special tools with the aim of blood circulation in launching it and can be an effort to relieve fatigue and goals with treatment efforts (Ningsih, 2017).

Preliminary studies have been conducted with four athletic national team athlete respondents who have been interviewed. The results of the interview explained that the toughest exercise for athletic athletes is technical training which requires them to work and practice optimally to get good technical movements. After technical training they explained that they usually do recovery to restore their condition. Five athletes argued that sport massage can recover quickly while, the other five athletes explained that ice bath, or cold water immersion also caused a fast recovery effect for their physical condition. This interview was conducted on Friday, December 23, 2022 when the athlete finished doing technical training in the morning at around 10.00 WIB. The observation used in this preliminary study is to observe athletes from several technical exercises performed at the Senayan athletic field with the number of athletes observed as many as ten athletes on the same day before the interview.

In both methods in this study, there are several advantages and disadvantages, namely, Cold Water Immersion can improve cardiovascular circulation for heart health, a strong immune system, mental health and high energy levels after participating in high intensity. The disadvantages of Cold Water Immersion are the shock of cold water that will respond automatically where the heart rate increases and lose control of breathing and arrhythmia or heart rhythm disturbances and hypothermia because the core temperature is too cold. As for sports massage, it can release and reduce tension in the muscles, improve circulation and encourage the removal of lactic acid during high intensity and reduce injuries. However, the side effects that can occur are nausea, headache, pain in the massaged muscle, bruising, bleeding in some cases, and skin irritation. The disadvantage that can be seen from cold water immersion, sports massage, fatigue levels and stress reduction levels is that in cold water immersion there is a response called the hunting response that can occur in preventing tissue damage due to anoxia in the tissue. In a cold condition, the hypothalamus which regulates skeletal muscles actively for vasoconstriction can be a cause of a person experiencing chills and increased body temperature, therefore requiring rapid control and observation in carrying out this treatment. Sport massage has a weakness if it is wrong in performing massage techniques on the body precisely in the muscles then the results felt by athletes do not become significant. Weaknesses in the level of fatigue and stress reduction include requiring sports activities that make athletes tired and stress that can change quickly and the condition of external factors that can affect the athlete.

Several reasons for comparing the two recovery methods between sports massage and cold water immersion were found in a preliminary study of national team athletics athletes while doing technical training in Senayan on December 23, 2022, 10 athletes were interviewed and observed about the choice of recovery method. A total of 4 athletes (40%) argue that they feel more efficient sport masage, 1 athlete (10%) chooses passive rest and 5 other athletes (50%) argue that cold water immersion is more efficient,

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

popular, and widely used. This is one of the reasons for choosing, in comparing the two methods. The benefits found in sport massage and cold water immersion are aimed at recovery in improving adaptation for athletes to physical stress for the body and mentally during competition and training, recovery programs for affected athletes can be applied to reduce fatigue and efforts to be made in reducing fatigue and stress levels.

The selection of respondents in this study were sprinters at PPLP Bogor and in accordance with the characteristics of athletes in sports that require fast recovery and athletes who already have a definite schedule in the training period. Based on this explanation, it is necessary to conduct a deeper research and study with the topic of comparing the effectiveness between the provision of sports massage and the cold water immersion method towards fatigue recovery and post-exercise stress levels of PPLP sprinters.

METHODS

Quasi experiment is a type of research that is a method in research that is commonly used in finding the effect of certain treatments on objects under controlled conditions and there is treatment, control and supervision (Sugiyono, 2018). Research with quasi-experimental type research and using cross sectional method which is a study as a type of research that is included in observational by analyzing variable data collected at a certain point in time from the entire population of samples or subsets that have been determined. The research design is pretest-posttest control group design. The population used in this study were a number of 100m sprint athletes at PPLP Bogor, totaling 32 athletes. The sampling technique is random sampling used in this study, namely random sampling by adjusting the needs of athletes and some considerations from the coach. So, with the sample size formula that the sample in this study was obtained totaling 30 sample participants. The 30 participants in the study were divided into 10 participants in each group. 10 participants in the sports massage manipulation group, 10 participants in the cold water immersion manipulation group, and 10 participants in the control group. This study has a specific criterion in representing the sample which is then used in research, the criteria for the sample are based on the inclusion and exclusion criteria as follows: 1) Inclusion Criteria, including PPLP Bogor sprint athletes number 100 m, adolescent individuals with an age range of 14 - 18 years, willing to become respondents. 2) Exclusion criteria, including being injured, being sick, allergic or sensitive to cold temperatures. The data collection technique in this research is a questionnaire. Instruments in data collection for fatigue level recovery using Fatigue Assessment Scale (FAS), Rating Perceived Exertion (RPE), and Pulse Rate. Data collection instruments for stress levels used the Daily Wellness Questionare. Validity and Reliability of the FAS measuring instrument is classified as good and can be used with validity values > 0.59 - 0.68 and Reliability 0.74 - 0.80 which means this measuring instrument is very reliable (Zhang M., et al, 2015). The validity and reliability of the RPE measuring instrument is classified as good and can be used with a validity value of 0.88 and reliability of 0.84-0.91 which means that this measuring instrument is highly reliable (Lea, J.W.D et al, 2022). The validity and reliability of the Daily Wellness Questionaire (DWQ) measuring instrument is 0.75 as a reliability coefficient which has Acceptable internal consistency and can be considered reliable. The validity value or coefficient value> 0.3 is considered valid. data analysis techniques in this study are divided based on each treatment group, namely, the sports massage group, the cold water group and the control group. Data analysis techniques include prerequisite tests (normality and homogeneity tests), hypothesis testing using the one way anova test on normally distributed data, while the Kruskal Wallis test is used on non-normally distributed data.

RESULTS

The characteristics of respondents in this quasi-experimental study follow the inclusion and exclusion criteria that have been determined before data collection. The following can be described the characteristics of the subjects in this quasi-experimental study in table 1.

Table 1. Characteristics of Research Subjects Based on Age, Height, Weight and Body Mass Index

Groups	Total	Age (mean±SD)	Height (mean±SD)	Weight (mean±SD)	BMI (mean±SD)
SM	10	16.90±1.10	169.40±5.62	56.90±3.66	19.85±1.36
CWI	10	15.80±1.13	168.50±7.30	59.30±6.29	20.85±1.16
Control	10	15.70±1.25	162.60±3.71	55.20±4.91	20.87±1.61
Total	**30**				

The table above presents data or characteristics of respondents in the study. Based on the characteristics of the average age of the three groups is 16 years old. The highest average height was in the sports massage group with 169.4 cm. The highest average body

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

weight is in the cold water immersion group with a value of 59.3 kg and the lowest BMI is in the sports massage group with a value of 19.8.

Table 2 below will explain the characteristics of quasi-experimental research subjects based on gender.

Table 2. Characteristics of Research Subjects based on Gender

Groups	Gender		Total (%)
	Male (n/%)	Female (n/%)	
SM	4 (40)	6 (60)	
CWI	7 (70)	3 (30)	
Control	3 (30)	7 (70)	
Total	15 (50)	15 (50)	100

Characteristics based on gender. The most male gender is in the cold water immersion group as many as 7 athletes and the most female gender is in the control group as many as 7 athletes.

Descriptive data including pretest and posttest regarding pulse rate, FAS, RPE and DWQ can be explained in the table below:

Table 3. Descriptive Data of Pretest, Post-test and Difference in Pulse Rate (DN), FAS, RPE and DWQ by Groups

Groups	Test	Parameters (mean±SD)			
		DN	FAS	RPE	DWQ
SM	Pretest	109.20 ± 13.44	24.40 ± 4.35	3.60 ± .96	30.20 ± 6.05
	Post-test	80.00 ± 13.54	21.50 ± 4.47	.750 ± .54	26.80 ± 4.35
	Selisih	29.20 ± .1	2.90 ± .12	2.85 ± .42	3.40 ± 1.7
CWI	Pretest	111.60 ± 12.38	23.00 ± 3.83	4.10 ± 1.10	30.40 ± 3.30
	Post-test	68.70 ± 6.49	21.60 ± 4.16	0.40 ± .39	26.70 ± 4.57
	Selisih	42.90 ± 5.89	1.40 ± .33	3.70 ± 0.71	3.70 ± 1.27
Control	Pretest	113.20 ± 21.05	24.80 ± 4.89	4.40 ± 1.17	31.10 ± 5.23
	Post-test	100.40 ± 17.22	22.90 ± 4.63	1.90 ± 0.87	29.80 ± 6.07
	Selisih	12.80 ± 3.83	1.92 ± .26	2.50 ± .30	1.30 ± .84

Descriptive data based on the sport massage, cold water immersion and control groups resulted in the following data values. There is a difference in value in the data above before getting treatment and after getting treatment both in the parameters of pulse rate difference, fatigue assessment scale, rating perceived exrcertion and daily wellness questionnaire. The most difference in pulse rate is in the cold water immersion group, the difference in FAS is most in sport massage, the most RPE difference is in cold water immersion, and the most difference in DWQ is in the cold water immersion group..

The data normality test uses the Shapiro-Wilk method with a significance level of 0.05. The results of the normality test are presented in Table 4:

Table 4. Normality Test Results

Variables	Groups	Shapiro Wilk		
		Statistic	Df	Sig
DN	SM	.906	10	.254
	CWI	.921	10	.365
	Control	.923	10	.387
FAS	SM	.965	10	.842
	CWI	.907	10	.264
	Control	.941	10	.568
RPE	SM	.366	10	.000
	CWI	.878	10	.124
	Control	.366	10	.000

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

DWQ	SM	.960	10	.791
	CWI	.891	10	.173
	Control	946	10	.621

In the data above the pulse rate, FAS, and DWQ variables have a significance value (p> 0.05) so that the data can be said to be normally distributed. RPE data in the sports massage group and control group have a significance value (p < 0.05) so that the data can be said to be not normally distributed. For normally distributed data using the One Way Anova hypothesis test and for data that is not normally distributed using the Kruskal Wallis test.

The homogeneity test uses the Levene Test with a significance level of 0.05. The results of the homogeneity test are presented in Table 5:

Table 5. Homogeneity Test Pretest - Posttest

Variables	Statistic	df1	df2	Sig
DN Pre	2.80	2	27	.078
DN Post	3.11	2	27	.061
FAS Pre	1.18	2	27	.320
FAS Post	.26	2	27	.769
RPE Pre	.36	2	27	.699
RPE Post	7.81	2	27	.002
DWQ Pre	1.69	2	27	.203
DWQ Post	.26	2	27	.105

Based on the homogeneity data above the significance value> 0.05, the data is homogeneous. RPE Post data <0.05, which means that the data is not homogeneous or data where the test is carried out to determine whether the variances of two or more distributions are equal.

Hypothesis Test 1

The following table shows the results of hypothesis testing using one way anova for the variables of pulse fatigue level and FAS.

Table 6. One way Anova for fatigue level variables pulse rate (DN) and FAS

Variables	Sum of Squares	Mean Square	F	Sig.
DN	5162.46	2581.23	14.82	.001
FAS	12.20	6.10	.31	.735

The results of the One Way Anova Test, the DN variable has a significance value (p < 0.05) and shows there is a significant difference (p < 0.05) between treatment groups so it needs to be continued with the Tukey Post Hoc test, while for the FAS variable has a significance value (p> 0.05) which indicates there is no significant difference.

The Kruskal Wallis test was then conducted for the RPE fatigue level variable and is shown in the following table:

Table 7. Kruskal Wallis Test

Variabel	Chi-Square	Df	Asymp.Sig
RPE	14.94	2	.001

The test results on the RPE variable show a significance value (p < 0.05) between groups so that there are significant differences between groups. So that the results of RPE can be explained that based on measurements through athlete perceptions, there are differences in the effectiveness of sports massage and cold water immersion on post-training fatigue recovery in PPLP sprinters.

Hypothesis Test 2

The following is a table of hypothesis test results using one way anova for the stress reduction level variable.

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

Table 8. One way Anova for DWQ stress level variable

Variable	Sum of Squares	Mean Square	F	Sig.
DWQ	62.06	31.03	.69	.510

In the DWQ variable results, with a significance value (P> 0.05), there is no significant difference between treatment groups or there is no difference in the effectiveness of sports massage and cold water immersion on reducing post-training stress levels in PPLP sprinters.

Tukey's Post Hoc Test

a. Pulse Rate/DN

Following up on the results of the data test with one way anova and getting a significance value <0.05, the next step is to test the pulse fatigue level variable in the following table:

Table 9 Tukey's Post Hoc Test for DN fatigue level variable

	Groups	SM	CWI	Control
	SM	-	0,154	0,005
DN	CWI	-	-	0,000
	Control	-	-	-

The results of Tukey's post Hoc test for the pulse rate variable showed that there was a significant difference in pulse rate parameters between the Sport Massage, Cold Water Immersion and Control groups. However, between the sport massage and cold water immersion groups there is no significant difference. Based on the results of the analysis that there is no significant difference because both have almost the same effectiveness value so there is no significant difference.

b. RPE

Tukey's Post Hoc test was also conducted for the RPE variable in measuring fatigue levels as it had a significance value of <0.05. Table 10 follows:

Table 10. Tukey's Post Hoc Test for RPE fatigue level variables

	Groups	SM	CWI	Control
	SM	-	0,956	0,001
RPE	CWI	-	-	0,000
	Control	-	-	-

The results of Tukey's post Hoc test for RPE variables showed that there was a significant difference in RPE parameters between the Sport Massage, Cold Water Immersion and Control groups. However, between the Sport Massage and Cold Water Immersion groups there was no significant difference based on athletes' perceptions of the level of fatigue they felt and could also occur because the design of high-intensity training activities did not make athletes feel tired.

DISCUSSION

Based on the results of the data obtained and have been processed with the SPSS software application, the discussion will be explained below. Subject characteristics based on the age of the participants are in the range of 14 to 18 years, with a height from an average of 162 cm to 170 or more, which has an average body weight of 55 kg to 59 kg or more, and has a fairly good BMI from a scale of 19 - 21 and above which can be said to still be in Normal BMI especially for sprinter athletes. Based on gender, it is divided into 15 female athletes and 15 male athletes with a total of 30 athletes in this study.

The next descriptive data is descriptive data of pretest and post-test and the difference between the two values. The parameters used are the mean or average value and standard deviation on each variable. The difference in pulse rate between the sports massage, cold water immersion, and control groups with the most difference is in the cold water immersion group with a value of 42.90 with SD 5.89 compared to other groups. The difference in FAS fatigue level measurements between the sports massage group, cold water immersion, and the control group with the most difference is in the sports massage group with a value of 2.90 with SD .12 compared to other groups. The difference in RPE fatigue level measurements between the sports massage, cold water immersion, and control groups with the most difference being in the cold water immersion group with a value of 3.70 with SD .71

compared to other groups. The difference in measurement of the level of stress reduction DWQ between the sports massage group, cold water immersion, and the control group with the most difference is in the cold water immersion group with a value of 3.70 with SD 1.27 compared to other groups. Based on this data, the level of fatigue and the level of stress reduction of each variable experienced a difference in value change.

Data normality test on pulse rate, FAS and DWQ variables has a significance value ($p > 0.05$) which has data with normal distribution. Data normality on RPE variables in the sports massage group and control group has a significance value ($p < 0.05$) so that the data is not normally distributed.

In the data homogeneity test using the Levene test resulted in data for the RPE data variable ($p < 0.05$) so that the data was not homogeneous, while the data on other variables, namely pulse rate, FAS, and DWQ had homogeneous data. Normally distributed data and homogeneous data can be continued with one way anova data processing while for data that is not normally distributed can use the Kruskall Wallis test.

In the hypothesis test in answering the research question that there is a difference in the effectiveness of sport massage and cold water immersion on post-training fatigue recovery in PPLP sprinter athletes through one way anova testing with a significance value (0.001), so that the Tukey Post Hoc test is carried out for pulse rate variables which gives the result that there is a significant difference in pulse rate parameters between the sport massage group and the control group with a significance value (0.005), the cold water immersion group with the control group with a significance value (0.000), but between the sport massage and cold water immersion groups (0.154) there is no significant difference. The RPE variable uses the Kruskall Wallis test with a significance value of (0.001), and continued with Tukey post hoc which explains there is a significant difference in RPE parameters between the Sport Massage treatment group, Cold Water Immersion and the control group. The significance value of the sport massage group and the control group (0.001), the cold water immersion group (0.000), and the sport massage and cold water immersion group (0.956) which means that between the Sport Massage and Cold Water Immersion groups there is no significant difference based on the athlete's perception of the level of fatigue. In the results of the one way anova test on the variable level of DWQ stress reduction, it gives a significance value (0.510) which means there is no significant difference between treatment groups.

In line with research by Kurniawan (2021) argues that sports massage with several movements can stimulate vegetative nerves or the autonomic nervous system in all parts of the body and affect the body. The implementation in this manipulation is distinguished based on the place or part that is massaged. Abdominal shaking is only a small intensity vibration using the shaking technique. Some limbs that are shaken are required to be in a state of comfort or relaxation. Having the purpose of manipulation to relax the muscles, increase tissue flexibility, get calm the nervous tension in the area of massage so that there is a significant difference from the group that gets treatment or massage manipulation after high intensity training. The same as getting a cold water immersion treatment that is explained by doing water immersion with cold temperature is a method of immersion in cold water with a vertical position (Tsaqif, 2018). Cold water immersion is a recovery method where a part of the body is immersed in cold temperature water with a constant temperature (Akhsan, 2018). Cold therapy and cold water immersion is the use of cold water to treat symptoms of inflammation and pain (Rijal, 2019). Implemented either after training to soak in cold temperature water breaks the lactic acid that accumulates in the body from physical activity that has been done. So that it has an impact on the central autonomic nervous system that can recover effectively, therefore there is a significant difference between groups that do cold therapy treatment and not.

The most important thing to consider after training or competition is recovery. Rest helps the whole body adjust when after physical activity. Increasing recovery time as a means of helping athletes maintain fitness and performance status and can increase their likelihood of participation and competition. Therefore, the three groups were given different treatments with the control group using passive rest, the sports massage group with treatment, and the cold water immersion group with cold water immersion, this was done in this study to determine effective recovery by resting.

On the variable level of stress reduction with the daily wellness questionnaire measuring instrument, there is no difference in effectiveness between sports massage and cold water immersion in reducing the level of stress after training PPLP athletes among the three groups. The DWQ measuring instrument is a measuring tool used by the body's response to intense physical exercise which includes changes in mood, sleep quality, energy levels, muscle soreness and stress as measured by the Daily wellness questionnaire. One of the reasons why there was no significant difference in stress levels in the sprinters was because this tool was only used once on the same day, and should have been used the day after to get maximum results on other variable components. There was no significant difference in stress levels between the groups because the intensity of the training was not too high for them so the stress levels were also affected by that.

The Effectiveness of Sports Massage and Cold Water Immersion towards Fatigue Recovery and Post-Exercise Stress Levels of Sprinters at the Student Sports Education and Training Center (PPLP)

According to research conducted by Parwata (2015) fatigue is basically reduced productivity reduced work capacity and reduced endurance and is explained in a state of fatigue, the state of subjective fatigue dominates. Therefore, the possibility that can occur that athletes in perceiving the level of stress reduction is still subjective in assessing and training intensity designed is not a stressor for them because stress does not always have a negative connotation. The impact of stress can be both positive and negative. In determining the state of the athlete, it is necessary to have a certain level of sports stress and gain performance in order to achieve success in sports. On the other hand, excessive levels of stress can affect performance and damage parts of the body. This ability to adapt to stress can be improved by developing systematic practices. Performance and Avoidance or the result of overload. The lack of difference in effectiveness in reducing stress levels may be due to athletes being well adapted to their usual training or activities.

The opinion expressed by Jarvis (in Walerinczyk & Stolarski, 2021) explains that one of the goals of sports psychology is to improve athletic performance, and not only about performance but sport is seen as a place or laboratory in research on efficiency under high pressure and the strong emotions that accompany it. So stress can occur and not in athletes who want to improve their performance and how athletes manage high pressure and emotions in high intensity training.

CONCLUSIONS

Based on the results of research and discussion, it can be concluded that there are differences in the effectiveness of sports massage and cold water immersion on post-training fatigue recovery in PPLP sprinters. 1) There is a difference in the effectiveness of sports massage and cold water immersion on post-training fatigue recovery in PPLP sprinter athletes. In the pulse rate and RPE variables, there is a significant difference between the Sport Massage, Cold Water Immersion and Control groups. However, between the sport massage and cold water immersion groups there is no significant difference. 2) There is no difference in the effectiveness of sport massage and cold water immersion on the recovery of post-training stress levels in PPLP sprinters. It is interpreted that there is no significant difference between Sport Massage, Cold Water Immersion and Passive Rest on reducing post-training stress levels.

REFERENCES

1) Akhsan, M. (2018). Pengaruh Penerapan Perendaman Air Dingin (Cryotherapy) Setelah Latihan Terhadap Penurunan Kadar Asam Laktat Pada Atlet Futsal Polewari Mandar. FIK Universitas Negeri Makasar. Retrieved From : http://eprints.unm.ac.id/9879/

2) Haugen, T., Seiler, S., Sandbakk, Ø. et al. (2019). The Training and Development of Elite Sprint Performance: an Integration of Scientific and Best Practice Literature. Sports Med, 5(44). Retrieved From : https://doi.org/10.1186/s40798-019-0221-0

3) Ingram, J., B. Dawson, C. Goodman, K. Wallman, and J. Beilby. (2009). Effect of water immersion methods on post-exercise recovery from simulated team sport exercise. J. Sci. Med. Sport, 12.

4) Jalilvand, F. et al. (2016). Effect of different sprint training methods on sprint performance over various distances: a brief review. Strenght Con Res, 30(06). Retrieved From : https://pubmed.ncbi.nlm.nih.gov/26492101/

5) Kurniawan, A. W., & Kurniawan, M. T. A. (2021). Sport Massage : Pijat Kebugaran Olahraga. Tulung Agung : Akademia Pustaka.

6) Lea, J.W.D., O'Driscoll, J.M., Hulbert, S. et al. (2022). Convergent Validity of Ratings of Perceived Exertion During Resistance Exercise in Healthy Participants: A Systematic Review and Meta-Analysis. Sports Med – Open, 8(2). Retrieved From : https://doi.org/10.1186/s40798-021-00386-8

7) Margono. (2006). Upaya Pencegahan Pulled Muscle pada Sprinter. Medikora, 2(1), 57-67. Retrieved From : https://media.neliti.com/media/publications/152118- ID-upaya-pencegahan-pulled-musclepada-sprin.pdf.

8) Monedero, J., and B. Donne. (2000). Effect of recovery interventions on lactate removal and subsequent performance. Int. J. Sports Med, 21. Retrieved From: https://pubmed.ncbi.nlm.nih.gov/11156281/

9) Ningsih, Y. F., Kurniasih, F., Dyah A. P., Mahmudi, & Arik A. W. (2017) The Effect of Sport Massage and Thai Massage to Lactic acid and Pulse Decreased. Int. J. Advance Engineering Research and Science, 4(12). Retrieved From : https://www.neliti.com/publications/237335/the-effect-of- sport-massage-and-thai-massage-to-lactic-acid-and-pulse-decreased

10) Nopriansyah. (2015). Pengaruh Sport Massage Terhadap Penurunan Perasaan Lelah Setelah Latihan Di UKM PencakSilat UNY. Jurnal Olahraga Prestasi, 11 (2). Retrieved From: https://journal.uny.ac.id/index.php/jorpres/article/view/5750

11) Rijal, S. (2019). Perbandingan Pengaruh Pemberian Masase Olahraga Dan Perendaman Air Dingin Terhadap Penurunan Kadar Asam Laktat Atlet Karate Kota Makasar. Jurusan Ilmu Keolahragaan, FIK Universitas Negeri Makasar.Retrieved From : http://eprints.unm.ac.id/14487/1/jurnal%20skripsi.pdf

12) Sugiyono. (2018). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Penerbit Alfabeta.

13) Sukirno. (2011). Dasar-dasar Atletik dan Latihan Fisik. Palembang: Universitas Sriwijaya.

14) Tsaqif, Muchammad & Sifaq, A. (2018). Perbandingan Metode Hydrotherapi Cold Water Immersion (Cryotherapy) Dengan Sport Massage Terhadap Penurunan Kadar Asam Laktat Pasca Circuit Training. S1 PKO, FIO Universitas Negeri Surabaya. Retrieved From: https://jurnalmahasiswa.unesa.ac.id/index.php/8/article/view/26275

15) Waleriańczyk, W., & Stolarski, M. (2021). Personality and sport performance : The role of perfectionism, Big Five traits, and anticipated performance in predicting the result of distance running competitions. Personality and Individual Differences. Retrieved From: https://www.sciencedirect.com/science/article/pii/S0191886920301823

16) Wilcock, I.M., J.B. Cronin, and W.A. Hing. (2006). Physiological response to water immersion: a method for sport recovery. Sports Med, (36). Retrieved From : https://pubmed.ncbi.nlm.nih.gov/16937951/

17) Zhang M, Sparer EH, Murphy LA, Dennerlein JT, Fang D, Katz JN, Caban- Martinez AJ. (2015). Development and validation of a fatigue assessment scale for U.S. construction workers. Am J Ind Med, 58 (2). Retrieved From : 10.1002/ajim.22411

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

Desi Andini[1], Pamuji Sukoco[2], Nevitaningrum[3], Wahyu Dwi Yulianto[4]

[1,2,3,4] Department of Sport and Health Science, Yogyakarta State University, Yogyakarta, Indonesia

ABSTRACT:

Aim of this research aim to develop an Android-based *Rhythmicgym application* to improve the rhythmic gymnastics skills of Yogyakarta City Middle School students.

Method of this research use development (R&D). This research procedure adapts the ADDIE development model (*analysis, design, development, implementation, evaluation*). The research subjects were divided into three groups, namely: (1) three expert lecturers (2) small-scale tests were tested on 36 students and one Physical Education teacher, (3) large-scale tests were tested on 72 students and one Education teacher Physical. Data collection instruments used questionnaires and observation rubrics. The data analysis technique in the validation test uses Aiken V analysis, the feasibility test questionnaire is analyzed using a *Likert scale*

Results The results of the material and media instrument validation tests obtained an average Aiken V value of 0.883 and 0.937 respectively with a very high validity category . The results of the instrument reliability test for material and media instruments respectively with *Cronbach's Alpha values* of 0.761 and 0.652 mean that the instrument is declared reliable. The results of small-scale trials on 36 students and one Physical Education teacher showed a percentage of 78% in the appropriate category. The results of a large-scale trial that was tested on 72 students and one Physical Education Teacher showed a percentage of 81% with a very feasible category.

Conclusion Based on the research results, it can be concluded that the Android-based *RhytmicGym application is declared valid, reliable, feasible, practical and effective for* improving the rhythmic gymnastics skills of Yogyakarta City Middle School students.

KEYWORDS: Application RhythmicGym , Skills , Rhythmic Gymnastics

I. INTRODUCTION

Sports and health physical education is a learning process that provides positive effects such as being skilled in carrying out basic movements in sports, besides being able to provide improvement and development in terms of affective, cognitive and social relations (Fardhany, 2016 **;** Setyawan & Dimyati, 2015). 21st century skills crystallize in four basic skills, namely 4C skills, namely *Creative* , *Collaborative* , *Communicative* , and *Critical Thinking* (critical thinking) (Anggraeni et al, 2023). These four skills provide a strong foundation for the ability to adapt, innovate and solve problems in the era of the fourth generation industrial revolution. One thing that can be a means of connecting in processing 4C skills is learning media. In line with Tafonao (2018, p. 103) learning media is a tool in the teaching and learning process to stimulate the thoughts, feelings, attention and abilities or skills of learners so that they can encourage the learning process. Six categories the basis of media is text , audio, visual, video, engineering (manipulative) (objects), and people (Suryadi , 2020 ,; Daulay & Priono , 2020) .

Physical education sports and health at the level School Intermediate First (SMP) refers to Implementation Independent Learning Curriculum , in frame enhancement fitness physical Skills movement and health participant educate (Kemendikbudristek, 2022) . Elements of movement skills and sub-elements of movement skills in rhythmic activities and elements of movement knowledge in rhythmic movement in phase D. Teachers can develop a flow of learning objectives, learning stages according to the needs and conditions of the school and teachers can adjust the gradation of specific movement skills for class VII, namely movement skills. specifically, class VIII is specific movement variation skills and class IX is specific movement variation and combination skills (Physical & Health, nd). In Phase D, the gradation of movement skills in the movement skill elements of class

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

VIII students is variations in specific movement sequences in rhythmic movement activities, namely practicing the results of analysis of variations in movement sequences in rhythmic movement activities. Then, in the Movement Knowledge Element, class VIII students are identifying facts, concepts and procedures for movement skills in rhythmic activities. Specific movements in rhythmic movement activities are specific movements of arm swings and specific movements of foot steps. So in class VIII students will learn the skills of varying arm swings and rhythmic foot steps.

The presence of rhythmic movement activities in the sports and health physical education curriculum is considered by some teachers as burdensome material, this causes PJOK teachers to rarely provide rhythmic exercise material. This is confirmed by research by Kartiningtyas, et al (2018) which states that there are 30.4% who have taught rhythmic gymnastics to their students and 69.6% who have not taught rhythmic gymnastics to their students. This is based on not having supporting learning media, as well as teachers who do not master rhythmic movement material, especially teachers who do not like teaching rhythmic movement (Abdullah & Lubis, 2020 ; Amri- Dardari et al , 2022)

Students as objects in learning rhythmic movement activity material find it difficult to understand rhythmic movement activity material. In line with Azprizal's (2022) literature which states that most students are less enthusiastic and choose game sports rather than learning rhythmic gymnastics, this is shown when given the choice of sports and health physical education subject matter for the following week, the majority prefer game sports material. than rhythmic gymnastics. This is of course a challenge for a teacher to increase students' interest in following rhythmic gymnastics material. The right learning media will really help students' learning processes and outcomes (Muhammad Rusli & Dadang Hermawan, 2017). In line with Basri (2018) stated that the assistance of audio-visual media in learning rhythmic gymnastics has an effect on student learning outcomes. The average score in the pre-cycle was 67.2 (not completed), this was still below the KKM (75), in the first cycle the students' average score increased to 72.25 (not completed), but still below the KKM, and in implementation In cycle II, the average student score has reached 77.77 (completed), which means they have reached the KKM score (75). It can be concluded that the use of learning media makes students motivated and happy (Artanty et al, 2023).

Development research on rhythmic gymnastics/basic rhythmic gymnastics based on Android applications has been carried out by Nuritasari (2022). This research produces products in the form of videos and applications that explain the process for learning exercises to develop a model of the basic elements of rhythmic gymnastics based on an Android application. The resulting product has specifications in the form of pictures, videos and procedures for how to perform the basic elements of rhythmic gymnastics, jumps, turns and balance in accordance with FIG rules. simply. However, this research is still limited in its use only to athletes, and when carrying out the research process, athletes do not immediately master the basic element movements given so it requires time and guidance from the coach for athletes to be able to carry out the movements well and correctly. Therefore, this development research will be adapted to the characteristics and learning outcomes of junior high school students in the form of the Android-based *RhythmicGym application* to improve the rhythmic gymnastics skills of junior high school students. This application will be equipped with history, rhythmic gymnastics material and videos of various types of basic footstep movements and basic arm swing movements in the form of videos, and a competency test in the form of a game making variations of rhythmic gymnastics movements.

II. METHOD

This research is study development (R&D). In research developed products is Android-based rhythmic gymnastics application to improve the rhythmic gymnastics skills of Yogyakarta City Middle School students . Procedure study adapting the ADDIE development model , namely a development model consisting of of five stages which include analysis , design , development , implementation and evaluation . The research subjects were divided into three groups, namely: (1) three expert lecturers (2) small-scale tests were tested on 36 students and one Physical Education teacher, (3) large-scale tests were tested on 72 students and one Education teacher Physical. Data collection instruments used questionnaires and observation rubrics. The data analysis technique in the validation test uses Aiken V analysis, the feasibility test questionnaire is analyzed using a *Likert scale* .

III. RESULTS AND DISCUSSION

Development carried out in study This is application *Rhythmicgym* Android based for increase rhythmic gymnastics skills participant Yogyakarta city junior high school student . Expert validation is carried out to determine the suitability of the instrument to guide application development. Researchers asked for expert assistance to assess the initial product development draft, several experts were involved including media experts and material experts. The validation results analyzed using Aiken V analysis are described in the following table:

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

Table 1. Results of Aiken V Media Expert Analysis

No	Statement	∑S	V	Category
Appearance				
1	The appearance design (attractiveness, format, color combination, menu appearance) is appropriate	10	0.833333	Tall
2	The type and size of the letters are appropriate and attractive to users	12	1	Very high
3	The combination of colors and button sizes in the application is appropriate and harmonious	11	0.916667	Very high
4	The layout composition (title, text, images, navigation) is appropriate	10	0.833333	Very high
5	Illustrations, drawings and photos with the concept of the application are appropriate	12	1	Very high
Audio				
6	The audio used in the application varies	12	1	Very high
7	The audio in the video sounds clear	12	1	Very high
8	Backsound or supporting music in accordance with gymnastics rhythm participant junior high school student	12	1	Very high
Grammar				
9	The delivery style in the application is easy to understand	11	0.916667	Very high
10	The language used is appropriate to the context known to students	12	1	Very high
11	The language used does not contain the use of words or phrases that could give rise to multiple interpretations	11	0.916667	Very high
12	Correct use of punctuation	12	1	Very high
13	Language used in accordance with PUEBI (General Guide to Indonesian Spelling)	12	1	Very high
Programming				
14	Installing the application to the smartphone is easy	10	0.833333	Very high
15	The application size is not too heavy	9	0.75	Tall
16	The application does not take a long time to load	10	0.833333	Very high
Use				
17	Applications on media are in accordance with the goals to be achieved	12	1	Very high
18	The images displayed on the media make it easier for users	12	1	Very high
19	The videos displayed in the application make it easier for users to understand the material	12	1	Very high
20	The application can be used practically	11	0.916667	Very high
Average		**11**	**0.9375**	**Very high**

The Aiken V value is obtained from the sum of the scores from each validator for each item and then calculated using the Aiken V formula. Of the 20 validated items, the category range is in the high to very high category. If conclusions are drawn by averaging the 20 items assessed, the Aiken V value reaches 0.9375, which is included in the very high category. This can be interpreted as meaning that the media instrument is considered valid to be used.

Table 2. Results of Aiken V Material Expert Analysis

No	Statement	∑S	V	Category
Suitability of Content/Material				
1	Suitability of material to research objectives	12	1	Very high
2	The material used is integrated with the Independent Middle School Curriculum	11	0.916667	Very high
3	The material covers important aspects of basic rhythmic gymnastics movements	12	1	Very high

4	The material covers the basic concepts of rhythmic arm swing exercises	12	1	Very high
5	The material covers the basic concepts of rhythmic footstep gymnastics	12	1	Very high
6	The basic movement material for arm swing rhythmic gymnastics is presented in a variety of ways	10	0.833333	Very high
7	Basic movement material for rhythmic gymnastics. The footsteps presented are varied	11	0.916667	Very high
8	The material presented is characteristic of middle school children	10	0.833333	Very high
9	The material is presented from easy to difficult	9	0.75	Tall
Construction				
10	The material discussed is deep enough so that users can understand the material presented	9	0.75	Tall
11	The material presented encourages curiosity	10	0.833333	Very high
12	The characteristics of the material are in accordance with the form of application media being developed	12	1	Very high
13	The material prepared includes a variety of topics and sub-topics in the basic movements of rhythmic gymnastics	11	0.916667	Very high
14	The material presented is in accordance with learning needs	11	0.916667	Very high
Language in Teaching Materials				
15	The systematic presentation of material on application media is effective and comprehensive	12	1	Very high
16	The material presented does not contain the use of words or phrases that could give rise to multiple interpretations	10	0.833333	Very high
17	The use of words is appropriate to the level of understanding of junior high school students	9	0.75	Tall
18	Ease of understanding the words in the material	9	0.75	Tall
19	The language used describes a situation or context that is known to students	10	0.833333	Very high
20	Language used in accordance with PUEBI (General Guide to Indonesian Spelling)	10	0.833333	Very high
Average		**10**	**0.833333**	**Very high**

Based on the table of Aiken V analysis results for material instruments, the Aiken V value is obtained for each item. Of the 20 validated items, the category range is in the high to very high category. If conclusions are drawn by averaging the 20 items assessed, the Aiken V value is 0.83333, which is included in the very high category. This can be interpreted as meaning that the material instrument is considered valid to be used.

Table 3 . Reliability of *RhytmicGym* Application Media Instruments

Cronbach's Alpha	N of Items
,652	20

Table 4. Reliability of Material Instruments

Cronbach's Alpha	N of Items
,761	20

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

Based on the results of the reliability test, it was found that the Cronbach's Aplha values for media instruments and material instruments were respectively 0.652, 0.761. According to Ghozali (2018), Cronbach's Alpha value is acceptable if the value is greater than 0.6. Because the Cronbach's Alpha value in this study for both instruments is more than 0.6, it can be concluded that the material instruments and media instruments are reliable to be used.

Development Trials Application Android Based *RhytmicGym*

No	Statement	Percentage	Category
1	The appearance design (attractiveness, format, color combination, menu appearance) is appropriate	74%	Worthy
2	The type and size of the letters are appropriate and attractive to users	77%	Worthy
3	The combination of colors and button sizes in the application is appropriate and harmonious	76%	Worthy
4	The layout composition (title, text, images, navigation) is appropriate	76%	Worthy
5	Illustrations, drawings and photos with the concept of the application are appropriate	83%	Very Worth It
6	The audio used in the application varies	77%	Very Worth It
7	The audio in the video sounds clear	84%	Very Worth It
8	Backsound or supporting music in accordance with gymnastics rhythm participant junior high school student	81%	Very Worth It
9	The delivery style in the application is easy to understand	79%	Very Worth It
10	The language used is appropriate to the context known to students	83%	Very Worth It
11	The language used does not contain the use of words or phrases that could give rise to multiple interpretations	81%	Very Worth It
12	Correct use of punctuation	80%	Very Worth It
13	The language used is in accordance with PUEBI (General Guide to Indonesian Spelling)	83%	Very Worth It
14	Installing the application to the smartphone is easy	59%	Decent Enough
15	The application size is not too heavy	70%	Worthy
16	The application does not take a long time to load	68%	Worthy
17	Applications on media are in accordance with the goals to be achieved	79%	Very Worth It
18	The images displayed on the media make it easier for users	81%	Very Worth It
19	The videos displayed in the application make it easier for users to understand the material	82%	Very Worth It
20	The application can be used easily	76%	Worthy
Average		78%	Worthy

The results of the assessments by 36 students and 1 Physical Education teacher on the items assessed were added up, the percentage of achievement calculated, and converted to determine the category. Based on the table of small-scale trial results for the development of the *RhytmicGym application* above, the 20 items assessed for their feasibility were in the feasible to very feasible category. If you look for the average for the 20 items assessed, the product is considered suitable for use with a percentage of 78%.

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

Table 6. Results of Large-Scale Trials for Android-Based *RhytmicGym Application Development*

No	Statement	Percentage	Category
1	The appearance design (attractiveness, format, color combination, menu appearance) is appropriate	81%	Very Worth It
2	The type and size of the letters are appropriate and attractive to users	81%	Very Worth It
3	The combination of colors and button sizes in the application is appropriate and harmonious	82%	Very Worth It
4	The layout composition (title, text, images, navigation) is appropriate	81%	Very Worth It
5	Illustrations, drawings and photos with the concept of the application are appropriate	83%	Very Worth It
6	The audio used in the application varies	83%	Very Worth It
7	The audio in the video sounds clear	86%	Very Worth It
8	Backsound or supporting music in accordance with gymnastics rhythm participant junior high school student	84%	Very Worth It
9	The delivery style in the application is easy to understand	84%	Very Worth It
10	The language used is appropriate to the context known to students	83%	Very Worth It
11	The language used does not contain the use of words or phrases that could give rise to multiple interpretations	82%	Very Worth It
12	Correct use of punctuation	82%	Very Worth It
13	The language used is in accordance with PUEBI (General Guide to Indonesian Spelling)	83%	Very Worth It
14	Installing the application to the smartphone is easy	69%	Worthy
15	The application size is not too heavy	76%	Worthy
16	The application does not take a long time to load	74%	Worthy
17	Applications on media are in accordance with the goals to be achieved	84%	Very Worth It
18	The images displayed on the media make it easier for users	84%	Very Worth It
19	The videos displayed in the application make it easier for users to understand the material	84%	Very Worth It
20	The application can be used easily	82%	Very Worth It
	Average	81%	Very Worth It

Based on test results scale The magnitude presented in the table above is known as the average for the 20 items assessed eligibility by 72 participants students and 1 PJOK teacher included in very worthy category with percentage 81%. These results have increased from the results of previous trials on a smaller scale, where there was an increase of 4%. This increase shows a good thing that there are improvements that support product quality so that it can be used on a wider scale.

IV. CONCLUSION

This research produces a product in the form of an Android application called *RhtymicGym* which aims to improve the rhythmic gymnastics skills of foot steps and arm swings of junior high school students, especially class VIII. This application was developed by taking into account several developments in terms of objectives, samples, methods, procedures and types of activities. This application can be installed and operated on an Android smartphone, equipped with history features, rhythmic gymnastics material, videos of basic foot steps and basic arm swing movements, as well as a competency test in the form of a game making variations of rhythmic gymnastics movements. Thus, the *RhytmicGym application* was developed into a feasible, practical and effective tool in improving rhythmic gymnastics skills for junior high school students in Yogyakarta City.

Based on material and media instrument validation tests, the average Aiken V scores were respectively 0.883 and 0.937 with very high validity categories. Meanwhile, the instrument reliability values for material and media instruments were respectively

Development of an Android-Based Rhythmicgym Application to Improve Rhythmic Gymnastics Skills of Junior High School Students in Yogyakarta

with Cronbach's Alpha values of 0.761 and 0.652. It can be concluded that the instrument prepared is valid and reliable enough to be used. The results of small-scale trials on 36 students and 1 Physical Education Teacher show that the development carried out is suitable for use with a percentage achievement of 78% in the feasible category. Meanwhile, in a large-scale trial which was tested on 72 students and 1 Physical Education Teacher, the percentage was 81% in the very feasible category. The percentage increase of 4% from the previous test shows an improvement in the quality of the media being developed so that the Android-based *RhytmicGym application* is considered very suitable for use in improving the rhythmic gymnastics skills of Yogyakarta City Middle School students.

REFERENCES
1) Abdullah, K., & Lubis, J. 2020. Learning Media-Based Rhythmic Gymnastics Learning Model for Middle School Students. 61–68. https://doi.org/10.21009/jpja.v3i02.16271
2) Amri-Dardari, A., Mkaouer, B., Amara, S., Hammoudi-Nassib, S., Habacha, H., & Ben Salah, FZ 2022. Immediate effect of self-modeling with internal versus external focus of attention on teaching /learning gymnastics motor skills. Journal of Human Kinetics, 84(1), 224-232.
3) Anggraeni , DR, Hendrakreatif , N., Setiawan, S., & Taufik, M. 2023. Implementation of the Problem Based Learning Model in Achievement 4c Skills Through the Learning Process in Class V. Pendas: Journal Science of Elementary Education, 8(3), 818-825.
4) Artanty, A., Setyawan, T., Pawitra, PRA, Windriyani, SM, Junaidi, A., Irawan, D., & Mushofi, Y. 2023. Analysis of the Need for Development of Android-Based Teaching Media for Learning Gymnastics for PJKR IKIP Budi Utomo Students . Journal of Sport Coaching and Physical Education, 8(1), 40-48
5) Asprizal, M., Resita, C., & Aminudin, R. 2022. The Influence of Remix Music Media on Student Interest in Rhythmic Gymnastics Material in Physical Education Learning at SMAN 13 Depok. Journal of Speed (Sport, Physical Education, Empowerment), 5(01), 63–78. https://doi.org/10.35706/jurnalspeed.v5i01.6685
6) Basri, H. 2018. Efforts to improve results rhythmic gymnastics learning through fitness exercises Physical 2012 with audio visual media. Motion: Physical Education Research Journal , 9(1), 43-52.
7) Daulay, DE, & Priono, J. 2020. Benefits of Using Visual Media in Supporting Physical Education Learning in Long Jump Material. Journal of Achievement, 4(1), 29. https://doi.org/10.24114/jp.v4i1.18621
8) Fardhany , PH (2016, December). Utilization of Blended Learning - Based Teaching Materials in Physical Education Sports and Health. In Proceedings of the National Seminar on Physical Education Postgraduate Um (pp. 456-471).
9) Ghozali , Imam. 2018. Application Multivariate analysis with the IBM SPSS 25 Edition 9 program. Semarang: Diponegor University Publishing Agency
10) Physical, P., & Health, AND (nd). Flow of Learning Objectives for Physical Education, Sports and Health Name of Institution.
11) KARTININGTYAS, B. 2018. Perceptions of Physical Education Teachers on Rhythmic Gymnastics Material for Middle School Level, Sub Rayon 7 Banyumas (Doctoral dissertation, Jenderal University Sudirman).
12) Ministry of Education and Culture. 2022. Copy of Regulation of the Minister of Education, Culture, Research and Technology of the Republic of Indonesia Number 7 of 2022 concerning Content Standards for Early Childhood Education, Basic Education Levels and Secondary Education Levels. Ministry of Education, Culture, Research and Technology, 1–72.
13) Muhammad Rusli, Dadang Hermawan, NNS 2017. Innovative Multi Media Learning. Basic Principles and Development Models (Ed 1).
14) Setyawan , H., & Dimyati , D. 2015. Game model activity outside class For develop realm cognitive , affective , and psychomotor high school student . Journal Sport , 3(2), 164-177.
15) Sriwahyuniati , CF, Nuritasari , NN, Budiarti, R., & Sukamti , ER 2022. Android Application-Based Basic Elements Model of Rhythmic Gymnastics.
16) Suryadi , A. 2020. Technology and learning media volume i . CV Trace (Publisher Trace).
17) Tafonao , T. 2018. The role of learning media in increase interest Study student . Journal communication education , 2(2), 103-114.

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

Thu Nhung Nguyen

Institute of Geography, Vietnam Academy of Science and Technology

ABSTRACT: Landscape has long been recognized as an invaluable resource for tourism development and the foundation for the sustainable development of an entire territory. However, in-depth research on landscape diversity for tourism development from the perspective of landscape science has not received much attention. Applying landscape analysis, field survey, and remote sensing methods, the study has shown diversity in the landscape formation components that determine the diversity of tourism types and products in the Central Highlands. Each landscape unit contains tourism resources, the vertical structure of the landscape unit represents the specificity and tourism potential, and the horizontal structure of the landscape represents the connection of tourism resources along the route. , landscape changes over time demonstrate seasonality in tourism. The landscape structure component is both an object resource for enjoyment and at the same time a place where the tourism process takes place. This is a solid basis for developing many types of tourism such as eco-tourism, cultural tourism, resort tourism, and adventure tourism... and creates the foundation for organizing tourist territories. sustainable history, exploiting and honoring indigenous cultural and historical values, protecting the environment, and ensuring the region's long-term development.

1. INTRODUCTION

The term landscape is a fairly ancient name for a complete geographical science, used to express a general idea about a set of interrelationships of different phenomena on Earth [12]. Along with that development, there have appeared many terms related to the landscape such as landscape structure, landscape rules, and landscape rhythm, but the terms contain many connotations, opening up many directions. That research is the term "landscape diversity".

The term landscape diversity today is understood in two main directions. First, in the study of ecosystems, landscape diversity implies diverse habitats of biological species, this concept is popular in Europe, Australia, and China [6, 7, 15, 20]. In recent years, the concept of landscape diversity in the ecological sense has received special attention due to the increasing process of landscape simplification, and the gradual loss of natural ecosystems and habitats for many species in the face of environmental degradation. human intervention. This concept appears in association with studies on biodiversity and species habitat conservation [4, 17]. Landscape diversity is the basis for biodiversity conservation and a condition for sustainable development of the territory. The International Convention on Biological Diversity, adopted in 1992 in Rio de Janeiro, recognized this [16]. Second, in the system of Earth sciences - landscape science, landscape diversity is understood as the diversity of territorial complexes, referring to studies of natural - territorial - landscape complexes, their morphological units, as well as complexes of a higher taxonomic level. Research in this aspect is of interest to Russian and Eastern European scientists and there are many profound studies [2, 21, 24]

Although landscape diversity is recognized as the most important feature of a territory, an indispensable component in the diversity of the natural environment, the concept of landscape diversity in landscape science is still limited. mentioned less than ecological science. The landscape diversity mentioned in landscape science has a broader meaning. Specifically, the concept of landscape diversity has been put forward by many Russian geographers in many different directions, considered a diverse combination of nature, history and culture, traditional environmental management, and organizations. Other combinations form structures that describe the landscape and determine the uniqueness of the territory [5]. According to A.I.Bacca and V.O.Mokiev (1997): landscape diversity is the expression of countless information of an individual or group on terrain areas, which the external expression of it is the interaction between nature and humans and the impact of those natural components. The development of

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

landscape diversity has become one of the areas of modern landscape research today, allowing us to obtain new scientific and practical results in the management and protection environment [4].

Currently, in landscape studies, there exist two approaches to studying landscape diversity. Firstly, the direction of qualitative and quantitative analysis of the landscape structure of the area is based on the landscape map and statistics to determine the coefficients. This direction determines the frequency of the appearance of landscapes in a certain space in complex natural complexes with heterogeneous geological structures. Second, diversity landscape research is based on remote sensing data, whereby landscape diversity is understood as the combination of the shape and size of different ecosystems over a large area [13].

Although research purposes are different, assessing landscape diversity will use different research methods. For tourism, landscape plays an important role, influencing tourists' decision-making because they have a close relationship with each other, specifically:

The first, the physical components that make up the vertical structure of the landscape that are attractive to tourists are considered tourism resources. Specifically: the location of the territory, terrain, hydro-climate, creatures, and products with material and spiritual value created by humans that have tourism value constitute tourism resources. Natural tourism and cultural tourism resources. Meanwhile, natural landscapes (including natural components) and cultural landscapes (created by humans) are both considered resources and regulate different types of tourism [14]. Affirming the important role of landscape in tourism Terkenli and colleagues (2021) affirmed "there is no tourism without landscape" [22].

Second, the level of landscape diversity per unit of territorial area determines the diversity of tourism types. The more diverse the landscape, the more types of tourism can be developed. When studying mountainous landscapes for tourism development, AN Dunet (2009) affirmed that "mountainous landscapes have great differentiation at different scales. The reason is due to differences in natural conditions and socio-cultural groups, so mountain areas are very favorable for tourism development" [10]. In another study AS Sokolov (2014) Usually, a territory with a high landscape diversity index will bring more forms of exploitation and use of the territory. In particular, many studies have confirmed that "a territory with a high landscape diversity index will be more suitable for tourism and entertainment development than a territory with a low diversity index" [3].

Third, the diversity of landscape functions determines the quality of tourism products. The term "function" stands for the material and energy flows of natural processes that provide goods and services to meet human needs [11]. For tourism, the information and entertainment function group, production, and supply functions play the most important role. Cultural and ethnic objects associated with humanistic elements of the landscape create intangible resources for the tourism industry [18]. Landscapes containing heritage and cultural heritage are considered "a gift from the past to the future". This is considered a special tourism resource, containing irreplaceable historical and cultural values. Heritage is the basis for developing cultural tourism, eco-tourism, sightseeing, discovery, and tourism associated with education and history. Tourism associated with heritage creates conditions to enhance knowledge, inspiration, and destination culture for tourists. Besides, Tourism is considered a "smokeless industry", but the level of natural resource consumption of tourism is not inferior to other industries. Tourism needs food, water, energy, space, and many other products provided to visitors. This functional group has provided the substrate for the tourism industry to develop. Without these goods and services of the landscape, the tourism industry cannot develop. Third, habitat functional group Natural and semi-natural landscapes provide living and breeding places for organisms, thereby maintaining biodiversity. This functional group has indirectly provided consumers for the tourism industry, especially by creating a premise for eco-tourism and nature-based tourism. In addition, the recreational and tourism functions of landscapes confirm the direct value of landscapes and ecosystems to the tourism industry. The landscape is a place of rest, relaxation, and inspiration, improving the mental and physical health of visitors.

Fourth, landscape diversity contributes to the conservation and development of tourist destinations. Preserving landscape diversity can create diverse and enriching experiences for visitors. For example, a land with a combination of mountains, forests, seas, and cultural landmarks will bring visitors different experiences during a trip. This can make visitors feel interested and want to explore more about that land. From that perspective, landscape diversity can be considered the basis for tourism development in the territory [25]

In addition, preserving landscape diversity can also create experiences close to nature for visitors. Well-conserved areas will have a rich variety of animals, plants, and ecological activities. This can attract tourists who love to explore and explore nature and also help increase their awareness of environmental protection. This point of view has been pointed out by Nguyen Thu Nhung and colleagues (2024) for the Cat Ba National Park area of Vietnam [19] or Dunet et al (2022) affirmed that "Landscape diversity is a factor that promotes the development of the tourism industry and is the basis for sustainable development" [9]

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

However, if the landscape is degraded or loses diversity, the visitor experience will also be affected. Not only does it cause mental damage and create a feeling of unprofessionalism for the tourist destination, but the loss of landscape diversity can also make visitors feel bored and not want to return.

2. DATA AND RESEARCH METHODS

2.1 Research area

Tay Nguyen is the highland region of Vietnam, located in the center of Southern Indochina, including 05 provinces of Kon Tum, Gia Lai, Dak Lak, Dak Nong, and Lam Dong (arranged in order from North to South). The Tay Nguyen region has great potential for tourism because of its attractive natural landscape and long-standing ethnic and cultural traditions, creating a unique nuance.

Firstly, the Tay Nguyen has quite diverse terrain, from high mountains to large plateaus and valleys with rich fields..., which has created the Tay Nguyen with a fresh, cool climate. fresh all year round, especially Da Lat and Kon Plong (temperate climate in the tropics) are very favorable for the development of tourism in general and resort tourism in particular. At the same time, this place also discovered many mineral water sources that are very good for health such as Kon Du, Ngok Tu, Dac Mol,... - places where it is possible to build resorts and medical treatment areas.

Second, Tay Nguyen is home to attractive natural landscapes such as Pa Sy, Dak Ke, Dak Pne (Kon Tum), Phu Cuong, Pulse Khoeng (Gia Lai), Dray Nur, Gia Long, Trinh waterfalls. Nu (Dak Lak), Dray Sap, Lieng Nung (Dak Nong), Prenn, Pongour, Voi, Dantala (Lam Dong); Natural and artificial lakes such as Toong Dam lake, Toong Zo Ri (Kon Tum), T'Nung lake (Gia Lai), Lak lake (Dak Lak), Than Than lake, Xuan Huong lake (Lam Dong). Objects for tourists to visit and enjoy.

Third, Tay Nguyen has nature reserves - places that preserve the unique features of primary tropical vegetation, including many rare and valuable species of flora and fauna such as Po mu, Five-needle pine, Yew, Wild buffalo, Gray cow, Benteng cow, Gaur, Elephant, Carrot deer,... These are objects that can be exploited for sightseeing and research tourism.

Fourth, Tay Nguyen is a multi-ethnic and multicultural land. The attraction that stimulates the curiosity and discovery of tourists is the culture of the Montagnard ethnic groups in the Tay Nguyen. The lives of the Montagnard ethnic groups here were formed, existed, and developed throughout a long history, closely associated with forest culture, villages, customary laws, and traditional rituals; That has created a unique and unique cultural identity of Tay Nguyen with Rong houses, Longhouses, Elephant racing festivals, Po Thi festivals, water wharf worship ceremonies, Epics, Stone Instruments,...; In particular, Central Highlands Gongs are valuable as unique evidence of traditional cultural characteristics.

Reality shows that in Tay Nguyen, tourism development still has many difficulties and challenges. Therefore, landscape diversity research plays an important role in promoting the sustainable development of tourism in Tay Nguyen, creating reasonable and attractive tourism products and programs, and creating opportunities. for the community to participate in tourism development.

2.2 Research methods

To complete the research, we use 3 main groups of methods

a. Landscape analysis methods

This method is used to study the correlation between landscape components (geology, topography, soil, climate, hydrology, biology) of Tay Nguyen, thereby determining landscape diversity in structure. stratification structure. At the same time, this method aims to analyze the relationship between the landscape diversity of Tay Nguyen and tourism.

b. Field survey methods

Site-based and route-based field surveys between 2012 and 2021 were carried out to determine the reality of landscape diversity and tourism development. Field survey sites were carried out in Kon Tum Province, Gia Lai Province, Dak Lak Province, Dak Nong Province, and Lam Dong Province. Field survey routes were carried out along route 14, road 14C linking 05 provinces in Tay Nguyen and along herringbone routes connecting the Tay Nguyen provinces with the South Central and Southeast regions.

b. Remote sensing method

The Tay Nguyen is a vast territory with diverse terrain such as mountain, plateau, and mountain plain terrain. Although field survey methods were used, some points need to be surveyed located on rugged, difficult-to-reach terrain. So, remote sensing methods (Sentinel photo) are used to determine landscape characteristics. observe and evaluate the diversity and possibilities for tourism development at that point.

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

3. RESULTS AND DISCUSSION

3.1 Diversity of Tay Nguyen's Landscape

The landscape of Tay Nguyen is diverse not only in structure (including vertical and horizontal structures) but also in landscape function. The differentiation of natural formations, combined with the impact of human natural improvement activities, has created diversity in the stratification structure of Tay Nguyen's landscape. The geographical position of Tay Nguyen region compared to the sun's position and Earth's rotation, combined with topographic conditions play an important role in interacting with radiation and atmospheric circulation that has formed in the area01 tropical monsoon landscape system of continental Southeast Asia, 01 tropical monsoon - highland landscape subsystem. The differences in terrain types and changes in climate according to the law of high altitudes have determined the diversity in structure and differentiated the landscape of the region into 04 landscape classes, 08 landscape sub-classes; 17 landscape types, and 84 genera (Fig 1).

The diversity in landscape formation components determines landscape diversity. They have a close relationship with each other and with tourism resources. Each landscape unit contains tourism resources, the vertical structure of the landscape unit represents its specificity and tourism potential; The horizontal structure of the landscape represents the connection of tourism resources along routes, and the change in landscape over time represents seasonality in tourism. The landscape structure component is both an object resource for enjoyment and at the same time a place where the tourism process takes place. The diversity in the landscape structure of the Central Highlands has great potential for tourism development here.
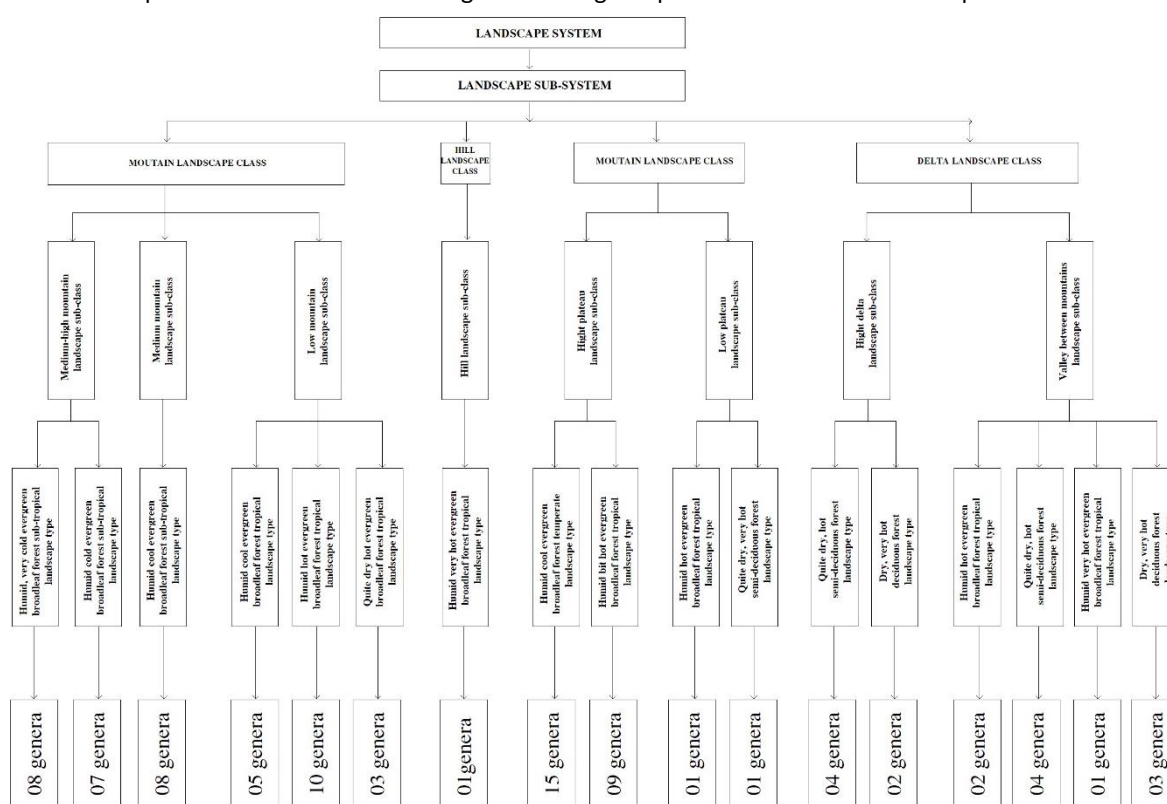

Fig 1: Diversity of Tay Nguyen's landscape structure

3.2 Diversity of Tay Nguyen's landscape structure - potential for tourism development

The mountain landscape classes occupy large in the total area of the entire region (53%) with mountain blocks and ranges with peak surfaces of over 2000 m such as the Ngoc Linh mountain range (Ngoc Linh peak 2598m), Chu Yang Sin mountain massif (Chu Yang Sin peak 2,442m), Dan So Na - Ta Dung range (Klang peak 2004m). The mountain landscape class is divided into 3 landscape sub-classes: low mountain landscape sub-class, medium mountain landscape sub-class, and medium-high mountain landscape sub-class. The landscape sub-classes are characterized by clear stratification according to high belts and great depth of separation.

*- Low mountain landscape subclass (<800m)*includes 3 landscape types and 18 genera distributed in Sa Thay (Kon Tum), Mang Yang, Krong Pa (Gia Lai), eastern Krong Pach, Lak (Dak Lak) districts, with a dense tropical climate. Characterized by an average annual temperature of 21-24°C, average rainfall >1600mm/year. The process of erosion - erosion and landslides take place mainly in this area, the level of deep separation and horizontal separation are both strong (average depth of separation is 180-250m; the level of horizontal separation is strong). >0.45km/km², high slope (average 20-30°), in some places the slope

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

reaches >35°. The dominant vegetation is tropical evergreen broad-leaved closed forest. However, very few of this type of carpet exist in its original form, concentrated mainly in national parks and conservation areas with a diversity of species composition such as Kien Kien (Hopea siamensis); Nausea (Vatica odorata); Honey mahogany (Sindora siamensis); Machilus sp.; Castor oil (Euphorbiaceae) and species of the Orchid family (Orchidaceae) are distributed at altitudes > 600m, concentrated in Sa Thay district. In addition, in this sub-class, there also exists a type of semi-deciduous closed broad-leaved forest, characterized by dioecious trees such as tea tree ben, and cymbidium, distributed at altitudes < 600m on low slopes. However, there is not much of this type of forest left, most of the area has been cleared by humans and converted to agricultural development purposes. Indigenous ethnic groups living mainly in this area include Ja Rai, Xo Dang, Ro Mam, Ba Na, and E De. These are ethnic groups with extremely unique and rich cultural features, including a system of festivals based on the life cycle, seasons, Gongs, sinus dances, and folk songs; writing; customs and practices; architecture of Rong house, Longhouse, statue of Mo house; costumes, cuisine…

Through analysis of natural conditions, it is shown that the landscape unit in Sa Thay district possesses great potential to develop a type of tourism to explore the forest ecosystem and culture of ethnic minorities. The large forest area and diverse flora and fauna create an attraction for tourists who love wild nature. Besides, the presence of traditional craft villages, unique festivals, and unique cultural identities of ethnic minorities also contribute to attracting tourists to visit and experience. On the contrary, landscape units distributed in some other districts such as Mang Yang, Krong Pa (Gia Lai province), Krong Pak, and Lak (Dak Lak province) face certain limitations in tourism development. Due to the characteristics of highly fragmented terrain, steep slopes, sparse vegetation cover, and great influence from human production activities, these districts do not possess favorable natural conditions to attract travelers. Rugged terrain, barren land, and limited transportation infrastructure are also factors that hinder the ability to develop tourism in these areas.

- *Medium mountain scene subclass (1000-1300m)*, including 2 landscape types and 13 genera, distributed in the districts of Dak Glei, Tu Mo Rong, Dak Ha, Kon Ray (Kon Tum), Mang Yang, Dak Doa, KBang (Gia Lai), Krong Bong, Lak (Dak Lak), Krong No, Dak Glong, Dak Song (Dak Nong). The terrain is a blocky low mountain type, with a large depth of division (250-300m), strong horizontal division (0.35km/km²), slopes of 25-30°, and the process of erosion and erosion is strong. Such terrain characteristics make it difficult for sightseeing tourism activities but are quite suitable for the development of adventure sports tourism. In addition, due to the dominant terrain altitude (1000-1300m), the medium mountain landscape sub-class is characterized by a humid subtropical climate in the mountains with a temperature that decreases with altitude, the average temperature from 18-22°C, average rainfall >2000 mm/year, average number of cold months 2-3 months, average number of rainy days 141-180 days. Such climatic conditions not only create conditions for the development of humid subtropical evergreen broad-leaved forests but are also very favorable for resort tourism. Currently, this type of forest still retains its basic primitive nature, distributed in the buffer zone of Ngoc Linh, Kon Cha Rang, Nam Nung, Ta Dung nature reserves, and Kon Ka King and Chu Chu national parks. Yang Sin. The dominant plants are broad-leaved tree species belonging to the families Fagaceae, Lauraceae, Hamamelidaceae, Theaceae, Myrtaceae,... Species The trees of this forest type have a relatively large diameter, an average of 25-30 cm, an average height of 16-20m, and an average reserve of 200-300 m³/ha. Because the plant cover here is still quite rich, there are also many animals with many valuable species such as Red-faced Monkeys, Golden Deer, etc. The diversity of flora and fauna in the medium mountain landscape sub-class creates favorable conditions. Convenient for sightseeing, research, and development tourism.

Through analysis of landscape characteristics, the potential for tourism development is quite large. However, the landscape classes in this landscape sub-class develop on rather steep land (25-30°), with large depth separation (250-300m), exogenous geodynamic processes, and conflicts. weakest, most unstable with frequent landslides, erosion - erosion and mud and rock floods. This is one of the challenges and obstacles to developing tourism activities.

- *Medium-high mountain landscape subclass (>1600m)* includes 02 landscape types, and 10 genera, distributed in Dak Glei, Tu Mo Rong (Kon Tum), Krong Bong, Lak (Dak Lak), Lac Duong, Dam Rong (Lam Dong). The terrain of the region is a blocky mountain terrain with sharp peaks, steep slopes (>35°), large deep divisions (250-400m), and strong horizontal divisions (>0.45 km/km²). Due to the high terrain, the temperature drops further (average annual temperature ranges from 17-18°C), the coldest month (January) is no more than 14°C, and the hottest month (June) is no more than high. 20°C; The number of cold months is 2-3 months, except for some high peaks in the Ngoc Linh and Chu Yang Sin areas, the number of cold months is ≥4 months; Rainfall >2000 mm/year, number of rainy days 141-180 days. Thus, the climatic conditions in the medium-high mountain landscape sub-class are favorable for the development of resort tourism.

In this area, the natural vegetation type almost retains its integrity (concentrated in Ngoc Linh, Chu Yang Sin nature reserves, and Bidoup-Nui Ba National Park), and production activities in Agriculture and forestry rarely take place. Species belonging to subtropical evergreen broad-leaved closed forests mixed with temperate conifers appear in this sub-class with a preponderance of the Lauraceae, Fagaceae, Magnoliaceae, and Po families. mu (Forkenia hodginsii) and gymnosperm trees such as Pinus dalatensis are quite abundant. In addition, this place has many rare medicinal plants such as Panax sp., Polygonum

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

multiflora, etc. The mountains are high and the forests are good, so animals are quite rich with many animals. Wild animals such as leopards, tigers, short-tailed porcupines, gaurs, fire leopards, black-shanked doucs, yellow-cheeked gibbons, tawny-cheeked gibbons, mountain-eared gibbons, gray-cheeked black-headed babblers, tree frogs...

Along with majestic natural landscapes and diverse flora and fauna ecosystems, this place also contains the unique cultural identities of indigenous ethnic groups such as Ba Na, Xo Dang, Gie Trieng, Ede, and M. 'Nong with traditional festivals and unique dishes such as green vegetables, grilled meat, sour fish, bitter eggplant,...

Analysis of landscape characteristics shows that the rich natural and cultural potential in the medium-high mountain landscape sub-class will attract quite a large number of tourists, scientists, and researchers to explore the landscape. as well as research on ecology and botany.

The hill landscape class accounts for a small proportion of Tay Nguyen, including 01 landscape sub-class, 01 landscape type, and 01 genera distributed in the Cat Tien region. The terrain is high, eroded and eroded hills, with an average slope of 15-20° and a depth of separation of less than 100m; Developed on mixed rocks including Sandstone, conglomerate, and siltstone of early-middle Jurassic age. This landscape unit is located at an average altitude of 300-400m located entirely in Cat Tien district (Lam Dong). Due to the high altitude of the terrain located in a transitional position, the climate here is hot and humid, the average annual temperature reaches 24°C, and there is no winter; The average annual rainfall ranges from 1300-1900mm, the number of rainy days is > 181 days, however, there are up to 3 dry months (January, February, March), humidity ranges from 66-71%. The above thermal and humid foundation creates conditions for the formation of tropical broad-leaved evergreen closed forests. However, due to strong human impacts causing forest degradation, natural vegetation has been replaced by planted forests and agricultural ecosystems. This is the residence of two indigenous ethnic groups, the Ma and the K'Ho, with traditional crafts such as brocade weaving, bamboo, and rattan weaving,... and also preserves a treasure of literature and art. There is a very rich folk culture such as the system of Gongs, Stone Instruments, legends, folk songs, etc. In particular, this place has discovered an animistic temple belonging to the Funan culture on the top of hill A1 (Quang commune). Ngai, Cat Tien district, Lam Dong) in the Dong Nai river watershed area - evidence of a unique culture dating back more than 1,000 years of history. Analyzing the characteristics of this landscape unit shows the potential for developing cultural and spiritual tourism.

Plateau landscape class rarely 36.5% of the total natural area of the entire region, most of the area is distributed in the provinces of Gia Lai, Dak Lak, Dak Nong, and Lam Dong. This landscape class has differentiation according to altitude:

The high plateau landscape subclass includes 3 landscape types, and 24 genera, in the districts of Kon Plong (Kon Tum), Dak Song, Tuy Duc, Dak R'Lap, Gia Nghia City, Dak Mil, Cu Jut (Dak Nong), Da City Lat, Bao Loc City, Di Linh, Bao Lam (Lam Dong) at an average altitude of 900-1900 m above sea level. The terrain is a basalt plateau with erosion, erosion, strong horizontal division (horizontal division ≥ 0.45 km/km²), and medium deep division (25-30m); However, the surface is quite flat (average slope 12-18°). In general, the climate in this landscape sub-class is quite pleasant with an average annual temperature of 18-23°C, average rainfall >2000 mm, a short number of dry months (1-2 months), and an average number of rainy days. from 141-180 days/year. With a cool and pleasant climate, it is a favorable condition for the development of resort tourism. At the same time, it is a favorable condition for the development of closed evergreen broadleaf forests and open coniferous forests. Currently, closed evergreen broad-leaved forests have largely been exploited and land areas have been converted to agricultural and forestry production activities. The remaining natural forests are distributed in the Kon Plong district. However, due to nature's favorable climatic conditions, Kon Plong district, Da Lat City, and Bao Loc City have developed service-oriented agriculture with flower gardens, tea gardens, and branded specialty fruits. , is attractive to domestic and international tourists. The sparse coniferous forest type still exists mainly in the Kon Plong district and Da Lat city. This type of forest combined with a cool, fresh climate creates a beautiful, poetic natural landscape - an object exploited for tourist tourism development. This place is the residence of the ethnic groups: Xo Dang, M'Nam, K'Dong, H's, M'Nong, Ma, Ede, Khmer, and Lach with unique cultural features through their products. of craft villages, cuisine, and traditional culture. The existence of indigenous ethnic villages has great appeal to tourists who love to explore, explore, and research their origins.

The low plateau landscape sub-class (<800m) includes 2 landscape types, 2 genera distributed in the highlands of Pleiku (Gia Lai), Buon Ma Thuot, and M'drak (Dak Lak). The terrain is eroded, moderately to slightly weakly divided (20-30m deep division in Pleiku, Buon Ma Thuot; 50-70m in M'drak; horizontal division 0.35 km/km²), the surface is relatively gentle, average slope of 3-12°, especially the M'drak area is steeper (15-20°). With an average annual temperature fluctuating between 22-24°C, rainfall of 1300-1900 mm/year, and no cold months, this sub-layer of landscape develops closed evergreen tropical broadleaf forests and forests. closed tropical semi-deciduous broadleaf tree. However, due to the strong human impact on agricultural and forestry production activities, these forest types have been replaced by planted forests and long-term industrial crops. The conditions analyzed above show that the potential for tourism development in the lowland landscape sub-class is not high, however, if there is the right investment, it will create opportunities for agricultural tourism development (coffee) in this landscape unit.

Studying Landscape Diverse for Tourism Development in the Tay Nguyen Region, Vietnam

The mountain plain landscape class accounts for 10%, with gradation according to terrain altitude, including 02 landscape sub-classes:

- High plain landscape sub-layer (350-700m) includes 2 landscape types and 6 genera, distributed in Chu Prong (Gia Lai), Ea Sup, Buon Don (Dak Lak), and Dak Mil (Dak Nong) districts. The terrain is a denuded plain with wavy hills and mountains, a slope of 3-8°, divided into 2 relatively distinct areas: from Ban Don towards Ea Sup, the terrain is flat and wide; From Ban Don towards Dak Mil, the hilly terrain is more undulating and deeply divided. This landscape sub-class is directly influenced by the tropical plateau continental climate, with uniformly high temperatures and hot sunshine, average annual temperature of 25-26°C, no cold months, and average annual rainfall of 1400 -1500 mm. The typical vegetation type is a deciduous broad-leaved forest with a predominance of plants from the Dipterocarpaceae family, in addition to the presence of the Anacardiaceae and Loganiaceae families. In particular, along the rivers and streams (Yok Don National Park), there exists a type of closed semi-deciduous broad-leaved forest with the upper layer dominated by Lagerstroemia calyculata, Oxytenanthera nigrociliata, and the dominant upper layer. The lower layer of the canopy is Grewia tomentosa, Pterospermum sp., and Madhuca pierrei. Currently, these forest types exist mainly in Cu M'Lan, Ea Bung, Ea H'Mo, and Ya Lop communes (south of the Buon Don district). This is the residence of the Ede people, the M'nong people are famous for taming elephants and preserving many unique cultural features expressed through traditional festivals such as grave leaving ceremonies, water wharf worshiping ceremonies, and festivals. Gongs and handicrafts such as statues, tomb houses, etc. Although climatic conditions are not favorable for the development of activities related to resort tourism, this landscape has great tourism potential. Developing tourism activities to visit and experience special areas of Ban Don and Yok Don National Park.

- Subclass of lowland landscape between mountains (350-550m) includes 4 landscape types and 10 genera, distributed in the districts of Dak Ha, Dak To, Kon Tum City (Kon Tum), An Khe, Dak Po, Kong Chro, Mang Yang, Chu Se, Phu Thien, Ayun Pa, Ia Pa, Krong Pa (Gia Lai), Krong Pak, Cu Kuin, Krong Ana, Lak (Dak Lak). The terrain is of the denudation-accumulation type with residual hills, the surface is relatively flat, with little slope (3-8°), at the edge where it meets the mountains, the hilly terrain is relatively strongly dissected. and steeper (8-12°). Located between the mountainous terrain and the plateau, the climate of this landscape sub-class is not only humid tropical but also typical of the valley climate. Average annual temperature 23- 5°C, no cold months; Average annual rainfall is 1200-1700 mm, average number of rainy days is 140-181 days. Currently, due to the impact of human development activities, natural vegetation types are replaced by artificial vegetation cover (planted forests and agricultural ecosystems).

Due to the low-lying terrain, it is The low-lying landscape between mountains becomes a place where water from nearby rivers and streams gathers, forming large, concentrated, and long-lasting floods. In recent years, almost every rainy season has caused widespread flooding. That shows that the potential for tourism development here is not much.

3.3 Specificities in Tay Nguyen's landscape diversity - a lever for the development of diverse types of tourism

First, Tay Nguyen is the only region in Vietnam with a climate similar to the temperate zone, located at the 16th parallel to the south. This climate is clearly shown in the landscapes of Kon Plong, Kon Ray, Tu Mo Rong districts, Kon Tum province, and in Lac Duong, Don Duong districts, Da Lat City, and Lam Dong province. These landscapes are located at an average altitude of 1,200m above sea level, surrounded by pine forests, and the climate has many characteristics of the temperate zone: average temperature from 18-21°C, The highest temperature does not exceed 30°C, the lowest temperature does not exceed 5°C. According to the tourism bioclimatic index, this area is assessed to have good to very good tourism development potential, especially in the form of resort and health recovery tourism.

Second, Tay Nguyen is one of the regions that still exists the typical "dipterocarp forest" vegetation - sparse forests of dry, tropical deciduous broad-leaved trees, distributed in the landscape class of Ea Sup and Buon Don districts. (Dak Lak). Characteristics of this type of vegetation: bare leaves, barren land in the dry season, and trees grow strongly and lushly in the rainy season. Currently, in the Tay Nguyen, this type of vegetation is preserved in Yok Don National Park. This is not only the habitat of rare animals, the dipterocarp forest also has many valuable plant species such as Pterocarpus macrocarpus, Afezelia Xylocarpa, and Sindora siamensis.)… and the typical coniferous forest type distributed in the landscape class of the Da Lat plateau. Thanks to the diversity of vegetation, Tay Nguyen has become an attractive destination for ecotourism, sightseeing, and research activities. Visitors can learn about the forest ecosystem, see typical plant species, and admire the beauty of vast green forests.

Third, this is the only region in Vietnam to date that owns the longest volcanic cave system in Southeast Asia. This cave system is located in the landscape of Krong No district, Dak Nong province, with a length of up to 25 km, and includes many large and small caves of diverse sizes and shapes. These caves are one of the extremely valuable geological heritages, always containing many scientific values of both nature and society, as well as tourism values. Therefore, it is necessary to invest in comprehensive

research to fully establish the geological, cultural, and biological heritage values. This is one of the major tourist attractions in the Central Highlands and also possesses enormous potential for developing adventure tourism.

Fourth, Tay Nguyen is famous for its majestic waterfall system, each waterfall is associated with its legend of indigenous ethnic groups. These waterfalls are widely distributed throughout the Central Highlands, including waterfalls distributed across landscape classes in Kon Tum Province, Gia Lai Province, Dak Lak Province), Dak Nong Province, and Lam Dong Province. The diversity and majesty of the waterfall system have a great potential to develop sightseeing tourism, attracting tourists to explore the natural beauty of the Central Highlands.

Fifth, not only is it a land with majestic mountains and forest scenery, but Tay Nguyen is also known as a place to preserve and promote unique traditional cultural values, including Tay Nguyen gong cultural space. This cultural space was recognized by UNESCO as an Intangible Cultural Heritage of Humanity in November 2005. Gongs are typical musical instruments of the indigenous ethnic group Tay Nguyen, closely associated with life. their culture and spirit. The sound of gongs is not only the voice of the mountains and forests but also the voice of spirituality and the human soul. Through the sound of gongs, people in Tay Nguyen express their joys, sorrows, aspirations, and dreams in life, work, and daily activities. Tay Nguyen gong cultural space spreads throughout the five provinces of Kon Tum, Gia Lai, Dak Lak, Dak Nong, and Lam Dong. This has created favorable conditions for the preservation, development, and spread of these unique cultural values. In that space, rituals and festivals related to gongs are held regularly, attracting a large number of local people and tourists to participate. With unique cultural values, Tay Nguyen Gong's cultural space has become an attractive destination for domestic and foreign tourists. Coming here, visitors can immerse themselves in bustling gong festivals, admire precious ancient gong sets, and learn about interesting cultural stories behind the resounding gong sounds. UNESCO's recognition of the Tay Nguyen Gong cultural space has contributed to enhancing the position and influence of this land on the world tourism map. Not only that, it also promotes the strong development of cultural tourism in Tay Nguyen, creating conditions for local people to preserve and promote their traditional cultural values.

4. CONCLUSION

The diversity of the Western landscape determines the type and tourism products in Tay Nguyen. The diversity in topography, climate - hydrology, and vegetation are both components of the landscape of Tay Nguyen, and the cultural diversity of the people in the Upper region is both a component in changing the landscape and at the same time natural tourism resources and cultural tourism resources of Tay Nguyen. That diversity has created unique features of Central Highlands tourism, which has great appeal to tourists. However, for Tay Nguyen's tourism to develop sustainably, preserving and managing landscape diversity is necessary. Measures such as strengthening monitoring and control of deforestation, protecting rare animals, investing in green technology to reduce environmental pollution, etc. will help protect and maintain contracts. landscape formation as well as tourism resources of Tay Nguyen.

REFERENCES

1) Abegg B (1996) Climate change and tourism: Climate impact research using the example of winter tourism in the Swiss Alps. vdf Hochschulverlag AG

2) Alexander D, Evgeny K, Nadezhda K, Olga B, Natalia Y (2022). Landscape diversity is an attraction basis in the design of tourist and recreational areas (the case of Bolshaya Belookurikha). Acta Biologica Sibirica 918–928

3) A. S (2014) Landscape diversity: theoretical foundations, approaches and methods of study. Geopolitics and eco-geodynamics of regions 10:208-213

4) Barthlott W, Lauer W, Placke A (1996) Global Distribution of Species Diversity in Vascular Plants: Towards a World Map of Phytodiversity (Globale Verteilung der Artenvielfalt Höherer Pflanzen: Vorarbeiten zu einer Weltkarte der Phytodiversität). Erdkunde 50:317–327

5) Beruchashvili NL, Zhuchkova VK (1997) Methods of complex physical-geographical research: Textbook. for universities in the field and specialty "Geography." Изд-во Моск. ун-та, Москва

6) Castellarini F, Cuezzo F, Luna Toledo E, Buffa L, Orecchia E, Visintín A (2024) Local and landscape drivers of ground-dwelling ant diversity in agroecosystems of Dry Chaco. Agriculture, Ecosystems & Environment 367:108955. doi: 10.1016/j.agee.2024.108955

7) Cheng Q, Zhong F (2019) Evaluation of tourism climate comfort in the Grand Shangri-La region. J Mt Sci 16:1452–1469. doi: 10.1007/s11629-018-5081-4

8) Dac Phan Tat Dac, Pham Ngoc Toan, Dac PT (1980) Climate and life (Basic issues of bioclimatology). Science and Technology Publishing House, Hanoi

9) Dunets A, Krupochkin E, Kurepina N, Baryshnikova O, Yurochkina N (2022) Landscape diversity as an attraction basis in the design of tourist and recreational areas (the case of Bolshaya Belokurikha). 1 8:918–928. doi: 10.5281/zenodo.7686800

10) Dunets, A. N (2013) Approach to the study of tourist development of mountain regions. Karadeniz International Scientific Journal 1:13–21

11) de Groot R, Hein L (2007) Concept and valuation of landscape functions at different scales. In: Mander Ü, Wiggering H, Helming K (eds) Multifunctional Land Use: Meeting Future Demands for Landscape Goods and Services. Springer, Berlin, Heidelberg, pp 15–36

12) Hai Pham Hoang Hai, Nguyen Thuong Hung, Nguyen Ngoc Khanh (1997) Landscape basis of rational use of natural resources, environmental protection of Vietnamese territory. Education Publishing House, Hanoi

13) Idrisova RA (2009) Landscapes of the Chechen Republic: spatial structure and features of residential load. Кандидат географических наук

14) Jiménez-García M, Ruiz-Chico J, Peña-Sánchez AR (2020) Landscape and Tourism: Evolution of Research Topics. Land 9:488. doi: 10.3390/land9120488

15) Jin H, Xu J, Peng Y, Xin J, Peng N, Li Y, Huang J, Zhang R, Li C, Wu Y, Gong B, Wang R (2023) Impacts of landscape patterns on plant species diversity at a global scale. Science of The Total Environment 896:165193. doi: 10.1016/j.scitotenv.2023.165193

16) Korn H, Bockmühl K, Feit U, Piechocki R, Stadler J (2013) The convention on biological diversity 20 years on history, process and outcomes. Natur und Landschaft 88:441–446

17) Leser H, Nagel P (2001) Landscape diversity — a holistic approach. In: Barthlott W, Winiger M, Biedinger N (eds) Biodiversity: A Challenge for Development Research and Policy. Springer, Berlin, Heidelberg, pp 129–143

18) Pham Trung Luong, Dang Duy Loi (2000) Resources and tourism environment in Vietnam. Education Publishing House, Hanoi

19) Nhung Nguyen Thu, Hoa Thu Le, Van Huong Le, Hoang Hai Pham, Thu Huong Le, Thuy Van Tran Thi (2024) Multi-criteria model to assess the potentials of Cat Ba National Park to develop tourism ties to conservation. Ukrainian Geographical Journal 1:19–29. doi: https://doi.org/10.15407/ugz2024.01.019

20) Premke K, Attermeyer K, Augustin J, Cabezas A, Casper P, Deumlich D, Albrecht J, Gerke HH, Gessler A, Grossart H-P, Hilt S, Hupfer M, Kalettka T, Kayler Z, Lischeid G, Sommer M, Zak D (2016) The importance of landscape diversity for carbon fluxes at the landscape level: small-scale heterogeneity matters. WIREs Water 3:601–617. doi: 10.1002/wat2.1147

21) Sergeevich CoA (2016) Cartographic analysis of regional features of landscape diversity in Belarus. Pskov Regionalological Journal 59–70

22) Terkenli TS, Skowronek E, Georgoula V (2021) Landscape and Tourism: European Expert Views on an Intricate Relationship. Land 10:327. doi: 10.3390/land10030327

23) thuvienphapluat.vn (2024) Tourism Law 2005 No. 44/2005/QH11. In: LAW LIBRARY. https://thuvienphapluat.vn/van-ban/Thuong-mai/Luat-du-lich-2005-44-2005-QH11-2659.aspx. Accessed 26 Apr 2024

24) Zanozin V, Barmin A, Yamashkin S, Yamashkin A (2020) Methods and algorithms for assessing landscape diversity in morphological terms on the example of the central part of the Volga River Delta. ICIGIS 26:114–130. doi: 10.35595/2414-9179-2020-4-26-114-130

25) Озгелдинова Ж, Бектемирова А, Мукаев Ж, Берденов Ж, Асылбеков К, Оспан Г (2022) Landscape diversity of the territory of tobol river basin within the Kostanay region. Вестник КазНУ Серия географическая 67. doi: 10.26577/JGEM.2022.v67.i4.02

Professional Liabilities of Legal Officer in Providing Legal Opinion to the Corporate Directors

K. Ikka Shintya Daivi[1], Johannes Ibrahim Kosasih[2], I Made Arjaya[3]

[1,2,3]Warmadewa University & Terompong No.24, Sumerta Kelod, Denpasar, Bali 80239

ABSTRACT: The legal officer must be neutral when providing legal opinions to the directors. Therefore, the liability for providing legal opinions belongs to the directors. The research objectives are to specifically analyse the position of a legal officer as an employee of a company; and analyse the professional liability of a legal officer in providing legal opinion to the company's directors. This research uses normative law research method with normative case studies in the form of legal behaviour products. While the approach method is a statutory approach. The legal officer is authorized in determining the measures to be taken by the company in accordance with the orders of the directors and applicable company regulations. The liability of the legal officer is limited to providing opinions in accordance with the duties and functions assigned by order of the directors in good faith and professionally.

KEYWORDS: Limited Liability, Legal Opinion, Legal Officer, Legal Behaviour, BoD

I. INTRODUCTION

Humans in social life have a certain role as a form of life association. Human position is determined by humans themselves for their existing capacities.[1] One of the purposes of humans or groups is to fulfill the needs of life. Therefore, they work, interact, and in the modern era, they form business groups called business entities. Business entities are divided into two types, those that are incorporated and non-incorporated. A business entity is an economic juridical entity that establishes a business to operate any type of commerce that is lasting and persistent, built up, working, and domiciled inside the region of Indonesia to obtain profit.[2]

It consists of a civil partnership, a firm partnership and a limited liability partnership. Legal forms of business entities are cooperatives and restricted liability companies. The most common form of business substance is the restricted liability company because the business risk for a limited liability company as a legal entity does not involve the personal assets of the shareholders unless otherwise stipulated by law or regulation. The presence of a Limited Liability Company (PT) as a business substance in daily life cannot be overlooked. Commerce practices conducted by commerce actors, be those traders, industrialists, investors, temporary workers, distributors, financiers, insurance companies, brokers, agents and so on are no longer separated from the presence of a limited liability company. The most well-known mode of doing commerce is employing a restricted liability company, whether on a small, medium or large scale.[3]

Companies have a great concern for the progress of the economy in a country, however, the development of the economic and business sectors in the current era, the competition implemented by each company is based on the individual profits of the companies. According to Law No. 40/2007 on Limited Liability Companies, a Limited Liability Company is a legitimate substance that is a capital association, built up based on an agreement to conduct commerce activities with authorized capital which is completely partitioned into shares and fulfills the requirements set in law and its implementing regulations.

Limited Liability Company is a business cooperation where the business activities are conducted by corporate officers, such as the directors, commissioners and the general meeting of shareholders. These entities are the ones who legally represent the company. All directors are entrusted with the full management of company for the interests and purposes of it, representing the company both inside and outside the court, in accordance with the law and the company's articles of association. The duties of the BOD are divided into two, which are (1) management duties are assigned by the Board of Directors of the Company's Chairman; (2) representation duties are assigned by the Board of Directors who represent the company both inside and outside the court. Directors are responsible as executives based on the principle of fiduciary duty. If the company operates defective and damages

to third parties or shareholders, then the BOD should be responsible. In this case, fiduciary duty is a duty that the director must assume with full responsibility for the interests (benefits) of other people or parties (the company).[4]

In general, Limited Liability Companies have problems related to the legal field, in this case the Division that is closely related to legal science is the legal division where someone who works in the legal division is called a legal officer position.[5] A legal officer in a Limited Liability Company has important duties and functions. This position is expanding as legal expertise is needed in the company.

The duties of a legal officer in a Limited Liability Company consist of conducting legal audits, ensuring that the company is free from legal problems, providing legal opinions, preparing and reviewing legal documents, resolving legal issues as a mediator, managing legal documents, reporting on the progress of work in the legal field, providing advice or consideration, being a public speaker for the company, and representing the Board of Directors or the founder of the company.[6]

The company faced various problems, both internal and external. Internal issues mainly include employee demonstrations and disputes with the government over business license regulations. Companies often have to rely on legal officers to handle licenses from the government, as these documents are very important for establishing and operating a business. When the legal officer provides a legal opinion to the director, he/she acts like an advocate who provides legal advice. The legal opinion of the legal officer significantly affects the director's decision. In addition, the legal officer also drafts legal documents, such as agreements between customers and companies.

Depending on the legal officer, the legal opinion may turn out to be wrong and detrimental to the company, or mistakes may be made in legal documents and documents may disappear. Many companies now more often use legal consultants to provide legal opinions.

Legal opinion is a legal practitioner's response to a client's inquiries about a legal issue. If the legal opinion of a legal scholar is used by the judge as a basis for finding the law, then the legal opinion can already be referred to as doctrine.[7]

Based on the previous description, it is explained that legal opinion is a doctrine that is presented primarily for practical purposes. Doctrine is one of the legal sources. If legal opinion is the same as doctrine, then the position of legal opinion as a source of law is the subject of this research. This research aims to discuss the subject matter relating to the legal opinion. In performing a task there are always problems that occur and must be resolved immediately with speed and timeliness, this is the responsibility of someone who performs the task begins to speak.

II. RESEARCH METHODOLOGY

The position of a legal officer in a company is an employee in accordance with Law No. 13/2003 concerning Manpower. Regarding his status as an employee, the legal officer has duties and functions that are tasked with handling and managing all legal issues in the company and providing legal opinions. In his relationship as an employee, the legal officer serves as one of the main legal officers in the company, the legal officer is authorized to determine the actions that must be taken by the company in accordance with the orders of the Board of Directors and in accordance with the applicable company regulations. Legal officers are responsible for protecting the company from violations of the law, because as someone with a background in law education, legal officers must protect the company's position from criminal violations of the law.

Responsibility is inherent, which means that it has become part of human life, that every human being is loaded with responsibility, if studied, responsibility is an obligation that must be taken as a result of the actions of the party who acted. The responsibility for problems in the company still goes to the leadership. The responsibility of the legal officer is limited to providing opinions in accordance with the limits in accordance with the duties and functions given and has been performed with the orders of the Board of Directors in good faith professionally as a legal opinion provider. Therefore, the legal officer is not responsible to third parties but he/she is only responsible to the company.

III. DISCUSSION

A. *The Position of Legal Officer as an Employee in a Company*

1. Legal Officer as a Legal Profession in the Company

The legal officer has an important role in the company, because all matters that relate to company operations are highly dependent on documents, licenses, letters, and legal procedures that must be implemented if legal problems occur. Legal officer is an employee who is tasked with handling and managing all legal issues in the company. A legal officer must be able to ensure that the company is free from the risk of legal problems or ongoing legal problems, both internal and external.

In addition to the company's employees, the legal officer has a very important role in ensuring that the company operates properly and efficiently in legal terms. Legal officers help strengthen the company's position in the industry and ensure that companies stand on legal and ethical principles by providing legal assistance and helping companies address legal issues.

Professional Liabilities of Legal Officer in Providing Legal Opinion to the Corporate Directors

The position and function of the legal officer in a company, especially a company in the form of a Limited Liability Company (PT) is very important, because as we know that every company is inseparable from all kinds of problems, both from within the company (internal) and from outside the company (external). Therefore, legal officers are needed for the continuity of the company's business, but not all companies can assign legal positions in their companies.

2. The Definition and Regulation of Legal Officer in Positive Law

A legal officer is a person who works for a company or organization. His or her job is to handle various legal issues that the institution may possibly confront. The position of a legal officer is indeed very important for an agency, company or organization. The position of the legal officer in the company is very important, because a company will not avoid various problems, whether it is internal company problems or external company problems that occur within the company.

Potential legal problems can occur in companies due to internal and external factors, therefore strengthening legal advocacy management needs to be conducted. However, this regulation only discusses advocates, not legal officers, as stated in Article 1 Paragraph 1 and 2:

1) Article 1 Paragraph 1: "Advocate is a person whose profession is to provide legal services, both inside and outside the court who meets the requirements based on the provisions of this Law."
2) Article 1 Paragraph 2: "Legal services are services provided by an advocate in providing legal consultation, legal assistance, exercising power of attorney, representing, accompanying, defending, and committing other legal acts for the legal interests of the client."

3. The Relationship between Profession and Ethics Code

Ethics is defined as a compilation of principles or values related to morals or norms. The definition of ethics as a concept of value and a collection of principles defines ethics as a value system. Profession is a permanent job that is service occupation in its implementation by applying scientific knowledge in a particular field.

Regarding professional ethics and code of ethics, both of them are things that have a relationship, that the code of ethics is the actualization of these values from the ethical discussion of the legal profession. The legal profession must provide the main service to its "clients" based on moral values and justice, although in reality there are many deviations or violations, so it requires a legal order that will minimize these negative things, the legal order is realized by the existence of a code of ethics.

4. Legal Officer as a Legal Profession

Indeed, the all-encompassing role of the legal officer is one of assurance that the Limited Liability Company operates in accordance with the prevailing regulations. The Legal officer is a profession that is known as a special profession for graduates of law faculty. However, in medium-sized companies, the position of legal officer in a company is not only to manage the internal problems of the company, but also to manage the external problems of the company. However, in medium-sized companies, the legal officer handles all matters including legal documents and issues.

Being a legal profession, a legal officer is a job that focuses on a person with a law degree. Legal officers are tasked with providing legal opinions, handling documents and licenses, and handling legal matters for both civil and criminal matters. Required skills include a thorough understanding of the law, good analytical skills, effective communication, and the ability to work collaboratively with various parties both inside and outside the organization. Regarding the requirements and scope of work, a legal officer can be referred to as a legal profession. Currently, legal officers cannot be called a profession in general, but can only be called a special profession for law graduates.

5. Legal Officer as an Employee in a Company

A legal officer is tasked to maintain the company from legal issues that occur both internally and externally. Generally, legal officers can be hired directly by companies, agencies, and other types of firms. Commonly, they will report directly to an upper-level staff member, such as the chief legal officer. A legal officer is a permanent employee who is recruited by the company through a recruitment process like any other employee.

As an employee of the company, a legal officer's job is to assist in explaining legal regulations in a simpler and easier-to-understand language. In addition, they are also tasked with helping the company to take strategic yet low-risk steps. A legal officer must always be updated with the latest legal regulations. It is important because government regulations and rules change frequently. If the company encounters a legal problem and needs to appear in court, the legal officer can attend but only helps to collect documents and explain the problem to the advocate because the legal officer is an employee, so the legal officer cannot represent the company in court.

6. The Structure of a Legal Officer in a Company

In general, legal officers in companies act as legal consultants. Companies often assign legal officers as expert staff of the Board of Directors. Because his position is directly under the Board of Directors, it is easy for the legal officer to coordinate with other

parts of the company, such as the company's personnel department, the company's marketing department, and the company's finance department. Therefore, the legal officer is able to support the legal needs of other divisions in the company.

Depending on the department, the legal officer can be positioned structurally in a department that has the same position as other departments in the company. In addition, companies can place this profession functionally whose position is directly under the Board of Directors.

7. The Position of Employees in the Company

Employees are one of the most important elements in a company. However, this is due to the role and function of employees in producing goods or services for the development of a company. Employees are the main wealth in a company, because without their participation, company activities will not be realized. Employees are people who sell services (mind or energy) and receive compensation whose amount has been determined in advance. The position of employees in the company is influenced by various factors, including roles, responsibilities, job status, and relationships with management. In general, employees can be grouped into several categories based on their status and role in the organization, namely Permanent Employees (PKWT); Contract Employees (PKWTT).[8]

8. The Rights and Obligations of a Legal Officer in a Company

Legal officers are responsible for managing all company documents, such as employment contracts, agreements, partnerships, and share certificates. They must write, review, and identify legal risks that could arise. Legal officers must regularly analyse company actions and decisions to detect potential legal issues. As employees of the company, legal officers have the same rights as other employees in accordance with Article 88 Paragraph (1) of Law No. 13/2003, which guarantees safety, occupational health, morale, and humane treatment. Currently, there is no specific law for legal officers, so the rules regarding this role are regulated by each company. The Legal Officer serves as the company's protector from external legal sanctions.

9. The Position of Legal Officer as a Company Employee in Providing Legal Opinions

The position of legal officer in a company has an important role. This is because everything related to the operation of a company is very dependent on documents, licenses, letters, and legal steps that must be taken in the event of legal problems. A Legal Officer is responsible for providing legal opinions to the company or organization in which they work.

These legal opinions can relate to various legal issues that the company faces, such as contracts, regulations, internal policies, disputes, or regulatory issues. In providing a legal opinion, a Legal Officer must carefully consider the relevant facts, applicable law, and underlying legal principles. The legal opinion provided must also be clear, accurate, and accountable. As an employee in providing a Legal Opinion, the Legal Officer must comply with applicable regulations, in good faith and made knowingly on behalf of the company.

10. The Legal Officer's Legal Relationship with the Company

A legal officer is an individual who is responsible for ensuring that a company or organization operates in accordance with applicable legal regulations. The legal officer's legal relationship with the company is very important because the legal officer has a strategic role in protecting the company from legal risks and ensuring regulatory compliance. Legal officers are responsible for ensuring that all company activities are in accordance with applicable legal regulations. They must understand and interpret regulations appropriately so that the company can avoid legal sanctions and litigation. Before being accepted to the company, the legal officer must have agreed to all employment contracts in the company where he/she works, so the legal relationship between the legal officer and the company is in the employment contract that was agreed upon at the beginning of the acceptance.

11. Legal Opinion as Legal Officer Assignment

Legal opinion is one of the many tasks usually assigned to a legal officer. A legal opinion is an analysis provided by a legal expert on a particular legal issue. This opinion may be provided based on the request of the company's management or other departments within the company. Legal opinions also help in the assessment of legal risks. Legal opinion has the function of providing input to the party receiving the legal opinion to serve as a guideline in addressing and finding the best way out or solution to a legal problem faced.

In providing a legal opinion, a legal officer must carefully consider the relevant facts, applicable laws, and underlying legal principles. The legal opinion provided must also be clear, accurate, and accountable. As an employee in providing legal opinions, the legal officer must comply with applicable regulations, in good faith and made consciously on behalf of the company.

12. The Professionalism of Legal Officers as Employees in Providing Legal Opinions

The professionalism of legal officers in providing legal opinions is very important as their legal opinions can have a significant impact on company decisions and operations. The following are some of the aspects of professionalism that a legal officer should possess in providing legal opinions. A legal officer must provide accurate and precise legal opinions based on a careful analysis of the relevant facts and law. A legal officer must operate in accordance with the ethical standards and code of conduct of the legal

profession. They must maintain confidentiality of information, avoid conflicts of interest, and handle all matters with integrity and professionalism.

B. *The Legal Officer's Professional Liability in Providing Legal Opinion to the Corporate Directors*

1. **Civil Liability as a Scope of Work for Legal Officers**

The legal liability for the acts committed by the legal officer in the discussion of this research is civil liability. A legal officer must ensure that all actions and transactions they perform are in accordance with applicable civil regulations, including contract law, property law, corporate law, and other relevant laws. Civil liability is one of the important aspects of a legal officer's job.

This civil liability regulates various matters relating to civil law, which is the law governing relationships between individuals, companies, or other entities in society. When an error is made by the legal officer in the course of his work, the legal consequences of the agreement made by the legal officer on behalf of the company, are binding on the company because the contract or agreement made by the legal officer is approved by the company, namely the board of directors and the board of commissioners, unless the agreement is made on behalf of the legal officer's personal name without the knowledge of the company, then the legal consequences are not on the company but on the legal officer concerned, but if the legal officer is on behalf of the company then the legal consequences remain with the company.

2. **Strict Liability**

One of the legal concepts adopted from the Anglo-Saxon legal framework is the concept of strict liability. The concept of strict liability is a form of civil liability that does not require the component of fault but only requires the component of loss as a condition for filing a claim for compensation for the illegal act model. The doctrine of strict liability developed in practice to overcome the restrictions of the doctrine of liability based on fault. Liability based on fault forces the burden of proof on the plaintiff, so it is regularly difficult for the plaintiff to demonstrate the presence of the illegal act.

3. **Presumption of Liability**

The presumption of liability principle is the principle that the defendant is continuously assumed to be liable. The word "presumed" in the principle of "presumption of liability" is important, because there is a possibility of the defendant exempting himself from liability, which is within the case where he can demonstrate that he has "taken" all essential measures to maintain a strategic distance from the loss.

4. **Presumption of non-liability**

Basically, there are several principles of liability in Indonesian law, one type of liability is the principle of presumption of non-liability which is the rule of presumption of non-liability is only known in a very constrained scope of consumer transactions, and such limitations are usually legitimized by general principles. An example of the application of this rule is in transportation law. Loss or damage to cabin baggage/hand luggage that is usually carried and directed by the passenger (customer) is the responsibility of the passenger. In this case, the carrier (commerce actor) cannot be liable.

5. **Limitation of Liability**

Limitation of liability is the principle relating to the business actor's attempt not to be responsible for certain matters, for example including a clause that "loss is borne by the owner (consumer)" or "goods that have been purchased cannot be returned." These are clauses that eliminate the responsibility of the business actor (extenuation clauses), which are known as standard clauses.

6. **The Professionalism of Legal Liability**

Responsibility is the characteristic of a civilized (cultured) human being. Professionals usually have ethical responsibilities and high-performance standards in implementing their work. Employees who are attached to the company will provide work performance that continues to increase due to dedication within themselves so that a sense of professional responsibility arises to continue working and contribute to the success of the company in achieving its goals. Employees in performing their duties must have agreed or agreed to do their work or duties with maximum effort in what is called Inspanning Verbintenis. Inspanning Verbintenis is an agreement or agreement to make maximum efforts in implementing whatever has been discussed.

7. **The Principles of Professionalism in the Assignment of Legal Liability**

Professionalism comes from the word professional which means doing a profession that is conducted properly and in accordance with the correct ethics and professional lines that apply to the profession. Shifting corporate responsibility can be an effective strategy to improve efficiency, increase focus on core business, or adjust to market and industry changes. A key principle in the transfer of legal liability is to ensure that all steps taken in the process comply with applicable laws and regulations.

Regarding professionalism, the legal officer in accordance with his duties, namely providing legal opinions to the company's Board of Directors, must be in accordance with applicable laws. The decision on whether or not to use the legal opinion remains in the hands of the Board of Directors as the head of the company, so in this case the Legal Officer is not responsible for the legal

Professional Liabilities of Legal Officer in Providing Legal Opinion to the Corporate Directors

opinion he provides to the Board of Directors. If the legal opinion is used by the Board of Directors and causes legal problems, then the responsibility for the error can be transferred to the Board of Directors (Article 1367 of the Civil Code).

8. The Implementation of Fault-Based Liability in the Legal Officer Profession

The application of fault-based liability in the legal officer refers to the principle of vicarious liability, which explains the liability of others. This principle originates from civil law in the common law system, namely the doctrine of respondeat superior which explains the relationship between employees/employees and superiors, in this case between the authorizer and the recipient of the power of attorney, which applies if a person who does something through another person, then the action is considered as an act committed by himself. The legal opinion provided by the legal officer is not binding on the legal officer. The term error in legal opinion does not exist, because an opinion is an individual's perspective or an individual's argument on a problem or something that is happening.

9. Directors as Leaders in Managing Corporate Liability

The Board of Directors is a strategic management unit that manages and leads the company to achieve its corporate goals. Directors are responsible for the long-term business strategies and policies of the company. They must ensure that the decisions taken support the growth and sustainability of the company. Directors have the responsibility to supervise the performance of senior management and ensure that the company is being operated efficiently and effectively. They should monitor the achievement of corporate objectives and evaluate the performance of key executives.

The BOD is completely responsible for the administration of the company. Each member of the BOD is completely and personally liable if he/she is guilty or negligent in performing his/her duties. In performing its duties, the BOD must comply with the company's articles of association and prevailing laws and regulations. In this regard, the BOD must perform its duties in good faith and with full responsibility.

10. The Concept of Vicarious Liability in Employment Relationship

This principle of vicarious liability explains the liability committed by others. This principle comes from civil law in the common law system, namely the doctrine of respondeat superior which explains the relationship between employees and superiors, in this case between the authorizer and the recipient of the power of attorney that applies if a person who does something through another person, then the act is considered as an act committed by himself. However, considering that there is no regulation that examines more deeply related to the explanation of the limitations in the application of the elements of Article 1367 of the Civil Code, confusion often arises from various parties in the process of resolving legal cases like this, especially when it involves work relations between employers and their subordinates.

11. Board of Directors as the Operational Movement of the Company

The Board of Directors is an organ of the company that is authorized and completely responsible for the administration of the company for the benefit of the company, in accordance with the aims and objectives of the company and represents the company, both inside and outside the court in accordance with the articles of association. In exercising its authority, the Board of Directors is actually only entitled and authorized to act on sake of and for the benefit of the company within the limits allowed by the prevailing laws and regulations and its articles of association. Any activity taken by the Board of Directors outside the authority granted is referred to as ultra vires action. The legitimate activities of the Board of Directors are considered ultra vires if they surpass the limits of authority expressed within the articles of association and laws and regulations.

12. The Board of Directors is Responsible for the Legal Officer's Performance

The BOD must perform their duties with full responsibility and in good faith. Directors are personally liable for the company's losses if they are guilty or negligent in carrying out their duties. Legal officer is an employee who works for a company or organization. His job is to handle various legal issues that the company may face. The responsibility of the Board of Directors on the performance of the legal officer is that the Board of Directors is responsible for supervising and evaluating the performance of the legal officer in fulfilling his duties. This includes ensuring that the legal officer understands and complies with all relevant policies, rules and regulations.

The Board of Directors has full responsibility for the legal opinion provided by the legal officer to the Board of Directors. The legal opinion provided by the legal officer is used or not used, the decision belongs to the Board of Directors, if the legal opinion is used and it causes a legal risk either loss or something else, the Board of Directors is responsible for it, because the legal officer is an employee who works under the orders of the Board of Directors.

IV. CONCLUSIONS

The position of a legal officer in a company is an employee in accordance with Law No. 13/2003 concerning Manpower. Regarding his status as an employee, the legal officer has duties and functions that are tasked with handling and managing all legal issues in the company and providing legal opinions. In his relationship as an employee, the legal officer serves as one of the main

Professional Liabilities of Legal Officer in Providing Legal Opinion to the Corporate Directors

legal officers in the company, the legal officer is authorized to determine the actions that must be taken by the company in accordance with the orders of the Board of Directors and in accordance with the applicable company regulations. Legal officers are responsible for protecting the company from violations of the law, because as someone with a background in law education, legal officers must protect the company's position from criminal violations of the law.

Responsibility is inherent, which means that it has become part of human life, that every human being is loaded with responsibility, if studied, responsibility is an obligation that must be taken as a result of the actions of the party who acted. The responsibility for problems in the company still goes to the leadership. The responsibility of the legal officer is limited to providing opinions in accordance with the limits in accordance with the duties and functions given and has been performed with the orders of the Board of Directors in good faith professionally as a legal opinion provider. Therefore, the legal officer is not responsible to third parties but he/she is only responsible to the company.

The legal officer is expected to review regulations for legal officers that directly regulate the position of legal officer in a company, to avoid a lack of norms for legal officers. Since the development of technology, the need for legal officers will increase, as indicated by the many specialized trainings on legal officers.

The Board of Directors should be expected that the company provides special requirements such as having more than 2 years of experience or being an advocate to recruit a legal officer in order to minimize the risks that occur to the business.

REFERENCES

1) Ibrahim J. Hukum Organisasi Perusahaan : Pola Kemitraan dan Badan Hukum. Cet1 ed. Bandung: Refika Aditama; 2006.
2) Asyhadie Z. Hukum Bisnis: Prinsip dan Pelaksanaannya di Indonesia. Rajawali Pers; 2011.
3) Nadapdap B. Hukum Perseroan Terbatas. Jala Permata Aksara; 2009.
4) Terry GR, Rue LW. Dasar-dasar Manajemen. Bumi Aksara; 2011.
5) Sembiring JJ. Legal Officer. VisiMedia; 2009.
6) Basri A, Hamsir H. Peran dan Tanggung Jawab Legal Officer. Alauddin Law Dev J ALDEV. 2020;2(3).
7) Mertokusumo S. Mengenal Hukum Suatu Pengantar. Cet.1. Yogyakarta: Cahaya Atma Pustaka; 2010.
8) Manullang M. Manajemen personalia. Gadjah Mada Univ Press; 200

Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia

Teddy Giolanda Pratama[1], Hari Yuliarto[2], Soebagyo[3], Ngatman[4], Achad Imam Ma'ruf[5]

[1,2,3]Department of Physical Education for Elementary School, Faculty of Sports and Health Science, Yogyakarta State University, Indonesia

[4,5]Department of Physical Education, Health and Recreation, Faculty of Sports and Health Science, Yogyakarta State University, Indonesia

ABSTRACT: The aims of this study was evaluate the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency based on the aspects of context, input, process, and product model. The subjects of this evaluation were school principals, sports, health and physical education teachers, and students at Senior High School 1 Tanjungpandan, Belitung Regency. The sampling technique used was purposive sampling, with the criteria: respondents who are willing to be the sample and fill out a questionnaire from the researcher. The sample consisted of 1 school principal, 3 sports, health and physical education teachers, and 30 students with details of 10 students in class X, 10 students in class XI, and 10 students in class XII. Data collection techniques using observation, interviews, questionnaires, and documentation. The data were analyzed with descriptive quantitative and qualitative analysis. The results showed that the evaluation of the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency was 2.47 (poor). Based on each evaluation component, the following conclusions were obtained. (1) Context evaluation of the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency, at 2.70 was good. (2) The input for the evaluation of the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency, was 2.41 (poor). (3) The evaluation process for the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency, was 2.35(poor). (4) Product evaluation of the sports, health and physical education learning program at Senior High School 1 Tanjungpandan, Belitung Regency was 2.29 (poor).

KEYWORDS: Evaluation, CIPP, Sports, Health and Physical Education

I. INTRODUCTION

Education is one of the ways to form a whole, noble and good personality human being based on positive experiences that include changes in the way of thinking (cognitive), behavioral (affective), and motion (psychomotor). These changes are consistent with Sports, Health and Physical Education (Nurjanah & Mulyana, 2019: 9).

Physical activity becomes the primary and dominant thing in Sports, Health and Physical Education learning. Sports, Health and Physical Education learning also can improve the physical fitness and health of the students, improve and strengthening their physical skills. This learning program can also improve the student's understanding in the principles of movement and how to apply them in practice (Wright & Richards, 2021: 21).

Senior High School 1 Tanjungpandan is the oldest senior high school in the district of Belitung, Indonesia. This school is also conducting the Sports, Health and Physical Education is a primary learning program in Tanjungpandan Senior High School in the district of Belitung. Based on the interview with the teachers, various obstacles and learning problems were experienced in the Senior High School 1 Tanjungpandan district of Belitung. Based on the results of the interviews it is known that the condition of the students during the study is still not optimal. Students only interested in the sport games, such as playing soccer, volleyball, etc. Specifics materials on the sports, health and physical education learning program were less interesting for the students.

Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia

Observation with the teachers shows that the learning process is still values oriented. Game activity is less developed in the learning process, so the movement of students cannot be explored. Facilities and infrastructures for the sports, health and physical education learning program were also limited. This condition affects the effectivity of learning process. Teachers cannot deliver the materials based on learning plan since the inadequate facilities and infrastructures. Only cognitive aspects can be explored.

The implementation of sports, health and physical education learning must be adapted to the ability of each student and the implementation given must be systematic, in accordance with the characteristics of the student and managed through physical development effectively and efficiently towards the formation of the whole human being. Therefore, to measure the extent to which learning is available, a process called evaluation is needed.

Evaluation is very closely related to the learning process. Evaluations are useful as one way to monitor the learning progress of students, as well as to know how far the learning that has been formulated is fulfilled. There are many evaluation models with their respective formats and systematics, although sometimes they are found in the same number of models as other assessment models, one of which is the Context, Input, Process, Product (CIPP) evaluation model. This evaluation was developed by Stufflebeam which is decision-oriented (Finey, 2020: 27; Erdogan & Made, 2021: 2).

The CIPP model is a model for providing information to decision makers, so the purpose of this evaluation is to make decisions. Kitivo, et al., (2021:2) stated that the evaluation of the CIPP model meant comparing the performance of various program dimensions with a certain number of criteria, to eventually come to the description and judgment of the strengths and weaknesses of the program being evaluated. The learning activity as a system consists of the components of the teacher, the student, the purpose, the material, facilities, strategies and assessments. Each components are interrelated. Teachers cannot be separated from students who are targeted in the learning process. The learning process carried out by the teacher must have a clear purpose, with a variety of materials that must be fulfilled in order to achieve the goal that has been planned.

Based on the problems described above, the researchers are interested in conducting further study under the title "Context, Input, Process, Product Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia".

II. METHODS

The design of this study was evaluative study with combined quantitative and qualitative methods. Sukmadinata (2017: 68) stated that evaluative research is a research activity whose nature is to evaluate an activity/program that aims to measure the success of an activity /program and determine the successful of a program and whether it has been in accordance with what is expected. This research is also directed to assess the successful benefits, usefulness, contribution and validity of a program of activity of a particular unit / agency.

The subjects in this research were school principals, Sport, health and physical education teacher and students of Senior High School 1 Tanjungpandan, Belitung, Indonesia. Purposive sampling method was used for sample selection with the sample criteria are respondents who are willing to be a sample and fill in a questionnaire from the researcher. All the subjects (1 head School Officer, 3 Sport, health and physical education teacher, 30 students (10 grade X, 10 grade XI, 10 grade XII) were then asked to fill in a questionnaire with google formulir. The evaluation instrument with context, input, process, product model was shown in Table 1.

Table 1. Context, Input, Process and Product Evaluation Instrument

Factor	Indicator	Point
Context	The philosophy of Sport, health and physical education learning program	5
	Purpose of Sport, health and physical education learning program	5
Input	Teacher's profile (professionalism)	6
	Students profile (affective, cognitive and psychomotor skill)	5
	Facilities and infrastructure for Sport, health and physical education learning program	5
Process	Sport, health and physical education learning plan	10
	Sport, health and physical education learning process	14
Product	Evaluation of Sport, health and physical education learning process	4
	Evaluation of Sport, health and physical education learning outcome	4

Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia

Results of the questionnaire were then analyzed with Stake model which compare result data obtained by criteria that have been predetermined (Table 2).

Table 2: The Successful Criteria

No	Percentage	Criteria
1	3,26-4,00	Very good
2	2,51-3,25	Good
3	1,76-2,5	Poor
4	1,00-1,75	Very poor

III. RESULTS

This study was done with context, input, process and product (CIPP) model to evaluate the Sport, health and physical education learning program at Senior High School 1 Tanjungpandan, Indonesia.

The evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan based on context indicator was included in the good category (Figure 1). Both philosophy (2,67) and objective (2,73) of the learning program were in the good category.
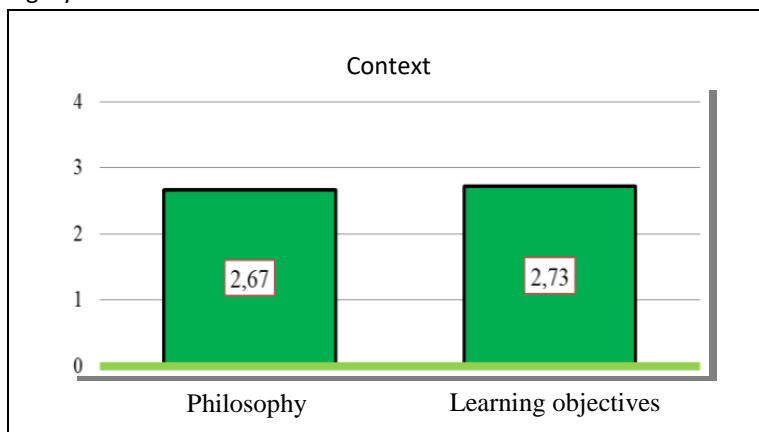
Figure 1. Diagram of Context Evaluation

The input evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan shows that teachers profile was good (2,78), meanwhile students profile (2,19) and facilities and infrastructure (2,27) were in the poor category (Figure 2).
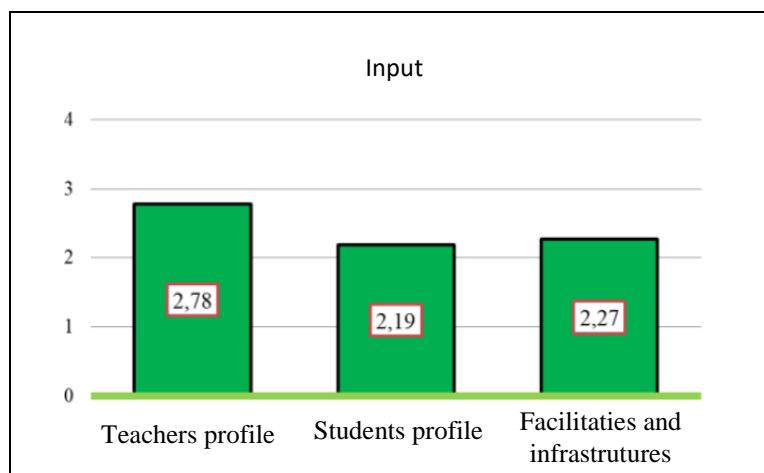
Figure 2. Diagram of Input Evaluation

The process evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan was shown in Figure 3. It shows that the learning plan was good (2,52), while learning process was poor (2,17).

Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia
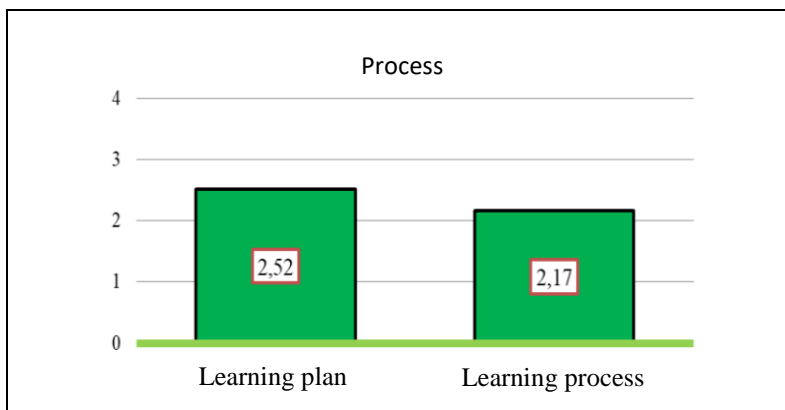

Figure 3. Diagram of Process Evaluation

Evaluation based on product context shows that evaluation of learning process (2,33) and evaluation of learning outcome (2,25) were poor (Figure 4).
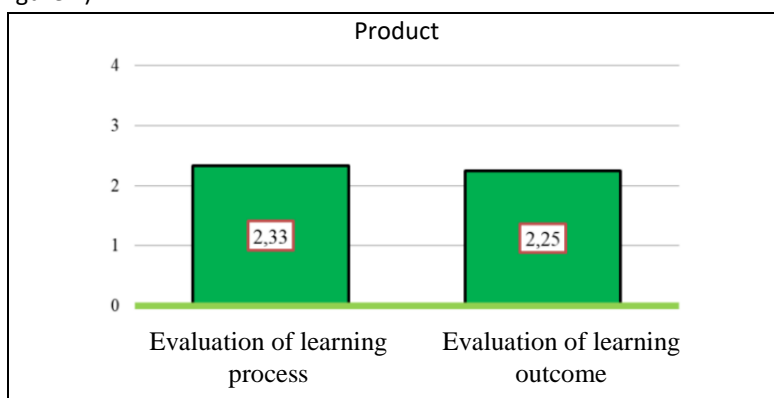

Figure 4. Diagram of Product Evaluation

Overall, the evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan based on context, input, process and product was poor (2,44) (Figure 5). These evaluation based on each component can be explained as context indicator was good (2,70), meanwhile input (2,41), process (2,35) and product (2,29) indicators were included in the poor category.
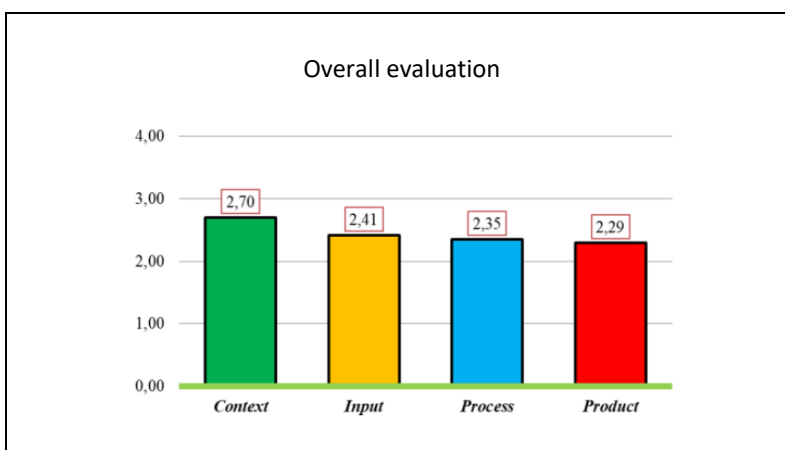

Figure 5. Diagram of Evaluation of Sports, Health and Physical Education Learning Program in Senior High School 1 Tanjungpandan

Context, Input, Process, Product (CIPP) Model Evaluation of the Sports, Health and Physical Education Learning Program at Senior High School 1 Tanjungpandan, Indonesia

IV. DISCUSSION

A. Context

The results of this study shows that the evaluation of the sports, health and physical education learning program in Senior High School 1 was good. Both philosophy (2,67) and purpose (2,73) of the learning program were in the good category. Ability of teacher in formulating learning objectives includes potential, knowledge, and skills to formulate the behavior or the abilities you want to achieve by students during the learning process. sports, health and physical education learning program should consider the growth rates and development of students' abilities, so that the learning process is effective and successful (Sayfei et al., 2020: 99).

B. Input

The input evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan shows that teachers profile indicator was good (2,78). The teachers were actively improve their skill in learning process through books and internet. Teachers ability and infrastucture supports were important in the sports, health and physical education learning program to achieve the learning objective that is important in the growth and development of the students.

The result of this study on input evaluation also shows that students profile in Senior High School 1 Tanjungpandan was poor. There were many students who do other activities during the sports, health and physical education learning process. This was seen from learning participation, involvement, willingness and activeness of students during the class. These result can be caused by the learning model that was implemented by the teacher. The attractiveness of learning model can lead to the improvement on students attention during the learning process. Characteristics of the students were also some aspects that could influence the student experiences on the effectiveness of the learning process (Aprianto, et al., 2020: 4).

Facilities and infrastructure indicators in sports, health and physical education learning program were poor (2,27). Availability of adequate facilities and infrastructure is very important to improve and develop the quality of learning process. The facilities and infrastructures used in learning process has to be in accordance with learning needs and learning objectives. All the components of learning process (teachers, students, school office) has to understand how to use and maintain all the facilities and infrastructures given for the learning program.

Overall, the input evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan were poor (2,41).

C. Process

Based on the result of this study, the evaluation of process in the sports, health and physical education learning program was poor. The learning plan indicator was 2,52 (good). It showed that there were some difficulties for teachers in planning the learning program. The difficulty in the preparation of the learning plan and teaching materials causes teachers to have difficulties to deliver the program effectively. These condition also impact the students, because there is a lot of learning material planned by the teacher cannot be well delivered to students.

The learning process indicator for the sports, health and physical education learning program was 2,17 (poor). This condition can be caused by the ineffective of learning methods. The effective learning process can be obtained by (1) know precisely the factors that can supports or beneficial in the teaching and learning process; (2) identify the problems that was expected and/or usually arise that will confound the teaching and learning process; (3) the implementation of various approaches or learning methods in a suitable condition.

The overall evaluation of process were poor can be caused by the failure of implementation of learning plan.

D. Product

Evaluation on the the sports, health and physical education learning program in Senior High School 1 Tanjungpandan based on product context shows that the evaluation of learning process (2,33) and evaluation of learning outcome (2,25) were poor (Figure 4). The evaluation of learning process can be made through students assessment that's includes a series of collection and processing of internal information regarding student learning outcome (Permendikbud No. 23 of 2016 Article 1: 1 –2). Educational assessment standard consisted of criteria regarding the scope, benefits, principles, mechanism, objectives, procedures and instruments assesment of students learning outcome. These standard were used to evaluate the learning outcomes for students in primary and secondary education levels.

The evaluation of learning outcomes was also poor (2,25). The indicator of successful learning program was the completion of learning outcomes/competencies. These competencies consisted of the students cognitive, affective, and psychomotor aspects. The application of good values in students thinking or attitude could also be the indicator of a successful learning program. The learning outcomes were important for the evaluation process and future improvement of the learning

program. It shows the students comprehension on the learning materials given by teacher during the learning process (Hapsari & Hanif, 2019: 12).

V. CONCLUSION

Based on the results of this study, we can conclude that the evaluation of sports, health and physical education learning program in Senior High School 1 Tanjungpandan, Belitung regency, Indonesia based on context, input, process and product was poor (2,44). Further explanation for that conditions are:

1. The context indicator was good (2,7): philosophy indicator was 2,67 (good) and learning objective indicator was 2,73 (good)
2. The input indicator was poor (2,41): teachers profile was 2,78 (good), students profile was 2,19 (poor), facilities and infrastructures were poor (2,27)
3. The process indicator was poor (2,35): learning plan was 2,52 (good), learning process was poor (2,17)
4. The product indicator was poor (2,29): evaluation of learning process was 2,33 (poor), evaluation of learning outcome was 2,25 (poor).

REFERENCES

1) Aprianto, I., Alhaddad, M. R., Fauzi, H., Gusvita, M., Sahroni, M. P. I., Nasution, F., & Sopian, A. 2020 Manajemen peserta didik. Penerbit Lakeisha.
2) Arikunto, S. 2019 Prosedur penelitian; suatu pendekatan praktik. (Edisi revisi) Jakarta: Rineka Cipta.
3) Erdogan, G. and Mede, E. 2021 The evaluation of an english preparatory program using CIPP model and exploring A1 Level Students' Motivational Beliefs. Journal of Education and Educational Development, 8(1).
4) Finney, T. L. 2020 Confirmative evaluation: new CIPP evaluation model. Journal of Modern Applied Statistical Methods, 18(2), 30.
5) Kitivo, E. M. and Kavulya, J. M. 2021. Evaluation of training programmes: a review of selected models and approaches. Practice, 4(1-4), 1-16.
6) Nurjanah, V. L., and Mulyana, N. 2019 Implementasi outdoor education terhadap motivasi belajar pendidikan jasmani. Journal of Physical Education and Sport Science, 1(3), 9-14.
7) Sugiyono. 2017 Metode penelitian pendidikan pendekatan kuantitatif, kualitatif, dan R&D. Bandung: Alfabeta.
8) Wright, P. M. and Richards, K. A. R. 2021 Teaching social and emotional learning in physical education. Jones & Bartlett Learning.

WHY PUBLISH WITH IJMRA?

1. WE PROVIDE FULL OPEN ACCESS.

2. DOI OF EACH PUBLISHED ARTICLE.

3. THE ARTICLE WILL BE UPLOADED AFTER PUBLICATION IN THE FOLLOWING INDEXING SERVICES: GOOGLE SCHOLAR, INDEX COPERNICUS, DRJI, CITE FACTOR, ISI, EURO PUB, ACADEMIA, ZENODO, SCRIBD ETC. (MANY MORE)

4. FAST RESPONSE, PEER REVIEW, AND FAST PUBLICATION.

5. GLOBAL INTERNATIONAL KNOWLEDGE SHARING.

6. A DIGITALLY SIGNED E-CERTIFICATE WILL BE PROVIDED TO THE AUTHOR FOR A PUBLISHED ARTICLE.

7. YEARLY SUBSCRIPTION

Feel free to contact us, if you need any queries to be answered

info@ijmra.in
editor@ijmra.in
board@ijmra.in

www.https://ijmra.in/   Email: editor@ijmra.in