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## Diversity of EPIFIT Orchid Types in the Mangrove Ecosystem in Ayari Village, Teluk Ampimoi Sub District, Yapen Islands District, Papua Province, Indonesia



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**ABSTRACT:** This research was conducted in Ayari village, Teluk Ampimoi sub District, Yapen Islands District for approximately two months or from November to October. The research objective was to determine the types of epiphytic orchids and their presence. The method used in this research is descriptive method with observation and documentation techniques. The results of this study found as many as 6 genera consisting of 16 species of epiphytic orchids, which grow on 3 types of mangroves. There are environmental factors that affect the distribution of mangroves that can have an indirect effect on orchids, namely: salinity, sunlight intensity and wind speed.

**KEYWORDS:** Epiphytic Orchid, Dendrobium, Mangrove, Ayari, Yapen Islands

### INTRODUCTION

Orchid is the general name for all types of plants in the *Orchidaceae* family (orchid family). This family is one of the largest groups among other flowering plants. The orchids are a family of flowering plants with the most members. Its species are widespread from the wet tropics to the circumpolar region, although most of its members are found in the tropics (Rosyadi, 2010).

It is estimated that around the world there are around 15,000-20,000 species of orchids with 900 genera (clans) which are endemic plants in forests spread over 750 countries. There are around 5,000 species of orchids in the world, of which there are in Indonesia (Agung, 2006). In Papua there are approximately 2,000 species of orchids, ranging from those that live on the beach to the high mountain slopes. The types, sizes, shapes and colors vary according to the habitat where they grow. *Dendrobium violaceum*, subspecies *violaceum* is an orchid that is widely found in New Guinea (the area includes Papua and Papua New Guinea), to be precise in mountain forests which reach an altitude of 2,000 meters above sea level (Agung, 2006). The spread of orchids in Papua varies greatly from the lowlands to the highlands. The spread of orchids in Papua varies greatly from the lowlands to the highlands. The distribution of orchids in the natural forest area of Kampung Sidey spreads at an altitude of 4-12 meters above ground level and 10-15 meters above sea level (Jumriani, 2006). Epiphytic orchids also grow and develop very well in the Cycloop Mountains Nature Reserve (Arobaya et al. 2022). According to their habitat, orchid plants are divided into four groups, namely: epiphytic orchids (living attached to the host tree without harming the host), lithophytes (growing on rocks), saprophytes (growing on humus and dry leaves) and terrestrial orchids (living on in soil).

Mangrove forests are a group of plant species that grow along tropical and sub-tropical coastlines that have a special function in an environment that contains salt and landforms in the form of beaches. Mangrove forest ecosystems are called brackish forest ecosystems because they are found in brackish areas, namely water areas with a salt content or salinity between 0.5 and 30, which are also called tidal ecosystems (Indriyanto, 2006). Mangrove ecosystems also dominate in several areas in the Ampimoi Bay District, Yapen Islands Regency. The total area of this regency is 19,994 km<sup>2</sup> or 4.6% of the land area of Papua province. According to the "Smitch and Ferguson" classification, this district is classified as a tropical climate or is called a wet tropical climate. It is characterized by high humidity, air temperature which changes every day throughout the year, and the rainy season which is influenced by the west, east and south seasons. This is what affects the diversity of flora and fauna including the diversity of orchid species in the Yapen Islands district, this condition certainly holds potential that needs to be explored. For this reason, the study of the biodiversity of orchid plants is the main concern in this research.

# Diversity of EPIFIT Orchid Types in the Mangrove Ecosystem in Ayari Village, Teluk Ampimoi Sub District, Yapen Islands District, Papua Province, Indonesia

## MATERIALS AND METHODS

Ayari Village is located in the Ampimoi Bay district in the Yapen Islands district geographically between 136°26'50.639" - 136°36'9.455" East Longitude and 1°47'36.808" - 1°53'57.157" South Latitude (Figure 1). The area of Ayari village is 20 km<sup>2</sup>, where 10,000 m<sup>2</sup> of the area of the village is the mangrove distribution area. This research was conducted for approximately two months in Ayari village, Ampimoi Bay District, Yapen Islands district. To support this research the tools and materials needed include: digital camera, salinometer, pH meter, herbarium equipment, identification key book, orchid plants and 70% alcohol. All types of epiphytic orchids in Ayari village are the population of this study, while the samples are epiphytic orchids found in the mangrove ecosystem. Data were collected by line transect technique and then analyzed descriptively qualitatively. To carry out this research, there are steps that must be taken, such as: conducting an initial survey at the research location, conducting interviews with the people of Ayari village, compiling a research proposal. The next step is to present the research proposal to receive inputs. The next stage is conducting research, collecting data through interviews, processing data and tabulating research results. The collected data were analyzed by descriptive analysis.



Figure 1. Map of epiphytic orchid research locations in Ayari village

## RESULTS AND DISCUSSION

Based on the results of research in the mangrove ecosystem area of Ayari village, 16 types of epiphytic orchids were found consisting of 6 genera, namely: *Acriopsis*, *Bulbophyllum*, *Dendrobium*, *Diplocaulobium*, *Flickingeria*, *Grammatophyllum*, and 16 species namely: *Acriopsis javanica* Reinw ex Blume., *Bulbophyllum* sp1, *Bulbophyllum* sp2, *Dendrobium antennatum* Lindl., *Dendrobium cancroides* T.E.Hunt., *Dendrobium insigne* (Blume) Rchb.f., *Dendrobium smillieae* F.Muell., *Dendrobium* sp1, *Dendrobium* sp2, *Dendrobium* sp3., *Dendrobium* sp4., *Dendrobium* sp5., *Diplocaulobium* sp, *Flickingeria comate*, *grammatophyllum papuanum* J.J.Sm., Types of epiphytic orchids with their host trees as follows (Table 1).

**Diversity of EPIFIT Orchid Types in the Mangrove Ecosystem in Ayari Village, Teluk Ampimoi Sub District, Yapen Islands District, Papua Province, Indonesia**

**Table 1. Types of epiphytic orchids in the mangrove forest of Ayari Village, Teluk Ampimoi District, Yapen Islands Regency**

Numb.	Genus	Species	Host tree
1.	<i>Aeriopsis</i>	<i>Acriopsis javanica</i> Reinw ex Blume	<i>Rhizophora</i> sp.
2.	<i>Bulbophyllum</i>	<i>Bulbophyllum</i> sp1 <i>Bulbophyllum</i> sp2	<i>Bruguiera</i> sp. <i>Bruguiera</i> sp.
3.	<i>Dendrobium</i>	<i>Dendrobium antennatum</i> Lindl <i>Dendrobium bifalce</i> Lind <i>Dendrobium cancroides</i> T.E.Hunt <i>Dendrobium insigne</i> Blume <i>Dendrobium smilieae</i> F.Muel <i>Dendrobium</i> sp.1 <i>Dendrobium</i> sp.2 <i>Dendrobium</i> sp.3 <i>Dendrobium</i> sp.4 <i>Dendrobium</i> sp.5	<i>Sonneratia</i> sp. <i>Bruguiera</i> sp. <i>Rhizophora</i> sp. <i>Bruguiera</i> sp. <i>Sonneratia</i> sp. <i>Sonneratia</i> sp. <i>Rhizophora</i> sp. <i>Bruguiera</i> sp. <i>Bruguiera</i> sp. <i>Bruguiera</i> sp.
4.	<i>Diplocaulobium</i>	<i>Diplocaulobium</i> sp.	<i>Bruguiera</i> sp.
5.	<i>Flickingeria</i>	<i>Flickingeria comata</i>	<i>Sonneratia</i> sp.
6.	<i>Grammatophyllum</i>	<i>Grammatophyllum papuanum</i> J.J.sm	<i>Sonneratia</i> sp.

Based on (Table 1) it can be seen that the most common types of orchids found in the ecosystem of Kampung Ayari are the *Dendrobium* genus, followed by *Bulbophyllum*, *Acriopsis*, *Diplocaulobium*, *Flickingeria*, *Gammatophyllum*. Orchid biodiversity in the islands of Papua province also shows differences. As many as 25 types of orchids belonging to 11 genera have been identified from SPTN III Wasur (Kusumastuti et al. 2021). The results of another study that was conducted on the potential of epiphytic orchids in the mangrove forest of the Sorendiwari Strait, Supiori district found only 1 family, 10 genera and 17 species (Wanma et al., 2022). The study in the study explained that 30 morphological characters of *Dendrobium* had been studied. There were 23 of the 30 morphological characters identified (76.67%) which showed various characters in flowers, leaves and roots (Hartati et al. 2022). Other research explains that three types of natural orchids in the KEHATI AQUA Wonosobo Park, namely *Dendrobium crumenatum*, *Eria retusa*, and *Liparis* sp can be cultivated. Overall the number of orchids found was 487 individuals. These three types of orchids are epiphytic orchids which are found in 6 types of host trees for species protection and conservation (Dapala et al. 2022). Communities in Oksibil also collect several types of epiphytic orchids for specific purposes (Agustini et al, 2012).

It is also known that the host trees most commonly grown by epiphytic orchids are *Bruguiera* sp, *Sonneratia* sp, and *Rhizophora* sp. The association of orchid root forms has distinct morphological characteristics. It is suspected that this is related to the morphological characters of the orchid in which the form of association shows a difference in mycorrhiza that is similar to *Rhizoctonia* and others in adjacent locations. Observations of mycorrhizae are similar to *Rhizoctonia*, especially the rough texture of the skin so that epiphytic orchids can easily attach their roots (Soelistijono et al. 2020). In addition, the shape of the branches, the shape of the leaves that are wide enough and the crowns that are dense enough make this species able to create a microclimate that suits the needs of epiphytic orchids.

The mangroves found at the study site from the shoreline towards the land, namely: *Avicennia* sp, *Sonneratia* sp, *Rhizophora* sp, *Bruguiera* sp and the transition zone between mangrove forests and lowland forests are several types of palms. The distribution of mangrove species is influenced by the level of salinity (Kusmana et al, 2003) areas with high salinity (small amount of fresh water entering from land) are grown by mangrove species *Avicennia* sp. For areas that get an abundant supply of fresh water from land (so that the salinity tends to be low), the mangrove species *Bruguiera* sp. The water salinity in the location of Ayari village, Ampimoi Bay District, Yapen Islands Regency is 10-30. So salinity can affect the distribution of orchids in mangroves, although indirectly (Kusamana, 2003). The results of measurements in the field explained that *Avicennia* sp. found on the beach with a salinity between 10-30 ppt, with sandy coral and sandy plate types. It is a pioneer plant on protected coastal lands, has the ability to occupy and grow in a variety of tidal habitats even in salty areas. This species is one of the most common plant species found in tidal habitats. The roots help bind sediment and speed up the process of forming raised soil.

*Sonneratia* sp., is associated with *Avicennia* sp., but this species is more landward (center) with a salinity of 10-30 ppt, sandy coral soil type, sandy slab. Pioneer species are intolerant of fresh water over long periods. Often found in coastal locations that are protected from waves, also in river mouths. *Rhizophora* sp. along the river with a salinity of 0-10 ppt, sandy to loamy soil

## Diversity of EPIFIT Orchid Types in the Mangrove Ecosystem in Ayari Village, Teluk Ampimoi Sub District, Yapen Islands District, Papua Province, Indonesia

types. Research conducted in Kamora, Mimika Regency showed that the mud substrate was very good for the growth of *Rhizophora* (Setyadi et al. 2021). The type of substrate is very suitable and in accordance with the types of mangroves in Ayari village. It grows in diverse habitats in tidal areas, favoring tidal river banks, but not as a pioneer species in coastal environments or on the inland part of mangroves. *Bruguiera sp.* found in the interior of mangrove forests with a salinity of 0-10 ppt, soil types are dusty, dusty clay to clay. It grows along waterways, on a variety of substrate types that are not frequently flooded. Tolerant of saltwater, brackish and fresh water conditions.

### CONCLUSION

The most common type of orchid found was *Dendrobium sp* with its host trees *Sonnerathia sp*, *Bruguiera sp*, and *Rhizophora sp*. The environmental factor that greatly influences the distribution of epiphytic orchids is salinity.

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### REFERENCES

- 1) Agung.2006. Cara tepat merawat anggrek. Agromedia Pustaka. Jakarta
- 2) Agustini V, Sufaati S, Suharno., 2012. Keragaman jenis anggrek di Kawasan hutan distrik Oksibil, Pegunungan Bintang, Papua. Jurnal Biologi Papua. Volume 4 (1):32-37.
- 3) Arobaya AYS, Zuhud EAM, Siregar IZ, Irawati. 2022. Short Communication: Diversity and distribution of epiphytic orchid *Dendrobium* section *Spatulata* on the host plants in the Cycloop Mountain Nature Reserve of Papua, Indonesia. Biodiversitas 23: 2025- 2034. <https://doi.org/10.13057/biodiv/d230438>
- 4) Dapala O, Suwadi S, Nugraha NS., 2022. Natural orchid diversity and its conservation strategies in Wonosobo Aqua Biodiversity Park. Advances in Tropical Biodiversity and Environmental Sciences.Vol 6 (2):62-66. [84654-1585-295185-1-10-20220730\(2\).pdf](https://doi.org/10.20220730(2).pdf)
- 5) Hartati S, Samanhuji, Cahyono O., 2022. Short communication: Morphological characterization of five species of *dendrobium* native to Indonesia for parent selection. Biodiversitas. Volume 23, Number 5: 2648-2654. DOI: [84654-1585-295185-1-10-20220730\(2\).pdf](https://doi.org/10.20220730(2).pdf)
- 6) Hiola SF, Dirawan GD, Wiharto M., 2015. Orchids conservation by community in round Mallawa resort areas at Bantimurung Bulusaraung National Park, South Sulawesi, Indonesia. International Journal of Science and Research (IJSR). Volume 6 (9):328-330. DOI 10.1088/1757-899X/551/1/012132
- 7) Jumriani. 2006. Jenis-jenis anggrek epifit pada kawasan hutan alam kampung Sidey Distrik Sidey kabupaten Manokwari. UNIPA. Manokwari
- 8) Kusumastuti N, Suratman, Pitoyo A., 2021. Orchids diversity on six forest types in Wasur National Park, Merauke, Papua, Indonesia. Biodiversitas. Volume 5, Number 2: 101-110. [View of Orchids diversity on six forest types in Wasur National Park, Merauke, Papua, Indonesia \(smujo.id\)](https://doi.org/10.20220730(2).pdf)
- 9) Rosyadi, 2010. Ciri khusus anggrek. [www.matematikacerdas.wordpress.com](http://www.matematikacerdas.wordpress.com). Diunduh 15 Agustus 2010
- 10) Setyadi G, Sugianto DN, Wijayanti DP, Pribadi R, Supardy E., Sediment accretion and total organic carbon accumulation among different mangrove vegetation communities in the Kamora estuary of Mimika Regency, Papua, Indonesia. Journal of Ecological Engineering. Volume 22 (11): 142-156. <https://doi.org/10.13057/biodiv/d221004>
- 11) Soelistijono R, Utami DS, Daryanti, Faizin M, Dian R., 2020. Short communication: Characterization of Rhizoctonia-like mycorrhizae associated with five *dendrobium* species in Java, Indonesia. Biodiversitas. Volume 21, Number 3:1007-1011. <https://doi.org/10.13057/biodiv/d210321>
- 12) Wanma AO, Penasifu AA, Wanggai J., 2022. Potensi dan keanekaragaman anggrek epifit di hutan mangrove Selat Sorendiwari, Kabupaten Supiori, Provinsi Papua. Bio Lectura: Jurnal Pendidikan Biologi. Vol 9, No:2; 255-264. DOI: 10.31849/bl.v9i2.11640



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## The Effect of the Project Based Learning Model with the Case Method and Nutritional Status on Physical Fitness of Learners Class Vii Smpn 21 Padang



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**ABSTRACT:** The purpose of this study was to determine the effect of learning models and nutritional status on the physical fitness of grade VII students of SMPN 21 Padang. This research model is a pseudo-experiment designed by Factorial by Level 2x2. The population of this study amounted to 119 people and a sample of 60 people with the Purposive Random Sampling technique. Collection of Nutritional Status data by tests using Body Mass Index (BMI) and Physical Fitness using the Indonesian Physical Fitness Test (TKJI) Age 13-15 years. Data were analyzed using two-path ANAVA at significance level  $\alpha=0.05$ . Furthermore, because no interaction was found between the learning model and physical fitness, the Tukey Test was not carried out. The results of the data analysis showed: (1) Overall there was no difference in the learning outcomes of the PjBL learning model with the Case Method learning model, (2) There was no interaction between the learning model and nutritional status on physical fitness, (3) Physical fitness of students treatment of PjBL learning model is better than Case Method learning model in high nutritional status group, (4) Physical fitness of students treatment of PjBL learning model is better than Case Method learning model in low motor group.

**KEYWORDS:** Learning Model, PjBL Learning Model, Case Method Learning Model, Nutritional Status, Physical Fitness

### I. INTRODUCTION

The development and progress of a nation is closely related to the problem of education. Education is not only seen as a medium in conveying knowledge from one generation to the next, but a medium that is expected to bring changes in the development of the nation's life. Education also makes a person learn to form character. Learning activities are the most basic activities in the entire educational process at school. This means that the success or failure of achieving educational goals depends a lot on how the achievement of the educational taxonomy experienced by students which includes cognitive, affective and psychomotor aspects (Douda et al., 2008; Mkaouer et al., 2018; J. Pion et al., 2015). Education is the responsibility of many parties, including parents, schools, communities, and the State (Aziizu, 2015; Kusuma, 2018)

The role of education is essential to create an intelligent, peaceful, open, and democratic society. Education reform must always be carried out to improve the quality of education of a nation Improving the quality of education is one of the quality of education development strategies in Indonesia. These efforts have a strategic role in the framework of the development of the Indonesian nation as a whole, because it involves the storage of human resources (HR) as implementers of development in the future (Das & Sarkar, 2020; Johan Pion et al., 2017).

National education strives to develop various potentials of students in order to have intelligence, personality, religious spiritual strength, self-control, noble morals and skills needed for themselves, society, and the nation. Good and quality schools are certainly the dream of all Indonesian people today. The importance of continuously refreshing the education system in order to produce the best children of the country who have potential, imaginative, creative, abilities, capacities, talents that develop and nurture in all daily problems, intellectually and truly admirably (Ávalos-Ramos & Vega-Ramírez, 2020; Hussein et al., 2022; Sukamti & Pranatahadi, 2019) The purpose of National Education is a formulation of the quality of modern humans that must be developed by each educational unit (Damanhuri et al., 2016; Nafisah, 2016; Risdiany & Dewi, 2021).

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To realize a quality national standard of education and master the times, it is not something simple, not so natural as turning hands, an order that can encourage national education. Education is an addition of skills or development of knowledge and understanding as a result of practice, study or experience (Hasan et al., 2022; Hassan et al., 2015).

Sports and Health Physical Education (PJOK) is one aspect that is needed by students in realizing the goals of national education to shape attitudes, behavior, discipline, honesty, cooperation and improve physical fitness and health as well as body resistance to disease (Andriadi & Saputra, 2021; Kurniawan, 2018; Septiana et al., 2022).

Looking at the legal umbrella regarding Physical Education, Sports and Health in accordance with Sports Law No. 11 of 2022 Chapter V Article 17 paragraph 11 concerning Sports Education, it is said that: "Sports education as referred to in Article 17 letter a is organized to instill character values and acquire the knowledge, skills, and attitudes needed to build a healthy, active lifestyle throughout life".

This is in line with one of the goals of physical education and sports where students are expected to have a healthy and fit body. Therefore, the educational process carried out in schools must refer to the purpose of education itself. The purpose of National Education is written in Law No. 20 of 2003 Article 1 paragraph 2 based on Pancasila and the Constitution of the Republic of Indonesia Year 1945.

The meaning of education is also stated in Law No. 20 of 2003 article 1 paragraph 1 which states:

"Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state". Then the Functions and Objectives of National Education are contained in article 3 of Law No. 20 of 2003 which reads:

"National education functions to develop the ability and shape the character and civilization of a dignified nation in order to educate the nation's life, aims to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens."

Physical Education, Sports and Health (PJOK) subjects taught in schools are expected to contribute to achieving national education goals. The current curriculum is formulated the purpose of physical education, which is to help students improve the degree of physical fitness, movement skills, and health through the introduction and cultivation of positive attitudes, maturation of mental attitudes implemented in various physical activities. Sports and Health Physical Education as a forum for improving personality and a means of developing attitudes, personalities, and behaviors lays a strong foundation of moral values through the values it contains such as sportsmanship, honesty, discipline, responsibility, cooperation, confidence, and democracy (Pardiansyah, 2015; Roji, 2022; Tao et al., 2020).

Sports and Health Physical Education (PJOK) is an educational tool, or what is referred to as one of the educational media that in the process can realize the goals of education as well as culture (Mashud, 2019; Rahmadi & Irianto, 2020). The provision of this learning experience is directed to foster good physical growth and psychological development, as well as form a healthy and fit lifestyle (McMillan & Hearn, 2015; Sari, 2016; Wahyuningsih, 2017).

Physical Education, Sports and Health (PJOK) is education that is carried out systematically through body activities. In essence, Sports and Health Physical Education is an educational process that is carried out consciously through intensive Sports and Health Physical Education activities and lifelong coaching which has a very important role (Mustafa, 2021; Wajdi & Jamaluddin, 2019). Where students are given the opportunity to be directly involved in the learning experience through physical activities, play and exercise which are carried out systematically in order to increase the potential that exists in students, and can increase interest in following Sports and Health Physical Education lessons. Physical education in schools has significance for education as a whole. The existence of physical education in schools not only improves children's health and physical fitness but provides experience in the cognitive, affective and psychomotor fields for children (Ibrahim, 2017; Linda, 2016; Taras, 2010).

Sports and Health Physical Education (PJOK) according to a special learning environment characterized by many conditions and stimuli that are specifically designed also with the intention of providing opportunities for good influences on physical, emotional, social, intellectual, so as to bring changes in students in the desired direction. Thus, PJOK subjects are one of the compulsory subjects taught to students in schools, which aims to help students to strengthen physical fitness and health through the introduction and cultivation of positive attitudes, as well as the ability to move basic various physical activities (Arya, 2016; Hakiem, 2015; Rolheiser & Ross, 2015).

Learning Outcomes of Physical Education, Sports and Health (PJOK) Subjects for Junior High School grade VII are equivalent to phase D. At the end of phase D, learners can demonstrate the ability to practice specific movement skills as a result of correct knowledge analysis, perform physical activity and fitness exercises for health in accordance with exercise principles,

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demonstrate personal and social responsibility behavior and monitor them independently, in addition, it can also maintain the values of physical activity (Head of the Education Standard, Curriculum, and Assessment Agency, 2022).

To achieve the physical education objectives mentioned above, teachers are the main technical implementing elements who are in charge and responsible for carrying out learning process activities in schools. This is intended so that learning activities run as they should, teachers are required and expected to try their best to develop learning strategies and models and improve the cognitive, affective and psychomotor abilities of students. The success of Sports and Health Physical Education learning in order to achieve the expected goals is strongly influenced by several factors including learning planning, learning implementation, learning evaluation, student learning motivation, learning models used, socio-economic and facilities and infrastructure (Indrawathi et al., 2021; Mutawakkil, 2017; Nasution & Syaleh, 2021).

Sports and Health Physical Education (PJOK) learning planning is a process of preparing alternatives to overcome problems carried out in order to achieve national education development goals by considering the realities that exist in the social, economic, cultural, and overall development needs of national education (Hidasari & Bafadal, 2020; Petukhov et al., 2022).

From the outline, the implementation of learning includes three main activities, namely learning preparation or planning, the learning process and learning evaluation. Some principles in developing or compiling Learning Implementation Plans (RPP), namely: (1) Elaboration of curriculum ideas; (2) RPP development; (3) encourage active participation of learners; (4) develop a culture of reading, writing, arithmetic; (5) provide feedback and follow-up; (6) linkage and cohesiveness; and (7) apply information and communication technology. (Ngalimun, 2016; Ryanto, 2017; Salman & Darsi, 2020).

Learning is an activity carried out by teachers in such a way that the behavior of students changes for the better. Of course, in carrying out activities and efforts to achieve goals, there needs to be a driver to foster the interest and motivation of students carried out by teachers. Teachers play a role in providing educational services in accordance with educational objectives so that they can explore the abilities of students with good results. Teachers as facilitators and responsible by establishing the best environment (Ardanari et al., 2020; Cairney et al., 2019; Mirawati & Rahmawati, 2017).

In the learning process all depends on what learning objectives are to be achieved, what model is used in the learning process. The Sports and Health Physical Education (PJOK) teacher provides examples through the movements given, then students develop the movements that have been given by the teacher. In other words, learning is centered on students to be more active in learning and moving to follow learning, especially learning Physical Education, Sports and Health. The ultimate goal of learning Sports and Health Physical Education (PJOK) is the result of movements or skills that can be carried out by students through a process that has been determined by the Sports and Health Physical Education teacher itself.

Psychomotor is the main goal, but it does not mean that other aspects of education are ignored such as the cognitive aspects and affective aspects of the learners. On the contrary, other aspects are also seen in the learning process, how there students play an important role in the success of following the learning presented by Physical Education, Sports and Health teachers. In addition, the learning model used by Sports and Health Physical Education (PJOK) teachers must be in accordance with the characteristics of students.

Through the learning model set by the teacher and needed by students, as well as teacher skills to provide explanations both verbally and nonverbally, it is hoped that the learning objectives of Sports and Health Physical Education (PJOK) can be implemented properly. In the 2013 curriculum, there are several learning models that can support teaching and learning activities, Physical Education, Sports and Health in schools. This is based on Permendikbud No. 103 of 2014 which has a vision so that students can develop and have scientific character, curiosity and social behavior.

Some of the models that are the mainstay of the 2013 curriculum (K13) are the Project Based Learning Model (Project Based Learning), Problem Based Learning Model (Problem Based Learning), and case method model. But now the government has issued an independent learning curriculum. Curriculum Merdeka is a curriculum with diverse intracurricular learning where the content is more optimal so that students have enough time to explore concepts and strengthen competencies. Teachers are more free to choose various teaching devices so that learning can be adjusted to the learning needs and interests of students (Alaswati et al., 2016; Irianto, 2019).

Based on observations and interviews conducted by researchers on PJOK teachers at SMPN 21 Padang, that when students returned to carrying out normal face-to-face learning at school, there were some students who were lazy to move to follow the series of physical activities given during the learning process, especially during PJOK learning in the classroom. One of the PJOK teachers of SMPN 21 Padang, Mr. Yuda, said, "Children have dropped their grades, their physique (physical fitness) is also easily tired, maybe because of this corona online effect. We are also confused about which model is good to use today." Based on the above problems, it is necessary to conduct research on the effect of the Project Based Learning (PjBL) learning model with the Case Method model on the physical fitness of grade VII students of SMPN 21 Padang.



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## II. MATERIAL AND METHODS

The research method used is quasi-experimental. Quasi-experimental research is a study that moves to find the influence between certain variables on other variables whose presence of these variables is triggered regarding a tightly controlled situation with the aim of finding a causal relationship between the two variables. The research design used is Posttest-only control design. Nutritional Status data collection by tests using Body Mass Index (BMI) and Physical Fitness using the Indonesian Physical Fitness Test (TKJI) Ages 13-15 years. Data were analyzed using two-path ANAVA at significance level  $\alpha=0.05$ . Furthermore, because no interaction was found between the learning model and physical fitness, the Tukey Test was not carried out.

### Data Analysis Techniques

The data obtained from the results of collecting analytical data are gradually in accordance with the research objectives. To analyze the data in this study is with the design of Factorial by Level 2 x 2, if an interaction is found between the learning model and nutritional status, it will be continued with the Tukey Test. Before the data is processed using the Anava Analysis technique, Anava requirements are first tested, namely the Normality test and the Homogeneity test of variance with a significant level of  $\alpha=0.05$ , while the Anava requirements test is:

#### 1. Normality Test

The normal distribution test is a test to determine whether our data has a normal distribution so that it can be used in parametric statistics (inferential statistics). The usual way to calculate this problem is  $L_{table}$ . A data is said to be normal if the calculation obtained is  $<$  when compared to the  $L_{table}$

#### 2. Homogeneity Test

Homogeneity testing is the testing of whether or not there are variances of two or more distributions. The variance homogeneity test is very necessary before we compare two or more groups, so that the differences are not caused by differences in basic data (the inhomogeneity of the groups being compared).

## III. RESULTS AND DISCUSSION

### Result

#### A. Data Description

The object of this study is the difference in Physical Fitness results as a result of treatment between the PjBL learning model and the Case Method model treatment associated with Physical Fitness. Based on research design by level 2x2 using two-track ANAVA.

The research data were grouped into: (1) Physical Fitness results treated with PjBL learning model (2) Physical Fitness results treated with Case Method learning model, (3) Physical Fitness results that have high nutritional status, (4) Physical Fitness results that have low nutritional status, (5) Physical Fitness results given PjBL learning model and have high nutritional status, (6) Physical Fitness results given by the PjBL learning model and have low nutritional status, (7) Physical Fitness results given the Case Method learning model and have high nutritional status, (8) Physical Fitness results given the Case Method learning model and have low nutritional status.

#### 1. Physical Fitness Results of PjBL Learning Model Treatment Group

Based on the results of data analysis on Physical Fitness results from the scores achieved in the group treated with the PjBL learning model the lowest score was 8, the highest score was 22, the average score was 12.47, and the standard deviation was 3.19. Presentation of data through frequency distribution tables with many classes 6 and intervals of class 3,

#### 2. Physical Fitness Results Case Method Learning Model Treatment

Based on the results of data analysis on Physical Fitness from the scores achieved in the group treated with the Case Method learning model as many as 30 samples, the lowest score 9, the highest score 17, the average score 12.47, and standard deviation 2.31. Presentation of data through frequency distribution tables with many class 6 and class 3 intervals.

#### 3. Physical Fitness Results with High Nutritional Status

Based on the results of data analysis on Physical Fitness from the scores achieved in the group that has the ability of High Nutritional Status as many as 30 samples, the lowest score 8, the highest score 22, the average score 12.47, and standard deviation 3.18. Presentation of data through frequency distribution tables with many class 6 and class 3 intervals.

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## 4. Physical Fitness Results of Low Nutritional Status Group (B2)

Based on the results of data analysis on Physical Fitness results from scores achieved in groups that have Low Nutritional Status as many as 30 samples, the lowest score 9, the highest score 17, the average score 12.47, and standard deviation 2.31. Presentation of data through frequency distribution tables with many class 6 and class 3 intervals

## 5. Physical Fitness Results of PjBL Model Group with High Nutritional Status

Based on the results of data analysis on Physical Fitness from the scores achieved in the PjBL model treatment group which had High Nutritional Status as many as 15 samples, the lowest score 8, the highest score 22, the average score 12.87.75, and standard deviation 4.01. Presentation of data through frequency distribution tables with many class 5 and class 3 intervals

## 6. Physical Fitness Results of PjBL Model Group with Low Nutritional Status

Based on the results of data analysis on Physical Fitness from the scores achieved in the PjBL model treatment group which had low nutritional status as many as 15 samples, the lowest score 9, the highest score 17, the average score 12.07, and standard deviation 2.24. Presentation of data through frequency distribution tables with many class 5 and class 3 intervals

## 7. Physical Fitness Results of Case Method Model Group that Has High Nutritional Status

Based on the results of data analysis on Physical Fitness from the scores achieved in the Case Method model treatment group which had a High Nutritional Status of 15, the lowest score of 9, the highest score of 16, an average score of 12.07, and a standard deviation of 2.2.1. Presentation of data through frequency distribution tables with many class 5 and class 3 intervals

## 8. Physical Fitness Results of Case Method Model Group with Low Nutritional Status

Based on the results of data analysis on Physical Fitness from the scores achieved in the Case Method model treatment group which had a low Nutritional Status of 15 samples, the lowest score of 9, the highest score of 17, the average score of 12.87, and the standard deviation of 2.33. Presentation of data through frequency distribution tables with many classes 5 and intervals of class 3.

## B. Test Analysis Requirements

The inferential analysis used in this study is the Analysis of Two-Road Variance with Interaction (ANAVA). Then proceed with the test of the difference in the average value of the two treatment groups. For this form of analysis, several requirements are needed regarding the data to be analyzed. Those requirements include randomness of sample data, data coming from normally distributed populations, and data from treatment groups coming from homogeneous populations. The randomness test of sample data is based on the assumption that the sample subjects in each treatment group are randomly selected from the study population. Fulfillment of the requirement that the sample data come from a normal distribution population is carried out through testing the normality of the data using the Levene test. Fulfillment of the homogeneous population variance requirement for the entire treatment group was carried out using the Bartlett test at a significance level of  $\alpha=0.05$ .

### 1. Normality Test

Data normality testing in this study was carried out on eight groups of data, namely: 1) Physical Fitness results given PjBL learning model treatment (2) Physical Fitness results given Case Method learning model treatment, (3) Physical Fitness results that have high nutritional status, (4) Physical Fitness results that have low Physical Fitness motor ability, (5) Physical Fitness results given the PjBL learning model and have high nutritional status, (6) Physical Fitness results given by the PjBL learning model and have low nutritional status, (7) Physical Fitness results given the Case Method learning model and have high nutritional status, (8) Physical Fitness results given the Case Method learning model and have low nutritional status. In the test, the real level of  $\alpha = 0.05$  was used. A summary of the calculation results is shown in the table below:

**Table 1. Two Way Anova Normality Test Results Research Data Distribution**

Tests of Normality							
	KELAS	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual for SQRT_TKJ	A1	.204	30	.033	.910	30	.115
	A2	.159	30	.050	.939	30	.084
	B1	.142	30	.127	.934	30	.062
	B2	.195	30	.055	.922	30	.051
a. Lilliefors Significance Correction							

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Tests of Normality							
	KEL	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
HASIL	KELAS A1B1	.252	15	.051	.868	15	.081
	KELAS A1B2	.151	15	.200*	.935	15	.320
	KELAS A2B1	.211	15	.071	.923	15	.214
	KELAS A2B2	.240	15	.020	.917	15	.176

\*. This is a lower bound of the true significance.  
a. Lilliefors Significance Correction

Based on the table above, it shows that all data groups tested for normality with the Shapiro-Wilk test give a Sig. value that is greater than a Ltable value of 0.05. Thus it was concluded that all data groups in this study were normally distributed.

## 2. Test Homogeneity of Variance

The homogeneity test in this study using Levene's test was carried out on (a) two treatment groups A1 and A2, (b) two attribute groups B1 and B2 and (c) four groups of cells in the experimental design A1B1, A1B2, A2B1, A2B2. Testing the homogeneity of variance through the Sig. approach with testing criteria accept H0 if Sig. > 0.05 which means homogeneous variance and H0 rejected if Sig. < 0.05 which means inhomogeneous variance. Tested at confidence level  $\alpha = 0.05$ . The results of the calculation and test of the significant variance of each group of data can be summarized in the table below:

**Table 2. Two Way Anova Homogeneity Test Results Research Data**

### Levene's Test of Equality of Error Variances<sup>a</sup>

Dependent Variable: Physical Fitness

F	df1	df2	Sig.
2.365	3	56	.081

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.<sup>a</sup>

a. Design: Intercept + Model + SG + Model \* SG

A. Based on the table above, the homogeneity test result with the test criteria is H0 Sig. 0.081 > 0.05 which means homogeneous variance with significance  $\alpha = 0.05$ . Thus it can be concluded that all four data groups are Homogeneous.

## C. Hypothesis Testing

Hypothesis testing using a two-track Analysis of Variance (ANOVA) using SPSS. Furthermore, if there is an interaction between the learning model and nutritional status on physical fitness of SMP Negeri 21 Padang. Two-path variance analysis is a calculation technique that aims to investigate two influences, namely the main effect and the interaction effect. The main influence is the influence of differences in the PjBL learning model and the Case Method learning model, as well as the influence of differences in Nutritional Status in the form of high Nutritional Status and low Nutritional Status on physical fitness, while the interaction is the influence between the learning model and Nutritional Status on Physical Fitness. Before calculating the two-path ANAVA, the required values are first calculated, namely normality and homogeneity of the data. Furthermore, two-lane ANAVA is calculated using SPSS. The results of the two-line ANAVA calculation using SPSS can be briefly seen in the following table:

**Table 3. Summary of Two-Line ANAVA calculation results**

### Tests of Between-Subjects Effects

Dependent Variable: Kebugaran Jasmani

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	9.200 <sup>a</sup>	3	3.067	.395	.757
Intercept	8930.400	1	8930.400	1151.249	.000
Model	3.267	1	3.267	.421	.519
SG	4.267	1	4.267	.550	.461
Model * SG	1.667	1	1.667	.215	.645
Error	434.400	56	7.757		
Total	9374.000	60			
Corrected Total	443.600	59			

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Based on the calculation results presented in the two-track ANAVA table above, it can be argued that in making decisions, the basis for two-track ANAVA is:

- 1) If the Sig. value  $< 0.05$ , then there is a difference in physical fitness results based on factor variables.
- 2) If the value of Sig.  $> 0.05$ , then there is no difference in physical fitness results based on factor variables.

To answer the research hypothesis, you must look at the value of Sig. which is compared to 0.05.

- a) Sig.  $0.421 > 0.05$  were obtained, so it can be concluded that "there is no difference in the results of Physical Fitness of students based on the learning model provided".
- b) Sig.  $0.55 > 0.05$  were obtained, so that it can be concluded that "there is no difference in the results of Physical Fitness of students based on nutritional status".
- c) Sig.  $0.215 > 0.05$  were obtained, so it can be concluded that "there is no significant interaction between the learning model and nutritional status in determining the results of students' Physical Fitness".

With the proof of the research hypothesis that states that there is no significant interaction between the PjBL learning model and the Case Method learning model with Nutritional Status on Physical Fitness, no further tests were carried out with the Tukey Test. Based on the two-track ANAVA test using SPSS, it showed that there was no interaction between the learning model and Nutritional Status so that Tukey Further Test was not carried out. This is in accordance with what is said Ahmaddien & Syarkani, (2020) that if the interaction of both factors is insignificant (accepting the null hypothesis), it means that there is no need to carry out further analytical actions.

### **DISCUSSION**

#### **1. Overall, there is no difference between physical fitness of the PjBL Learning Model and the Case Method Learning Model**

The results of the first hypothesis testing showed that the overall average physical fitness score in the PjBL learning model group was the same as the Case Method learning model group. In the PjBL learning model group, the results are not much different, which means there is no significant difference from the Case Method learning model. Thus, it can be clearly said that these two learning models both have the same influence on physical fitness.

The advantages of applying these two learning models greatly determine the success of a given learning. The learning model consists of the PjBL learning model and the Case Method model are two ways of delivery in the learning process given to obtain physical fitness in physical education, sports and health subjects. The Project Based Learning (PjBL) learning model is a way of implementing learning activities through a project carried out by students in groups. Thus, learners are directly involved in learning activities. Alnedral, (2016) Learning activities that use the Project Based Learning approach in learning activities require students to work independently or in groups in constructing real products. So that students carry out learning activities actively and can practice skills in learning Physical Education, Sports and Health. Through Project Based Learning learning can improve the learning experience of students, this is said because students are given a real problem in the form of a learning topic then asked to find solutions and do it in the form of group activities to complete a project. The learning process of the PjBL model basically requires active students to search for material independently. Learning through an activity or project becomes a key strategy for creating independent thinkers and learners. So that the application of PjBL brings many undoubted benefits to students and teachers.

Based on the explanation and results of the study, both the PjBL learning model and the Case Method score results show that they both have an influence on physical fitness. Thus, it is clear, in the results of this study there is no difference in influence between the group given the PjBL learning model and the Case Method learning model on the physical fitness of students.

#### **2. There is No Interaction between Learning Model and Nutritional Status on Physical Fitness**

Based on the results of the hypothesis test, data results were obtained Sig.  $0.215 > 0.05$ . This proves that the proposed research hypothesis does not have an interaction between the learning model and nutritional status on the physical fitness of students.

It can be seen that in the treatment of the PjBL learning model, the Case Method learning model which is in the high nutritional status group and the treatment with the PjBL learning model, the Case Method learning model which is in the low nutritional status group both have no interaction. Thus, it states that there is no influence of interaction between learning models and nutritional status on the learning outcomes of Physical Education, Sports and Health. The learning model given as treatment in this study consists of two models given, namely the PjBL learning model and the Case method learning model. Learning models have a good impact on children's success in achieving learning goals with nutritional status support. This means that nutrition is the initial potential that must be possessed by every individual as a supporter of physical activity. Every individual has a body that must be supplied with good nutrition, and to be able to utilize the nutrition of students, in order to be

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successful in learning PJOK learning materials provided by teachers using both the PjBL learning model and the Case method learning model.

Zarwan & Edwarsyah, (2019), "Nutritional status is the state of health of individuals or groups developed by the degree of physical need for energy and other nutrients obtained from food and food whose physical impact is anthropometrically". Nutritional status is a measure of success in fulfilling nutrition for children indicated by the child's weight and height (Irnani & Sinaga, 2017; Septikasari, 2018).

Based on the explanation above, it shows that to get physical fitness to be achieved based on learning objectives, in the implementation of learning, especially Sports and Health Physical Education, not only apply one learning model, you should combine several learning models to produce effectiveness in the teaching and learning process so that you can obtain the desired physical fitness.

### **3. Physical Fitness of Students Treatment of PjBL Learning Model is Better Compared to Case Method Learning Model on High Nutritional Status**

Based on the results of the third hypothesis test, the average score in the group that has high nutritional status through a descriptive statistical approach shows that the average difference in physical fitness between groups of students given the PjBL learning model is greater than the Case method learning model. Both learning models have an average score of 12.87 and 12.07, so descriptively showing they are different. Based on the results of these calculations, it can be said that the learning model using Project Based Learning learning is better than the learning model that uses the Case Method on physical fitness, Physical Education, Sports and Health which has a high nutritional status. Students who have high nutritional status are able to realize their knowledge into the form of skills and are able to utilize the surrounding environment as a medium or tool that supports the teaching and learning process when working on certain projects. Learning using projects is an effective way of approaching education because it has a goal on creative thinking, problem solving, and student peers in interacting to create and utilize new knowledge. Learning using Project Based Learning can create more freedom in students to be more active, so they can choose the appropriate topics, can plan the products to be displayed, are able to distribute responsibilities among group members and can display their final products (Marwan, 2015).

Project-Based Learning is a way of learning that provides freedom of thought to learners related to the content or teaching material and planned objectives (Aliriad et al., 2020). However, this model, like other teaching models, has some disadvantages such as according to (Habók & Nagy, 2016) who argue that PjBL is an activity that requires great time and attention to detail. In line with that said, it is very important to make projects meaningful by giving learners enough freedom to have a voice and choose about how to carry out learning activities. Learners are encouraged to use their ideas in designing the project, what tools to use, finding sources of learning information and how to be able to practice or display directly the final product. This means that learning using the PjBL model will help students become more creative and independent learners. The Case Method learning model requires students to think critically about the case to be solved. The teacher tries to relate the cases given in accordance with the PJOK material that students will learn.

### **4. Physical Fitness of Students Treatment of PjBL Learning Model Compared to Case Method Learning Model on Low Nutritional Status**

The results of testing the fourth hypothesis showed that overall, the physical fitness scores of group students who used the PjBL learning model and the Case Method learning model on low nutritional status had an average result score that was not much different. Judging from the magnitude of the average score produced by the two learning models, namely 12.00 and 11.87, it can be said that the learning model with the PjBL learning model produces physical fitness scores for Sports and Health Physical Education which are not much different from the learning model with the Case method model. Thus, overall the learning model using the PjBL learning model equally affects physical fitness compared to the Case Method learning model in groups that have low nutritional status.

Based on all the results of the analysis that have been described both by descriptive analysis and inferential analysis, it is very reasonable to say that the use of learning models using the Project Based Learning (PjBL) model is more effective for the physical fitness of students. In the application of the learning model using Project Based Learning (PjBL) in learning activities, it is necessary to pay attention to the characteristics of the nutritional status of students, this is said because this model provides slightly greater score results in groups of students who have high nutritional status.

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## IV. CONCLUSION

Based on the results of hypothesis testing and discussion of research results, it can be concluded as follows: 1) Overall There is No Difference in Physical Fitness of the PjBL Learning Model with the Case Method Learning Model, judging from the average value of the PjBL learning model (12.46) is not much different from the average value of the Case Method learning model (11.83) and in the calculation of the two-track ANAVA there is no significant difference due to Sig.  $0.421 > 0.05$ . 2) There is no interaction between the learning model and nutritional status of physical fitness can be seen from Sig.  $0.215 > 0.05$ . 3) Physical fitness of students The treatment of the PjBL learning model is better than the Case Method learning model in the high nutritional status group. The PjBL learning model has an average score of 12.86 and the Case Method learning model has an average score of 12.06, so it descriptively shows the two are different. 4) Physical fitness of students treatment of PjBL model is better than the Case Method Learning model in the low nutritional status group. PjBL learning model 12.00 and Case Method learning model 11.87.

## REFERENCES

- 1) Ahmaddien, I., & Syarkani, Y. (2020). *Statistika Terapan dengan Sistem SPSS*.
- 2) Alaswati, S., Rahayu, S., & Rustiana, E. R. (2016). Evaluasi pelaksanaan pembelajaran kurikulum 2013 pjok. *Journal of Physical Education and Sports*, 5(2), 111–119.
- 3) Aliriad, H., Soegiyanto, S., & Setijono, H. (2020). the Influence of ProjectBased Learning Learning Model and Educability Motor Level of Fundamental Motor Skill Students. *International Journal*, 24(06), 7304–7309.
- 4) Alnedral. (2016). *Strategi Pembelajaran Pendidikan Jasmani Olahraga dan Kesehatan. Jurnal Pendidikan Jasmani, Olahraga dan Kesehatan*.
- 5) Andriadi, A., & Saputra, A. (2021). Pengembangan model pembelajaran gerak dasar melompat berbasis permainan untuk anak sekolah dasar. *Jurnal Pendidikan Jasmani Indonesia*, 17(1), 41–47. <https://doi.org/10.21831/jpji.v17i1.35422>
- 6) Ardanari, P., Mintarto, E., Tuasikal, A. R. S., & Suroto, S. (2020). Aktivitas Bermain Meningkatkan Keterampilan Manipulatif : Review Jurnal. *Gelombang Pendidikan Jasmani Indonesia*, 4(1), 79. <https://doi.org/10.17977/um040v4i1p73-78>
- 7) Arya, K. I. (2016). Peningkatan Kemampuan Senam Guling Depan Dengan Pembelajaran Bervariasi Pada Peserta didik Kelas 4 SDN Kreet Semarang Sragen Tahun Ajaran 2015/2016. *Jurnal Ilmiah SPIRIT*, 16, 2.
- 8) Ávalos-Ramos, M. A., & Vega-Ramírez, L. (2020). Gender differences in the level of achievement of gymnastic and acrobatic skills. *International Journal of Environmental Research and Public Health*, 17(19), 1–9. <https://doi.org/10.3390/ijerph17197216>
- 9) Aziizu, B. Y. A. (2015). Tujuan besar pendidikan adalah tindakan. *Prosiding Penelitian Dan Pengabdian Kepada Masyarakat*, 2(2). <https://doi.org/10.24198/jppm.v2i2.13540>
- 10) Cairney, J., Dudley, D., Kwan, M., Bulten, R., & Kriellaars, D. (2019). Physical Literacy, Physical Activity and Health: Toward an Evidence-Informed Conceptual Model. *Sports Medicine*, 49(3), 371–383. <https://doi.org/10.1007/s40279-019-01063-3>
- 11) Damanhuri, D., Bahrudin, F. A., Legiani, W. H., & Rahman, I. N. (2016). Implementasi Nilai-Nilai Pancasila Sebagai Upaya Pembangunan Karakter Bangsa. *Untirta Civic Education Journal*, 1(2). <https://doi.org/10.30870/ucej.v1i2.1890>
- 12) Das, A., & Sarkar, S. (2020). Effect of Selected Acrobatics Gymnastics Training Protocol on Balance Applied on Junior Artistic Gymnastics Boys. *Journal of Critical Reviews*, 6(1), 1492–1496.
- 13) Douda, H. T., Toubekis, A. G., Avloniti, A. A., & Tokmakidis, S. P. (2008). Physiological and anthropometric determinants of rhythmic gymnastics performance. *International Journal of Sports Physiology and Performance*, 3(1), 41–54. <https://doi.org/10.1123/ijsp.3.1.41>
- 14) Habók, A., & Nagy, J. (2016). In-service teachers' perceptions of project-based learning. *SpringerPlus*, 5(1), 1–14. <https://doi.org/10.1186/s40064-016-1725->
- 15) Hakiem, N. R. N. (2015). Aplikasi Mobile AcademicInformation System (Ais) Berbasis Android Untuk Pengguna Dosen Dan Mahapeserta didik(Studi Kasus : Pusat Teknologi Informasi dan Pangkalan Data (Pustipanda) UIN Syarif Hidayatullah Jakarta. *Jurnal Teknik Informatika*, Vol, 8(1).
- 16) Hasan, A. J., Hussein, G. L., & Al-Jadaan, D. A. N. (2022). the Effect of Karplus Strategy on Learning Some Basic Skills in. *ResearchJet Journal of Analysis and Inventions*, 3(4), 64–80. <https://doi.org/10.17605/OSF.IO/9U83F>
- 17) Hassan, H. S., Hanna, S. J., & Ameen, F. M. (2015). Effect of theoretical biomechanics on open jump the platform jumps performance using jumps (vault) in artistic gymnastics. *Journal of Human Sport and Exercise*, 10(2), 742–746.

## The Effect of the Project Based Learning Model with the Case Method and Nutritional Status on Physical Fitness of Learners Class Vii Smpn 21 Padang

<https://doi.org/10.14198/jhse.2015.10.Proc2.15>

- 18) Hidasari, F. P., & Bafadal, M. F. (2020). The Influence Of Teaching Style And Flexibility On Kayang Learning Outcomes. *Kinestetik : Jurnal Ilmiah Pendidikan Jasmani*, 4(2), 140–149. <https://doi.org/10.33369/jk.v4i2.12509>
- 19) Hussein, G. L., Hasan, A. J., Fadel, M. H., & Al-Jadaan, D. A. N. (2022). THE EFFECT OF BABY'S STRATEGY ON LEARNING SOME SKILLS IN THE ARTISTIC GYMNASTICS OF THE CUB. *ResearchJet Journal of Analysis and Inventions*, 3(4).
- 20) Ibrahim, N. dan I. (2017). Pengembangan Media Pembelajaran Mobile Learning Berbasis Android Mata Pelajaran IPA untuk Peserta didik SMP". *Refleksi Edukatika*, 8(1). <https://doi.org/10.24176/re.v8i1.1792>.
- 21) Indrawathi, N. L. P., Citra Permana Dewi, P., & Widiyanti, N. L. G. (2021). Faktor-faktor yang mempengaruhi hasil belajar pendidikan jasmani, olahraga dan kesehatan pada siswa kelas vii smp negeri 5 kuta selatan. *Jurnal Pendidikan Kesehatan Rekreasi*, 7(1), 239–247. <https://doi.org/10.5281/zenodo.4460837>
- 22) Irianto, T. (2019). Implementasi Kurikulum 2013 dalam Pembelajaran Pendidikan Jasmani Olahraga dan Kesehatan di Sekolah Dasar. *Multilateral: Jurnal Pendidikan Jasmani Dan Olahraga*, 13(1). <https://doi.org/10.20527/multilateral.v13i1.6107>
- 23) Irnani, H., & Sinaga, T. (2017). Pengaruh pendidikan gizi terhadap pengetahuan, praktik gizi seimbang dan status gizi pada anak Sekolah Dasar. *Jurnal Gizi Indonesia (The Indonesian Journal of Nutrition)*, 6(1), 58–64. <https://doi.org/10.14710/jgi.6.1.58-64>
- 24) Kurniawan, A. W. (2018). Multimedia-Based Learning Model for Gymnastics Skills. *Advances in Health Science Research (AHSR)*, 7. <https://doi.org/10.2991/icssh-18.2019.8>
- 25) Kusuma, R. S. (2018). Peran sentral kearifan lokal dalam peningkatan kualitas pendidikan. *PEDAGOGIK: Jurnal Pendidikan*, 5(2), 228–239. <https://doi.org/10.33650/pjp.v5i2.385>
- 26) Linda, L. (2016). Pengembangan Self Assessment Berbasis Website Untuk Mengukur Ketercapaian Literasi Sains. *Jurnal Pendidikan*, 1, 4.
- 27) Marwan. (2015). Pengaruh Model Pembelajaran Active Learning Tipe Learning Start With A Question Dan Motivasi Belajar Terhadap Hasil Belajar Ekonomi Siswa SMAN 2 Bayang. *Jurnal Pendidikan Tahun*. <http://journal.pendidikan.ac.id>.
- 28) Mashud, M. (2019). Analisis Masalah Guru PJOK Dalam Mewujudkan Tujuan Kebugaran Jasmani. *Analisis Masalah Guru PJOK Dalam Mewujudkan Tujuan Kebugaran Jasmani*.
- 29) McMillan, J. H., & Hearn, J. (2015). *Student Self-Assessment: The Key to Stronger Student Motivation and Higher Achievement*. educational HORIZON.
- 30) Mirawati, & Rahmawati, E. (2017). Jurnal Pendidikan : Early Childhood Permainan Modifikasi Untuk Stimulasi Keterampilan Gerak Dasar Manipulatif Anak Usia 2-4 Tahun. *Jurnal Pendidikan : Early Childhood*, 1(2), 1–13. <https://doi.org/10.35568/earlychildhood.v1i2.119>
- 31) Mkaouer, B., Hammoudi-Nassib, S., Amara, S., & Chaabène, H. (2018). Evaluating the physical and basic gymnastics skills assessment for talent identification in men's artistic gymnastics proposed by the International Gymnastics Federation. *Biology of Sport*, 35(4), 383–392. <https://doi.org/10.5114/biolsport.2018.78059>
- 32) Mustafa, P. S. (2021). Problematika Rancangan Penilaian Pendidikan Jasmani, Olahraga, dan Kesehatan dalam Kurikulum 2013 pada Kelas XI SMA. *Edumaspul: Jurnal Pendidikan*, 5(1), 184–195. <https://doi.org/10.33487/edumaspul.v5i1.947>
- 33) Mutawakkil, I. (2017). ATENSI PESERTA DIDIK DALAM PEMBELAJARAN PJOK SERTA FAKTOR-FAKTOR YANG MEMPENGARUHI (STUDI KASUS DI SMP NEGERI 15 YOGYAKARTA). *Pendidikan Jasmani Kesehatan Dan Rekreasi*, 6(9).
- 34) Nafisah, D. (2016). Peran pendidikan muatan lokal terhadap pembangunan karakter bangsa. *Citizenship Jurnal Pancasila Dan Kewarganegaraan*, 4(2), 451–468. <https://doi.org/10.25273/citizenship.v4i2.1078>
- 35) Nasution, M. C., & Syaleh, M. (2021). Analisis Faktor-Faktor yang Mempengaruhi Hasil Belajar PJOK pada Siswa Kelas V SD Negeri 104259 Citaman Jernih Kecamatan Perbaungan Kabupaten Serdang Bedagai Tahun Ajaran 2020/2021. *JOSEPHA: Journal of Sport Science And Physical Education*, 2(2), 1–10. <https://doi.org/10.38114/josepha.v2i2.156>
- 36) Ngilimun. (2016). *Strategi model pembelajaran*. Aswaja Presindo.
- 37) Pardiansyah, O. (2015). Upaya Meningkatkan Keterampilan Sikap Lilin Menggunakan Media Bantu Pada Peserta didik Kelas XI IPS 2. *Jurnal Ilmu Kelahragaan*, 2((4)).
- 38) Petukhov, A. Y., Polevaya, S. A., & Polevaya, A. V. (2022). Experimental Diagnostics of the Emotional State of Individuals Using External Stimuli and a Model of Neurocognitive Brain Activity. *Diagnostics*, 12(1), 125. <https://doi.org/10.3390/diagnostics12010125>
- 39) Pion, J., Lenoir, M., Vandorpe, B., & Segers, V. (2015). Talent in Female Gymnastics: a Survival Analysis Based upon Performance Characteristics. *International Journal of Sports Medicine*, 36, 935–940.

## The Effect of the Project Based Learning Model with the Case Method and Nutritional Status on Physical Fitness of Learners Class Vii Smpn 21 Padang

<https://doi.org/10.1055/s-?0035-?1548887>

- 40) Pion, Johan, Hohmann, A., Liu, T., Lenoir, M., & Segers, V. (2017). Predictive models reduce talent development costs in female gymnastics. *Journal of Sports Sciences*, 35(8), 806–811. <https://doi.org/10.1080/02640414.2016.1192669>
- 41) Rahmadi, R., & Irianto, T. (2020). Instrumen Penilaian Harian Aspek Kognitif Pendidikan Jasmani Olahraga Dan Kesehatan. *Stabilitas: Jurnal Pendidikan Jasmani Dan Olahraga*, 1(1), 25–31. <https://doi.org/10.20527/mpj.v1i1.476>
- 42) Risdiyany, H., & Dewi, D. A. (2021). Penguatan Karakter Bangsa Sebagai Implementasi Nilai-Nilai Pancasila. *Jurnal Pendidikan Indonesia*, 2(04), 696–711. <https://doi.org/10.36418/japendi.v2i4.140>
- 43) Roji. (2022). *Pendidikan Jasmani Olahraga dan Kesehatan*. Jakarta.
- 44) Rolheiser, C., & Ross, J. A. (2015). *Student Self-Evaluation: What Research Says and What Practice Shows*. Internet download.
- 45) Ryanto, I. A. (2017). *Pengembangan Model Keterampilan Motorik Berbasis Permainan*. Universitas Sebelas Maret.
- 46) Salman, E., & Darsi, H. (2020). Pengembangan Aktivitas Gerak Berbasis Modifikasi Permainan untuk Meningkatkan Kemampuan Keterampilan Motorik pada Anak Sekolah Dasar. *Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga (JPJO)*, 4(1), 47–60. <https://doi.org/10.31539/jpjo.v4i1.1203>
- 47) Sari, M. W. (2016). Implementasi Aplikasi Monitoring Pengendalian Pintu Gerbang Rumah Menggunakan App Inventor Berbasis Android. *Jurnal EKSIS*, 9(1), 21–22.
- 48) Septiana, R. A., Kurnia, D., & Friskawati, G. F. (2022). Pengembangan Video Assignment Based on Motion Analysis ( Vabma ) Pada Pembelajaran Senam Lantai Developing Video Assignment Based On Motion Analysis ( Vabma ) on Gymnastics Learning. *Physical Activity Journal (PAJU)*, 4(1), 13–22. <https://doi.org/10.20884/1.paju.2022.4.1.5145>
- 49) Septikasari, M. (2018). *Status gizi anak dan faktor yang mempengaruhi*. Uny Press.
- 50) Sukamti, E. R., & Pranatahadi, S. (2019). The Effect of Artistic Gymnastics Talent Scouting Application to Artistic Gymnastic Basic Skills. *Advances in Social Science, Education and Humanities Research*, 278, 319–321. <https://doi.org/10.2991/yishpess-cois-18.2018.79>
- 51) Tao, L., Pan, F. Bin, Liu, R., Jin, C., Jia, B. J., & He, X. (2020). Petrogenesis of the Cretaceous granitoids in Zhejiang, northeast South China Block and their implications for episodic retreat and roll-back of the Paleo-Pacific Plate. *Bulletin of the Geological Society of America*, 132(7–8), 1514–1536. <https://doi.org/10.1130/B35426.1>
- 52) Taras, M. (2010). Assessment-summative and formative-some theoretical reflections. *British Journal of Educational Studies*, 53(4), 466–478.
- 53) Wahyuningsih, R. D. (2017). Pengembangan Instrumen Self Assesment Berbasis Web Untuk Menilai Sikap Ilmiah Pada Pembelajaran Fisika Di SMA. *Jurnal Pendidikan*, 2((1)), 172–179 4193–7342.
- 54) Wajdi, R., & Jamaluddin, J. (2019). Studi Tentang Implementasi Kurikulum 2013 Pada Guru Mata Pelajaran Pendidikan Jasmani, Olahraga Dan Kesehatan. *SPORTIVE: Journal Of Physical Education, Sport and Recreation*, 2(2), 79–88.
- 55) Zarwan, Z., & Edwarsyah, E. (2019). Pelatihan Penyusunan Gizi Seimbang Bagi Pelatih Pplp Sumatera Barat. *Jurnal Berkarya Pengabdian Masyarakat*, 1(1), 21–26.



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## Utilizing Convolutional Neural Networks for Fingerprint-Based Attendance Monitoring



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**ABSTRACT:** The traditional method of taking attendance using paper sheets is prone to errors like impersonation, loss, or theft. To solve this issue, automatic attendance systems utilizing identification technology such as barcode badges, electronic tags, touch screens, magnetic stripe cards, and biometrics have been implemented. Biometric technology uses physiological or behavioral characteristics for identification purposes, but traditional biometric systems have limitations such as vulnerability to damage or alteration over time, and variations in occlusions, poses, facial expressions, and illumination can affect face recognition accuracy. Fingerprint identification relies on the distinctiveness of fingerprints and involves comparing two impressions of the friction ridges on human fingers or toes to determine if they belong to the same individual. There are five primary categories of fingerprints: arch, tented arch, left loop, right loop, and whorl. Various algorithms have been developed to recognize fingerprints using minutiae-based matching, which involves identifying key features like ridge ending and bifurcation. Deep learning algorithms, particularly convolutional neural networks, have been successful in improving identification accuracy by extracting features automatically from fingerprint images. In recent times, securing personal data has become increasingly important, and the Convolutional Neural Network (CNN) identification system is recommended for improving accuracy and performance. This paper proposes a fingerprint identification system that combines three models: CNN, Softmax, and Random Forest (RF) classifiers. The conventional system uses K-means and DBSCAN algorithms to separate the foreground and background regions and extracts features using CNNs and dropout approach. The Softmax acts as a recognizer. The proposed algorithm is evaluated on a public database and shows promising results, providing an accurate and efficient biometric identification system.

**KEYWORDS:** Fingerprint Identification, Convolutional Neural Network, Attendance Monitoring

### I. INTRODUCTION

Attendance holds significant importance in academic institutions and organizations for multiple reasons such as maintaining records, evaluating students, and encouraging regular attendance. In most educational institutions in developing countries, there is a requirement for a minimum percentage of attendance, which is not always followed due to the challenges posed by the current method of taking attendance. This conventional method involves the use of paper sheets or registers for recording attendance, which is prone to errors like impersonation, loss or theft of the attendance sheet [1]. Nowadays, the swift advancement of technology has been utilized to streamline work processes. Tasks that were traditionally performed by humans can now be automated through systems, such as an automatic attendance system implemented in schools. Instead of relying on manual or signature-based attendance procedures, some systems utilize automated identification technology [2]. By utilizing barcode badges, electronic tags, touch screens, magnetic stripe cards, and biometrics (such as fingerprints, retinal scans, and facial features), an automated system removes the necessity for paper tracking. This simplifies the process for users as their attendance are recorded automatically when they enter and exit the school premises. This eradicates the likelihood of timesheets being lost or tampered with [3]. The significance of personal identification technology is increasing in security systems. Traditional authentication methods like keys, passwords, and magnetic cards are not secure enough since they can be lost or easily forgotten. To enhance security, biometric technology has been integrated into various systems, including door control systems, public systems, and PC login. Biometric technology is a technique that utilizes inherent physiological or behavioral characteristics for identification purposes [4]. In today's world, ensuring the security of information has become a top priority for individuals. Traditional biometric personal identification systems, which rely on physiological characteristics and behavioral patterns like faces,

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irises, or voice, have several limitations. These features can be imitated due to the human eye's ability to perceive physical appearances. Moreover, the features are vulnerable to damage or alteration over time. The use of iris recognition is often considered less user-friendly due to the discomfort caused by the brightness of the light during the biometric capture process. Additionally, face recognition accuracy is influenced by variations in occlusions, poses, facial expressions, and illumination [5]. Table 1 summarizes the characteristics of the aforementioned methods:

**Table 1: Summary of characteristics of existing biometric system.**

Biometric Trait	Main Advantage	Defect	Security Level	Sensor	Cost
Voice	Natural and convenient	Noise	normal	Noncontact	low
Face	Remote capture	Lighting conditions	Normal	Noncontact	Low
Fingerprint	Widely applied	Skin	Good	Contact	Low
Iris	High precision	glasses	Excellent	Noncontact	High

A complete imprint of a fingerprint can be deliberately obtained by transferring ink from the skin's friction ridges onto a clean surface, like white paper. Fingerprint identification involves comparing two impressions of the friction ridges on human fingers or toes to determine if they belong to the same individual. This identification technique relies on the distinctiveness of fingerprints, which implies that no two finger or palm prints are identical in every aspect [6]. Toward the end of the seventeenth century, European scientists began publishing their research findings on human skin. Dr. Nehemiah Grew was the first to describe the patterns of ridges, furrows, and pores present on the surface of the hands and feet in great detail. This was published in the Philosophical Transactions of the Royal Society of London in 1684 [7]. In 1880, Faulds submitted a paper to the journal Nature, where he demonstrated the distinctiveness and permanence of fingerprints [8]. There are five primary categories of fingerprints: arch, tented arch, left loop, right loop, and whorl. The algorithm used to analyze fingerprints identifies and extracts specific points, such as cores and deltas, from the fingerprint image. Based on the number and locations of these singular points, the algorithm can classify the fingerprint into its appropriate category [9]. There are various ways to identify a person, and biometrics have been one of the most secure options so far. They are virtually impossible to imitate by anyone other than the desired person. They can be divided into two categories: behavioral features, which are actions that a person can uniquely create or express, such as signature and walking rhythm; and physiological features, which are characteristics that a person possesses, such as fingerprint and iris pattern. Many works revolve around recognition and categorization of such data including, but not limited to, fingerprints, faces, palm prints and iris patterns [10]–[14]. Fingerprints have found numerous uses in fields like forensics, transaction verification, and unlocking mobile phones. To recognize fingerprints, many algorithms rely on minutiae-based matching, which involves identifying key features like ridge ending, bifurcation, and short ridge on the ridges of the fingerprint. In the past, there have been various attempts to recognize fingerprints using manually designed features, followed by classification. In [15], Park proposed a fingerprint recognition system based on SIFT features. In [16], Cappelli introduced a novel approach to representation using a 3D data structure created from minutiae distances and angles, which he called Minutiae Cylinder-Code (MCC). More recently, Minaee et al presented a technique for fingerprint recognition that employs multi-layer scattering convolutional networks. This method dissects fingerprint images using wavelets with various scales and orientations [17].

Currently, the majority of popular fingerprint identification algorithms rely on pre-defined conventional fingerprint characteristics, such as orientation field and singular point, which are artificially established. [18], [19]. Nonetheless, since these algorithms depend heavily on pre-established features, the identification accuracy may suffer in cases of high image noise, where the artificial features cannot be effectively extracted [20], [21].

In this regard, convolutional neural networks (CNNs) have been immensely successful in multiple computer vision and natural language processing (NLP) tasks in recent times [22]. Their success is mainly due to three factors: the availability of large-scale manually labelled datasets; powerful processing tools (such as GPGPUs); and good regularization techniques (such as dropout, etc.) that can prevent the over fitting problem.

Deep learning has been employed to tackle various problems, including but not limited to classification, segmentation, superresolution, image captioning, emotion analysis, face recognition, and object detection. Compared to traditional approaches, deep learning has demonstrated a considerable improvement in performance [23]–[31]. It has also been used heavily in numerous NLP tasks, including sentiment analysis, machine translation, name-entity-recognition, and question answering [32]–[35]. What is particularly fascinating is that certain deep architectures have features that can be effortlessly transferred to other tasks. This implies that one can extract features from a trained model for a specific task and apply them to a different task by training a classifier or predictor on top of them [36].

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J. Chandramohan and colleagues have created a fingerprint recognition system that utilizes minutiae-based fingerprint algorithms in various techniques. This method primarily involves extracting minutiae points from model fingerprint images and then matching fingerprints based on the number of minutiae pairings between them. The authors of this paper also outline a method for designing a fingerprint-based student attendance system with the aid of GSM. In this system, a tracking module is used to identify the whereabouts of a missing person [37].

Stephane Kouamo and Claude Tangha have developed a method for using fingerprint recognition as a reliable biometric technique for identification and authentication applications. The proposed method involves the use of a neural network for authenticating individuals accessing an automated fingerprint system for E-learning. During the training stage, the back propagation algorithm is applied to a multilayer perceptron, which includes a hidden layer that allows the network to calculate probabilities on templates that are invariant to translation and rotation. The results of the study, which were obtained from both the NIST special database 4 and a local database, indicate that the proposed method performs well in some cases [38].

Convolutional Neural Network (CNN) is a type of artificial neural network, mainly used in computer vision [39]. CNN is applied in many fields of fingerprint analysis, such as fingerprint classification [40], [41], fingerprint distortion rectification [42], overlapped fingerprint separation [43], and fingerprint identification [44], [45].

In criminal investigations, fingerprints play an essential role in identifying individuals. Nevertheless, there are still issues in the multi-fingerprint overlapping identification work for criminal investigation. Yih Chi-Hsiao et al. use CNN to train a network for overlapping fingerprint partitioning work. They achieved good results on both single-fingerprint and multi-fingerprint recognition [43].

## II. FINGERPRINT IDENTIFICATION BASED ON CONVOLUTIONAL NEURAL NETWORK

The biometric recognition system typically consists of four key stages. The first stage involves the acquisition of the biometric trait, which entails obtaining a digital image of an individual using a specific capturing device. The second stage is the preprocessing stage, which aims to enhance the overall quality of the captured image. The third stage involves the extraction of feature data using various algorithms. Finally, the matching of the extracted features is typically carried out to perform the recognition of the individual.

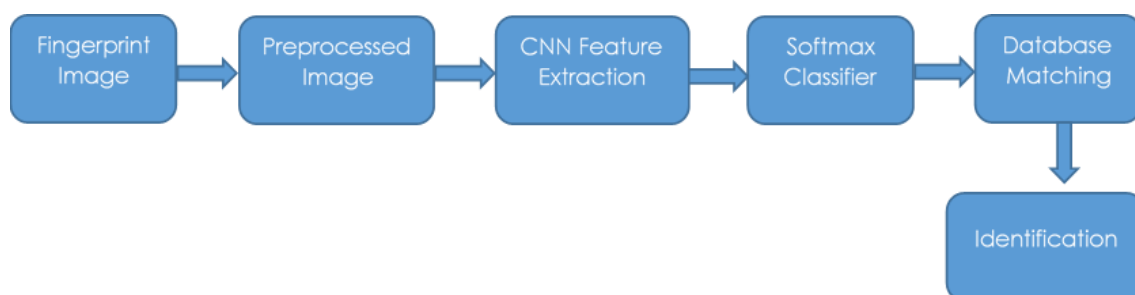


Figure 1: Block diagram of the proposed system

### Image Acquisition

Various techniques exist for acquiring fingerprints, with the inked impression method being the most widely used. However, inkless fingerprint scanners are also available which eliminates the need for digitization. The quality of the fingerprint itself is crucial, as it has a direct impact on the accuracy of the minutiae extraction algorithm.

### Fingerprint Image Enhancement

The orientation field of a fingerprint image is an intrinsic property that has been utilized in various methods to estimate it. The local orientation field filter-based or Gabor filter-based enhancement algorithms have been proposed for this purpose. The orientation field filtering techniques rely on accurate estimation of local ridge orientation, but this may not always be possible in low-quality fingerprint images, limiting their effectiveness. In contrast, Gabor filter-based techniques are more reliable, but computationally expensive, making them unsuitable for on-line fingerprint recognition systems like AFIS [46].

### Fingerprint Recognition System

The following section provides a detailed description of the fingerprint recognition system using CNN-Softmax. The proposed method consists of three main stages: (1) pre-processing the fingerprint image; (2) extracting features using a CNN model; and (3) using Softmax as a classifier. The pre-processing step involves using the Sobel and TopHat filtering method to enhance the image quality by limiting the contrast. Following the pre-processing step, the K-means and DBSCAN methods are utilized to segment the image into two regions: foreground and background [47]. The next step after pre-processing the fingerprint image is feature extraction, which is performed using a CNN architecture. To extract the region of interest (ROI) of the fingerprint, the Canny

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method [48] and the inner rectangle are used. The CNN is a type of neural network that uses deep supervised learning and convolutional layers. Essentially, the CNN can function as both a trainable classifier and an automatic feature extractor [49]. As shown in Fig. 2, the proposed fingerprint-CNN architecture is made up of five convolutional layers and three max-pooling layers, as specified in its configuration details which can be computed using Eq. (1). In addition, three rectified linear unit (ReLU) are used to our system which can be defined as Eq. (2).

$$O_n = \sum_{i=1}^{N-1} x_i f_{n-i}$$

### Equation 1

where O is the output map, x is input map, f is the filter and N is number of elements in x.

$$f(x) = \max(0, x)$$

### Equation 2

where x is the input to a neuron.

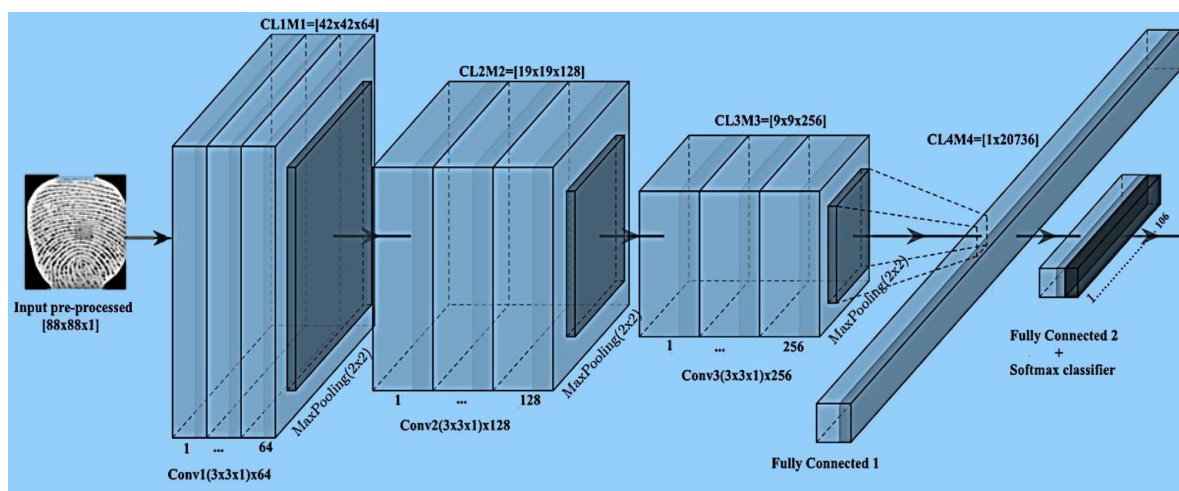


Figure 2: The Architecture of the proposed fingerprint-CNN model.

The Softmax function can be used to the fully convolutional layer output, as shown in Eq. (3).

$$S(r, i) = -\log\left(\frac{e^{z_i}}{\sum_{k=1}^N e^{z_j}}\right)$$

### Equation 3

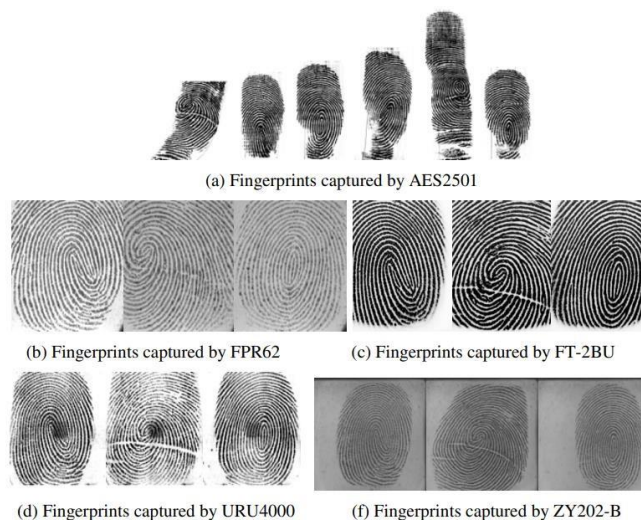
When the vector of output neurons is set to r, the probability of the neurons appropriate to the  $i^{\text{th}}$  class is provided by separation the value of the  $i^{\text{th}}$  ( $i = 1 \dots j$ ) element by the sum of the values of all elements.

The structure is described as follows: (1) L1: the input layer data size of  $88 \times 88$ , which is the size of input pre-processing fingerprint images; (2) L1M1: first hidden layer, composed by 64 convolutional filters of size  $3 \times 3 \times 1$ , ReLU activation function and a max-pooling layer of size  $2 \times 2$ . This layer changes the input data into CL1M1 =  $(42 \times 42 \times 64)$  features; (3) L2M2: second hidden layer, composed by 128 convolutional filters of size  $3 \times 3 \times 64$ , ReLU activation function and a max-pooling layer of size  $2 \times 2$ . This layer changes the input data into CL2M2 =  $(19 \times 19 \times 128)$  features; (4) L3M3: third hidden layer, composed by 128 convolutional filter of size  $3 \times 3 \times 128$ , ReLU activation function and a max-pooling layer of size  $2 \times 2$ . In order to disconnect the connections between the first layer and the next layers the dropout probability of 20% is adopted. This layer transforms the input data into CL3M3 =  $(9 \times 9 \times 256)$  features; (5) L4M4: fourth hidden layer namely fully connected layer, represented the flattening process, which is converted all the resultant two-dimensional arrays into a single long continuous linear vector. The features size of input data is  $1 \times 1 \times 20,736$ ; (6) L5M5: final hidden layer. The Softmax function is used to predict labels of the input patterns.

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### Data augmentation

Data augmentation is a technique that can address overfitting issues in CNN architecture. By applying transformations such as image translation, rotation, and cropping, the amount of training data can be increased. This method has been used effectively in many previous studies to augment data. We implemented the data augmentation as expand to the work in [50] such as the rotation and the translation (left, right, up and down) [51].



**Figure 3: Sample images in the fingerprint database**

### III. EXPERIMENTAL RESULTS AND DISCUSSION

The experimental operation platform in this study is described as follows: the host configuration: Intel Core i7 – 8565U Processor (8MB Cache, up to 4.6 GHz) and NVIDIA GeForce GTX 980 4GO GPU, runtime environment: Windows 10 home (64 bit). In order to better verify our algorithm, the following classification methods are adopted in the experiment: support vector machine (SVM) [52], RF [53], logistic regression (LR) [54]. The algorithms were pitted against one another and, to verify the proposed algorithm's effectiveness, the outcomes were evaluated on the SDUMLA-HMT [55] database which includes real multimodal data of fingerprint, finger vein and face images. The total number of fingerprint images was 25,440 we divided them into training, validation and test sets. The divided data set used in the experiment is shown in Table 2.

**Table 2: Dataset structure of fingerprint**

SDUMLA-HMT database	
Class number	5
Image number	25,440
Training	20,352
Validation	2,544
Test	2,544

The performance measure is the accuracy rate as defined by Eq. (6).

$$\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN} \times 100$$

Equation 4

Where True Positive Rate (TP) is the probability of authorized users that are recognized correctly over the total number tested, True negative rate (TN) is the probability of authorized users that are not recognized over the total number tested. False positive rate (FP) describes the percentage of unauthorized users that are recognized to the total number tested. False negative rate (FN) describes the percentage of unauthorized users that are not recognized falsely to the total number tested.

As can be seen from Table 3, the proposed fingerprint recognition using CNN with dropout method [56] leads to a significant performance improvement on real database.

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**Table 3: The training set result of proposed fingerprint recognition using CNN.**

Images	Train set without dropout		Training set with dropout	
	Accuracy (%)	Loss (%)	Accuracy (%)	Loss (%)
Original FP	98.96	3.65	99.31	2.35
Enhanced FP	99.49	1.93	99.56	1.23
Proposed Enhanced FP	99.13	2.16	99.63	1.17

Notably, the dropout technique yielded the greatest improvement in accuracy for both the training and test sets across four datasets. Furthermore, utilizing the dropout method resulted in the lowest loss, especially for the database being employed. For training set, it can be noted from Table 4 that the accuracy of 99.13% is augmented to 99.63% and the lost rate of 2.16% is reduced to 1.17% in the proposed method due to add the drop function in our system. For test set, based on the results yielded in Table 4, the accuracy of 99.33% is augmented to 99.48% and the lost rate of 2.16% to 2.03% in the proposed fingerprint identification method.

**Table 4: The test set result of proposed fingerprint recognition using CNN.**

Images	Test set without dropout		Test set with dropout	
	Accuracy (%)	Loss (%)	Accuracy (%)	Loss (%)
Original FP	97.06	9.12	97.66	5.71
Enhanced FP	98.29	5.68	99.16	3.14
Proposed Enhanced FP	99.33	2.16	99.48	2.03

From Table 5, to demonstrate the superiority of the proposed fingerprint system, we tested its performance using different classifiers, including SVM, LR, RF, and CNN. Our findings indicate that the Softmax classifier achieved the highest accuracy of 99.48%, outperforming the other classifiers.

**Table 5: The result of proposed system recognition biometric using CNN with different classifiers.**

Classifiers	Fingerprint
CNN & SoftMax	99.48%
CNN & SVM	97.65%
CNN & LR	85.61%
CNN & RF	97.33%

Finally, we can conclude from these results that the proposed system is superior to other methods because:

1. The enhanced fingerprint patterns proposed in this study are noticeably distinct and more prominent compared to other enhanced versions. As a result, the proposed methods are highly likely to achieve a high identification rate.
2. The use of the dropout method results in better recognition accuracy compared to using only the dataset method.
3. Typically, using the CNN approach leads to better performance compared to combining different processes such as windowing and feature extraction. Therefore, a biometric recognition system based on CNN technique can outperform other classical and complex techniques.
4. Compared to current biometric systems, the proposed algorithm provides improved accuracy in identifying individuals and enhanced security for their information and data.

## IV. CONCLUSION

This study presents a biometric identification system for attendance monitoring that utilizes fingerprint recognition based on Convolutional Neural Network. The experimental results, obtained from real databases, demonstrate that the overall performance of the proposed system, which incorporates CNN and different classifiers, outperforms the artificially pre-defined traditional fingerprint biometric systems in terms of identification accuracy. Based on the results, it can be inferred that the pre-processing algorithm has a positive impact on the accuracy of the proposed system. The dropout technique significantly contributes to increasing recognition accuracy by reducing the system's loss rate. For future research, extending the proposed algorithm to other applications would be worthwhile, and testing it on a more challenging dataset with a larger number of subjects should be considered.

### REFERENCES

- 1) O. Shoewu and O. a. Idowu, "Development of Attendance Management System using Biometrics.," *Pacific J. Sci. Technol.*, vol. 13, no. 1, pp. 300–307, 2012.
- 2) M. Ula, A. Pratama, Y. Asbar, W. Fuadi, R. Fajri, and R. Hardi, "A New Model of the Student Attendance Monitoring System Using RFID Technology," *J. Phys. Conf. Ser.*, vol. 1807, no. 1, 2021, doi: 10.1088/1742-6596/1807/1/012026.
- 3) S. Rahman, M. Rahman, and M. Rahman, "Edelweiss Applied Science and Technology using Fingerprint Recognition," vol. 2, no. 1, pp. 90–94, 2018.
- 4) J. Da Wu and S. H. Ye, "Driver identification using finger-vein patterns with Radon transform and neural network," *Expert Syst. Appl.*, vol. 36, no. 3 PART 2, pp. 5793–5799, 2009, doi: 10.1016/j.eswa.2008.07.042.
- 5) S. Ahmad Radzi, M. Khalil-Hani, and R. Bakhteri, "Finger-vein biometric identification using convolutional neural network," *Turkish J. Electr. Eng. Comput. Sci.*, vol. 24, no. 3, pp. 1863–1878, 2016, doi: 10.3906/elk-1311-43.
- 6) H. Zhengfang, A. J. P. Delima, I. K. D. Machica, J. C. T. Arroyo, S. Weibin, and X. Gang, "Fingerprint Identification based on Novel Siamese Rectangular Convolutional Neural Networks," *Int. J. Emerg. Technol. Adv. Eng.*, vol. 12, no. 5, pp. 28–37, 2022, doi: 10.46338/ijetae0522\_04.
- 7) E. H. Holder, "U.S. Department of Justice Office of Justice Programs," Office.
- 8) J. Marriott, B. Mukhopadhyay, and P. Chatterjee, "On the Skin-Furrows of the Hand," *Britain in India, 1765-1905*, pp. 285–287, 2021, doi: 10.4324/9781003113577-9.
- 9) K. Karu and A. K. Jain, "Fingerprint classification," *Pattern Recognit.*, vol. 29, no. 3, pp. 389–404, 1996, doi: 10.1016/0031-3203(95)00106-9. [10] K. W. Bowyer and M. J. Burge, *Introduction to the Handbook of Iris Recognition*. 2016. doi: 10.1007/978-1-4471-6784-6\_1.
- 10) "FACE RECOGNITION USING SCATTERING CONVOLUTIONAL NETWORK Shervin Minaee , Amirali Abdolrashidi and Yao Wang ECE Department , NYU School of Engineering , USA".
- 11) C. Ding and D. Tao, "Robust Face Recognition via Multimodal Deep Face Representation," *IEEE Trans. Multimed.*, vol. 17, no. 11, pp. 2049–2058, 2015, doi: 10.1109/TMM.2015.2477042.
- 12) S. Minaee and A. Abdolrashidi, "HIGHLY ACCURATE PALMPRINT RECOGNITION USING STATISTICAL AND WAVELET FEATURES
- 13) Shervin Minaee and AmirAli Abdolrashidi ECE Department, NYU Polytechnic School of Engineering , NY , USA," pp. 31–36, 2015.
- 14) E. Marasco and A. Ross, "A survey on antispoofing schemes for fingerprint recognition systems," *ACM Comput. Surv.*, vol. 47, no. 2, 2014, doi: 10.1145/2617756.
- 15) U. Park, S. Pankanti, and A. K. Jain, "Fingerprint verification using SIFT features," *Biometric Technol. Hum. Identif. V*, vol. 6944, p. 69440K, 2008, doi: 10.1117/12.778804.
- 16) R. Cappelli, M. Ferrara, and D. Maltoni, "Minutia Cylinder-Code: A new representation and matching technique for fingerprint recognition," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 32, no. 12, pp. 2128–2141, 2010, doi: 10.1109/TPAMI.2010.52.
- 17) S. Minaee, A. Abdolrashidi, and Y. Wang, "IRIS RECOGNITION USING SCATTERING TRANSFORM AND TEXTURAL FEATURES Shervin Minaee , AmirAli Abdolrashidi and Yao Wang ECE Department , NYU Polytechnic School of Engineering , USA," 2015 *IEEE Signal Process. Signal Process. Educ. Work.*, pp. 37–42, 2015.
- 18) F. A. Afsar, M. Arif, and M. Hussain, "Fingerprint identification and verification system using minutiae matching," *Natl. Conf. Emerg. Technol.*, pp. 141–146, 2004, [Online]. Available: <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Fingerprint+Identification+and+Verification+System+using+Minutiae+Matching#0>
- 19) A.M. Bazen and S. H. Gerez, "Systematic methods for the computation of the directional fields and singular points of fingerprints," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 24, no. 7, pp. 905–919, 2002, doi: 10.1109/TPAMI.2002.1017618.
- 20) K. N. Mutter, Z. M. Jafri, and A. A. Aziz, "Automatic fingerprint identification using gray hopfield neural network improved by run-length encoding," *Proc. - Comput. Graph. Imaging Vis. Mod. Tech. Appl. CGIV*, pp. 205–210, 2008, doi: 10.1109/CGIV.2008.25.
- 21) H. a Abdullah, "Fingerprint Identification System Using Neural Networks," *Nucej*, vol. 15, no. 2, pp. 234–244, 2012.
- 22) K. S. Choi, J. S. Shin, J. J. Lee, Y. S. Kim, S. B. Kim, and C. W. Kim, "In vitro trans-differentiation of rat mesenchymal cells into insulin-producing cells by rat pancreatic extract," *Biochem. Biophys. Res. Commun.*, vol. 330, no. 4, pp. 1299–1305, 2005, doi: 10.1016/j.bbrc.2005.03.111.

## Utilizing Convolutional Neural Networks for Fingerprint-Based Attendance Monitoring

- 23) S. Karimi-Bidhendi, F. Munshi, and A. Munshi, "Scalable Classification of Univariate and Multivariate Time Series," Proc. - 2018 IEEE Int. Conf. Big Data, Big Data 2018, pp. 1598–1605, 2019, doi: 10.1109/BigData.2018.8621889.
- 24) S. Minaee et al., "A Deep Unsupervised Learning Approach Toward MTBI Identification Using Diffusion MRI," Proc. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. EMBS, vol. 2018-July, pp. 1267–1270, 2018, doi: 10.1109/EMBC.2018.8512556.
- 25) S. Minaee et al., "MTBI Identification from Diffusion MR Images Using Bag of Adversarial Visual Features," IEEE Trans. Med. Imaging, vol. 38, no. 11, pp. 2545–2555, 2019, doi: 10.1109/TMI.2019.2905917.
- 26) Y. Sun, Y. Chen, X. Wang, and X. Tang, "Deep learning face representation by joint identification-verification," Adv. Neural Inf. Process. Syst., vol. 3, no. January, pp. 1988–1996, 2014.
- 27) A. Jasuja and S. Rathee, "Emotion Recognition Using Facial Expressions," Int. J. Inf. Retr. Res., vol. 11, no. 3, pp. 1–17, 2021, doi: 10.4018/ijrr.2021070101.
- 28) D. Fleet, T. Pajdla, B. Schiele, and T. Tuytelaars, "Learning a deep convolutional network for image super-resolution," Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics), vol. 8692, no. September, pp. 184–199, 2014, [Online]. Available: <http://mmlab.ie.cuhk.edu.hk/projects/SRCNN.html>.
- 29) H. Rampersad, "Developing," Total Perform. Scorec., pp. 159–183, 2020, doi: 10.4324/9780080519340-12.
- 30) Badrinarayanan, A. Kendall, and R. Cipolla, "<https://arxiv.org/pdf/1511.00561.pdf> {Segnet: A deep convolutional encoder-decoder architecture for image segmentation}," IEEE Trans. Pattern Anal. Mach. Intell., vol. 39, no. 12, pp. 2481–2495, 2017, [Online]. Available: <https://arxiv.org/pdf/1511.00561.pdf>
- 31) Sangeetha and K. J. R. Prasad, "Syntheses of novel derivatives of 2-acetylfuro[2,3-a]carbazoles, benzo[1,2-b]-1,4-thiazepino[2,3-a]carbazoles and 1-acetyloxycarbazole-2- carbaldehydes," Indian J. Chem. - Sect. B Org. Med. Chem., vol. 45, no. 8, pp. 1951–1954, 2006, doi: 10.1002/chin.200650130.
- 32) D. Bahdanau, K. H. Cho, and Y. Bengio, "Neural machine translation by jointly learning to align and translate," 3rd Int. Conf. Learn. Represent. ICLR 2015 - Conf. Track Proc., pp. 1–15, 2015.
- 33) S. Minaee and Z. Liu, "Automatic question-answering using a deep similarity neural network," 2017 IEEE Glob. Conf. Signal Inf. Process. Glob. 2017 - Proc., vol. 2018-Janua, pp. 923–927, 2018, doi: 10.1109/GlobalSIP.2017.8309095.
- 34) A. Severyn and A. Moschitti, "Learning to rank short text pairs with convolutional deep neural networks," SIGIR 2015 - Proc. 38th Int. ACM SIGIR Conf. Res. Dev. Inf. Retr., pp. 373–382, 2015, doi: 10.1145/2766462.2767738. [35] Y. Chen, "Convolutional Neural Network for Sentence Classification by," 2015.
- 35) T. C. Buck, M. S. Müller, M. Plattner, and A. W. Koch, "CNN Features off-the-shelf: an Astounding Baseline for Recognition Ali," Opt. Meas. Syst. Ind. Insp. VI, vol. 7389, p. 738930, 2009.
- 36) J. Chandramohan, R. Nagarajan, M. A. kumar, T. Dineshkumar, G. Kannan, and R. Prakash, "Attendance Monitoring System of Students Based on Biometric and GPS Tracking System," Int. J. Adv. Eng. Manag. Sci., vol. 3, no. 3, pp. 241–246, 2017, doi: 10.24001/ijaems.3.3.16.
- 37) S. Kouamo and C. Tangha, "Fingerprint Recognition with Artificial Neural Networks: Application to E-Learning," J. Intell. Learn. Syst. Appl., vol. 08, no. 02, pp. 39–49, 2016, doi: 10.4236/jilsa.2016.82004.
- 38) M. V. Valueva, N. N. Nagornov, P. A. Lyakhov, G. V. Valuev, and N. I. Chervyakov, "Application of the residue number system to reduce hardware.
- 39) costs of the convolutional neural network implementation," Math. Comput. Simul., vol. 177, pp. 232–243, 2020, doi: 10.1016/j.matcom.2020.04.031.
- 40) M. Galar et al., "A survey of fingerprint classification Part I: Taxonomies on feature extraction methods and learning models," Knowledge-Based Syst., vol. 81, no. February, pp. 76–97, 2015, doi: 10.1016/j.knosys.2015.02.008.
- 41) D. Peralta, I. Triguero, S. García, Y. Saeys, J. M. Benitez, and F. Herrera, "On the use of convolutional neural networks for robust classification of multiple fingerprint captures," Int. J. Intell. Syst., vol. 33, no. 1, pp. 213–230, 2018, doi: 10.1002/int.21948.
- 42) Dabouei, H. Kazemi, S. M. Iranmanesh, J. Dawson, and N. M. Nasrabadi, "Fingerprint distortion rectification using deep convolutional neural networks," Proc. - 2018 Int. Conf. Biometrics, ICB 2018, pp. 1–8, 2018, doi: 10.1109/ICB2018.2018.00012.
- 43) A. H. Yih, J. L. Hung, J. A. Wu, and L. M. Chen, "Overlapped fingerprint separation based on deep learning," ACM Int. Conf. Proceeding Ser., pp. 14–18, 2018, doi: 10.1145/3299852.3299857.
- 44) M. Aritonang, I. D. Hutahaean, H. Sipayung, and I. H. Tambunan, "Implementation of Fingerprint Recognition Using Convolutional Neural Network and RFID Authentication Protocol on Attendance Machine," ACM Int. Conf. Proceeding Ser., pp. 151–156, 2020, doi: 10.1145/3397391.3397449.



## Utilizing Convolutional Neural Networks for Fingerprint-Based Attendance Monitoring

- 45) S. Minaee, E. Azimi, and A. Abdolrashidi, "FingerNet: Pushing the Limits of Fingerprint Recognition Using Convolutional Neural Network," 2019, [Online]. Available: <http://arxiv.org/abs/1907.12956>
- 46) Y. Zhang, Y. Jiao, J. Li, and X. Niu, "A Fingerprint Enhancement Algorithm using a Federated Filter," *Quality*.
- 47) E. M. Cherrat, R. Alaoui, and H. Bouzahir, "Improving of fingerprint segmentation images based on K-means and DBSCAN clustering," *Int. J. Electr. Comput. Eng.*, vol. 9, no. 4, pp. 2425–2432, 2019, doi: 10.11591/ijece.v9i4.pp2425-2432.
- 48) J. Canny, "Canny1986," no. 1, pp. 1–17.
- 49) B. Bhanu and A. Kumar, *Advances in Computer Vision and Pattern Recognition Deep Learning for Biometrics*. [Online]. Available: <http://www.springer.com/series/4205>
- 50) A. Krizhevsky, I. Sutskever, and G. E. Hinton, "ImageNet classification with deep convolutional neural networks," *Commun. ACM*, vol. 60, no. 6, pp. 84–90, 2017, doi: 10.1145/3065386.
- 51) E. Park, W. Kim, Q. Li, H. Kim, J. Kim, and V. Corp, "Of Random Sample Patches," 2016.
- 52) L. D. Avendaño-Valencia and S. D. Fassois, "Natural vibration response-based damage detection for an operating wind turbine via Random
- 53) Coefficient Linear Parameter Varying AR modelling," *J. Phys. Conf. Ser.*, vol. 628, no. 1, pp. 273–297, 2015, doi: 10.1088/1742-6596/628/1/012073.
- 54) W. Deng, Z. Huang, J. Zhang, and J. Xu, "A Data Mining Based System for Transaction Fraud Detection," 2021 IEEE Int. Conf. Consum. Electron. Comput. Eng. ICCECE 2021, pp. 542–545, 2021, doi: 10.1109/ICCECE51280.2021.9342376.
- 55) M. P. LaValley, "Logistic regression," *Circulation*, vol. 117, no. 18, pp. 2395–2399, 2008, doi: 10.1161/CIRCULATIONAHA.106.682658.
- 56) Y. Yin, L. Liu, and X. Sun, "SDUMLA-HMT: A multimodal biometric database," *Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics)*, vol. 7098 LNCS, pp. 260–268, 2011, doi: 10.1007/978-3-642-25449-9\_33.
- 57) N. Srivastava, G. Hinton, A. Krizhevsky, I. Sutskever, and R. Salakhutdinov, "Dropout: A simple way to prevent neural networks from overfitting," *J. Mach. Learn. Res.*, vol. 15, pp. 1929–1958, 2014.



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## Organizational and Economic Problems of the Development of the Tourist Industry of Uzbekistan



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**ABSTRACT:** In this scientific article, in the context of accelerated development of the industry of Uzbekistan, the organizational and economic challenges of Uzbekistan's tourism services were analyzed and the employment of the population was analyzed. The country has developed a number of scientific proposals and recommendations on the pre-proportionous tourism services in the country, including the superior developed networks of the national economy and ensure the implementation of priorities set out in the concept of tourism. The introduction of developed proposals and recommendations will serve to strengthen the role of tourism services in the country's development and in the formation of macroeconomics indicators.

**KEYWORDS:** Tourism, global pandemic, unemployment, employment, new vacancies.

### INTRODUCTION

At the current stage of the development of society, the field of tourism services appears as a system covering social, economic, cultural-educational, political and other relations, therefore, the relations between the subjects in the field are rich, comprehensive and complex relations, which are governed by clear, firmly established and stable legal norms. It is very difficult to achieve the goal of tourism without regulation. Also, in the field of tourism services, countries with countries, international organizations with countries, enterprises, institutions and organizations that are registered in the prescribed manner and have the right to provide tourist services, have a license, all accommodation facilities serving tourists, catering and transport enterprises, cultural and educational, The effectiveness of the relationship processes between sports institutions, tourists, leaders of tourist groups, excursion leaders, employees of the security service for tourists, agencies protecting the rights of tourists, organizations and other subjects largely depends on the correct formation of the field from the organizational and economic point of view. The reason is that if the development of the tourism services sector is organizationally optimal and flexible in relation to the service market conjuncture, the quality and efficiency of the service will be higher.

Many economists have conducted a number of scientific and practical works on the components of the rapid development of the tourism services sector, its role in the socio-economic development of the country, and its role in the development of labor relations. Among the CIS countries' economists, many scientific studies have been conducted in this regard. In particular, G.A. Karpova, T.A. Lavrova[1], I.I. Opolchenov[2], M.A. Morozov[3], E.A. Titova[4], O.V. Kuropyatnik[5] and others paid great attention to the theoretical and practical aspects of the development of tourism services.

Among the scientists who conducted scientific research on the nature of tourism in Uzbekistan, its role in socio-economic development and issues of its development, N.T. Tukhliev[6], M.M. Mukhammedov[7], M.Q. Pardaev, G'.H. Gudratov[8] can be shown. In their scientific research, they studied the theoretical and methodological problems of the development of the tourism sector.

In recent years, the field of tourism services is considered as an important strategic sector in ensuring the implementation of priority tasks such as diversification of the national economy of Uzbekistan, rapid development of regions, creation of new jobs, increase of incomes and living standards of the population, and investment attractiveness of the country. In particular, the development of tourism is set in the "Concept for the development of the tourism sector in the Republic of Uzbekistan in 2019-2025", approved by the decree of the President of the Republic of Uzbekistan dated January 5, 2019 No. PF-5611 "On additional measures for the rapid development of tourism in Uzbekistan"[9] The establishment of a seven-year program for achieving the target indicators requires a lot of work to be done in this area and full use of all opportunities in their implementation.

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Available scientific researches and statistical data were studied to clarify the organizational and economic aspects of the development of the field of tourism services in Uzbekistan. Also, economic comparison and analysis, logical thinking, scientific abstraction, information grouping, analysis and synthesis, induction and deduction methods were widely used in the research.

### ANALYSIS AND RESULTS

The effect of the effective macroeconomic policy of the state on the regulation and support of tourism in Uzbekistan, which is implemented in real life and aimed at realizing the huge potential of the network, is the reaction of the spread of COVID-19, which suddenly occurred in the development of society in 2020 and caused the global economic crisis to derail economic systems. Faced with great difficulties with naturally, these secular processes, which do not depend on Uzbekistan, had a very strong negative impact on the economic life of the country. The negative impact of the coronavirus pandemic on the tourism network, which has its own characteristics and the development of international tourism directly depends on the strength of inter-country integration relations, has been huge.

As part of the quarantine measures introduced in the country due to the coronavirus pandemic, all air and rail transport activities in Uzbekistan have been temporarily suspended since March 2020. This situation led to a sharp decrease in the number of tourists visiting our country. For example, in January-March 2020, i.e. before the international movement of vehicles was stopped, the number of foreign citizens who came to the Republic of Uzbekistan for tourist purposes was 1214.01 thousand people, in April-June of this year, i.e. after the international movement of vehicles was completely stopped later, this indicator was only 2.1 thousand people. In other words, the number of tourists visiting the country from abroad has decreased by 5816 times as a result of quick measures taken out of desperation due to the coronavirus pandemic in a short period of time. Based on the average amount of income per foreign citizen who visited Uzbekistan in 2019 (2028.5 thousand soums)[10], due to the decrease in the number of foreign tourists by 1211.9 people due to the pandemic, the number of tourists visiting Uzbekistan only we can calculate the amount of export of tourism services lost due to the decrease. The amount of export of services is 245833 trillion. organized soums. The decrease in our country's income from tourism exports is not only a reality due to a sharp decrease in the number of visitors in April-June. Even in January-March 2020, that is, before the suspension of international traffic, it can be observed that the number of tourists visiting the country has decreased significantly due to the spread of COVID-19 in the countries of the world. Results of the analysis, as a result of the increase in the number of foreign citizens who visited Uzbekistan during the first three months of the year, the number of foreign citizens who came to the Republic of Uzbekistan in January-June 2020 totaled 1216.1 thousand people (in the first half of 2019, it was 3034.8 thousand people) formed) and this was only 40% of the number of tourists visiting from abroad in the same period of the previous year, that is, it decreased by 2.5 times. As a result of the pandemic, the number of foreign tourists visiting the country decreased by 1,818,700 compared to the same period of 2019, and the loss of tourism exports to the country amounted to 368,923, 295 billion. amounted to soums (1818.7 thousand people x 2028.5) [10].

The crisis that began in the tourism of all countries in the world seriously damaged the tourism of Uzbekistan and the rate of growth of its indicators at the macro level. For example, in 2020, the volume of export of tourism services in Uzbekistan by the state will be 1360.0 mln. It was planned to deliver to US dollars. But its actual volume was almost 81% less than the plan and amounted to 260.9 million. made US dollars (Table 1).

**Table 1. Analysis of the damage caused to the tourism sector under the influence of the coronavirus pandemic in the Republic of Uzbekistan in 2019-2021<sup>1</sup>**

Indicators	2019		2020		2021	
	Prognosis	Real	Prognosis	Real	Prognosis	Real
Number of foreign tourists visiting Uzbekistan (thousands of people)	6041	6748	7010	1504,1	8410	1881,3
Export of tourism services (million US dollars)	1180	1313	1360	260,9	1620	422
Number of domestic tourists (thousand visits)	16100	14748	17230	3534,1	18806	5813,9
Number of hotels and similar accommodations (units)	1100	1056	1620	1308	2200	1442
Number of rooms in accommodation facilities (thousand)	24	26,1	35	29,2	47	33,4
Number of seats in placement vehicles (thousands)	49	54,7	72	61,5	95	71,2
Number of tour operators (people)	1100	1481	1190	1344	1250	1467

<sup>1</sup> Made by the author based on the information of the State Statistics Committee of the Republic of Uzbekistan.

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According to the Decree of the President of the Republic of Uzbekistan on January 5, 2019, dedicated to the "Concept for the development of the tourism sector in the Republic of Uzbekistan in 2019-2025", the volume of export of tourism services of Uzbekistan in 2021 will be 1360 million. dollars, and if we take into account the fact that the plan was fulfilled by 16% in 2019, the volume of export of tourism services in the country in 2020 (even if the previous goals of 2019 are preserved) will be 1577 (1360x1.16) million. could be US dollars. In reality, the total was only 260.9 million US dollars.

Also, today (after the pandemic) in Uzbekistan, in order to rapidly develop the field of tourism services, although it is considered as one of the "growth points" of the national economy, the existence of unused opportunities, organizational and economic shortcomings and problems in the field of activity are highlighted. According to the conducted analysis, it was found that a number of shortcomings and problems are arising as a result of secondary demand in other sectors of the country's economy: transport, hotel business, catering, trade and other household sectors. These disadvantages can be seen in:

- Most of the tourists visiting Uzbekistan or domestic tourists said that the geolocation system is not well established, and the tourist visiting the country on his own will face difficulties in going where he wants and finding what he wants[11]. One of the next important objections is that the quality of the Internet is below average, the Wi-Fi system in hotels, restaurants, cafes, public transport is very weak or does not exist at all.
- the cost of hotels and transportation in the country is quite expensive compared to food and other products (clothes, drinks, gifts, etc.). There are problematic situations in connecting the regions of the country with each other (for example, direct flights from Shahrisabz to Khiva were not launched even in the peak of the tourist season) [12].
- According to tourists who have visited the country, the biggest inconvenience in traveling to Uzbekistan is related to registration. A separate form is filled out for entering and exiting the country, even during check-in and check-out. Also, there are no private currency exchange offices in Uzbekistan, and it can be exchanged only in banks and specialized exchange services[13]. In addition, most banks are closed on Saturdays and Sundays, so it is almost impossible to exchange currency.
- Value added tax (VAT) in the service sector all over the world, especially in the hotel chain, is either completely absent or set at a much lower rate than the general value added tax imposed in the economy. For example, in Turkey, which has a well-developed tourism sector, VAT is set at 18 percent, but 8 percent for hotels. Germany, Greece, France - in all of them VAT for hotels is at least 2 times lower [14]. But in Uzbekistan, the same 15 percent rate is set for all economic entities. This, in turn, affects the price of hotel services.
- Although social networks are the cheapest and most convenient means of advertising today, according to tourists, it is impossible to get complete information about Uzbekistan. For example, according to the Committee on Religious Affairs, more than 30 million people who believe in the Naqshbandi sect live in Turkey. But according to the polls, most of them do not know that the mausoleum of Sheikh Bahauddin Naqshband is in Bukhara [15].
- According to visitors, it is difficult to predict the quality of hotel rooms, it is somewhat difficult to compare different options during the selection process. Also, there is a lack of quality collective residential buildings corresponding to 3-4 categories in the country.

Despite the fact that the Concept of tourism development in Uzbekistan has defined a program of specific tasks and measures to eliminate the problems and shortcomings listed above and which await their solution, their existence in practice indicates, on the one hand, that the effectiveness of the consistent policy on the rapid development of tourism services in Uzbekistan is low, and on the other hand, they it can be considered as a negative result of the consequences of the pandemic in the world.

Therefore, practice shows that the development of tourism services as an important strategic sector of the national economy, diversification and quality improvement of tourist services, and improvement of tourist infrastructure, including attracting foreign investments and conducting effective advertising and marketing activities, as well as meeting the target indicators defined in the Concept In many ways, there is a need for the active participation of the state in the network economy. The rapid development of tourism cannot be realized without the direct and active participation of the state, without its well-thought-out quick measures and highly effective policies. In our opinion, the effectiveness of the development of tourism services in Uzbekistan in the future depends on the policy of the state authorities in the management of the tourism sector from the economic, socio-cultural, ecological, financial, image and marketing point of view.

In our opinion, the only way to quickly eliminate the problems and shortcomings that hinder the development of the field of tourism services of Uzbekistan and to fulfill the priority tasks set for the rapid development of the field in the future is to manage the field on the basis of a clear system and program. The effective implementation of the priority tasks and its effectiveness depend to a large extent on the systematic approach. If the tasks are implemented on the basis of a specific system and program, the efficiency of achieving the expected result will be higher.

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### CONCLUSIONS AND SUGGESTIONS

Based on the above, we have developed the priority tasks facing the state authorities and which should be implemented immediately to raise the development of tourism services in the new Uzbekistan to a new level (Table 2).

**Table 2. Tasks before the state authorities on the development of tourism services in the country <sup>2</sup>**

<b>Economical</b>	<p>a) Attracting additional investments or increasing local areas such as "tourist neighborhood", "tourist village", "tourist town" on the basis of public-private partnership;</p> <p>b) Creating conditions for tourism purposes by reorganizing historical heritage objects that are not used for tourism purposes on the basis of public-private partnership;</p> <p>c) Turning remote areas suitable for the establishment of new tourism destinations into tourist recreation zones, as well as providing these zones with all kinds of financial and economic freedoms, benefits and preferences, as in "free economic zones";</p> <p>d) Organization of tourism clusters in order to provide high-quality, fast and modern tourism services to consumers of the domestic and foreign markets of tourism, thereby increasing the employment of the able-bodied population and achieving the creation of new jobs;</p> <p>e) To achieve digitalization of the system by attracting modern information technologies to the activity of the industry in order to form quality tourism services that meet the requirements of today's times and meet international standards;</p> <p>f) Optimizing the balance of payments in the economy and tourism, providing economically attractive conditions for business</p>
<b>Socio-cultural</b>	<p>a) In order to improve the living standards and quality of the population of the region and to develop domestic tourism, to increase the possibilities of using tourist services for the population in need of social protection (poor families, families who have lost their breadwinners, children of school age, pensioners and disabled people);</p> <p>b) To develop the activities of HEIs, medical institutions and all types of other economic entities in order to develop educational, medical and business tourism in the country and to adapt them from the point of view of tourism;</p> <p>c) Based on the country's geographical location, ecological and other indicators, developing measures to reduce the lack of personnel in the field by organizing and developing new tourism directions that do not depend on the season;</p> <p>d) Considering the issue of postponing the summer vacation of school-aged students (taking into account the tourist season) in order to develop domestic tourism in the country and encourage the population to use tourism services, and through this to form a tourism culture in them;</p> <p>e) Making it mandatory to establish a high-speed WI-FI system in all types of tourist service entities (accommodation facilities, cafes, restaurants, etc.);</p>
<b>Ecological</b>	<p>a) Paying attention to the environmental problems of the region, solving them with the help of ecological tourism, increasing attention to the use of renewable resources;</p> <p>b) Formation of a normative legal framework aimed at increasing responsibility and accountability for the use of natural resources and preservation of ecology in the country;</p> <p>c) Creation of necessary conditions for rapid development of ecological tourism;</p>
<b>Financial</b>	<p>a) Establishing a separate tax, monetary and customs policy for business entities engaged in tourism services and increasing the benefits of this type for them (based on international experience, reducing the VAT rate for goods and services in the field of tourism to 8% and exemption from profit tax);</p> <p>b) In order to extend the tourism season in the country and to encourage domestic tourism, to develop a mechanism for state reimbursement of expenses of tour operators on the organization of railway and air transport services during the off-season (for example, between November and March);</p> <p>c) Implementation of anti-crisis measures to support organizations in the field of tourism, providing subsidies up to 50% of the cost of interest payments on loans;</p> <p>d) In order to activate the activities of tour operators and develop tourism services, the introduction of the "tourist cashback" system in the country (in which a certain percentage of the expenses incurred by the tourist who used the service of tour operators will be returned as cashback).</p> <p>e) Taking measures to establish currency exchange offices operating 24/7 in localities in order to create freedom for them based on the demands and wishes of foreign tourists;</p>

<sup>2</sup> Made by the author.

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<b>Visual</b>	<p>a) Create an external image (image) of Uzbekistan as a convenient and safe country for tourism, strengthen economic and cultural relations with other developed countries, form a positive public opinion about the region and carry out its constant analysis;</p> <p>b) Development of the "National rating", "National quality label" system for tourism services;</p> <p>c) To raise the ratings of the region in the field of economy and tourism, to reach the relevant world standard level of service quality and safety;</p> <p>d) establishment of the President's Council on creating a national brand;</p> <p>e) Development of a unified state strategy for the formation of the image of Uzbekistan and its protection.</p>
<b>Marketing</b>	<p>a) Organization of large national media holdings competitive to mass media in the regional and international information space;</p> <p>b) Raising the level of cooperation with mass media and research centers in developed foreign countries to a new level;</p> <p>c) Establishment of a satellite television channel broadcast in leading foreign languages;</p> <p>d) Organization of "Travel journalism" (travel journalism) directions in HEIs specializing in foreign languages and tourism;</p> <p>e) Development of new forms and standards of tourist services</p>

The priority tasks recommended to be implemented in table 2 should be considered as an important factor for the rapid development of the tourism services sector in Uzbekistan, returning it to the active state before the pandemic and taking a worthy place in the world tourism market. In order to achieve the expected result from these processes, the state should coordinate relations and cooperation between business entities and state organizations responsible for tourism.

Therefore, the comprehensive development of the field of tourism services in Uzbekistan, strengthening its role in the formation of the macroeconomic indicators of the country, aimed at providing the country's domestic and foreign tourism market with quality tourism services, and carefully considering the structure of measures that need to be improved within the framework of the Concept of rapid development of tourism in 2019-2025 analyzing, we are convinced that the country's tourism prospects in the future are largely related to the active participation of the state in the network economy and socio-economic, political and financial organizational and leadership activities in the development of tourism services.

In our opinion, the coordination of the activities of all enterprises and organizations providing tourism services based on the model and strategy developed by us will increase the tourist attractiveness of the country in the future, the active and high-speed development of the tourism services industry, and ultimately the solution of a number of social problems such as the well-being, income and employment of the country's population. has a positive effect. Also, we believe that the program of recommendations proposed by us will be effective in ensuring the implementation of measures and measures set within the framework of the Concept of the Development of the Tourism Sector in Uzbekistan and in achieving the target indicators.

The following general conclusions and proposals were developed as a result of the research on the development of the tourism services sector and the prospects of increasing its role in ensuring employment of the population:

1. Development of the field of tourism services in Uzbekistan as an important strategic sector of the national economy, the priority tasks facing the state authorities in order to return it to the active state before the pandemic and reach the target indicators defined in the Concept, and the systematic model of its rational management from an organizational and economic point of view development;
2. To promote the tourism services sector in Uzbekistan as a "driver" of the economy, to achieve the set goals through the comprehensive development of the sector, to achieve the set goals based on a clear plan and program, and to strengthen the responsibility and accountability of regional state authorities, "Strategy for the development of tourism services in the regions" "to develop;
3. Based on the advanced experience of developed countries, in the future, as one of the most effective ways to increase employment in the field of tourism services of the country, to develop a program of measures to reduce the lack of personnel and solve the problem of seasonality in the field, in which MICE tourism in Uzbekistan is a solution to these important tasks. rapid development and development of its organizational and economic mechanism;

### REFERENCES

- 1) Karpova G. A., Lavrova T. A. Features of the development of tourism and the study of the tourist potential of St. Petersburg. Monograph. - St. Petersburg, 2007.
- 2) Opolchenov I.I. Marketing in tourism: Description of the market position: Textbook. - M.: Soviet sport, 2003. -192s.

## Organizational and Economic Problems of the Development of the Tourist Industry of Uzbekistan

- 3) Morozov M.A. Economics of tourism: textbook / M.A. Morozov, N.S. Morozova, G.A. Karpova, L.V. Khoreva. - M. : Federal Agency for Tourism, 2014. - 320 p.
- 4) Titova E.A. Employment in the field of tourism services in a post-industrial economy // Tourism and cultural heritage: Mayvuz. Sat. scientific papers - Saratov: Publishing house of Sarat.un-ta, 2007. Issue 4
- 5) Kuropyatnik O.V. Modern trends and forecast for the development of international tourism // Geography and ecology: scientific creativity, interdisciplinarity, educational technologies: materials of the International scientific and practical science. M. : Publishing house of the Moscow State Regional University, 2017. S. 85-89.
- 6) Tukhliiev I.S., Kudratov G.Kh., Pardaev M.K. Tourism Ta'lim Yunalishi Talabalari Uchun Darslik/Samarqand Iqtisodiyot va Service Institute. - T. : Iktisod-Moliya, 2010.-260 bet.
- 7) Mukhammedov M.M. va boshkalar. Hizmat kursatish sohasi va tourism rivozhlantirishning nazariy asoslari. Monograph. "Zarafshon" nashriyoti, 2017. - 300 b.
- 8) Pardaev M.K. va boshkalar. Khizmat kursatish, service va tourism sohalarini rivojlantirish: muammolar va ularning echimlari. Monograph. - Tashkent: Iktisodiyot-moliya, 2008. - 260 b.;
- 9) Decree No. PF-5611 dated January 5, 2019 of the President of the Republic of Uzbekistan "On additional measures for the rapid development of tourism in the Republic of Uzbekistan"
- 10) Muhammedova Z.M. Increasing the economic efficiency of investment resources in the innovative development of tourism: Iqt.fan.fals.d-ri diss... autoref. – Samarkand: SamISI, 2020. – P.18.
- 11) Official news portal of Uzbekistan: Pandemiyadan keyingi tourism: Uzbekiston nimalarga etibor karatishi kerak?. URL: <https://kun.uz/11780695> (accessed 20.01.2023)
- 12) Official news portal of Uzbekistan: "Pandemiadan keyingi tourism: Uzbekiston nimalarga etibor karatishi kerak?". URL: <https://kun.uz/11780695?q=%2F11780695> (accessed 20.01.2023)
- 13) "Zamin" - News of Uzbekistan. "Pandemiadan keyingi tourism: Uzbekiston nimalarga etibor karatishi kerak?". URL: <https://zamin.uz/jamiyat/85825-pandamiadan-kejingi-turizm-uzbekistan-nimalarga-jetibor-aratishi-kerak.html> (accessed 20.01.2023)
- 14) Official news portal of Uzbekistan: "Pandemiadan keyingi tourism: Uzbekiston nimalarga etibor karatishi kerak?". <https://kun.uz/news/2021/03/25/uzbekistonda-nega-mekhonkhonalar-kimmat> (accessed 20.01.2023)
- 15) Official news portal of Uzbekistan: "Pandemiadan keyingi tourism: Uzbekiston nimalarga etibor karatishi kerak?". URL: <https://kun.uz/11780695?q=%2f11780695> (accessed 20.01.2023)



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## Settlement of Defaults in the Implementation of Agreements for the Use of Mapping Services with Drones on Mapping Services Drones Indonesia (MSDI)



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**ABSTRACT:** In general, natural human needs are divided into two, namely primary needs and secondary needs. Primary needs are absolute basic needs such as clothing, food and shelter. Meanwhile, secondary needs are needs related to creating a prosperous life such as economic needs. One form of welfare life created by humans is technology. Technology is a concept related to the type of use and knowledge of tools and skills. Various business people utilize technology as a business field, one of which is *Mapping Services Drone Indonesia* (MSDI). MSDI uses *drone* technology to provide mapping services. In the transaction between business actors and clients, an agreement arises. Therefore, researchers are interested in discussing two formulations, namely: 1) how is the concept of *drone* agreement standards in providing balance for various parties? 2) How is the default settlement procedure in the implementation of the agreement on the use of mapping services with *drones* at *Mapping Services Drone Indonesia* (MSDI)? This research uses normative legal research methods, namely collecting and analyzing secondary data using secondary data sources only, namely books related to the problem, related laws and regulations, related court decisions, legal theories and relevant scholars' doctrines, and case studies related to legal issues. Although this type of research is normative law, this research also uses *purposive sampling* technique, which is one of the sampling methodologies used in research to achieve research objectives. The *purposive sampling technique* used in the research is obtained from *Mapping Services Drone Indonesia* (MSDI). The theories used are the theory of responsibility and the theory of legal protection. Based on the results of the analysis, it can be concluded that the agreement provided by the service provider / MSDI to the service recipient / client has fulfilled the principle of balance, such as the rights and obligations of each party, the payment system, and an explanation of risk sharing. This avoids conflicts of interest or possible risks in the future. In the context of the agreement, default resolution can be done in non-litigation or litigation. However, until now the default settlement can still be resolved in a non-litigation / peaceful manner.

**KEYWORDS:** Settlement of Default; Agreement; *Drone* Mapping Services

### INTRODUCTION

Relationships between nations are a natural need as humans who are predicated as social beings or better known as "*Zoon Politikon*"<sup>1</sup> so relations between nations or relations between regions are primary needs.<sup>2</sup> Primary needs are basic needs that must be met by all humans, namely clothing, food and shelter. These primary needs are the most important things to fulfill in order to continue life. In addition to primary needs, there are secondary needs, namely needs related to efforts to create or increase happiness in life. One of the efforts to create or increase the happiness of human life is to fulfill economic needs. Economic needs are one of the secondary needs of a nation in order to create prosperity. One of the secondary needs to create the welfare of life created by humans is technology.

The definition of technology according to Law Number 11 of 2019 concerning the National System of Science and Technology is a way, method, or process of applying and utilizing various scientific disciplines that are useful in fulfilling needs, sustaining, and improving the quality of human life. Technology is a concept related to the type of use and knowledge of tools and expertise. Various examples of technological developments that make it easier for humans to live their daily lives, namely: cell phones are useful for facilitating long-distance communication, internet media is useful for accessing various information and knowledge

<sup>1</sup> Chesters, G. and Welsh, I., 2006. *Complexity and social movements: Multitudes at the edge of chaos*. Routledge.

<sup>2</sup> Gintis, H., Van Schaik, C. and Boehm, C., 2015. *Zoon politikon: The evolutionary origins of human. political systems*. *Current Anthropology*, 56(3), pp.327-353.



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easily and quickly, or in the banking sector the presence of Automated Teller Machines (ATMs) is useful for taking and depositing money anywhere and anytime. In addition to the fields mentioned above, there are many other fields that are helped by the presence of technology. Including in the business sector. Various business people try their luck in starting their business by utilizing technology. One of the business people who utilize technology as their livelihood is *Mapping Services Drone Indonesia (MSDI)*. MSDI is a private company that specializes in surveying and mapping services with *drone* technology.

With the development of this survey and mapping service business, there are often problems in the agreement between the business actor as a *drone* mapping service provider and the client as the recipient of the service.<sup>3</sup> The term used in the breach of the agreement is referred to as "default". Default is not fulfilling or neglecting to carry out obligations (achievements) as specified in the agreement made between the service provider and the service recipient.<sup>4</sup> Default can be in the form of: first, not doing what he promised to do, second, doing what he promised but not as it should, third, doing what he promised but late, fourth, doing something that according to the agreement he should not do. If a party does not carry out or fulfill the performance in accordance with the agreement, then the party has made a default.<sup>5</sup>

Based on this background, the researcher formulates the problem as follows:

1. How does the standard drone agreement concept provide a balance for the various parties?
2. How is the default settlement procedure in the implementation of the agreement on the use of mapping services with drones at Mapping Services Drone Indonesia (MSDI)?

### METHODS

The research method used in this writing is normative legal research, namely research by collecting and analyzing secondary data, normative research usually uses secondary data sources only, namely books related to the problem, related laws and regulations, related court decisions, legal theories and relevant scholars' doctrines, and case studies related to legal issues. The various approaches used in this research are: *statue approach*, *conceptual approach*, and case approach.

In obtaining data that is accurate and can be accounted for both in practical and juridical terms, this research uses various sources of legal material, namely primary, secondary, and tertiary. Primary legal materials used in this research, namely: 1945 Constitution of the Republic of Indonesia, Civil Code, Law No.30 of 1999 concerning Arbitration and Alternative Dispute Resolution, Law No.11 of 2019 concerning the National System of Science and Technology. 2019 concerning the National System of Science and Technology, Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 34 of 2021 concerning Civil Aviation Safety Regulations Part 22 concerning Airworthiness Standards for *Remotely Piloted Aircraft* Systems, Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 63 of 2021 concerning Civil Aviation Safety Regulations Part 107 concerning Small Unmanned Aircraft Systems, Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 37 of 2020 concerning the Operation of Unmanned Aircraft in the Airspace Served by Indonesia, and Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 27 of 2021 concerning Procedures for Supervision and Imposition of Administrative Sanctions for Violations of Legislation in the Aviation Sector. Secondary legal materials used in this research are books and legal journals or the views of legal experts related to this research. While tertiary legal materials used in this research are dictionaries, encyclopedias, and others. The legal material collection technique used in this research is the literature study technique. This technique is to conduct literature research on laws and regulations, legal theories and related legal issues, to obtain qualitative material which is then analyzed into conceptual, theoretical, normative and philosophical justifications. Although this type of research is normative law, this research also uses *purposive sampling* technique. The technique is one of the sampling methodologies used in research to achieve research objectives. The *purposive sampling* technique used in the research is obtained from *Mapping Services Drone Indonesia (MSDI)*. The data presentation technique used in this research is qualitative descriptive because it is to develop theories built through data obtained in the field. The form of legal material analysis technique is *content analysis*, which is an integrative analysis method and conceptually tends to be directed to find, identify, process, and analyze legal materials to understand the meaning contained clearly and relevantly.

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<sup>3</sup> Castro-Leon, E. and Harmon, R., 2016. *Cloud as a service: Understanding the service innovation ecosystem*. Apress.

<sup>4</sup> Salim H.S., 2003, *Contract Law: Theory and Practice of Contract Drafting*, Sinar Grafika Publisher, Jakarta, p. 98

<sup>5</sup> Mariam, Darus, 2001, *Compilation of Bond Law*, PT Citra Aditya Bakti, Bandung, p. 9.

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### RESEARCH RESULTS AND DISCUSSION

#### The Standard Concept of *Drone* Agreement in the Urgency of Providing Balance for Parties

Standard contracts or standard agreements are the use of exoneration clauses in consumer transactions. Standard contracts are basically born from the needs of society which aim to provide convenience or practicality for the parties in conducting transactions. In practice, it is often found that to bind a certain agreement, one of the parties has prepared a *draft* that will apply to the parties. The draft is prepared in such a way that at the time of signing the agreement the parties only need to fill in some subjective matters such as; identity and date of making the agreement which was deliberately left blank beforehand. Meanwhile, the provisions regarding the agreement (*terms of conditions*) are already written (printed) complete basically cannot be changed anymore. This agreement concept is called a standard contract (standard agreement / standard agreement).<sup>6</sup>

Agreements in Indonesia generally have a special name, as well as those that are not known by a certain name, or often referred to as named agreements (*benoemd/nominaat*) and unnamed agreements (*onbenoemde overeenkomst/innominaat*). The definition of a named agreement (*benoemd/nominaat*) is an agreement that has been regulated and named by the legislator. The arrangement is contained in Book III of the Civil Code, Chapter V through Chapter XVIII. Meanwhile, the definition of an unnamed agreement (*onbenoemde overeenkomst/innominaat*) is an agreement that has not been regulated in the Civil Code, but exists in the community.<sup>7</sup> The birth of anonymous agreements is possible because Book III of the Civil Code has an open system and the principle of freedom of contract, as stipulated in Article 1338 of the Civil Code. Some examples of unnamed agreements are lease purchase agreements, fiduciaries, *franchises*, *leasing*, consignment, and many more unnamed agreements known in economic and business practices in Indonesia.

The agreement on the use of mapping services with *drones* between the business actors, namely *Mapping Services Drone Indonesia* (MSDI) and the client can be categorized as an unnamed agreement or *innominaat*.<sup>8</sup> This is because this service usage agreement is not specifically regulated in laws or regulations, so it does not have a special name or term such as a sale and purchase agreement, lease agreement, or employment agreement.

An agreement or contract is basically an agreement that confirms a relationship or transaction made between two or more parties and forms an engagement between them. In the agreement/contract, in addition to containing the rights and obligations of the parties, the payment system, and risk-free, it must also be based on applicable legal principles. One of the important principles that must be contained in an agreement is the principle of balance. The principle of balance for the parties is a principle that states that the rights and obligations in an agreement must be equal and balanced for all parties involved.

From the research results, it can be seen that the cooperation agreement or contract owned by *Mapping Services Drone Indonesia* or MSDI has accommodated the principle of balance for the parties. For example, if the MSDI company as the business actor and the client cooperate to carry out mapping services with *drones* carried out by the business actor, then the principle of balance for the parties in this case will ensure that the rights and obligations of both parties must be equal and balanced. Not only that, the principle of balance for the parties also ensures that the contract must be accepted and understood by all parties. This is important because it ensures that each party understands their rights and obligations and ensures that each party cooperates well and respects their rights and obligations. It also helps to avoid conflicts that may arise in the future and ensures that the contract works well and is beneficial to all parties.

Hans Kelsen's theory of responsibility relates to sanctions or penalties given to someone who violates the rule of law. In the context of an agreement on the use of mapping services by *drones*, this theory of responsibility can be applied to the responsibilities of the parties in carrying out the agreement. In the agreement on the use of mapping services by *drones*, the parties usually have their respective responsibilities. The mapping service provider, in this case *Mapping Services Drone Indonesia* (MSDI), has the responsibility to provide *drones* in accordance with user requests, ensure that the *drones* operate properly, and guarantee the safety and quality of the services provided. Meanwhile, the service recipient, in this case the Client, has the responsibility to pay the agreed fee and comply with the applicable rules and regulations. Thus, Hans Kelsen's theory of responsibility can be applied in the practice of agreements on the use of mapping services by *drones* as a form of law enforcement against parties who violate the agreement. This can also increase the parties' awareness and compliance with the agreement or contract.

<sup>6</sup> Zulfirman, 2017, *Basic Human Rights in Indonesian Contract Law: A Crisis Analysis of Contract Terms*, Journal of Legal Research *De Jure* 17, no. 2, p. 155-176.

<sup>7</sup> Mariam Darus Badruzaman, *op.cit.* p. 67.

<sup>8</sup> Baloloy, A.B., Blanco, A.C., Ana, R.R.C.S. and Nadaoka, K., 2020. Development and application of a new mangrove vegetation index (MVI) for rapid and accurate mangrove mapping. *ISPRS Journal of Photogrammetry and Remote Sensing*, 166, pp.95-117.

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*Burgelijk Wetboek* or known as the Civil Code is a legislation originating from the Dutch colonial government which was applied in the archipelago (formerly known as the Dutch East Indies) through a Dutch East India Company called *Vereenigde Oostindische Compagnie* (VOC). The *Burgelijk Wetboek* was then enforced in the Dutch East Indies on May 1, 1848 through the principle of *concordance* (*concordantie beginsel*) which regulates issues that are in the realm of private law, which is different from public law that regulates the public interest (community, nation, or state).<sup>9</sup>

The *Burgelijk Wetboek* or Civil Code is a very important legislation in Indonesian law, especially in terms of regulating issues relating to private law. This regulation is a legacy of the Dutch colonial period in Indonesia, and has been the basis of civil law in Indonesia since its enactment in 1848. In its development, the *Burgelijk Wetboek* has undergone various changes and revisions in accordance with the times and the needs of society. Until now, this regulation is still valid in Indonesia and has become an important basis for civil law.

Law as a set of arrangements to regulate community relations authorizes legal subjects to act according to their rights and obligations, and is guaranteed by law.<sup>10</sup> An engagement is a rule that regulates legal relations in property between two or more parties, the law gives rights to one party (creditor) and obliges the other party (debtor) to achieve an achievement.<sup>11</sup>

Arrangements regarding ties regulated in the Civil Code are matters of ties that bind between individuals and individuals, individuals and business entities incorporated, as well as business entities incorporated with other legal entities. This is regulated in Article 1313 of the Civil Code which states:

"A contract is an act by which one or more persons bind themselves to one or more persons".

The obligation itself is regulated in Article 1233 of the Civil Code which states: "Every obligation is created either by consent or by law".

From this article, the Civil Code wants to emphasize that an obligation can arise from an agreement that the parties want, or arise because the law has regulated it. The obligation arising from an agreement that is desired by the parties is regulated in Article 1313 of the Civil Code above.<sup>12</sup>

In the engagement or what is often referred to as an agreement, there is the term "default". Default is the performance of an obligation that is not fulfilled or a breach of promise or negligence committed by the debtor either by not carrying out what has been promised or even doing something that according to the agreement should not be done.

The term default comes from the Dutch language, namely "*wanprestatie*"<sup>12</sup> which means the non-fulfillment of achievements or obligations that have been determined against certain parties in an engagement, either an engagement born from an agreement or an engagement arising from law.

In the author's research on *Mapping Services Drone Indonesia* (MSDI), there are various acts of default committed by the second party, namely the client in the process of the agreement to use mapping services with the drone. Among other things, the second party does not fulfill the performance at all, the second party fulfills the performance but not on time payment or the second party fulfills the performance not in accordance with the agreement, even though the results of the mapping data provided by the first party are in accordance with the agreement and have been used by the second party. In this case, the second party can be said to have committed an act of default.

If there is an act of default by the second party, namely the client, against the first party, namely *Mapping Services Drone Indonesia* (MSDI), then the first party has the right to take legal action according to statutory regulations.

For example, if the second party does not fulfill the performance at all, the first party can first make a letter of reprimand or subpoena to the second party to request the fulfillment of the performance in accordance with the agreement. If the second party still does not fulfill the performance, the first party can file a lawsuit to the court to demand the fulfillment of the agreement or compensation.

Meanwhile, if the second party fulfills the performance but is not on time in payment, the first party can first give a summons to the second party to pay immediately. If the second party still does not pay, the first party can take legal action in accordance with laws and regulations, namely conducting collateral seizure or filing a lawsuit in court.

<sup>9</sup> Johannes Ibrahim Kosasih, 2021, *Parate Execution of Fiduciary*, CV. Mandar Maju, Bandung, p. 107

<sup>10</sup> I Putu Esha Wiryana Putra, I Made Arjaya, 2021. *Legal Protection of Advocates and Clients in Civil Case Settlement*. (Journal of Legal Construction), Vol. 2, No. 3, pp. 4, (<https://doi.org/10.22225/jkh.2.3.3668.599-604>, accessed on November 22, 2022)

<sup>11</sup> Kadek Dwinta, Pradnyasar, Johannes Ibrahim Kosasih. 2021. *Default in Credit Agreements at Village Credit Institutions (LPD) in Bebetin Village, Sawan District, Buleleng Regency*. (Journal of Legal Construction), V ol. 2, No. 2, (<https://doi.org/10.22225/jkh.2.2.3210.223-227> , accessed March 5, 2023) <sup>12</sup> Johannes Ibrahim Kosasih, *op.cit.*, p. 107-108.

<sup>12</sup> Mak, V., 2009. *Performance-oriented remedies in European sale of goods law*. Bloomsbury Publishing.

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In this case, it is important for the first party, namely *Mapping Services Drone Indonesia* (MSDI) to pay attention to the provisions in the agreement and follow the predetermined procedures to resolve default problems.

Settlement of defaults in agreements can be done through various forms of dispute resolution mechanisms. There are several forms of dispute resolution, such as mediation, arbitration, court settlement, and so on. Each form of settlement has its own advantages and disadvantages, so it is important to consider certain factors in choosing the most appropriate form of settlement to resolve default disputes in the agreement.

If the debtor defaults, the creditor generally gives an order or warning letter explaining that the party/debtor has neglected its obligations. This letter is referred to as a summons. Regarding the summons, the provisions of Article 1238 of the Civil Code explain that the debtor is declared negligent by warrant, or by similar deed, or based on the strength of the obligation itself, namely if this obligation causes the debtor to be considered negligent with the passage of time specified. Somasi is an effective step to resolve disputes before a court case is filed. Somasi aims to give an opportunity to the potential defendant to do or stop an action that is demanded.

In the context of an agreement on the use of mapping services with *drones* at *Mapping Services Drone Indonesia* (MSDI), default settlement can be done either through non-litigation or litigation settlement. In general, non-litigation settlement is dispute resolution outside the Court. Meanwhile, litigation settlement is a dispute resolution through the Court.

In its implementation, the service provider / MSDI prioritizes non-litigation settlements such as negotiation, mediation, or arbitration. Because this settlement effort is faster and can be negotiated deliberately. This aims to maintain good relations and minimize losses due to disputes. However, if efforts to resolve disputes through non-litigation resolution methods are unsuccessful, then the service provider / MSDI can settle litigation by filing a lawsuit in court. However, until now the default settlement can still be resolved non-litigation or amicably.

### **CONCLUSIONS AND SUGGESTIONS**

Based on the above discussion, the following conclusions can be drawn:

1. The standard agreement in the agreement to use mapping services with *drones* is a concept to provide a balance between the parties involved in the use of mapping services with *drones* at *Mapping Services Drone Indonesia* (MSDI). This concept aims to fulfill the principle of balance and ensure that the parties involved have clear and equal rights and obligations in the agreement. In general, the principle of balance is the principle that the rights and obligations of the parties must be balanced and fair. The agreement/contract provided by the service provider/MSDI to the service recipient/client has fulfilled the principle of balance, such as the rights and obligations of each party, the payment system, and an explanation of risk sharing. This avoids conflicts of interest or possible risks in the future.
2. In the context of an agreement on the use of mapping services with *drones* at *Mapping Services Drone Indonesia* (MSDI), default settlement can be done either through nonlitigation or litigation settlement. In general, non-litigation settlement is dispute resolution outside the Court. Meanwhile, litigation settlement is a dispute resolution through the Court. In its implementation, the service provider / MSDI prioritizes non-litigation settlements such as negotiation, mediation, or arbitration. Because this settlement effort is faster and can be negotiated deliberately. This aims to maintain good relations and minimize losses due to disputes. However, if efforts to resolve disputes through nonlitigation resolution methods are unsuccessful, then the service provider / MSDI can settle litigation by filing a lawsuit in court. However, until now the default settlement can still be resolved non-litigation or amicably.

Based on the above discussion, the following suggestions can be made:

1. To the Government, it can make clear regulations regarding the requirements for the use of *drones* and their coverage areas, including dispute resolution procedures. With clear regulations, the parties involved in the agreement can refer to these regulations as guidelines in carrying out the agreement.
2. To Academics, it is hoped that it can contribute to research related to anonymous / innominaat agreements. This research is expected to help deepen the understanding of innominate agreements and improve the practice of making and implementing effective innominate agreements.
3. To the Community/Client, to always read and understand carefully the service use agreement that will be signed, including the consequences of default. In addition, it is advisable to conduct prior research on the company or service provider to be selected, including the quality of service, experience, and reputation of the company.
4. To the service provider or *Mapping Services Drone Indonesia* (MSDI), to always ensure the quality of services and clear contracts with customers, comply with regulations and safety standards in the use of *drones*, protect the privacy and security of

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customer data, resolve disputes amicably by non-litigation means first, conduct litigation settlements with professionalism and transparency if necessary, and strengthen relationships with customers through high-quality services and innovation.

### REFERENCES

#### BOOKS

- 1) Castro-Leon, E. and Harmon, R., 2016. *Cloud as a service: Understanding the service innovation ecosystem*. Apress.
- 2) Chesters, G. and Welsh, I., 2006. *Complexity and social movements: Multitudes at the edge of chaos*. Routledge.
- 3) Darus, Mariam, 2001, *Compilation of Bond Law*, PT Citra Aditya Bakti, Bandung.
- 4) HS, Salim, 2003, *Contract Law: Theory and Practice of Contract Drafting*, Sinar Grafika, Jakarta.
- 5) Kosasih, Johannes Ibrahim, 2019, *Halal Kausa and the Position of Indonesian in the Law of Treaties*, Sinar Grafika, Jakarta.
- 6) Mak, V., 2009. *Performance-oriented remedies in European sale of goods law*. Bloomsbury Publishing.

#### JOURNAL

- 1) I Putu Esha Wiryana Putra, I Made Arjaya, 2021. *Legal Protection of Advocates and Clients in Civil Case Settlement*. (Journal of Legal Construction), Vol. 2, No. 3, pp. 4, (<https://doi.org/10.22225/jkh.2.3.3668.599-604>, accessed on November 22, 2022)
- 2) Baloloy, A.B., Blanco, A.C., Ana, R.R.C.S. and Nadaoka, K., 2020. Development and application of a new mangrove vegetation index (MVI) for rapid and accurate mangrove mapping. *ISPRS Journal of Photogrammetry and Remote Sensing*, 166, pp.95-117.
- 3) Gintis, H., Van Schaik, C. and Boehm, C., 2015. Zoon politikon: The evolutionary origins of human political systems. *Current Anthropology*, 56(3), pp.327-353.
- 4) Pradnyasar, Kadek Dwinta, Johannes Ibrahim Kosasih. 2021. *Default in Credit Agreements at Village Credit Institutions (LPD) in Bebetin Village, Sawan District, Buleleng Regency*. (Journal of Legal Construction), Vol. 2, No. 2, (<https://doi.org/10.22225/jkh.2.2.3210.223-227>, accessed November 22, 2022)
- 5) Zulfirman, 2017, *Basic Human Rights in Indonesian Contract Law: A Crisis Analysis of Contract Terms*, Journal of Legal Research De Jure 17, no. 2, 155- 176.

#### LEGISLATION

- 1) Constitution of the Republic of Indonesia Year 1945
- 2) Civil Code (*Burgerlijk Wetboek voor Indonesie*)
- 3) Law No.30 of 1999 Concerning Arbitration and Alternative Dispute Resolution State Gazette of the Republic of Indonesia of 1999 Number 138, Supplement to the State Gazette of the Republic of Indonesia Number 3872
- 4) Law No.11 of 2019 on the National System of Science and Technology
- 5) Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 37 of 2020 concerning the Operation of Unmanned Aircraft in the Airspace Served by Indonesia
- 6) Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 34 of 2021 concerning Civil Aviation Safety Regulations Part 22 concerning Airworthiness Standards for *Remotely Piloted Aircraft Systems*
- 7) Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 27 of 2021 concerning Procedures for Supervision and Imposition of Administrative Sanctions for Violations of Legislation in the Aviation Sector.
- 8) Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 63 of 2021 concerning Civil Aviation Safety Regulations Part 107 concerning Unmanned Small Aircraft Systems



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## Strategies for Overcoming Environmental Noise in Recreational Area (Case Study in Tibubeneng Village, Kuta Utara District, Badung Regency)



Ni Made Sri Utami Dewi<sup>1</sup>, Wayan Maba<sup>2</sup>, Ni Putu Pandawani<sup>3</sup>

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**ABSTRACT:** This research aims to analyze noise due to traffic volume what happened in the village of Tibubeneng. Quantitative data collection was obtained by calculating the noise level due to traffic volume which is measured for 1 (one) hour and calculating the noise level due to human activity Which dB(A) sound pressure level measurement for 10 minutes for each measurement and readings are taken every 5 seconds. The results are set forth in a traffic volume, noise and road geometry survey form. Traffic Noise Level Prediction Method (CoRTN). The research results show that Noise levels due to human activities at the study site on weekdays and holidays have exceeded the noise quality standards listed in KMLH no 48 of 1996 concerning Noise Level Standards, where the noise level in recreational areas is 70 dB (A). The strategy for noise sources from human activities is to regulate the operating hours of recreational areas, arrange the implementation of activities that cause higher noise levels such as launching fireworks, adding silencers and planting trees in recreation areas. While the strategy for noise sources from traffic activities is to carry out traffic engineering, regulate traffic speed and add noise reduction from natural materials such as planting trees.

**KEYWORDS:** Strategy, Noise, Human Activity, Traffic

### INTRODUCTION

Transportation is a movement or movement of both people and goods from a place of origin to a destination. Transportation has an important role in growth and development in all aspects. The need for transportation equipment in Indonesia continues to increase along with the increase in population every year. Based on data from the Central Statistics Agency for 2022, the population in Indonesia reaches 275.77 million people spread across 37 provinces in Indonesia. Transportation is one of the important means of driving life and cannot be separated from life. Where without transportation, human life will be sluggish and difficult to develop. The most widely owned means of transportation in Indonesia are motorized vehicles. Almost everyone has a motorized vehicle because it can help save time in moving from one place to another. This causes increased mobility and movement which is characterized by the demand for transportation needs. Each of these mobility and movements use means of transportation in the form of vehicles which in operation generate sounds, where at a certain level these sounds can still be tolerated so that the consequences they cause are not a nuisance. However, if the noise generated by vehicles is at a higher level, it is already a disturbance or pollution called noise. This causes increased mobility and movement which is characterized by the demand for transportation needs. Each of these mobility and movements use means of transportation in the form of vehicles which in operation generate sounds, where at a certain level these sounds can still be tolerated so that the consequences they cause are not a disturbance. However, if the sound generated by vehicles is at a higher level, it is already a disturbance or pollution called noise. This causes increased mobility and movement which is characterized by the demand for transportation needs. Each of these mobility and movements use means of transportation in the form of vehicles which in operation generate sounds, where at a certain level these sounds can still be tolerated so that the consequences they cause are not a nuisance. However, if the noise generated by vehicles is at a higher level, it is already a disturbance or pollution called noise. where at a certain level these sounds can still be tolerated so that the consequences they cause are not a nuisance. However, if the noise generated by vehicles is at a higher level, it is already a disturbance or pollution called noise. where at a certain level these sounds can still be tolerated so that the consequences they cause are not a nuisance. However, if the noise generated by vehicles is at a higher level, it is already a disturbance or pollution called noise.

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Tibubeneng is a village in North Kuta sub-district, Badung regency, Bali, Indonesia. Tibubeneng is one of the famous areas in Bali, which is visited by many tourists, both domestic and foreign. The location is easy to reach by any transportation. Tibubeneng can be famous, because there are many tourist destinations and also interesting activities that can be done.

The attraction of the Tibubeneng Bali area is that there are beautiful beaches. Some of the beaches are also often used as favorite places to do water sports and are suitable for relaxing. If the sea water conditions are calm, people swim on the beach, sunbathe, or just take pictures. Several beaches in the Tibubeneng area also have quite large waves, because they are still on the same coastline as Kuta, making them suitable surfing spots for tourists. Even though it is now filled with shops, bars, and so on, Tibubeneng is still synonymous with views of rice fields. Many rice fields can still be found on the outskirts of Jalan Tibubeneng. Apart from enjoying the green scenery, the moment can also be captured by taking pictures. Villas are one of the targets for tourist lodging, when visiting Tibubeneng. Many villas in Tibubeneng offer this because the atmosphere is natural, comfortable and serene, making it perfect for relaxing.

Currently, the attractiveness of Tibubeneng Bali does not only rely on natural beauty. Tibubeneng is now surrounded by many entertainment venues, such as bars, restaurants and beach clubs. So, the atmosphere of the night is the main attraction for the area. One of them is Atlas Beach Fest. Atlas Beach Fest is a new beach club in Bali which was opened in the Berawa area, Tibubeneng, North Kuta, Badung which was just inaugurated on July 18, 2022.

The attraction that Tibubeneng has causes tourists to glance at beach resorts. This has resulted in the rapid development of tourism facilities, especially hotel accommodations of various types, restaurants, bars and restaurants. In addition, tourism facilities such as surfing board rentals and other tourist equipment for tourists to use for activities on the beach and sea are starting to appear. Then, souvenir shops developed, rental of sea transportation equipment such as boats or traditional jukung and land transportation such as taxis, rental cars, motorbike rental, bicycles and other tourism facilities.

The rapid development of tourism support facilities is also directly proportional to the growth in the number of immigrants to the region. Of course, this is also offset by the rapid development of new settlements, including the rapid growth of boarding house rentals and the result is that the flow of transportation in the area's routes is increasingly congested and there are even frequent traffic jams to the west towards the Tanah Lot tourist attraction (source: travel.detik.com). This is the map of the shift in the location of tourism. Entrepreneurs are starting to look at places that are comfortable and new, including in Tibubeneng. The current atmosphere of Tibubeneng does not only rely on the beach, but has many bars, beach clubs and night clubs. Noisy sounds until the early hours of the morning emerged from the entertainment venues that night.

If left continuously, it can cause hearing loss in the community. This is supported by the Naek Silitonga Journal, Adlin Adna n, Ikhwanisyah Isranuri, T. Siti Hajar Haryuna, Fotarisman entitled The Relationship between Noise and the Hearing of Workers (Case Study of Discotheques A, B, C in Medan City) states that from the results of the investigation regarding the level of sound hazard loud disco music (between 100 - 110 dB), loud music can damage the hearing of someone who is there every day. Especially if the sound of the music exceeds the normal threshold that can be tolerated by the ear. The magnitude of the effect of sound on the ear depends a lot on the intensity and duration of hearing, the amount of time heard and the sensitivity of each, including the age of the listener. The existing discotheque entertainment employs a workforce consisting of Disc Jockeys, Bartenders, and Waiters who throughout their work shift are continuously exposed to loud music from loudspeakers. These workers are prone to hearing loss. Research conducted by the Ministry of Manpower of Singapore in 1996 proved that amplifier music played in discotheques can cause hearing loss in workers. Based on the journal I Made Cahyadi Dwi Putra and Ketut Tirtayasa, states that work in areas with high noise levels is a risk factor for hearing loss. Workers in nightclubs are exposed to high levels of sound. The sound level on the dance floor exceeds 100 dB(A). Meanwhile, sound exposure for disc jockeys (dj) is 95-100 dB(A) and sound exposure for service staff is 90-95 dB(A). Even though the working time is less than 20 hours per week, the daily exposure of 96 dB(A) for djs and 92 dB(A) for service staff still affects hearing acuity.

Based on these problems, the authors try to raise these problems in a proposed thesis proposal entitled: "Strategy To Overcome Environmental Noise In Recreational Area (Case Study In Tibubeneng Village, Kuta Utara District, Badung Regency"

### **LITERATURE REVIEW**

#### **Noise Caused by Human Activities**

As the five senses that function to capture sound, our ears have a maximum limit of sound that can be tolerated so that ear health is maintained. The various sounds that enter our ears every day unconsciously have the potential to reduce the quality of hearing. However, this decreases in the quality or ability to hear often goes unnoticed because the process occurs gradually. In addition, we are very used to hearing loud noises around us because we consider them to be part of our daily activities. In fact, the sound

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of motorized vehicles on the highway, the sound of machines in the surrounding environment, even the sound of a baby crying can damage hearing if the ears are exposed to these sounds for more than the recommended time. So, so that our sense of hearing is always maintained,

### Handling Of Noise Caused by Human Activities

Handling noise caused by human activities, namely by: There are rules when visiting recreational areas; Barrier with plant type Plants used for noise barrier must have enough leaf density and density and be evenly distributed from the ground surface to the expected height. For this reason, it is necessary to arrange a combination of ground cover plants, shrubs, and trees or a combination with other materials so that the barrier effect becomes optimum. The plants that can be used are:

1. ground cover (cover crops); grass; leguminosae.
2. shrub; pringgodani bamboo (*Bambusa Sp*); likuan-yu (*Vermeria Obtusifolia*);
  - a. bad boy (*Durante Repens*); soka (*Ixora Sp*); kakaretan (*Ficus Pumila*); sebe (*Heliconia Sp*); teas (*Durante*);
3. Tree; acacia (*Acacia Mangium*); johar (*Casia Siamea*); lush trees with low branches

### Handling Of Noise Due to Traffic Volume

#### a. Noise handling at noise sources

Handling of noise sources can be done in several ways, including Traffic regulation; The arrangement is intended to reduce the volume of passing vehicle traffic. This can be done by carrying out traffic engineering, building ring roads to reduce the burden on the urban road network, etc. Good traffic management can reduce noise levels between 2 to 5 dB(A). Heavy vehicle restrictions; Heavy vehicles have a large influence on noise levels due to road traffic. By limiting the types of heavy vehicles, it can reduce the impact of noise on existing sensitive areas. A 10% vehicle weight restriction can reduce noise levels by up to 3.5 dB(A). Speed settings; Road slope improvement; The slope of the road directly affects the noise level. Reducing the slope every 1% can reduce the noise level by 0.3 dB(A). Selection of the type of pavement. At speeds above 80 km/h, replacing solid concrete asphalt pavements (non-uniform grained) with open asphalt pavements (uniform grained) can reduce traffic noise levels to 4 dB(A).

Handling noise on the propagation path. Handling noise on the path of sound propagation is generally done by installing Noise Absorbers (PB). PB can be a natural barrier and an artificial barrier. Natural barriers usually use various combinations of plants and berms, while artificial barriers can be made of various materials, such as brickwork, glass, wood, aluminum, and other materials. To achieve adequate performance, the material used as a barrier should have a minimum weight-area ratio of 20 kg/m<sup>2</sup>.

Noise mitigation in the form of PB installation must consider the following factors: Road user safety related to visibility and construction resistance to collisions; Ease of maintenance, including the surrounding buildings, such as drainage channels; Construction stability and service life reach 15 to 20 years; Construction costs which depend on the type of foundation required and the construction method used; The beauty or aesthetics of the surrounding environment.

Handling noise at the point of reception. The noise level at the reception point can be reduced by changing the orientation of the building which was originally facing the noise source to sideways to the noise source or turning its back to the noise source. To be able to apply this method, planners need to pay attention to the flexibility of space, building access, and the beauty of the building's architecture. If the available land is sufficient, a garage, warehouse, or building facility can be built adjacent to the noise source which is also a barrier to sound propagation. In addition to changing the orientation of the building, noise handling at the reception point can also be done with insulation on the building facade. The use of this insulation is done if other efforts to reduce noise are not possible. This method is applied to areas with high density, such as the city center, both for residential buildings and office buildings. Mitigation methods for the impact of noise originating from an increase in traffic volume along the existing road include several works, including: Replacement of windows, for example with double panes; Installation of damper walls; Installation of a special ventilation system.

## RESEARCH METHODOLOGY

The research location will be carried out on Jalan Pantai Brawa, Tibubeneng, North Kuta District, Badung Regency, to be exact 100 meters from the source of the noise, namely Atlas Beach Fest, at a point near the residential area to be precise. The location of the research point is in a flat location. This research uses quantitative methods. Quantitative data collection is obtained by calculating the noise level due to traffic volume which is measured for 1 (one) hour and calculating the noise level due to human activity which dB(A) sound pressure level measurement for 10 minutes for each measurement and readings are taken every 5 seconds. The results are set forth in a traffic volume, noise and road geometry survey form, then the data is processed according to the Decree of the State Minister for the Environment Number Kep 48/MENLH/11/1996 of 1996 concerning Noise Level



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Standards and Traffic Noise Level Prediction Method (CoRTN). The data analysis technique used in this study is using a qualitative descriptive analysis. This analysis relates to techniques for recording, organizing, and summarizing information from numerical data. Where later the results of measurements in the field will be compared with the Traffic Noise Quality Standards and Traffic Noise Level Prediction Methods Lintas (CORTN). To determine the strategy to reduce noise levels, using a Qualitative Descriptive Analysis.

### RESULTS AND DISCUSSION

#### Traffic Characteristics Analysis

##### Traffic Volume

Traffic volume data was obtained from a survey of the volume of vehicles passing the observation point at 07.00-22.00, and 22.00-06.00 WITA, with a sample of 7 (seven) measurements. The survey was conducted for 2 days, namely Monday representing weekdays and Saturday representing holidays. The research location was at a point near the residential areas on Jalan Pantai Berawa near Atlas Beach Fest. Types of traffic volume that are calculated are motorcycles (MC) and light vehicles (LV). From the results of the calculation for 7 hours, the traffic volume on weekdays is 5,867 vehicles / 7 hours and on weekends there are 6,003 vehicles / 7 hours. Calculation details can be seen in Table 1 and Table 2.

**Table 1. Results of the Recapitulation of Traffic Volume Calculations on Working Days**

NO	TIME	MC (veh/hour)	LV (veh/hour)	TOTALS PER HOUR
1	07.00 - 08.00	909	102	1011
2	12.00 - 13.00	896	201	1097
3	16.00 - 17.00	1190	232	1422
4	20.00 - 21.00	519	150	669
5	23.00 - 24.00	471	187	658
6	01.00 - 02.00	653	143	796
7	04.00 - 05.00	194	20	214
Total Per Vehicle Type		4,832	1035	
Average Hourly Traffic Volume				838
Total				5,867

**Table 2. Results of Recapitulation of Traffic Volume Calculations on Holidays**

NO	TIME	MC (veh/hour)	LV (veh/hour)	TOTALS PER HOUR
1	07.00 - 08.00	523	228	751
2	12.00 - 13.00	825	152	977
3	16.00 - 17.00	1401	236	1637
4	20.00 - 21.00	626	193	819
5	23.00 - 24.00	494	124	618
6	01.00 - 02.00	581	240	821
7	04.00 - 05.00	277	103	380
Total Per Vehicle Type		4,727	1,276	
Average Hourly Traffic Volume				858
Total				6003

In Tables 1 and 2, traffic volume data at the research location are presented on weekdays and holidays with the highest traffic volume occurring at 16.00 - 17.00 WITA with a total of 1,422 vehicles/hour on weekdays and on holidays. with the number of vehicles as many as 1,637 vehicles / hour. This is because in the afternoon it coincides with office hours which causes an increase in traffic volume compared to other hours and strategic research locations close to recreational areas such as bars and cafes and near the beach, namely Berawa Beach, so that it attracts tourists visiting cafes and bars. This causes an increase in traffic volume in the afternoon both on weekdays and holidays. This is in line with research (Gea.2018) in the Journal of Geography Education,

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Volume 18, Number 1, April 2018 that the noise level is high during the busy time of the afternoon (16.00-18.00) because many road users pass it for their activities.

In addition, in table 5.1 related to Recapitulation of Traffic Volume Calculations on Working Days, high traffic volume also occurs at 07.00-08.00 as many as 1,011 vehicles/hour and at 12.00-13.00 as many as 1,097 vehicles/hour. This is because during morning peak hours, road users generally catch up with office hours, which is the rush hour for people going to school or work and during the day rest hours for employees. Whereas in table 5.2 related to Recapitulation Traffic Volume Calculation During holidays, traffic volume is relatively even and fluctuates slightly.

### Vehicle Composition

The composition of the vehicles in this study aims to see what percentage of each type of vehicle is in the volume of traffic that occurs at the study site. The composition of vehicles in the study locations can be seen in Tables 3 and 4.

**Table 3. Composition of Vehicles on the Road During Workdays**

NO	TIME	MC PERCENTAGE (%)	LV PERCENTAGE (%)
1	07.00 - 08.00	89,91	10,09
2	12.00 - 13.00	88,63	18,32
3	16.00 - 17.00	117,71	16,32
4	20.00 - 21.00	51,34	22,42
5	23.00 - 24.00	46,59	28,42
6	01.00 - 02.00	64,59	17,96
7	04.00 - 05.00	19,19	9,35
Average Percentage Per Vehicle Type		68,28	17,55

**Table 4. Composition of Vehicles on the Road on Holidays**

NO	TIME	MC PERCENTAGE (%)	LV PERCENTAGE (%)
1	07.00 - 08.00	69,64	30,36
2	12.00 - 13.00	84,44	15,56
3	16.00 - 17.00	85,58	14,42
4	20.00 - 21.00	76,43	23,57
5	23.00 - 24.00	79,94	20,06
6	01.00 - 02.00	70,77	29,23
7	04.00 - 05.00	72,89	27,11
Average Percentage Per Vehicle Type		77,10	22,90

In Tables 3 and 4 it can be seen that at the study location, the composition of vehicles passing through the study location was dominated by motorcycles (MC). This is in line with statistical data on the number of motorized vehicle ownership in Bali, where motorbikes are the largest number owned by Balinese people. The percentage of vehicle types is used in calculating noise level predictions using the CoRTN method.

### Vehicle Space Average Speed

The results of the survey of the average space speed of vehicles can be seen in Tables 5 and 6.

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**Table 5. Survey Results of Vehicle Space Average Speed during Workdays**

No	Time	The results of the calculation of the average space velocity (MPH)			The result of the calculation of the average speed of space (km/h)			Average speed per hour (km/h)
		Kend I	Kend II	Kend III	Kend I	Kend II	Kend III	
1	07.00 - 08.00	26	28	27	42	45	43	43,44
2	10.00 - 11.00	28	25	29	45	40	47	43.98
3	16.00 - 17.00	27	29	23	43	47	37	42.37
4	20.00 - 21.00	33	32	30	53	51	48	50.95
5	23.00 - 24.00	34	33	29	55	53	47	51,49
6	01.00 - 02.00	32	30	31	51	48	50	49.88
7	04.00 - 05.00	42	36	40	68	58	64	63,29
Average vehicle speed								49,34

In Table 5 it can be seen that the lowest average speed of vehicle space in the research location on weekdays occurs at 16.00 - 17.00 WITA, which is 42.37 km/hour. This is in line with the results of a traffic volume survey where this hour is the hour with the highest traffic volume compared to other hours, resulting in lower vehicle speeds. This is in line with related research (Tamin, 2008). Speed and volume relationship where The basic relationship between speed and volume is that by increasing the traffic volume, the average speed of the space will decrease until the critical density (maximum volume) is reached. After the critical density is reached, the average velocity of space and volume will decrease. The low speed during this hour is caused by the large number of motorists who visit the beach in the afternoon as well as places to relax around it, either bars or cafes. In addition, pedestrians heading to the beach also seem to increase and many walk right up to the road which causes high side barriers. While the highest average speed of vehicle space occurs at 04.00 - 05.00 WITA, which is 63.29 km/hour, this is in line with the results of a traffic volume survey where the lowest traffic volume also occurs at that hour and allows vehicles to go faster compared to other hours.

**Table 6. Survey Results of Vehicle Space Average Speed on Holidays**

No	Time	The results of the calculation of the average space velocity (MPH)			The result of the calculation of the average speed of space (km/h)			Average speed per hour (km/h)
		Kend I	Kend II	Kend III	Kend I	Kend II	Kend III	
1	07.00 - 08.00	30	28	35	48	45	56	49.88
2	10.00 - 11.00	26	28	29	42	45	47	44,52
3	16.00 - 17.00	23	25	26	37	40	42	39,69
4	20.00 - 21.00	29	32	28	47	51	45	47,73
5	23.00 - 24.00	33	32	31	53	51	50	51,49
6	01.00 - 02.00	33	25	30	53	40	48	47,20
7	04.00 - 05.00	25	45	42	40	72	68	60.07
Average vehicle speed								48,56

In Table 6 it can be seen that the lowest average vehicle speed at the study site during holidays also occurs at 16.00 - 17.00 WITA, which is 39.69 km/hour. This is in line with the results of a traffic volume survey where this hour is the hour with the highest traffic volume compared to other hours, resulting in lower vehicle speeds. This is in line with related research (Tamin, 2008). Speed and volume relationship where The basic relationship between speed and volume is that by increasing the traffic volume, the average speed of the space will decrease until the critical density (maximum volume) is reached. After the critical density is reached, the average velocity of space and volume will decrease. The low speed during this hour is caused by the large number of motorists who visit the beach in the afternoon as well as places to relax around it, either bars or cafes. In addition, pedestrians heading to the beach also seem to increase and many walk right up to the road which causes high side barriers. While the highest average vehicle speed occurs at 04.00 - 05.00 WITA, which is 60.07 km/hour, this is in line with the results of a traffic volume survey where the lowest traffic volume also occurs at that hour and allows vehicles to go faster than at other hours. The highest speed at that

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hour is because at that hour around the research location which is a recreational area has not yet been operating so that one of the traffic side barriers is reduced and the speed achieved can be higher.

### Traffic Density

Traffic density is obtained from the data processing of traffic volume and average speed of space. Details of traffic density calculations can be seen in Table 7.

**Table 7. Traffic Density Calculation Results on Working Days**

NO	TIME	Traffic Volume (veh/hour)	Average Speed Per Hour (km/h)	Vehicle Density (veh/km)
1	07.00 - 08.00	1011	43,44	23,27
2	10.00 - 11.00	1097	43.98	24.94
3	16.00 - 17.00	1422	42.37	33,56
4	20.00 - 21.00	669	50.95	13,13
5	23.00 - 24.00	658	51,49	12.78
6	01.00 - 02.00	796	49.88	15.96
7	04.00 - 05.00	214	63,29	3.38

In Table 7 it can be seen that the heaviest traffic density occurs at 16.00 - 17.00 WITA, traffic density has a very close relationship with traffic volume and vehicle speed. This is supported by research (Tamin, 2008) showing that the density will increase if the volume also increases. When the maximum volume is reached, the roadway capacity has been reached. After reaching this point the volume will decrease even though the density increases until congestion occurs. At that hour is the hour for tourists to surf on the beach and relax in bars and cafes so that this affects traffic volume and vehicle speed at that hour.

**Table8. Traffic Density Calculation Results During Holidays**

NO	TIME	Traffic Volume (veh/hour)	Average Speed Per Hour (km/h)	Vehicle Density (veh/km)
1	07.00 - 08.00	751	49.88	15.06
2	10.00 - 11.00	977	44,52	21.95
3	16.00 - 17.00	1637	39,69	43,60
4	20.00 - 21.00	819	47,73	17,16
2	23.00 - 24.00	618	51,49	12.00
3	01.00 - 02.00	821	47,20	17.40
4	04.00 - 05.00	380	60.07	6,33

In Table 8 it can be seen that the heaviest traffic density occurs at 16.00 - 17.00 WITA, traffic density has a very close relationship with traffic volume and vehicle speed. At that hour is the hour for tourists to surf on the beach so this affects the traffic volume and vehicle speed at that hour.

### Traffic Noise Level

#### Traffic Noise Level Results Of Field Measurement Based On Kmlh Method

Calculation of traffic noise levels using the method set out in KepMenLH No. 48 of 1996 concerning Noise Level Quality Standards is carried out in a simple way with an ordinary SLM and the sound pressure level is measured dB (A) for 10 (ten) minutes for each measurement. Noise level readings are carried out every 5 (five) seconds so that 120 data are obtained. The results of calculating traffic noise levels at the two study locations can be seen in Tables 9 and 10.

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**Table 9. Noise Level Calculation Results During Weekdays**

RECREATION AREA					
No	Measurement Time		Symbol	Noise Intensity Level (dB)	
	Time Intervals (WITA)	Measurement Time 10 minutes (WITA)		Day 1 (working day)	Ket
1	06.00 - 10.00	07.00 - 07.10	L1	86,83	Appendix 26
2	10.00 - 14.00	12.00 - 12.10	L2	87,74	Appendix 27
3	14.00 - 17.00	16.00 - 16.10	L3	89,68	Appendix 28
4	17.00 - 22.00	20.00 - 20.10	L4	82.53	Appendix 29
5	22.00 - 24.00	23.00 - 23.10	L5	86.98	Appendix 30
6	24.00 - 03.00	01.00 - 01.10	L6	84,61	Appendix 31
7	03.00 - 06.00	04.00 - 04.10	L7	76,73	Appendix 32
Noon			LS	81.35	Appendix 33
Night time			LM	80,19	Appendix 33
Day and Night time			NGO	70.02	Appendix 33

Table 9 shows that the highest 10-minute equivalent noise level (Leq) occurs in the afternoon at 16.00 - 16.10 WITA, which is 89.68 dB(A). This is due to human activities in the research location where the noise level shown in table 6 in line with the relatively high traffic volume and traffic density as well as the low average speed on Jalan Berawa. So it can be concluded that the higher the number of motorized vehicles affects the level of noise intensity, or it can be said to be directly proportional between the number of vehicles and the noise level (Triwinarti, 2015). High density results in low speed and causes congestion which eventually collects many vehicles in the study area (high traffic volume). The traffic volume has an impact on the noise that occurs because it contributes to the noise generated from the exhaust sound, engine sound and the sound of tires rubbing against the road.

**Table 10. Noise Level Calculation Results During Holidays**

RECREATION AREA					
No	Measurement Time		Symbol	Noise Intensity Level (dB)	
	Time Intervals (WITA)	Measurement Time 10 minutes (WITA)		2nd day (holiday)	Ket
1	06.00 - 10.00	07.00 - 07.10	L1	79,76	Appendix 34
2	10.00 - 14.00	12.00 - 12.10	L2	81.73	Appendix 35
3	14.00 - 17.00	16.00 - 16.10	L3	87,16	Appendix 36
4	17.00 - 22.00	20.00 - 20.10	L4	88.02	Appendix 37
5	22.00 - 24.00	23.00 - 23.10	L5	89.32	Appendix 38
6	24.00 - 03.00	01.00 - 01.10	L6	85,84	Appendix 39
7	03.00 - 06.00	04.00 - 04.10	L7	75,24	Appendix 40
Noon			LS	79,41	Appendix 41
Night time			LM	82.01	Appendix 41
Day and Night time			NGO	72,11	Appendix 41

In Table 10, it can be seen that the highest 10-minute equivalent noise level (Leq) occurs during the day at 23.00 – 23.10 WITA, which is 89.32 dB(A). This is due to human activity at the beach club which causes the sounds of music from those on Jalan Berawa, as well as the sound of firecrackers or fireworks being launched which increases the noise at that hour. This shows that the noise that occurs is dominantly generated by human activities around the research location such as bars, cafes, beach clubs, etc., not from traffic activity. This is in line with the results of a traffic volume survey at this time which is quite low compared to other hours. Supported by Anusanto's research (2006) which states that reducing traffic speeds to 20 km/hour will reduce noise levels.

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### Prediction Of Traffic Noise Levels Based on The Cortn Method

Calculation of noise level predictions using the Calculation of Road Traffic Noise (CoRTN) method takes into account several influential factors such as vehicle volume, speed, gradient, pavement type, receiving distance and height, and the presence of damper buildings. Details can be seen in Tables 11 and 12.

**Table 11. Calculation of Predicted Noise Levels on Weekdays**

STAGE	DESCRIPTION	PARAMETER	DATABASE	NOISE LEVEL dB(A)	
1	Segment Distribution	-	-	-	
2	Basic noise level	- 1 hour traffic volume	1422	vehicle	73,73
		- Vehicle speed	75	kms/hour	
		- Percent of heavy vehicles	0		
		- Gradient	0		
	BASIC NOISE LEVEL				73,73
3	Correct	- Percent of heavy vehicles	0.00	%	-3.66
	Traffic characteristics, geometric and road surface types	- Vehicle speed	42.37	kms/hour	
		- Gradient	1.5	%	0.45
		- Type of road surface	air conditioning		1.00
	NOISE LEVEL AT SOURCE				71.52
	Propagation	- The distance of the receiver to the sound source	100	m	-1.49
		- Recipient height	2,5	m	
		- Average height of propagation	0		0
		- Type of ground cover	0		0
		- Damper building height	0		0
		- The distance of the silencer building to the sound source	0		0
	Reflection	continuous wall			1
	Viewpoint	- North direction	0	degrees	0.00
		- Southbound	0	degrees	0.00
	North direction noise level				70.03
	South direction noise level				70.03
4	Combined noise level predictions for all segments	- North direction	70.03	dB(A)	73.04
		- Southbound	70.03	dB(A)	
PREDICTION NOISE LEVEL, L10 1 HOUR					73.04
CONVERSION OF 1 HOUR L10 TO 1 HOUR LEQ					-3
1 HOUR LEQ PREDICTION NOISE LEVEL					70.04

Information:

\*The 1 hour traffic volume used is the highest traffic volume from 07.00 – 22.00 and 22.00 – 06.00, namely the traffic volume at 16.00 – 17.00, the speed and percent of heavy vehicles used follow the data for the highest 1 hour traffic volume .

Based on Table 11, it is found that the predicted traffic noise level that occurs on Jalan Berawa, to be precise at the research location, is calculated by the CoRTN method, which is 70.04 dB(A). Predicted traffic noise levels generated at the study site have exceeded the noise quality standard for recreational areas, namely 70 dB(A). The results of the traffic noise level that

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occurs are influenced by several parameters as shown in table 11, where if these parameters change, the resulting traffic noise value will also change. The parameters that change most often in this method are traffic volume and speed, so that the high traffic volume will also be directly proportional to the increased traffic noise generated. In accordance with the results of research conducted by Mediastika (2003) states that traffic noise is mainly the noise of motorbikes which is the largest supplier of traffic noise. This is also in accordance with the results of a study by the Department of Transport, UK London (1988) which states that the noise generated by motorbikes is usually higher than that of passenger vehicles. At the research location, from the traffic survey, the volume of traffic that occurred was high enough to cause high traffic noise, besides that the absence of dampers also resulted in unreduced traffic noise and eventually reached the surrounding residents. QNoise level can also be reduced by having a natural barrier. For natural barriers can reduce noise by 6 dBA (Krisindarto, 2006).

**Table 12. Calculation of Predicted Noise Levels on Holidays**

STAGE	DESCRIPTION	PARAMETER	DATABASE	NOISE dB(A)	LEVEL
1	Segment Distribution	-	-	-	
2	Basic noise level	- 1 hour traffic volume	1637	vehicle	74,34
		- Vehicle speed	75	kms/hour	
		- Percent of heavy vehicles	0		
		- Gradient	0		
	BASIC NOISE LEVEL				74,34
3	Correct	- Percent of heavy vehicles	0.00	%	-3.95
	Traffic characteristics, geometric and road surface types	- Vehicle speed	39,69	kms/hour	
		- Gradient	1.5	%	0.45
		- Type of road surface	air conditioning		1.00
	NOISE LEVEL AT				71,84
SOURCE	Propagation	- The distance of the receiver to the sound source	100	m	-1.49
		- Recipient height	2,5	m	
		- Average height of propagation	0		0
		- Type of ground cover	0		0
		- Damper building height	0		0
		- The distance of the silencer building to the sound source	0		0
	Reflection	continuous wall			1
	Viewpoint	- North direction	0	degrees	0.00
		- Southbound	0	degrees	0.00
	North direction noise level				70.35
	South direction noise level				70.35
4	Combined noise level predictions for all segments	- North direction	70.35	dB(A)	73,13
		- Southbound	70.35	dB(A)	
	PREDICTION NOISE LEVEL, L10 1 HOUR				73,36
	CONVERSION OF 1 HOUR L10 TO 1 HOUR LEQ				-3
	1 HOUR LEQ PREDICTION NOISE LEVEL				70,36

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Information:

\* The 1 hour traffic volume used is the highest traffic volume from 07.00 – 22.00 and 22.00 – 05.00, namely the traffic volume at 16.00 – 17.00, the speed and percent of heavy vehicles used follow the data for the highest 1 hour traffic volume .

Based on Table 12, it is found that the predicted traffic noise level that occurs on Jalan Berawa, to be precise in one of the residential areas near Atlas Beach Fest which is calculated by the CoRTN method is 70.36 dB(A). Predicted traffic noise levels generated at the study site have exceeded the noise quality standard for recreational areas, namely 70 dB(A). In line with the noise results using the CoRTN method on weekdays, table 11, the high traffic volume will also be directly proportional to the increased traffic noise generated. At the research location, from a traffic survey on holidays, the traffic volume that occurs is quite high, causing high traffic noise. Besides that, the absence of silencer buildings also results in unreduced traffic noise and eventually reaches the surrounding residents. What distinguishes the level of traffic noise on weekdays and holidays calculated using the CoRTN method is the level of traffic volume. Overall, the level of traffic volume is higher on holidays, so that the traffic noise that occurs is also higher on holidays.

### **Noise Level Reduce Strategy**

Noise control in general must refer to sound arrangement which according to Satwiiko (2004) will involve four elements, namely sound source, media, sound reception and sound waves. Noise reduction according to Egan, MD, (1998), noise reduction can be carried out in three aspects, namely the source, media and receiver. There are several ways to control noise, namely by reducing the vibration of the noise source means reducing the level of noise emitted by the source. With the media aspect covering the source of the sound, attenuating noise with sound absorbing or sound absorbing materials and with the receiving aspect blocking the propagation of sound, protecting the space where humans or other creatures receive sound and protecting the ear from sound. According to Zikri (2015) said efforts to deal with noise can be in the form of: Countermeasures for direct noise to the source of noise, countermeasures can be carried out in buildings, namely by making a barrier in the form of a higher fence or wall so that noise can survive and be reflected. Countermeasures by using green belts, namely by planting trees around residential areas. Trees can muffle sound by absorbing sound waves by leaves, branches and twigs. The most effective plant species for muffling sound are those with thick crowns with shady leaves. Plant leaves can absorb noise up to 95%. By planting various types of plants with various strata consisting of trees and shrubs or 10 shrubs that are quite dense and tall will be able to reduce noise. namely by making a barrier in the form of a higher fence or wall so that noise can persist and be reflected. Countermeasures by using green belts, namely by planting trees around residential areas. Trees can muffle sound by absorbing sound waves by leaves, branches and twigs. The most effective plant species for muffling sound are those with thick crowns with shady leaves. Plant leaves can absorb noise up to 95%. By planting various types of plants with various strata consisting of trees and shrubs or 10 shrubs that are quite dense and tall will be able to reduce noise. namely by planting trees around residential areas. Trees can muffle sound by absorbing sound waves by leaves, branches and twigs. The most effective plant species for muffling sound are those with thick crowns with shady leaves. Plant leaves can absorb noise up to 95%. By planting various types of plants with various strata consisting of trees and shrubs or 10 shrubs that are quite dense and tall will be able to reduce noise. namely by planting trees around residential areas. Trees can muffle sound by absorbing sound waves by leaves, branches and twigs. The most effective plant species for muffling sound are those with thick crowns with shady leaves. Plant leaves can absorb noise up to 95%. By planting various types of plants with various strata consisting of trees and shrubs or 10 shrubs that are quite dense and tall will be able to reduce noise.

In addition, based on the Forum Group Discussion (FGD) with several Tibubeneng Village staff which was held at the Tibubeneng Village Office on Friday, 10 February 2023, it was concluded that the strategy that needs to be achieved to reduce noise levels on Jalan Berawa is to regulate the hours of operation for recreation areas so that there is no disturbing the local community.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusion**

Based on the results of the study it can be concluded that: The total noise level (Leq day and night) at the study site on weekdays was 70.04 dB(A) while on holidays the intensity of the total noise level (Leq day and night) was 72.11 dB(A). So it can be concluded



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that the noise level due to human activity at the study site on weekdays and holidays has exceeded the noise quality standards listed in KMLH no 48 of 1996 concerning Noise Level Standards, where the noise level in recreational areas is 70 dB(A) .

The level of traffic noise at the research location calculated using the CoRTN method is 70.04 dB(A) on weekdays while on holidays it is 70.36 dB(A). So it can be concluded that the noise level due to traffic activities at the research location on weekdays and holidays has exceeded the noise quality standards listed in KMLH no 48 of 1996 concerning Noise Level Standards, where the noise level in recreational areas is 70 dB(A) .

The strategies used to reduce noise levels are divided based on the source of the noise, namely strategies for noise originating from human activities and strategies for noise originating from traffic activities. The strategy for noise sources from human activities is to regulate the operating hours of recreational areas, arrange the implementation of activities that cause higher noise levels such as launching fireworks, adding silencers and planting trees in recreation areas. While the strategy for noise sources from traffic activities is to carry out traffic engineering, regulate traffic speed and add noise reduction from natural materials such as planting trees.

### **SUGGESTION**

From the results of this study, the researcher recommends: From the results of the analysis of traffic characteristics at the study site, it was found that the highest traffic volume, the lowest speed and the highest density so that it is better to carry out traffic engineering management in these hours so as to reduce the generated traffic noise. Another thing that can be done is by the use of barriers such as by making living barriers / trees.

From the results of the analysis of traffic noise levels based on the results of field measurements and CoRTN predictions, it was found that the traffic noise level at the study site had exceeded the noise quality standards, so it was suggested that recreational areas at the study location be equipped with noise dampening rooms while still paying attention to indoor air conditioning system so that the sounds of music are not heard outside the recreation area.

From the results of modeling traffic noise levels, traffic characteristics have a significant influence on the noise that occurs, so it is suggested to the Denpasar City Government to pay more attention to land use by placing recreation areas not close to residential areas.

A study that has been carried out at the research location, the conclusions drawn certainly have implications for recreational activities and traffic activities. In this regard, the implications based on the results of the research above are that human activities and traffic activities contribute greatly to the noise level that occurs at the study site, therefore it is necessary to make efforts to reduce noise levels so as not to disturb the surrounding population. These efforts are: Conduct traffic engineering so as to reduce density levels which will also have an impact on reducing noise levels. Adding noise dampers such as planting trees that can reduce noise, one of the trees that can be used is an acacia tree. Adding noise dampers in recreational locations so that the sounds generated can be restrained and do not come out of recreational locations. In the long term, the government must pay more attention to the regulation of land use according to its designation.

### **REFERENCES**

- 1) AASHTO. 1993. Guide on Evaluation and Abatement of Traffic Noise. American Association of State Highway and Transportation Officials Highway Subcommittee, USA.
- 2) Arlan, M. 2011. The Influence of Vehicle Volume on Noise and Noise Mapping Using Arcview Software in PondokChina Village, Depok, Due to Transportation Activities on Jalan Margonda Raya (Unpublished Final Project, Environmental Engineering Study Program, Faculty of Engineering, University of Indonesia, 2011)
- 3) Central Bureau of Statistics for Bali Province. 2022. Bali in Figures 2022, BPS Bali Province.
- 4) Bolla, ME, Messah, and Johanes, L. 2015. Study of the Application of One Way System Traffic Engineering at the Simpang Tiga Straat A, Kupang City, Journal of Civil Engineering Vol. : IV No. 2. Kupang
- 5) Public Works Department. 2005. Guidelines for Mitigating the Impact of Noise Due to Road Traffic. Public Works Department. Jakarta.
- 6) Ministry of Health of the Republic of Indonesia. 1992. Decree of the Directorate General of Prevention of Infectious Diseases and Health of the Residential Environment of the Ministry of Health of the Republic of Indonesia Number 70-1/PD.03.04. Lp regarding Guidelines for Implementing Health-Related Noise Control. Jakarta: Ministry of Health of the Republic of Indonesia.

## Strategies for Overcoming Environmental Noise in Recreational Area (Case Study in Tibubeneng Village, Kuta Utara District, Badung Regency)

- 7) Ministry of Transportation. 2009. Law no. 22 of 2009 concerning Road Traffic and Transportation. Jakarta: Directorate General of Land Transportation.
- 8) Ministry of Environment. 1996. Decree of the state minister for the Environment No. Kep 48/MENLH/11/1996 concerning Noise Level Standards.
- 9) Subagya & Yayan. 2009. Effect of Noise Level on Productivity Level. Yogyakarta.
- 10) Pradana, Adrian. 2016. Analysis of Traffic Noise Levels in Trade and Service Areas in Denpasar City (Case Study: Jalan Gatot Subroto Timur). Denpasar: Mahasaraswati Denpasar University.
- 11) Ministry of Tourism. 2019. Law of the Republic of Indonesia Number 10 of 2009 concerning Tourism.
- 12) Anusanto, JD 2006. Prediction of Motorized Vehicle Noise Levels Due to Traffic Growth. Atma Jaya University. Yogyakarta.
- 13) Bangun, LP 2009. Traffic Noise and Its Relation to the Level of Community Disturb (Case Study: Jalan Bojongsoang, Bandung Regency). Bandung Institute of Technology. Bandung.
- 14) Hidayati, N. 2007. Effect of Traffic Flow on Noise (Case Study: Several Educational Zones in Surakarta).
- 15) Triwinarti, T. 2015. Study of Traffic Noise in the Area of Brawijaya University Malang. Brawija University. Poor.
- 16) Zikri, Moehammad Ryan. 2015. Analysis of the Impact of Noise on Communication and Concentration of School Student Learning on Traffic-Dense Roads. Tanjungpura University. Pontianak
- 17) Satwiko, P. 2004. Building Physics 1. Andi. Jakarta.
- 18) Department of Transport Welsh Office HMSO. 1988. Calculation of Road Traffic Noise. Crown copyright, London.
- 19) Siswanto, A. 1991. Noise. Center for Health and Safety at Work, East Java.
- 20) Tamin, OZ, 2008, "Planning, Modeling, & Transportation Engineering", ITB, Bandung



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## Dissemination of Information Desire to use Trans-Metro Dewata Services



Septina Ayundani<sup>1</sup>, I Ketut Arnawa<sup>2</sup>, I Ketut Sumantra<sup>3</sup>, Wayan Maba<sup>4</sup>

**ABSTRACT:** Study This carried out in areas served by the Trans Metro Dewata Bus public transportation, especially Denpasar City, more precisely on corridor 3 which serves the Ubung Terminal route - Sunrise Beach with the route that is passed by the Dalung Integrated Security Post - North Tiara Gatsu - Duku Sari Housing - North Aston - Terminal Ubung – Rs Manuaba – Puri Jero Kuta – Gajah Mada Heritage Area – Surapati – East Sudirman Corner – Bank Indonesia Renon – Samsat Office – Plaza Renon – SDN 2 West Sanur – Kfc Sanur – Sunrise Beach. usample size of 100 samples. Analysisdata used isDescriptive analysis, Likert scale and Qai-Square analysis.The research results show that tThere is a significant relationship between the characteristic variables and the level of people's desire to use the Trans Metro Dewata Bus service on the characteristics of age, type of work and vehicle ownership with a Sig value. 0.000, 0.000 and 0.006. While the variable level of knowledge with the level of people's desire to use the Trans Metro Dewata Bus service shows a significant value of 0.020, so that there is a significant relationship between the level of knowledge and the level of desire to use the Trans Metro Dewata bus public transportation service or knowledge influences desire.

**KEYWORDS:** Dissemination, characteristic, level of people's desire

### INTRODUCTION

The Provincial Government of Bali is trying to present solutions to overcome problems, one of which is realizing a program related to Bus-based mass public transportation ([dephub.go.id](http://dephub.go.id)). This transportation is known as SARBAGITA. The Trans Sarbagita Bus is a public transportation bus that serves destinations between districts and cities that connect a number of routes in four areas in Bali, namely Denpasar City, Badung Regency, Gianyar and Tabanan. Sarbagita is an acronym for Denpasar (SAR), Badung (BA), Gianyar (GI) and Tabanan (TA). Trans Sarbagita is a bus rapid transit (BRT) type of public transportation which has been operating since 2011 in the South Bali region. Trans Sarbagita managed by Perum Damri initially had 25 bus fleets with 17 corridors but now in 2022 Trans Sarbagita only serves 2 corridors with 10 fleets. In 2020, the same type of BRT-based public transportation is available, which is a Buy The Service program from the Ministry of Transportation through the Directorate General of Land Transportation, namely Easy, Reliable and Comfortable Economical Transportation (TEMAN) Buses operated by PT Satria Trans Jaya with full financing by The central government, namely the Ministry of Transportation.

According to research by Sugiyanto, et al (2021) the quality of public vehicle services is felt to be lacking so that people are reluctant to choose public transportation as the mode of transportation used (25.6%). Most Balinese people still depend on safety and security aspects in choosing a mode of transportation. They think that security, comfort and safety can only be obtained by using private vehicles compared to public transportation(Sugiyanto, et al, 2021).The public transportation that has been operating in Bali is now called Friend BUS or Trans Metro Dewata. Based on the results of interviews with managers, Trans Metro Dewata has been equipped with complete facilities such as CCTV for security, clean bus conditions, clear, uniformed and certified driver identities, non-cash payment systems, clear travel routes and the Friends Bus application to make it easier for transportation users in accessing the Friends Bus service. Services provided by Sahabat Bus include the location of the nearest bus stop, currently operating buses, waiting times and other services. However, the advantages possessed by Trans Metro Dewata are still unable to entice people to use this public transportation.

The existence of public transportation is expected to be a solution to solving traffic jams in Bali. However, in reality the existence of the Trans Metro Dewata public transportation has not been fully felt by the public, this is evident from the vehicle occupancy rate which reached 42.51% (Dirjendat, 2021). Based on data obtained from PT. Satria Trans Jaya as the operator of the Trans Metro Dewata Bus, the occupancy value or Load Factor of the five corridors from July to September 2022 reaches an average

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of 41.95%, this is very unfortunate if it is not utilized optimally by the community besides being able to reduce traffic jams and pollution, of course this will save expenses or transportation costs.

Research by Komang, et al (2019) explains that Trans Sarbagita is good public transportation that meets the requirements and wishes of the community. When viewed from the community factor, the observation results explain that there is still a lack of public awareness to use public transportation. These users are still small, even though the promotion of the Trans Sarbagita Bus has been carried out and the government has given suggestions to use the Trans Sarbagita mode of transportation (Komang RT, et al, 2019). Another study stated that out of 130 respondents, 70% used transportation to carry out their daily activities using motorbikes; 17.7% private car; 6.9% public transportation; and 2.3% online taxi. There were also various reasons, namely 49.2% said the travel time was faster; 23.1% related to safety and convenience; and 20% on a lower cost. The conclusion from the research of Hendrialdi, et al (2021) is that the main factor for respondents in choosing a mode of transportation is travel time, so they prefer motorcycles because they are considered effective and efficient in terms of cost (Hendrialdi, et al, 2021).

Problems related to lowering people's desire to use the Trans Metro Dewata Bus can be due to their lack of knowledge regarding information about Trans Metro Dewata Bus services. The Provincial Government of Bali has full responsibility for disseminating information to the public. Dissemination in KBBI means sowing seeds or spreading ideas. Dissemination is an interactive process for conveying information to a group or individual, with the aim of being able to change their mindset and actions. Important elements in dissemination are innovation, time, dissemination process, the media used, and the parties involved (Roger, 1983).

Interesting promotional innovations are suggested to be able to attract the interest of the Balinese people towards the existence of the Trans Sarbagita Corridor I mode. The aim is to increase public interest in using the Trans Sarbagita service (Bhakti and Rhena, 2020). Several studies that have been conducted still focus on technical service performance such as service coverage, headway, travel time, and tariffs. If these conditions are already optimal because the buy the service scheme has been implemented, then the thing that needs to be studied is the stages of delivering these services to the public. Is the information conveyed by the government and operators to the people in the Sarbagita area optimal? The aim is to find out information dissemination that has been carried out by the Ministry of Transportation.

This research aims to examine the information dissemination of services from Trans Metro Dewata, the characteristics of the people through which the Trans Metro Dewata route passes, and public knowledge of the existence of Trans Metro Dewata services and the people's desire to use the service. The thing that is being considered is why the Trans Metro Dewata has been operating since 2020 not optimally used by the community, or it can be said that it is still rare for people to use the Trans Metro Dewata public transportation service. Even though technically it is in accordance with the minimum service standards in public transport operations, such as service time, headway, and convenience besides that it has also passed the main routes. It needs to be known from different perspectives, whether from a limited socialization side or from other aspects. So it is necessary to study one of the causes of this problem, among others, in terms of public knowledge of the existence of these public transport services. So to answer this, the researcher will test the information dissemination of the public's desire to use the Trans Metro Dewata service.

## LITERATURE REVIEW

### Transportation Demand and Supply

#### Transportation demand

RequestTravel has a big connection with activities in society. The more and the importance of existing activities, the higher the level of travel.

According Marvin (1979) the form of travel destinations that are usually used by transportation planners are:

1. Work trips
2. School trips
3. Shopping trips (shopping trips)
4. Work business trip (Employers business trip)
5. Social trips (social trips)
6. Trip to eat (trip to eat meal)
7. Travel for recreation (Rectional trip)

On basically demand for transportation services is a reflection of the need for transportation from users of the system. According to Djoko Setijowarno and Frazila (2001), basically the demand for transportation services is derived from:

1. A person's need to walk from one location to another to carry out an activity.
2. Requests for the transportation of certain goods so that the desired place is available.

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Publics the main factor in carrying out travel activities, they always want their requests to be fulfilled. According to White (1976), the existing demand from the public for meeting transportation needs is influenced by each person's income, health, travel purposes, age, type of trip, number of passengers (group/individual) and urgent trips.

Fulfillment the demand for transportation needs is generated by the characteristics of travel that affect the choice of modes, where people as users of transportation services can use existing modes. The factors contained in the characteristics of the trip in question are:

1. Travel distance Travel distance affects people in determining the choice of mode. The closer the distance traveled, in general, people tend to choose the most practical mode.
2. Travel goals Travel goals have a relationship between the desires of each person in choosing the desired mode. The demand for transportation arises from human behavior regarding the movement of people or goods that have special characteristics. These characteristics are permanent and occur all the time. These characteristics experience peak hours in the morning when people start their activities and in the afternoon when they return from work. It has no peaks but also lows on certain days of the year. This fixed need and behavior is the basis for the emergence of transportation demand.

### Transportation supply

In the standard microeconomic theory approach of supply and demand it is said to be in perfect competition if it consists of a large number of buyers and sellers where no single seller or buyer can disproportionately influence the price of goods as well as in terms of transportation, it is said to achieve perfect competition if tariffs or transportation costs are not affected by the passengers or providers of transportation facilities. In this case it can be said that supply is sufficient if demand is met without any influence on travel fares from both transportation providers and passengers.

Demand is a positive function of cost. the reality that a lot happens in transportation is offered at a certain price level so that however the supply of this transportation is very much influenced by the prices involved. The prices involved are for example: terminal costs and movement costs. There is a tendency that the increasing demand for travel that increases the volume of trips will increase travel fares. This is closely related to the capacity of transportation facilities and infrastructure. An increase in travel volume will increase queues for travel schedules, pick-up and drop-off times, traffic density and so on.

The supply of transport services includes the level of service and price starting from the premise that an increase in price results in an increase in the amount produced and offered for sale. The level of transportation service is as closely related to volume as it is to pricing. With regard to people's transportation services according to Marvin (1979) there are several factors that can affect the above, namely speed, safety, frequency, regularity, capacity, completeness, affordable prices, accountability, and comfort.

### Socialization

Socialization is a learning process to become a member of society, and through socialization one can become a social being. Being social is a lifelong experience, which is achieved through interacting with others and participating in the daily routines of cultural life. Socialization is a concept that recognizes that a person's social identity, role and history are formed in a continuous process of cultural transmission. Socialization can be distinguished between primary and secondary socialization.

- a. Primary socialization is associated with the basic or initial formation of personality, this process begins with accumulating the knowledge and skills necessary to become members of a particular society.
- b. Secondary socialization consists of complex experiences that occur over time to become members of a particular society or cultural group. Secondary socialization is a process of understanding and feeling the various cultures shown in life as a whole. Some experts say that socialization is the process of an individual learning to interact with others in a society according to the system of values, norms and customs that govern the society concerned, whereas according to Suharto socialization or the process of society is the process of people adapting themselves to the norms. concerned can be accepted as a member of a society.

Fisher's theory, socialization is a complex process in which individuals are able to acquire certain knowledge, skills and attitudes, so that they can successfully participate (get along) in the society around them.

The theory of Paul B. Horton and Chester L. Hunt., Socialization is a process by which a person lives (ingrains, internalizes) the norms of the group in which he lives so that a unique "self" arises.

The theory of David B. Brinkerhoff and Lynn K. White, socialization is a process of learning the roles, status and values required for participation in social institutions.

James W. Vander Zanden's theory, socialization is a process of social interaction by which people acquire knowledge, attitudes, values, and behaviors essential for participation, effective participation in society.

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### 2.1.1 Education

Education or also known as education is all planned efforts to influence other people, both individuals, groups and communities so that they do what is expected by the educational actors. In the Big Indonesian Dictionary (KBBI) Education comes from the basic word educate (educate), namely: to maintain and provide training (teaching, leadership) regarding morals and intelligence of mind. According to Law Number 2 of 1989 education is a conscious effort to prepare students through guidance, teaching and/or training activities for their future roles.

Cartet V. Good theory, Pedagogy is the art, practice, or profession of teaching, The systematized learning or instruction concerning principles and methods of teaching and of student control and guidance: largely replaced by the term education. Education is the art, practice, or profession of teaching; Systematic science or teaching related to principles and methods of teaching, supervision and guidance of students: in a broad sense it is replaced by the term Education.

According to Ki Hajar Dewantara's theory, education is guidance in the lives of children growing up, while the purpose of education is to guide all the natural forces that exist in these children, so that they as human beings and as members of society can achieve the highest safety and happiness.

Ahmad D. Marimba's theory, education is conscious guidance or leadership by the educator on the physical and spiritual development of the educated towards the formation of the main personality. The elements contained in education in this case are:

- a. Effort (activity), the effort is guidance (leadership or assistance) and is carried out consciously.
- b. There are educators, mentors or helpers.
- c. Some are educated or the educated
- d. Guidance has a basis and purpose.

Langeveld's theory, education is every effort, influence, protection and assistance given to a child is aimed at the child's maturity, or more precisely helping so that the child is capable enough to carry out his own life tasks. That influence comes from adults (or is created by adults such as schools, books, daily life cycles, and so on) and is shown to immature people.

John Dewey's theory, education is the process of forming intellectual and emotional fundamental skills towards nature and fellow human beings.

JJ Rousseau's theory, education is to give us supplies that do not exist in childhood, but we need them in adulthood.

Driyarkara's theory, education is the humanization of young people or the appointment of young people to the human level.

### Marketing strategy

According to the Big Indonesian Dictionary (KBBI), strategy is the science and art of using all resources to carry out certain policies in war or peace. Explicitly, Strategy is a plan of action that outlines the allocation of resources and other activities to respond to the environment and help the organization achieve its objectives.

In essence, strategy is the choice to perform different activities or carry out activities in a different way from competitors. This means that the strategy is a unified, comprehensive and integrated plan linking the advantages of the company's strategy with environmental challenges and designed to ensure that the company's main goals can be achieved through proper implementation by the company.

Marketing is the marketing logic by which business units hope to create value and profit from their relationships with consumers.

David W. Craven's theory, marketing strategy is an analysis of the development strategy and implementation of activities in the strategy of determining target markets for products in each business unit, setting marketing objectives, and developing, implementing, and managing marketing program strategies, determining market positioning designed to meet target market consumer wants.

Philip Kotler's theory, marketing strategy is being able to design and apply the concept of STP (Segmentation, Targeting, and Position) in marketing management.

### Hypothesis

In research, the hypothesis is defined as a temporary answer to the research problem formulation. In statistics and research there are two kinds of hypotheses, namely the null and alternative hypotheses (Sugiyono, 2008).

#### Hypothesis 1:

There is no relationship between gender and the level of desire to use public transportation services

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There is a relationship between gender and the level of desire to use public transport services

### **Hypothesis 2:**

There is no relationship between age and the level of desire to use public transportation services

There is a relationship between age and the level of desire to use public transportation services

### **Hypothesis 3:**

There is no relationship between the level of education and the level of desire to use public transport services

There is a relationship between the level of education and the level of desire to use public transport services

### **Hypothesis 4:**

There is no relationship between the type of work and the level of desire to use public transportation services

There is a relationship between the type of work and the level of desire to use public transportation services

### **Hypothesis 5:**

There is no relationship between vehicle ownership and the level of desire to use public transport services

There is a relationship between vehicle ownership and the level of desire to use public transport services

### **Hypothesis 6:**

There is no relationship between income and the level of desire to use public transport services

There is a relationship between income and the level of desire to use public transport services

### **Hypothesis 7:**

There is no relationship between family status and the level of desire to use public transportation services

There is a relationship between family status and the level of desire to use public transport services

### **Hypothesis 8:**

There is no relationship between residence status and the level of desire to use public transportation services

There is a relationship between the status of residence with the level of desire to use public transportation services

### **Hypothesis 9:**

There is no relationship between public knowledge of services and the level of desire to use public transport services

There is a relationship between public knowledge of services and the level of desire to use public transport services

## Dissemination of Information Desire to use Trans-Metro Dewata Services

### RESEARCH METHODS

In this study the approach taken is through qualitative and quantitative approaches. The quantitative approach is seen as an exploratory and inductive nature. Quantitative focus on reliability is key (Sekaran & Bougie, 2016).

Study This carried out in areas served by the Trans Metro Dewata Bus public transportation, especially Denpasar City, more precisely on corridor 3 which serves the Ubung Terminal route - Sunrise Beach with the route that is passed by the Dalung Integrated Security Post - North Tiara Gatsu - Duku Sari Housing - North Aston - Terminal Ubung – Rs Manuaba – Puri Jero Kuta – Gajah Mada Heritage Area – Surapati – East Corner Sudirman – Bank Indonesia Renon – Samsat Office – Plaza Renon – SDN 2 West Sanur – Kfc Sanur – Sunrise Beach..

Study planned for 6 (six) months from September 2022 to February 2023. The population in this study is people who live in areas served by the Trans Metro Dewata public transportation route, especially the city of Denpasar, based on the Trans Metro Dewata Bus route corridor 3 Ubung – Sunrise Terminal visiting several villages with a population based on the Denpasar city data center in 2021. The formula used to determine the number of samples using the Slovin formula. Calculation of the number of samples using the slovin formula obtained results with a value or sample size of 99.95 samples, rounded up to 100 samples  $n$ .

Analysis data also called data processing and data interpretation. Data analysis is a series of activities for reviewing, grouping, systematizing, interpreting and verifying data so that a phenomenon has social, academic and scientific value (Siyoto and Sodik, 2015: 109). Study This study uses qualitative methods obtained from interviews at PT. Satria Trans Jaya and quantitative obtained from distributing questionnaires with the purposive sampling method, both people who have or have never used the Trans Metro Dewata bus or called the Mix method where the analysis is descriptive analysis, Likert scale and Qai-Square analysis.

### RESEARCH RESULTS AND DISCUSSION

#### Information dissemination of Trans-Metro Dewata services

Information dissemination or dissemination regarding public transport services is important for the Trans Metro Dewata Bus so far it has been carried out intensively through Instagram social media with the @transmetrodeiwata account, information regarding changes in service hours, service routes or other services has been informed through that account, apart from socialization has also been carried out to several Elementary Schools and Senior High Schools. Apart from via Instagram @transmetrodeiwata, overall information from Indonesian bus friends can also be obtained on the bus friend application or Instagram @temanbus.

Based on the results of the interviews, it can be seen that the average community knows information about Trans Metro Dewata from several sources, including online media such as Instagram, from the surrounding environment and directly seeing the operation of the Trans Metro Dewata bus on the road. However, there are still many people who do not know in depth about the services and operations provided by Trans Metro Dewata. This indicates that information dissemination from operators and regulators has not been well received by the public.

#### Community Characteristics in the Trans Metro Dewata Route Area

The distribution of questionnaires conducted in villages around corridor 3 of the Trans Metro Dewata bus route Ubung Terminal – Matahari Terbit Beach obtained 100 respondent data with the following details:

**Table 4.1 Community Characteristics based on gender in the Trans Metro Dewata Route Area in 2023**

Gender	Amount
Man	59
Woman	41
Total	100

Based on table 4.1 it shows that the majority of respondents were male with a total of 59 people and 41 women.

**Table 4.2 Community Characteristics by Age in the Trans Metro Dewata Route Area in 2023**

Age (years)	Amount
<20	13
20 to 30	58
31 to 40	22
41 to 50	6
> 50	1
Total	100



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Based on table 4.2 it shows that in terms of age the most respondents were between 20 to 30 years, namely 58 respondents and the lowest was 1 person over 50 years of age.

**Table 4.3 Community Characteristics based on Education Level in the Trans Metro Dewata Route Area in 2023**

Level of education	Amount
No School	0
SD	2
JUNIOR HIGH SCHOOL	3
SENIOR HIGH SCHOOL	52
College	43
Total	100

Based on table 4.3, it shows that the highest educational background of the respondents was at the high school level with 58 people and 43 people in second place at the tertiary level.

**Table 4.4 Community Characteristics by Type of Work in the Trans Metro Dewata Route Area in 2023**

Type of work	Amount
Not yet working	4
Student (elementary/middle/high school)	2
Student	44
Housewife	1
Self-employed	24
PNS/TNI/POLRI	18
Teacher/Lecturer	2
Other	5
Total	100

Based on table 4.4 it shows that the most dominating type of work is at the student level as many as 44 people, then 24 people are self-employed and there are 4 people who have not worked.

**Table 4.5 Community Characteristics based on Vehicle Ownership in the Trans Metro Dewata Route Area in 2023**

Vehicle Ownership	Amount
Car	13
Motorcycle	74
Cars and Motorcycles	13
Total	100

Table 4.5 shows that 74 people own motorbikes, 13 people own cars and 13 people own cars and motorbikes.

**Table 4.6 Community Characteristics based on average income in the Trans Metro Dewata Route Area in 2023**

Average Income in a month	Amount
No Income	23
< Rp. 1,000,000,-	26
Rp. 1.000.000,- up to Rp. 4,000,000,-	24
Rp. 4.000.000,- up to Rp. 6,000,000,-	16
> Rp. 6,000,000,-	11
Total	100

Based on table 4.6 it shows that the average income in a month with the largest number of respondents is in the income of less than Rp. 1,000,000, namely 26 people and those who have income above Rp. 6,000,000 there are 11 people while those who do not have income are 23 people.

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**Table 4.7 Community Characteristics based on Family Status in the Trans Metro Dewata Route Area in 2023**

Family Status	Amount
family	40
Not/Not Yet Married	60
Total	100

Based on Table 4.7, it shows that the family status of the respondents is 60 people who are not yet married, and the remaining 40 people are already married.

**Table 4.8 Community Characteristics based on Residential Status in the Trans Metro Dewata Route Area in 2023**

Status of residence	Amount
Stay at Home Alone	29
Living With Parents	40
Live in boarding houses	31
Total	100

Table 4.8 shows that the residence status of the respondents was 40 people living with their parents, 31 people living in boarding houses and the remaining 29 people living in their own homes.

**Table 4.9 Community Characteristics based on Use of Trans Metro Dewata Buses in the Trans Metro Dewata Route Area in 2023**

Ever Used the Trans Metro Dewata Bus	Amount
Once	49
No/Never	51
Total	100

Based on table 4.9, it shows that there are 51 people who have used the Trans Metro Dewata bus service and the remaining 49 people have never used it.

**Table 4.10 Community Characteristics based on Level of Desire to Use TMD in Trans Metro Dewata Route Areas in 2023**

Desire rate using TMD	Amount
No	2
Doubtful	2
Yes	96
Total	100

Based on table 4.10, it shows that the level of desire to use the Trans Metro Dewata bus is very large, namely 96 people, who are hesitant to use it, there are 2 people and 2 people who do not want to use it.

### 4.1 Relationship between Community Characteristics and Knowledge of Services with Desire to Use Public Transportation

#### 4.3.1 Likert analysis

**Table 4.11 Answer results based on question items for respondents who have used the TMD Bus**

No	Question	Correct	Wrong
1	What are some applications that make it easier to use or provide TMD bus public transport information?	470	40
2	What is the name of the public transportation that serves the Sarbagita area?	390	120
3	What is the predominant color of public transport buses serving the Sarbagita area?	410	100
4	What is the current fare for taking the TMD bus public transportation?	290	220

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5	Which routes are included in the TMD bus transit routes?	360	150
6	What is the payment system when using the TMD bus?	480	30
7	What time does the TMD bus operate every day?	260	250
8	What time does the last TMD/bus operation end from the starting or ending point each day?	100	410
9	Are TMD buses equipped with stands?	500	10
10	Is the TMD bus equipped with CCTV?	470	40

Source: Primary Data Analysis

**Table 4.12 Level of Knowledge based on a Likert Scale for Those Who Have Used a TMD Bus**

No	Total Value Score (%)	Category	Amount (person)
1	10 – 40	Do not know	2
2	40 – 70	Enough Knowing	23
3	70 – 100	Know	26
Amount			51

Source: Primary Data Analysis

Table 4.11 shows the results of processing scores from questionnaire answers in the form of a quiz consisting of 10 multiple choice questions related to the Trans Metro Dewata bus service for people who have used bus services. The value of the most incorrect answers to question number 8 regarding hours of completion of operational services with a value of 410. Table 4.12 results after classifying with a Likert scale, where it was found that 51 respondents who had used the Trans Metro Dewata Bus service consisted of 2 people with the criteria of not knowing, 23 people knowing enough and 26 people knowing.

**Table 4.13 Answer results based on question items for respondents who have never used the TMD Bus**

No	Question	Correct	Wrong
1	What is the name of the public transportation that serves the Sarbagita area?	310	180
2	What is the predominant color of public transport buses serving the Sarbagita area?	400	90
3	What is the current fare for taking the TMD bus public transportation?	80	410
4	How many TMD bus service corridors are there?	100	390
5	Which routes are included in the TMD freight route?	260	230
6	What is the payment system when using the TMD bus?	390	100
7	What time does the TMD bus operate every day?	160	330
8	What time does the last TMD/bus operation end from the starting or ending point each day?	100	390
9	Does the TMD bus stop at every stop/bus stop?	430	60
10	Is the TMD bus equipped with priority seats?	330	160

Source: Primary Data Analysis

**Table 4.14 Level of Knowledge based on a Likert Scale for those who have never used a TMD Bus**

No	Total Value Score (%)	Category	Amount(person)
1	10 – 40	Do not know	16
2	40 – 70	Enough Knowing	28
3	70 – 100	Know	5
Amount			49

Source: Primary Data Analysis

Table 4.13 shows the results of processing scores from questionnaire answers in the form of a quiz consisting of 10 multiple choice questions related to the Trans Metro Dewata bus service for people who have never used the Trans Metro Dewata Bus. The father's most correct answer to question number 9 does the TMD bus stop at every bus stop/bus stop with the correct number of 430 and the most wrong answers in number 3 regarding the current tariff with a value of 410. Table 4.14 shows the results of data processing based on a Likert scale obtained that 49 Respondents who had never used the Trans Metro Dewata Bus consisted of 16 people with the criteria of not knowing, 28 people knowing enough and 5 people knowing.

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**Table 4.15 Total Number of Respondents Based on Knowledge Level**

No	Total Value Score (%)	Category	Amount(person)
1	10 – 40	Do not know	18
2	40 – 70	Enough Knowing	51
3	70 – 100	Know	31
Amount			100

**Source:** Primary Data Analysis

Based on table 4.15 of the 100 respondents studied, most of the respondents' level of knowledge about Trans Metro Dewata bus services was in the sufficiently knowing category, namely as many as 51 people, 31 people knew and 18 people in the category did not know. This needs to be a concern that the dissemination of information is still not optimal and needs to be carried out intensively because it is important in increasing public knowledge regarding services, so that it is expected to be able to encourage people to use public transportation services, especially the Trans Metro Dewata Bus.

### 4.3.1 Chi-Square analysis

The answers to questions about the characteristics of the respondents, quizzes about public transport services and questions about the level of desire to use the Trans Metro Dewata bus public transportation were processed using SPSS where previously all answers had been changed to a code in the form of numbers instead of written answers. The test results with SPSS between characteristic variables and desire level variables using the Trans Metro Dewata bus are presented in the following table.

**Table 4.16 Chi Square Tests Characteristics with Desire**

Characteristics	Desire level		
	Value	Df	asympt. Sig.
Gender	1.474a	2	.478
Age	52.490a	8	.000
Level of education	2.847a	6	.828
Type of work	59.285a	14	.000
Vehicle Ownership	14.297a	4	.006
Income	25.243a	24	.393
Family Status	3.168a	2	.205
Status of residence	5.796a	4	.215

**Source:** Primary Data Analysis

Based on table 4.5, the chi square test using SPSS between the characteristics and the desire to use the Trans Metro Dewata bus service is known that the characteristics of age, type of work and vehicle ownership produce a Sig value. less than  $<0.05$  means there is a significant relationship with the desire to use the Trans Metro Dewata bus service. The characteristics of gender, education level, income, family status and residence status produce a Sig value.  $> 0.05$  means that there is no significant relationship with the desire to use the Trans Metro Dewata Bus service. This is in accordance with the research of Hendrialdi et al (2021) which states that out of 130 respondents, 70% of the transportation used to carry out their daily activities uses motorbikes; 17.7% private car; 6.9% public transportation; and 2.3% online taxi. There were also various reasons, namely 49.2% said the travel time was faster; 23.1% related to safety and convenience; and 20% on a lower cost. The conclusion from Hendrialdi's research is that the main factor for respondents in choosing a mode of transportation is travel time, so they prefer motorcycles because they are considered effective and efficient from the cost factor (Hendrialdi, et al, 2021).

The results of the related analysis show that there is a significant relationship between age and the desire to use Trans Metro Dewata public transportation in accordance with the opinion of White (1976), the existing demand from the community for meeting transportation needs is influenced by each person's income, health, travel purpose, age, type of trips, the number of passengers (group/individual) and urgent trips. Also conveyed by Jodi Rahardian, et al (2015), there are 9 factors and variables that influence the interest of public transport users which are obtained based on user preferences, ratings, and expectations, namely: capacity, accessibility, waiting time, safety, speed, comfort, age, gender, and motor vehicle ownership.

The results of the related analysis show that there is a significant relationship between vehicle ownership and the desire to use Trans Metro Dewata public transportation in accordance with what was conveyed by Ida Bagus PW (2010), that if the

## Dissemination of Information Desire to use Trans-Metro Dewata Services

difference between the costs of public transportation and private transportation is greater, then the opportunity to use private transportation will increase; Even though the cost of private transportation and public transportation is the same, workers still choose to use private transportation (as much as 79%) even though there is a cost difference of Rp. 2,800.00. A balance between the cost and use of private transportation and public transportation is obtained if the cost of private transportation is 1.4 times greater than the cost of public transportation.

**Table 4.17 Resultschi square Level of Knowledge with Desire**

	Value	df	Asymptotic Significance(2-sided)
Pearson Chi-Square	11.701a	4	.020
Likelihood Ratio	10013	4	040
Linear-by-Linear Association	5,979	1	014
N of Valid Cases	100		

Based on table 4.17, the chi square test using SPSS between the level of knowledge and the desire to use the Trans Metro Dewata bus service is known to have a value of Sig. that is equal to 0.020 < 0.05 so it can be concluded that there is a relationship between knowledge and the desire to use the Trans Metro Dewata bus service. In accordance with the hypothesis that has been made that if the value of Sig. < 0.05 then  $H_0$  is Rejected where  $H_0$  is there is no significant effect between the two variables, and if the value Sig value. > 0.05 then  $H_a$  is accepted, that is, there is a significant influence between the two variables. These results are in accordance with previous research by Bhakti and Rena (2020) which stated that interesting promotional innovations are suggested to be able to attract the interest of the Balinese people towards the existence of the Trans Sarbagita Corridor I mode. The aim is to increase public interest in using the Trans Sarbagita service (Bhakti and Rhena, 2020). With the promotion of innovation, the community will be interested so that their knowledge of the information will increase.

## CONCLUSIONS, SUGGESTIONS AND IMPLICATIONS

### 5.1 Conclusion

Based on the results of the study it can be concluded as follows:

1. Information dissemination of Trans Metro Dewata bus services has been carried out through social media in the form of Instagram and directly to the community, namely elementary and high school children. So far, the community has known information about Trans Metro Dewata services through several sources, but the information that is known has not been well received by the public.
2. The characteristics of Trans Metro Dewata bus service users come from a variety of different backgrounds including gender, age, education level, occupation, income, vehicle ownership and residence status, there are 51 people who have used transportation services. general Trans Metro Dewata buses and 49 people have never been, as many as 94 people wish to use transportation services public Trans Metro Dewata buses. The proportion is based on the level of knowledge for people who have used it, most of them already know and know enough. Meanwhile, those who have never used it need to know enough information related to this public transportation service.
3. There is a significant relationship between the characteristic variables and the level of people's desire to use the Trans Metro Dewata Bus service on the characteristics of age, type of work and vehicle ownership with a Sig value. 0.000, 0.000 and 0.006. While the variable level of knowledge with the level of people's desire to use the Trans Metro Dewata Bus service shows a significant value of 0.020, so that there is a significant relationship between the level of knowledge and the level of desire to use the Trans Metro Dewata bus public transportation service or knowledge influences desire.

### 5.2 Suggestion

Suggestions from the results of this study are addressed to the government in charge of transportation and recommendations for academics (further research):

1. The Ministry of Transportation and the Department of Transportation as well as operators should continue to socialize public transport services because this is an important matter that influences people's desire to use it by first knowing all the important information related to it. Besides that, it is also to maintain the quality and quantity of the public transport service network.
2. Further research is intended to increase the number of samples with the representativeness of all corridors to obtain more accurate results and to be representative of the existing population.

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3. A more in-depth analysis is needed to find out about the factors that cause people to want to use public transportation because in this study it only focuses on the relationship between two variables, namely the level of knowledge and desire to use the Trans Metro Dewata bus service.

### 5.3 Implications

Research that has been conducted regarding Public Transportation certainly has the following implications:

1. Dissemination of information related to public transportation services is carried out intensively through various media, whether social media, news or other online media, besides that socialization is not only to schools but to the community, especially the people around the routes served, and also by holding socialization at events such as car free days, transportation days or also by conducting campaigns at activity centers such as markets, malls and other crowded places. This is to increase public knowledge and insight regarding Trans Metro Dewata because there is already a clear relationship between the role of knowledge and the desire to use it.
2. In order to increase public transport users and reduce congestion, new service routes can be added so that they are able to accommodate areas that have not been served by public transport, of course accompanied by an increase in infrastructure facilities such as adequate bus stops, provided parking pockets close to bus stops, provided feeder transport. ), bus stop locations that are not too far away and maintain roadworthy vehicles.

### REFERENCES

- 1) Arikunto, S. (1998). *Research Procedures: A Practice Approach*. Jakarta: Rineka Cipta.
- 2) Avianto, BN, & Dindayanti, R. (2020). *Trans Sarbagita Corridor I (City-GWK) Public Transport Service Quality in 2018*. *Syntax Literate; Indonesian Scientific Journal*, 5(1), 17-27.
- 3) Axnur, V., & Awza, R. (2014). *The Role of the Department of Transportation in Delivering Trans Metro Route Information in Pekanbaru City*. *Student Online Journal (JOM) in Social and Political Sciences*, 1(2), 1-11.
- 4) Bowersox, C. (1981). *Introduction to Transportation*. New York: Macmillan Publishing Co., Inc.
- 5) Damsar. (2012). *Introduction to Political Sociology*. Jakarta: Kencana.
- 6) Gani, I., & Amalia, S. (2015). *Data Analysis Tools: Statistical Applications for Economic and Social Research*. Yogyakarta: Publisher And.
- 7) Good, CV, & Merkel, WR (1973). *Dictionary of education*. McGraw-Hill.
- 8) Hasbullah. (2013). *Revised Edition of Fundamentals of Education*. Jakarta: PT Raja Grafindo Persada.
- 9) Hendrialdi, et al. (2021). *Mass Transportation as an Alternative to Overcoming Traffic Congestion Problems Metropolitan Sarbagita*. *Journal of Transportation and Logistics Technology Volume 2 No 2, December 2021, Pages 79-86*.
- 10) Hidayat. AA (2008). *Midwifery Research Methods Data Analysis Techniques*. New York: Salemba Medika.
- 11) Decree of the Minister of Transportation No.15 of 2019 concerning Organizing the Transportation of People with Public Motorized Vehicles on Routes.
- 12) Komang RT, et al. (2019). *Trans Sarbagita Bus Public Transportation Services for the Community and Tourism of Denpasar City*. *Journal of Tourism Applied Science Vol.4, No.1, p.1-11*
- 13) Manheim, M.L. (1979). *Fundamentals of transportation system analysis Volume 1: Basic concepts*. Mit Press.
- 14) Morlok, EK (1995). *Introduction to Transportation Engineering and Planning*, Erlangga. Jakarta.
- 15) Mulyono, D. (2012). *The Smart Book of Savings and Loan Cooperative Business Strategies*. Yogyakarta: ANDI.
- 16) Noor, J. (2012). *Research methods. Thesis, Thesis, Dissertation, and Scientific Work*. Jakarta: Kencana Prenada Media Group.
- 17) Minister of Transportation Regulation No. 98 of 2013 concerning Minimum Service Standards for the Transport of People with Public Motorized Vehicles on Routes.
- 18) Government Regulation no. 74 of 2014 concerning Road Transportation, article 107.
- 19) Purwanto, I. (2006). *Strategy Management*. Bandung: Yrama Widya.
- 20) Men, IGABA (2015). *Evaluation Study of the Trans Sarbagita Bus Program for the Provincial Government of Bali (Doctoral dissertation, Airlangga University)*.
- 21) Rogers, EM (1983). *Diffusion of Innovations*. Third Edition, The Free Press, New York.
- 22) Santosa, I. (2011). *Sociology The Key Concepts*. Jakarta: Rajawali Press.
- 23) Sarwono, J. (2006). *Quantitative and Qualitative Research Methods*, Yogyakarta: Graha Ilmu.
- 24) Now, U. & Bougie, RJ, (2016). *Research Methods for Business: A skills Building Approach*. 7th Edition, John Wiley & Sons Inc. New York, US.

## Dissemination of Information Desire to use Trans-Metro Dewata Services

- 25) Setijowarno, D., & Frazila, RB (2001). Introduction to the transportation system. Semarang: Soegijapranata Catholic University.
- 26) Situmorang, SH, Muda, I., Doli, M., & Fadli, FS (2010). Data analysis for management and business research. USUpres.
- 27) Siyoto, S., & Sodik, MA (2015). Basic research methodology. publishing media literacy.
- 28) Steenbrink. (1974). Optimization of Transport Networks. General Soedirman University Final Project, Purwokerta.
- 29) Sugiyanto, et al. (2021). Analysis of Transportation Mode Selection Factors Using the Analytic Hierarchy Process Method. Journal of Transportation and Logistics Technology Volume 2 No 1, June 2021, Pages 11 -18.
- 30) Sugiyono, PD (2006). Statistics for research. Bandung: CV. Alfabet, 21.
- 31) Supranto, J., Theory and Application Statistics, Erlangga, Jakarta, 2000
- 32) Sumantri, Popi AI (2019). The Influence of Socialization, Education, and Marketing Strategy for Gold Savings Products on Customer Loyalty in Saving at PT. Sharia Pawnshop, Skip Branch, Bengkulu City. Thesis. Bengkulu: Bengkulu State Islamic Institute.
- 33) Tamin, OZ (2000). Transportation Planning and Modeling. ITB Publisher, Bandung.
- 34) Law Number 2 of 1989 concerning the National Education System.
- 35) Law Number 22 of 2009 concerning Road Traffic and Transportation.
- 36) Wibowo, RSS, Weningtyas, W., & Rahma, S. (2018). Information system service quality on Transjakarta public transportation. Journal of Transportation, 18(1), 67-76.



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## Innovative Approaches and Technologies to Increase the Productivity of Foothill Pastures Prone to Drought in the Upper Reaches of the Kashkadarya River



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**ABSTRACT:** The article describes the characteristics of the types of pastures of the Kamashi district in the Kashkadarya region, the degree of degradation and ways of their rational use. Materials on the species composition of vegetation cover and the improvement of degraded pastures by the introduction of long-term drought-resistant forage species within the framework of the SATREPS BLUE project are presented.

**KEYWORDS:** Pastures, degradation, forage plants, yield, soils, seeds, restoration technologies, agroforestry, biodiversity

### INTRODUCTION

The high sensitivity of desert and mountain ecosystems to climate change, combined with natural and anthropogenic desertification processes, make Uzbekistan one of the countries with the most serious land degradation. According to recent estimates, over 16.4 million hectares, i.e. 73% of the total area of pasture lands and hayfields, are subject to degradation as a result of overgrazing, the influence of man-made factors and climate change. The digression of pastures leads to the loss of their feed capacity. The natural vulnerability of pasture ecosystems is enhanced by the actions of local communities that overexploit natural resources (including pasture lands).

The pasture territories of the adyr zone of the Kamashi district are devoid of semi-shrubs- shrubby vegetation. In livestock farms, coarse feed is harvested and purchased annually (about 30-40%) in large quantities for livestock for the winter and throughout the year, which significantly reduces the efficiency of animal husbandry.

### PURPOSE AND OBJECTIVES

The aim of the work was to study the condition of various types of pastures in the Kamashi district of Kashkadarya region, the degree of degradation and ways of their rational use. The obtained materials are used in the development of scientific and practical foundations for the adaptive use of agroecological resources, including optimization of flora composition, assessment of biological diversity and identification of the resource potential of natural vegetation.

### MATERIAL AND METHODS OF RESEARCH

The object of research is the pastures of the Kamashi district of the Kashkadarya region, the lands of the farms "Altinboev Yeri", "Sora ibn Islom" and "Yashin Makon", specializing in pasture animal husbandry and rain-fed crop production.

During the study, the following methods were used: The description of vegetation, taking into account its floral composition, was carried out according to the Drude method generally accepted in geobotany [2]. The vegetation areas are specified on the basis of literature data and surveys of distribution areas within the Kamashi district of Kashkadarya region. We used the traditional route method of geobotanical research, as well as methods of cameral decryption of satellite images from Landsat, MODIS and Google. To study the seasonal dynamics of the feed mass on the control pasture plots, sections with an area of 10 m<sup>2</sup> were laid, mowing was carried out, then the biomass of forage plants and their nutritional value were determined by laboratory methods [1].



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The types of pastures were determined in accordance with the scheme of the typology of pastures of Uzbekistan (Guidelines for the geobotanical survey of natural forage lands of Uzbekistan, 1980) [2]. Contour areas were determined using GIS methods. Age-related changes of plants according to the method of T. A. Rabotnov [4]. Phenology was performed according to the method of I. N. Beideman [5]. The species belonging of the plants was indicated in accordance with S. K. Cherepanov [6] and the plant definitions of Central Asia and the identifier. Keys to the Plants of Central Asia (vol. I-X, 1968-1993).

### Research Area

#### Brief description and location of the plots

The research plots were selected within the framework of the SATREPS project to implement the monitoring system "crops-soil-water-land use-crop production" and to evaluate the results in quasi-real time of changes in water resources and land use, as well as the effects of demonstrated BMPs and reclamation programs.

Kamashi district is located within the catchment basin of the Kashkadarya River, which includes the micro-catchment of the Langar River and partially the Katta-Uryadarya and Yakkabagdarya rivers and extends from the central part of the Kashkadarya region to its eastern border with the Surkhandarya region. The terrain is located at an altitude within 1000 m, it is a hilly, gently sloping foothill plain ("Sora ibn Islom" and "Altynboev yeri"). The Yashin Makon farm is located on a steeply sloping foothill plain. The foothill loess hills are separated by wide ravines and valleys. The flat part is formed by the erosive-accumulative activity of the Langar River and shallow-water sais. The soils of the Kamashi district were formed in the high-altitude belt of serozems - typical and dark serozems.

The arid lands of the foothills of the project area are used as rain-fed arable land for growing grain crops, *Carthamus tinctorius*, and as pastures for grazing livestock. Due to frequent droughts, farmers suffer losses, they receive profits only in favorable years (1 time in 3-5 years). Degradation of agricultural lands, droughts and water scarcity, aggravated by climate change, violate the integrity and stability of natural ecosystems, the stability of the agricultural sector and threaten the well-being of the rural population. To improve the situation, the region needs innovative approaches and technologies

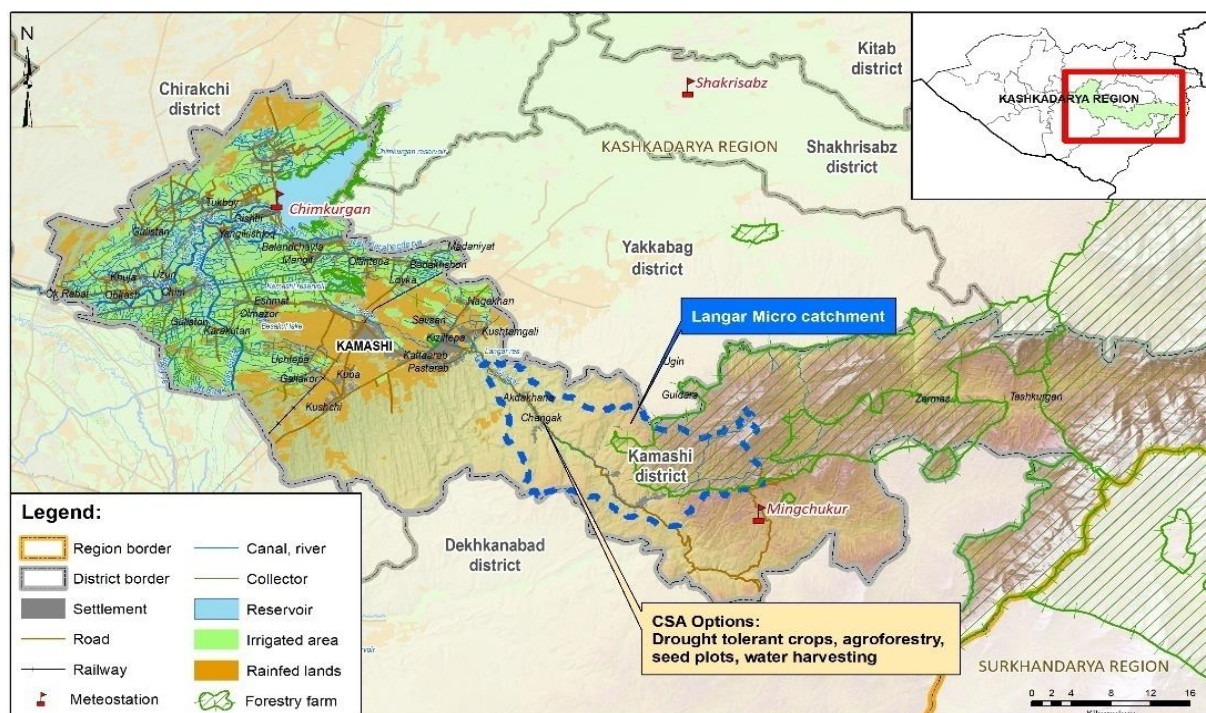


Fig. 1. Map of Kamashinsky district

## RESULTS AND DISCUSSION

### Natural pastures

The yield of natural pastures varies sharply by year and season and is, in bad years, 0.1 -0.15 and less t/ha, in good years up to 0.4-0.45 t/ha. The year 2021 was very lean, there was a slight amount of precipitation, the yield on natural pastures was only 0.02 t/ha. The average yield of this type of pasture over the years is 0.503 t/ha in spring, 260 kg of feed units per 1 ha, contains 25 kg/ha of protein. The seasonality of use is summer [2]. In the spring of 2021, the average yield was about 0.42 t/ha.

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Photo 1 and 2. Natural pastures

By autumn and winter, there is practically no fodder left on this type of pasture, except for vegetation that is poorly eaten, weedy and poisonous. The yield on adjacent pastures in the autumn period is about 0.01 -0.02 t/ha and consists of poorly eaten plants, mainly by *Prosopis farcta* (Banks & Sol.) J.F.Macbr., which is about 60-70% in pasture grass. In places, there is a *Trichodesma incanum*, a perennial poisonous plant from the family of *Boraginaceae*, common in Central Asia, growing in foothill areas on rain-fed lands. The stems of this weed are branching, usually form a bush up to 1 m high, densely shrouded in silvery-white hairs. This type of pasture is seasonal; it is used only in the spring-summer season. Therefore, on this type of pastures, it is necessary to sow perennial species of shrubs and semi-shrubs that used to grow on this type of cenoses, but as a result of anthropogenic impact fell out of these communities. Table 1.

Table 1. Seasonal yield of natural pastures

Types of pastures	Yield, t/ha			
	spring	summer	autumn	winter
Pastures of the Adyr zone	0.35	0.04	0.01	0



Photo 3. Kamashi pastures



Photo 4. Degraded pastures

Recently, due to a sharp increase in the number of livestock, the yield of natural pastures has noticeably decreased. 2019 and 2022 were very favorable for the development of pasture vegetation, the yield of foothill pastures in the spring period was 0.61-0.70 t/ha. Table 2.

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**Table 2. Dynamics of the number of species, changes in the projective coverage and yield of pastures of the Kamashi district in 2019-2022**

No	Number of species, pcs	Plant height, cm	Projective coverage,%	Yield, t/ha	Sheep capacity, head/ha
<b>2019 year</b>					
Farm "Altinbayev yeri"	4	39	45	3,8	0,47
Farm "Soro ibn Islom"	5	35	50	4,0	0,50
Farm "Yashil makon"	9	49	80	6,1	0,76
Average value	6	41	58,3	4,63	0,58
<b>2020 year</b>					
Farm "Altinbayev yeri"	5	47	45	3,5	0,44
Farm "Soro ibn Islom"	6	40	55	4,1	0,51
Farm "Yashil makon"	12	55	80	6,8	0,85
Average value	8	47,3	58,3	4,8	0,60
<b>2021 year</b>					
Farm "Altinbayev yeri"	3	25	35	2,5	0,31
Farm "Soro ibn Islom"	4	30	35	3,2	0,40
Farm "Yashil makon"	9	45	70	4,2	0,52
Average value	5	33,3	46,7	3,3	0,41
<b>2022 year</b>					
Farm "Altinbayev yeri"	5	40	55	3,2	0,40
Farm "Soro ibn Islom"	6	40	70	4,2	0,52
Farm "Yashil makon"	12	50	85	7,0	0,88
Average value	8	43,3	70,0	4,8	0,60

According to Table 2, in 2020, the percentage of projective coverage on the Adyrs ranges from 45 to 55%, on the low mountains 80.0%. Pasture yields also from 0.38 to 0.68 t/ha. Sheep capacity, on average is 0.44-0.85 heads per 1 ha of pasture territory, these pastures are seasonal and are intensively used by the local population for grazing animals, recommended for use in spring - summer periods of the year and haymaking. In the most favorable climatic conditions in 2019 and 2022, the height of herbaceous plants was 41.0 - 50.0 cm, and in arid 2021, 25.0 cm.

The pasture yield is slightly higher in the conditions of 2020 - 2022 and averaged 0.48 t/ha, in 2021 it is slightly lower than in 2020 and averaged 0.33 t/ha. The average sheep capacity in 2020 - 2022 is 0.6 heads /ha, and in the unfavorable 2021, 0.41 heads per 1 ha of pasture territory. In 2022, it was possible to keep more than 0.88 heads per 1 hectare on good plots.

### RESULTS OF FIELD AND LABORATORY STUDIES OF FARM SOILS

**The plot of the farm "Sora ibn Islom".** The specialization of the farm is animal husbandry and rain-fed agriculture. The total area is 130 hectares, of which 75 hectares of acreage. 2 pilot sites were created within the Sora ibn Islom farm for testing, demonstration of quasi-real monitoring of evapotranspiration and phenological development of food crops (*Triticum*, *Hordéum vulgáre*, *Carthamus tinctorius*, *Písum*, *Línium*). GIS linking of the Langar-Kamashi territory, farm and experimental plots with 9 types of crops, project area and plots to the FAO LUS/L digital map and the 1:100,000 Natural Reclamation Map was carried out to determine biophysical indicators and check the category of land use of experimental plots in the project area according to Kamashi. The study of soils in the farm, the morphological description of the soil profile was carried out on the basis of a soil section / pit with a depth of 2 m and 8 wells under each crop. The coordinates of the selection are given in Table 3, the location in Figure 2.

**Table 3. Coordinates of wells**

# well	Culture	N	E	Alt,m
1	<i>Písum</i>	38.72078	66.63722	981
2	<i>Avéna</i>	38.72081	66.63661	978
3	<i>Písum -2</i>	38.72247	66.63786	953

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4	<i>Linum</i>	38.72500	66.63633	921
5	<i>Solanum tuberosum</i>	38.72597	66.63417	931
6	<i>Carthamus tinctorius</i>	38.72792	66.63575	895
7	<i>Kochia prostrata</i>	38.72811	66.63633	909
8	<i>Carthamus tinctorius</i>	38.72647	66.63858	904
9	The pit	38.71964	66.63700	998

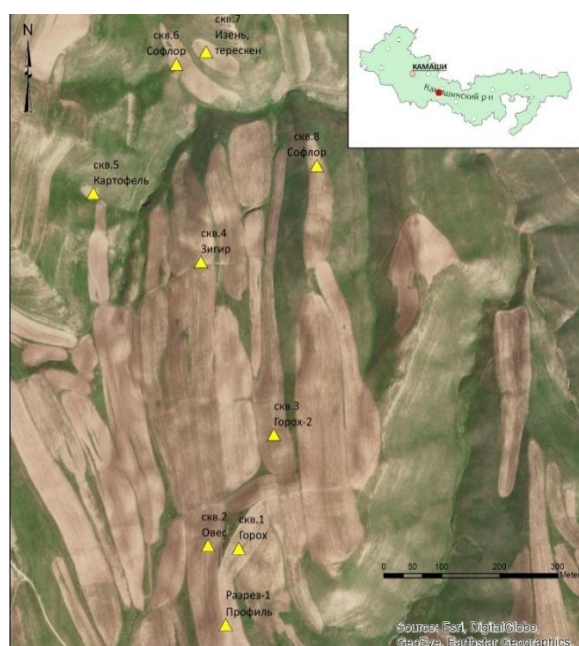


Figure 2. Location of soil sampling points

The soil cover on the site "Sora ibn Islom" is represented by bogar typical gray-earth carbonate soils formed on loess deposits. The soils are unsalted and not gypsum with a loamy texture (mainly medium and heavy loam with layers of sandy loam). The humus content varies from 0.4% to 1.48% and is classified as low for gray-earth type soils.

### The plot of the farm "Altynboev Yeri".

The demonstration site on the Bogar in the "Altynboev Yeri" farm was organized earlier as part of the GEF/FAO DS-SLM project in 2015-2018. Due to insufficient natural moistening of rain-fed lands, water erosion on the slopes, soil degradation is observed and the yield of winter wheat, which is grown without any crop rotation, is low and unstable. In some dry years, production costs are not compensated by the resulting harvest. After harvesting winter wheat, the field is a completely bare landscape, uncovered by vegetation.

The soil cover of the "Altynboev Yeri" farm is represented by a typical serozem composed of unsalted medium loams with deep groundwater that does not participate in the process of soil formation. The humus horizon extends to a depth of 50 cm with very low humus content – in the range of 0.50-0.60%. The content of nutrients in the soil - mobile forms of potassium is 173 mg/kg of soil, and phosphorus is 5.8 mg/kg of soil, and is classified as very low.

### The plot of the farm "Yashin Makon".

Kashkadarya region, Kamashi district, Langar territory, Kizilkishlok village. The plot of the farm "Yashil Makon" located on N-38 41320E-066; 44320; alt 1109m. The land is used for natural pasture with a poor variety of vegetation. On pastures there is *Carex pachystylis*, *Poa bulbosa*. A valuable admixture in the herbage of these plants are *Leptaleum filifolium*. Annual *Astragalus filicanlis*, *Bromus tectorum*, *Cousinia*, *Ferula* and *Phlomis*.

## Innovative Approaches and Technologies to Increase the Productivity of Foothill Pastures Prone to Drought in the Upper Reaches of the Kashkadarya River



Photos 5 and 6. Vegetation of the foothills

The yield of pastures of the studied territory is highly dependent on weather conditions and varies dramatically by year and season (from 0.35 to 0.70 t/ha). In terms of feed, the main forage plants of pasture lands are of poor quality: 1 kg of hay contains from 0.36 to 64 fodder units and from 11 to 73.0 digestible protein.

The degree of negative influence of pasture weeds depends on both the season and the type of animals. The number of plant species not eaten by sheep is relatively small. Heavy clogging of pastures is especially unfavorable for cattle and horses. In the summer, basically, only wormwood vegetation grows.

### Creation of primary seed production sites

Within the framework of the GEF/FAO Projects "Support for solutions for the promotion and dissemination of sustainable land management SLM in Uzbekistan" and the SATREPS sub-project Development of quasi-real monitoring "culture-soil-water-land use-crop production", fodder plants, semi-shrub species were sown to demonstrate various technologies for the restoration of degraded lands: *Kochia prostrata*, *Astemisia diffusa*, *Halothamnus subaphylla*, *Ceratoides ewersmanniana*, types of herbs *Onobrychis horossanica*, *Poa bulbosa*, *Agropyron desertorum* and species of *Astragalus*.

Agrophytocenoses reduce the speed of winds, delay snow and protect the soil from deflation, create a milder microclimate in the strip itself and in adjacent areas of pastures. This creates more favorable environmental conditions for the growth and formation of a larger crop of pasture feed. The use of these methods makes it possible to increase pasture forage by 2-3 times.

The seeds produced can be used to restore degraded lands, spread to other farms. The created plantings will allow the use of pastures in all seasons of the year, have a beneficial effect on improving the state of the environment and contribute to the creation of a system of pasture use adapted to the conditions of global climate change. The slopes of hills subject to water erosion are strengthened, the water regime is improved and the upper fertile layer of the earth is preserved. Two innovative technologies have been introduced on the heavily degraded slope lands of the "Altinboev Yeri" farm.

### Technology 1. Planting almonds and other tree species on small terraces:

The slopes of rain-fed lands require special processing techniques to improve the water regime and preserve the upper fertile soil layer. The technology being implemented includes the construction of small terraces on the slopes with the planting of *Prunus amygdalus* and other tree species. The width of the terraces is 1m, the planting scheme is 5x5 m. It is possible to sow drought-resistant plants between the terraces. The agroforestry site is fenced off from damage by cattle.

Of the planted tree seedlings, the *Ulmus densa* and the *Morus alba* took root best of all. *Haloxylon aphyllum* is developing well, *Juniperus* seedlings are in good condition, *Vitis vinifera* have developed well, and the condition of *Prunus amygdalus* is below satisfactory. The height of the *Haloxylon aphyllum* in the autumn-winter period is 155-220 cm. Photos 7 and 8.

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Photos 7 and 8. Agroforestry, the state of tree species on the farm

Woody vegetation –*Morus alba*, *Ulmus densa*, *Juniperus* have taken root well on the created green umbrella, the height of the trees is 2.2-2.5 m.

### Technology 2. Cultivation of drought-resistant crops on the bogar

The population living in the foothills is engaged in bogar farming and animal husbandry. The share of animal husbandry in the family budget is almost 90%. Therefore, to provide animal husbandry with feed, to solve the problems of the development of the industry, is an important task of agricultural science and practice. The introduction of drought-resistant desert forage plants will create additional feed stocks, ensure balanced nutrition of animals and reduce the load on pastures.

Table 4. Dynamics of fodder plants yields by year 2019-2022

№	Plant species	Yield, t/ha							
		2019		2020		2021		2022	
		Dry mass	seeds	Dry mass	seeds	Dry mass	seeds	Dry mass	seeds
1	<i>Kochia prostrata</i>	1.8	0.12	2.45	0.06	1.20	0.08	2.50	0.06
2	<i>Ceratoides Ewersmanniana</i>	1.4	0.11	1.51	0.05	1.05	0.06	1.86	0.09
3	<i>Halothamus subaphylla</i>	2.0	0.14	1.80	0.06	1.85	0.10	2.55	0.18
4	<i>Atriplex undulata</i>	1.8	0.14	1.65	0.06	1.65	0.11	0.85	0.05
5	<i>Onobrychis horossanica</i>	0.65	0.08	0.45	0.04	0.55	0.06	0.25	0.02
6	<i>Haloxylon aphyllum</i>	0.38	-	0.25	-	0.35	-	0.38	0.02
7	<i>Artemisia diffusa</i>	0.08	0.01	0.11	0.01	0.15	0.01	0.16	0.01
8	<i>Astragalus</i>	0.45	0.02	0.40	0.01	0.16	0.01	0.12	0.01

From the third year, a harvest of dry fodder mass of about 0.8-1.2 t/ha and seeds of 0.1-0.12 t/ha is formed. The largest yield of feed mass on the site was recorded in 2019 and 2021 -2.5t/ha, in the conditions of 2022, the yield of species was noticeably lower, due to high temperatures in July-August. Table 4.

With proper use of agrophytocenoses, i.e. with alienation or when grazing of plant mass by 70-75% and the possibility of plants to be seeded, these plant communities are able to self-regenerate for a long time. The ripened seeds will be carried by the wind, animals and spread over large areas.

Perennial forage plants - *Kochia prostrata*, *Ceratoides Ewersmanniana*, *Halothamus subaphylla*, *Haloxylon aphyllum*, *Atriplex undulata* and *Artemisia diffusa* are mown for livestock feed. The cutting of forage crops will allow to rejuvenate the plants, in the spring of next year, new young shoots will grow.

From the site of drought-resistant perennial fodder crops, using resource-saving technology, it will be possible to obtain about 200 - 240 kg of seeds from 2 hectares in the 3rd year of vegetation and use them in the future to improve degraded pasture areas

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and sell them to farmers and dehqan farms. Additionally, 3.0 - 3.2 tons of dry weight can be obtained from a plot of 2 hectares, which will allow you to have a stable feed base throughout the year, or to graze in the pasture rotation system in the autumn - winter periods of the year.

In the third year, the fence can be moved to another site, seeds of the same fodder plants can be sown on a new site, and the original site can already be used as a seed growing site and as pastures. It is recommended to mow plants to a height of 10 - 15 cm, so that the aboveground buds of renewal are preserved, from which new shoots will grow next spring. Eating plants on pastures of 100% aboveground phytomass can lead to plant death and degradation of pastures.

### CONCLUSIONS

The pastures of this zone are characterized by relatively low productivity and a significant degree of degradation of natural plant communities. The problem of land degradation and desertification in this area is more related to the plowing of significant areas for rain-fed crops of grain (Kamashi), which have low and unstable yields and very low profitability.

An increase in the number of sheep and an increase in the productivity of sheep almost completely depend on the state of pasture grass and the nutritional value of forage vegetation. In this regard, the development of a solution to the problem of livestock development and biodiversity conservation is one of the main tasks.

The created seed-growing areas can be further used as year-round pastures or hay fields. Grasses are cut off in spring and in the first half of summer, semi-shrubs in summer and autumn, and wormwood sprouting in the cenosis in autumn and winter. There is a lot of small undergrowth of plants that will grow large in the next year of vegetation.

### CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this paper.

### REFERENCES

- 1) Gaevskaya L. S. Karakul-growing pastures of Central Asia. Tashkent. FAN. 1971,323 p. (russ)
- 2) Guidelines for the geobotanical survey of natural forage lands in Uzbekistan, 1980, 170 p. (russ)
- 3) Dospekhov B.A. Methodology of field experience. M.: Kolos. 1979; 416. (russ)
- 4) Rabotnov T.A. (1950) Life Cycles of Perennial Grass Plants in Meadow Populations. Transactions of Institute of Botany of Academy of Sciences of USSR, Geobotany, Moscow, Leningrad, 176.
- 5) Beideman I.N. (1974) Methods for Studying the Phenology of Plants and Plant Communities. Nauka, Novosibirsk, 153 p.
- 6) Czerepanov S.K. (1995) Vascular Plants of Russia and Adjacent States (the Former USSR). Cambridge University Press, New York, 152.
- 7) Khaydarov Kh., Mukimov T., Islamov B., Nurullayeva N. Biological features and productivity of drought-tolerant fodder plants under the conditions of the Adyr zone of Uzbekistan. International Journal of Scientific and Technological Research. 2020; 6 (8):34-38.



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## The Effect of Liquidity, Investment Opportunity Set, Free Cash Flow, and State-Owned Enterprise on the Dividend Policy of Bank Listed in the Indonesia Stock Exchange



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**ABSTRACT:** The purpose of this study is to know the effect of liquidity, investment opportunity set, free cash flow, and state-owned enterprise on the dividend policy of bank companies listed on the Indonesia Stock Exchange (IDX) in 2011-2021. This study uses a purposive sampling technique to determine the research sample. The number of companies selected by the predetermined sample criteria is 8 companies from 46 companies listed in the IDX bank sector. In this study, an analytical test was conducted using descriptive statistics, classical assumption test, multiple linear regression test, t-test, and F-test. The result of this study showed that free cash flow gives a positive and significant influence on the dividend policy, while dividends on state-owned enterprise banks are fewer than on private banks. While liquidity and investment opportunity sets don't significantly influence the dividend policy.

**KEYWORDS:** dividend policy, liquidity, investment opportunity set, free cash flows, state-owned enterprise

### INTRODUCTION

One of the factors that investors pay attention to when investing in a company is dividends. Dividends are part of the company's profits or income, the amount of which is determined by the board of directors. With this definition, dividends are a form of compensation for open holding companies for individuals who participate in investments (OCBC NISP, 2022). Measurement of company performance can be seen through the distribution and increase in dividends distributed. The decision to distribute dividends is very crucial and has a big impact on investors and company managers. Dividend decisions, as determined by a company's dividend policy, are a type of funding decision that affects the amount of income a company distributes to shareholders versus the amount it retains and reinvests.

Dividend policy refers to the payment policy followed by the company in determining the size and pattern of cash distribution to shareholders over time (Baker, 2009). Dividend policy in each company is useful for determining whether to distribute dividends to shareholders or reinvest profits earned as reserves to carry out other investment activities by company managers so that performance will increase. If the decision is not carefully considered, it can cause problems or conflicts between shareholders and company managers.

One industry that attracts investors to invest their capital is the banking industry. Banking takes an important role in maintaining the stability of the country, especially in economic activities. Banks have the principle of *prudence* where they always act vigilantly in carrying out their duties so as not to harm customers and the state. Thus, if an economic crisis occurs, the Bank can still maintain and maintain financial stability. In addition, the role of banking is also the main driver of Gross Domestic Product. Based on data from the Central Statistics Agency (BPS), the contribution of the finance and insurance sector to GDP reached 4.44% in the second quarter of 2020 (Hutauruk, 2020). This was further emphasized by the Research Director of the Center of Reform on Economics (CORE) Indonesia, Piter Abdullah, who said "Banking plays a role in all economic activities. So that in simple logic it can be understood the big role of banking in the economy," This is one of the reasons for investors to invest in banking companies. One of the rewards expected by investors besides *capital gains* is the distribution of dividends to shareholders.

In this study, the amount of dividends to be distributed to investors is calculated by a percentage called the *dividend payout ratio (DPR)*. This is because DPR is the only indicator to measure the amount of cash or cash dividends distributed by banks on a regular or constant basis. In some literature, there are several factors that can influence the decision to distribute dividends by the managerial side of the company to shareholders. These factors include liquidity, *investment opportunity set*, *free cash flow*,



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and SOEs.

Liquidity is the company's ability to fulfill or pay its obligations. Liquidity can also show the financial position or wealth of a company. Therefore, the higher the liquidity level of a company, the higher the company's ability to distribute dividends to shareholders. In this study, the liquidity ratio was measured by the Loan to Deposit Ratio (LDR) proxy. LDR is used to analyze the liquidity level of bank companies. This is because the *loan to deposit* ratio is the ratio of loans to deposits. This ratio is used to measure the level of liquidity in banking by comparing total deposits with total bank loans in the same period.

In research conducted by Mui & Mustapha (2016) found that there is a positive relationship between company liquidity and dividend policy. However, in research conducted by Hesniati & Santi (2019) and Rijal & Said (2018), found that there is no significant effect of liquidity on dividend policy.

In addition to liquidity, dividend policy can also be predicted through investment opportunity set. A high company growth rate is often said to have high investment opportunities. Thus, motivating the managerial side of the company to reinvest in large amounts. The managerial party considers that making this investment can increase the profit earned by the company in the future. In this study, the investment opportunity set was measured *market to book value of equity* (MVE / BVE). This ratio is calculated by dividing market capitalization (stock price multiplied by the number of outstanding shares) by total assets.

In research conducted by Sumarni, Yusniar, and Juniar (2014), found that there is a significant negative relationship between investment opportunities and dividend policy. In research conducted by Hesniati & Santi (2019), found that there is a significant positive relationship between investment opportunities and dividend policy. This is because companies with a high level of investment opportunities tend to pay large dividends to shareholders to attract new investors and avoid conflicts with shareholders.

In addition, dividend policy can also be predicted through free cash flow. Free cash flow (FCF) is excess cash owned by the company that can be used for dividend payments to shareholders. This dividend payment can certainly be made if the company has made *capital expenditures* such as the purchase of fixed assets in cash. Therefore, the greater the free cash flow available, the greater the dividends that can be distributed to shareholders. In this study, free cash flow (FCF) is calculated by reducing cash flow from operations with capital expenditure.

In research conducted by Adnan, Gunawan, and Candrasari (2014), it shows a positive relationship between free cash flow and dividend payment decisions. However, research by Pradana & Sanjaya (2017) shows no effect of free cash flow on *dividend payout ratio*.

The last independent variable that can be used to predict dividend policy is state-owned enterprise. The definition of a State-Owned Enterprise (BUMN) in accordance with Law No. 19 of 2003 is a business entity whose capital is mostly owned by the state through direct participation from separated state assets. Capital ownership in BUMN companies is generally referred to as *government ownership*. According to Abiprayu & Wiratama (2016), decision making by managers in state-owned companies does not aim for the interests of the company, but aims for the interests of the state and together. The interests of the state and together are to improve the economy and social welfare of the community, and to support the development carried out by the government for the community. In this study, state-owned enterprise was proxied by a dummy variable. If the bank is a state-owned enterprise, it will be given a score of 1 or  $D = 1$ . If the bank is a non-state-owned enterprise, it will be given a score of 0 or  $D = 0$ .

In research conducted by Wuisan, Randa, and Lukman (2018), it shows that government ownership has a negative effect on dividend policy. However, research conducted by Thanatawee (2014) shows that there is a positive relationship between government ownership and dividend policy.

This research is a replication of Pradana & Sanjaya's research (2017) which analyzes the effects of profitability, free cash flow, and investment opportunity set on dividend policy for banking companies. In this study, researchers added an independent variable, namely liquidity which refers to Hesniati & Santi's research (2019) and state-owned enterprise variable which refers to Wuisan, Randa, & Lukman's research (2018). The addition of liquidity variables is done because these variables can be used to analyze the financial companies position. Meanwhile, the state-owned enterprise variable is a business entity whose capital is mostly owned by the state so that financial decisions are made by the government for the social welfare of the community. So, these two variables will affect the dividend policy in the company.

This research also has a different object from previous studies. If in previous studies most of the companies studied were manufacturing companies listed on the IDX, in this study the companies to be studied were bank companies listed on the Indonesian Stock Exchange. The period to be used in this study is the period 2011-2021 respectively.

This research is very important to do because in several previous studies the results shown were different. With this

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inconsistency, researchers want to re-examine research on the topic of the effect of liquidity, investment opportunity set, free cash flow, and state-owned enterprise on dividend policy. This aims to increase understanding, knowledge, and insight for researchers regarding dividend policy, and curiosity about what factors might affect a company's dividend policy.

### **HYPOTHESIS DEVELOPMENT**

#### **The Effect of Liquidity on Dividend Policy**

Liquidity is the company's ability to fulfill or pay its obligations. In this study, liquidity is proxied by Loan to Deposit Ratio or LDR. LDR has a positive influence on dividend policy. This is because liquidity can also show the financial position or wealth of a company. Where this reflects the extent of the company's performance. If the level of liquidity owned by a company is high, then the company's performance will be considered good.

According to research conducted by Mui & Mustapha (2016) states that liquidity has a positive effect on dividend policy. This study shows that companies with high liquidity levels have a high ability to distribute dividends to shareholders. However, research conducted by Hesniati & Santi (2019), and Rijal & Said (2018), found that there is no significant effect of liquidity on dividend policy.

**H1 : Liquidity has a positive effect on dividend policy**

#### **The Effect of Investment Opportunity Set on Dividend Policy**

A high company growth rate is often said to have high investment opportunities. Thus, motivating the managerial side of the company to reinvest in large amounts. The managerial party considers that making this investment can increase the profit earned by the company in the future. Investment opportunity set has a negative influence on dividend policy. This is because, in making these investments, managerial parties tend to choose to use internal sources of funds rather than external sources (issuing shares or bonds).

In accordance with research conducted by Sumarni, Yusniar, & Juniar (2014) found that there is a negative influence between investment opportunities and dividend policy. Therefore, the higher the level of *the investment opportunity set* by a bank, the lower the level of dividend distribution to shareholders. Research conducted by Pradana & Sanjaya (2017), found that investment opportunities do not have a significant effect on dividend policy.

**H2 : Investment opportunity set has a negative effect on dividend policy**

#### **The Effect of Free Cash Flow on Dividend Policy**

Free cash flow (FCF) is excess cash owned by the company that can be used for dividend payments to shareholders. This dividend payment can certainly be made if the company has made *capital expenditures* such as purchasing fixed assets in cash. According to Jensen (1976), free cash flow has a positive influence on dividend policy. Therefore, the greater the free cash flow available, the greater the dividends that can be distributed to shareholders.

Research conducted by Adnan, Gunawan, and Candrasari (2014), it shows a positive relationship between free cash flow and dividend payment decisions. Meanwhile, research by Pradana & Sanjaya (2017) shows no effect of free cash flow on *the dividend payout ratio*. This is because companies may use free cash flow to maintain *capital adequacy*.

**H3 : Free cash flow has a positive effect on dividend policy**

#### **The Effect of State-Owned Enterprises on Dividend Policy**

A state-owned enterprise is a business entity whose capital is mostly owned by the state through direct participation from separated state assets. Capital ownership in state-owned enterprises is generally referred to as government ownership. According to Abiprayu & Wiratama (2016), decision-making by managers in state-owned companies is not aimed at the interests of the company but aims to benefit the state and society. In this study, the state-owned enterprise was proxied by a dummy variable. If the bank is a state-owned enterprise, it will be given a score of 1 or  $D = 1$ . If the bank is a non-state-owned enterprise, it will be given a score of 0 or  $D = 0$ .

Research conducted by Wuisan, Randa, and Lukman (2018), it shows that government ownership has a negative effect on dividend policy. This is because companies managed by the government choose to reuse the profits generated in the form of retained earnings to strengthen the company's capital structure so that they can provide better services to the community. However, research conducted by Thanatawee (2014) shows that there is a positive relationship between government ownership and dividend policy.

**H4 : The dividend shared by the state-owned bank is less than the non-state-owned bank.**

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## METHOD

### Population and samples

The population in this study are all automotive and component companies listed on the Indonesia Stock Exchange or IDX. This research is included in the time series data with a research period of 11 years from 2011-2021. And it was found that there were 46 companies in the bank sector listed on the IDX. The sample is part of the population that is used as a research subject which is considered to represent all the population studied. This study used a purposive sampling technique, namely sampling through predetermined standards. The reason for using a purposive sampling technique is to obtain a representative sample or represent the population under study according to the wishes of the author.

### Variables

In this research, there is one dependent variable, namely dividend policy and four independent variables consisting of liquidity (loan to deposit ratio), investment opportunity set, free cash flow, and state-owned enterprise.

The amount of dividends to be distributed to investors is calculated by a percentage called the *dividend payout ratio* (DPR). DPR is calculated using the following formula:

$$DPR = \frac{\text{Amount of Cash Dividend}}{\text{Net Income}}$$

Thus if summarized, the dependent and independent variables and their measurements are as follows:

**Table 1: Variables and Measurement**

Variable	Symbol	Measurement
Dividend Policy	DPR	Amount of Cash Dividend/Net Income
Liquidity	LDR	(Loans granted/Total funds received) x 100%
Free Cash Flow	FCF	Operational Cash Flow - Capital Expenditure
State-Owned Enterprise	SOE	Dummy Variable, D = 1 if state-owned enterprise and D = 0 if non-state-owned enterprise

### Data Analysis

The multiple linear regression analysis model in this study is used to examine how much influence liquidity, investment opportunity set, free cash flow, and state-owned enterprise have on dividend policy. The multiple linear regression equation model is as follows:

$$DPR_i = \alpha + \beta_1 LDR_{2i} + \beta_2 IOS_{2i} + \beta_3 FCF_i + \beta_4 DBUMN + e$$

## RESULTS

### Descriptive statistics

From the results of the data tabulation, the description of the data can be seen from the descriptive statistics as follows.

**Table 2: Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
DPR	88	,07	1,76	,3974	,24919
LDR	88	,51	1,00	,8289	,09533
IOS	88	,35	12,46	1,9614	1,61278
FCF	88	-18,41	18,24	-3,9025	15,21711
CFO (Million Rupiah)	88	-3827066	129892493	15708634,68	29992762,05
CAPEX (Million Rupiah)	88	47411	144795764	22036769,88	34728429,69
SOE	88	,00	1,00	,3750	,48690
Valid N (listwise)	88				

**Source:** Data processed

Based on table 2, it can be seen that the results of the descriptive statistical test of the variables used in the study, namely the dividend policy variable proxied by the Debt Payment Ratio (DPR) obtained a minimum value of 0.07 (BBNI in 2021) and a maximum value of 1.76 (BDMN in 2020). The difference between the maximum and minimum values is 1.83. The financial distress variable has an average value (mean) of 0.3974, with a standard deviation or standard deviation of 0.24919, which means the

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standard deviation value < the average value so it can be concluded that the distribution of the data is uneven or collects at a mean value.

The liquidity proxied by Loan to Deposit Ratio (LDR) as a whole obtained a minimum value of 0.51 (BJTM in 2021) and a maximum value of 1.00 (BDMN in 2019). The difference between the maximum value and the minimum value is 1.51. This profitability variable has an average value (mean) of 0.8289 and a standard deviation value of 0.09533 which means the standard deviation value < the average value so it can be concluded that the distribution of the data is uneven or collects at a mean value.

The investment opportunity set variable as a whole obtained a minimum value of 0.35 (BNBA in 2015) and a maximum value of 12.46 (BBRI in 2015), so that the difference between the maximum and minimum values is 12.81. This variable has an average value (mean) of 1.9614 and a standard deviation value of 1.61278, which means the standard deviation value < the average value so that it can be concluded that the distribution of the data is uneven or collects at the average value.

The free cash flow variable as a whole obtained a minimum value of -18.41 (BBCA in 2016) and a maximum value of 18.24 (BMRI in 2020), so that the difference between the maximum and minimum values is 36.65. This variable has an average value (mean) of -3.9025 and a standard deviation value of 15.21711. The standard deviation value is greater than the average value, which means that the 2017-2021 research period has an even distribution of data.

The cash flow from operation variable as a whole obtained a minimum value of -38270667 (BBCA in 2011) and a maximum value of 129892493 (BMRI in 2021). The difference between the maximum value and the minimum value is 168163160. This variable has an average (mean) value of 15708634.68 and a standard deviation or standard deviation of 29992762.05. The standard deviation value is greater than the average value, which means that the 2017-2021 research period has an even distribution of data.

The capital expenditure variable as a whole obtained a minimum value of 47411 (BJTM in 2016) and a maximum value of 144795764 (BBCA in 2016), so that the difference between the maximum and minimum values is 144843175. In this variable the average value (mean) is 22036769.88 with a standard deviation value of 34728429.69. The standard deviation value > the average value so that it can be concluded that the distribution of the data is even.

The overall state-owned enterprise variable obtained a minimum value of 0.00 and a maximum value of 1. The difference between the maximum and minimum values is 1. The financial distress variable has an average value (mean) of 0.3750, with a standard deviation or standard deviation of 0.48690, which means that the standard deviation value > the average value so that it can be concluded that the distribution of the data is even.

### Hypothesis Test Results

Multiple linear regression analysis is used to examine how much influence liquidity, investment opportunity set, free cash flow, and state-owned enterprise have on dividend policy. With a significance level of 0.05, it means that the variable will be said to have a significant effect if the significance result is less than 0.05. From the research results, the results of hypothesis testing using multiple linear regression are as follows:

**Table 3: Hypothesis Test Result**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	,175	,242		,723	,472
LDR	,377	,288	,144	1,307	,195
1 IOS	-,015	,017	-,095	-,875	,384
FCF	,004	,002	,263	2,327	,022
SOE	-,118	,059	-,230	-1,989	,050

Source: Data processed

## DISCUSSION

### The Effect of Liquidity on Dividend Policy

Based on the results of the hypothesis testing above, it shows that liquidity proxied by Loan to Deposit Ratio (LDR) has no effect on the dividend policy rating. The results found are not in accordance with the first hypothesis which states that profitability has a positive effect on dividend policy, so the H1 hypothesis is rejected. Banks that have good liquidity have good corporate cash as well. However, the bank prefers to use the cash to meet its short-term obligations rather than use it for dividend distribution to shareholders. For example, bank customers often make withdrawals at indeterminate times. In addition, a good level of liquidity

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does not guarantee a good dividend distribution for banks that are classified as *mature*. Banks that have been operating for a long time will choose to use corporate cash to maintain their reputation by maintaining a good level of liquidity. If the bank chooses to pay dividends, then its liquidity level will decrease so that the bank's reputation will also decrease for shareholders or other parties.

This research supports research conducted by Hesniati & Santi (2019) and Rijal & Said (2018) which states that profitability has no effect on financial distress. However, these results are in contrast to research conducted by Mui & Mustapha (2016) which states that liquidity has a positive effect on dividend policy.

### **The Effect of Investment Opportunity Set on Dividend Policy**

The results of the second hypothesis test show that investment opportunity set has no effect on the dividend policy rating. This result is also inconsistent with the second hypothesis which states that liquidity has a negative effect on financial distress, so the H2 hypothesis is rejected. Banks that have investment opportunities will generally choose to use their cash as retained earnings rather than for dividend distribution to shareholders. This is because the retained earnings are used for investment activities so that the company can grow and generate greater profits. However, there are other factors that cause investment opportunities to have no effect on a bank's dividend policy. According to research conducted by Pradana & Sanjaya (2017), it is suspected that there is almost absolute authority exercised by majority or controlling shareholders at the GMS. Majority shareholders have strong authority in making decisions regarding dividend policy so that minority shareholders are only able to follow these decisions. Therefore, even though a bank has good investment opportunities, it does not always result in no dividend distribution for shareholders and vice versa. This depends on the decision made by the majority shareholder whether to continue to use the company's profit to distribute dividends, as retained earnings for investment activities, or not both.

From the results found, this research is in line with research conducted by Pradana & Sanjaya (2017) which states that investment opportunity set has no effect on dividend policy. However, on the other hand, these results are not in line with research conducted by Sumarni, Yusniar, & Juniar (2014) which state that investment opportunity set has a significant negative effect on dividend policy.

### **The Effect of Free Cash Flow on Dividend Policy**

The results of the third hypothesis test show that free cash flow has a positive and significant effect on the dividend policy rating. The results found are in line with the third hypothesis which states that free cash flow has a positive effect on dividend policy, so the H3 hypothesis is accepted. Banks that have *free cash flow* are more likely to distribute dividends to shareholders. *Free cash flow* is excess cash owned by the company and the rights of shareholders that can be used for investment activities or dividend distribution after making *capital expenditures*. If the *free cash flow* owned by a company is large, it is likely that the dividends distributed will be even greater. The company will still try to distribute dividends even with a small nominal. This aims to reduce the risk of agency problems and provide a positive signal to investors.

The results of this study are in line with research conducted by Adnan, Gunawan, & Candrasari (2014) which states that free cash flow has a significant positive effect on dividend policy. However, these results are not in line with research conducted by Pradana & Sanjaya (2017) which states that free cash flow has no effect on dividend policy.

### **The Effect of State-Owned Enterprise on Dividend Policy**

The fourth hypothesis test shows that state-owned enterprises have negative and significant influence on the dividend policy rating. The results found are in line with the fourth hypothesis which states that Dividend that shared on the state-owned bank is fewer than non-state-owned bank, so the H4 hypothesis is accepted. Decision-making by managers at state-owned enterprises does not aim for the interests of the company, but aims for the interests of the state and together. The interests of the state and together are to improve the economy and social welfare of the community, and to support the development carried out by the government for the community. Government-run companies choose that the profits generated are reused in the form of retained earnings to strengthen the company's capital structure, so that they can provide better services to the community. Therefore, the higher the government ownership, the less the amount of dividends that can be distributed to investors and the greater the dividends that the government will get for the benefit of the state and society.

The results of this study support research conducted by Wuisan, Randa, and Lukman (2018) which states that state-owned enterprises have a negative effect on dividend policy. However, the results of this study are not in accordance with research conducted by Thanatawee (2014) which states that state-owned enterprises have a positive effect on dividend policy.

## **CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of hypothesis testing, it can be concluded that free cash flow has a positive and significant effect on dividend

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policy, the results found are in line with the hypothesis, so the hypothesis is accepted. While the variable liquidity and investment opportunity set have no effect on dividend policy. State-owned enterprise variable can be concluded that dividend that shared the state-owned bank is fewer than non-state-owned bank, the result found are line with the hypothesis, so the hypothesis is accepted. These results, of course, still have weaknesses, such as only researching in one financial sector, namely bank companies, so it is hoped that this can be continued with research that uses more samples by future researchers.

### REFERENCES

- 1) abiprayu, K. B., & Wiratama, B. (2016, Maret). Does CEO's Hubris Affecting Dividends Payout? *Jurnal Dinamika Manajemen*, 7(1), 66-75.
- 2) Adnan, M. A., Gunawan, B., & Candrasari, R. (2014, Desember 2). Pengaruh Profitabilitas, Leverage, Growth, dan Free Cash Flow terhadap Dividend Payout Ratio Perusahaan dengan Mempertimbangkan Corporate Governance sebagai Variabel Intervening. *Jurnal Akuntansi dan Auditing Indonesia*, 18(2), 89-100.
- 3) Ainun, M. B. (2017, September). Efek Moderasi Kebijakan Hutang pada Pengaruh Kebijakan Dividen terhadap Harga Saham. *Jurnal Ekonomi dan Keuangan*, 3(3), 382-402.
- 4) Akinlo, O. O., & Olayiwola, J. A. (2021, Juni 6). Dividend Policy-Performance Nexus: PMG-ARDL Approach. *Future Business Journal*, 23(7), 1-9.
- 5) Baker, H. (2009). *Dividends and Dividend Policy*. Canada: John Wiley & Sons, inc., Hoboken, New Jersey.
- 6) Brigham, E., & Houston, J. (2009). *Fundamental of Financial Management* (12th ed.). Mason: Cengage Learning.
- 7) Chosiah, C., Purwanto, B., & Ermawati, W. J. (2019, Maret 19). Dividend Policy, Investment Opportunity Set, Free Cash Flow, and Company Performance: Indonesian's Agricultural Sector. *Jurnal Keuangan dan Perbankan*, 23(3), 403-417.
- 8) Chowdhury, R. H., Maung, M., & Zhang, J. (2014, Juli). Information Content of Dividends: a Case of an Emerging Financial Market. *Studies in Economics and Finance*, 31(3), 272-290.
- 9) Fatmawati, & Ahmad, R. (2017, September). Teori Catering dan Karakteristik Keuangan dalam Keputusan Dividen Perusahaan BUMN di Indonesia. *Jurnal Ekonomi dan Keuangan*, 1(3), 325-341.
- 10) Firmansyah, A., Fauzi, I., & Yuniar, M. R. (2020, November 28). Biaya Utang dari Sudut Pandang Kebijakan Dividen, Volatilitas Laba, dan Kualitas Akrua. *Jurnal Studi Akuntansi dan Keuangan*, 3(2), 109-129.
- 11) Fitriana, A., Dewi, A. C., & Setiawan, D. (2018, februari 24). Recent Developments in Dividend Policy: Evidence from Indonesia. *Jurnal Keuangan dan Perbankan*, 22(1), 37-50.
- 12) Gusni. (2017, Oktober 17). The Determinants of Dividend Policy: a Study of Financial Industry in Indonesia. *Jurnal Keuangan dan Perbankan*, 21(4), 562-574.
- 13) Hesniati, & Santi. (2019, januari). Pengaruh Profitabilitas, Hutang Perusahaan, Likuiditas, Kesempatan Berinvestasi, Ukuran Perusahaan, dan Tata Kelola Perusahaan terhadap Kebijakan Dividen. *Jurnal Inovasi*, 15(1), 53-64.
- 14) Hunjra, A. I. (2018, desember 30). Mediating Role of Dividend Policy among Its Determinants and Organizational Financial Performance. *Cogent Economics & Finance*, 6(1), 1-16.
- 15) Hutauruk, D. M. (2020, Agustus 17). *Peran Perbankan Sangat Besar dalam Menggerakkan Ekonomi Nasional*. Diambil kembali dari keuangan.kontan.co.id: <https://keuangan.kontan.co.id/news/peran-perbankan-sangat-besar-dalam-menggerakkan-ekonomi-nasional>
- 16) IDN Financial. (2022, Juni 28). *Laporan Keuangan*. Diambil kembali dari idnfinancials.com: <https://www.idnfinancials.com/id/>
- 17) Jawade, A. A. (2020, oktober 21). Does Promotor Holding Affect Financed Payout of Dividends? *Borsa Istanbul Review*, 21(4), 332-339.
- 18) Jensen, M. C., & Meckling, H. W. (1976, Oktober). Theory of The Firm: Managerial Behavior, Agency Cost and Ownership Structure. *Journal of Financial Economics*, 3(4), 305-360.
- 19) Madyan, M., Meidiaswati, H., Sasikirono, N., & Herlambang, M. H. (2019, Mei 14). Family Control, Institutional Ownership, dan Kebijakan Dividen Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia. *Jurnal Reviu Akuntansi dan Keuangan*, 9(1), 87-95.
- 20) Mui, Y. T., & Mustapha, M. (2016, Februari 29). Determinants of Dividend Payout Ratio: Evidence from Malaysian Public Listed Firms. *Journal of Applied Environmental and Biological Sciences*, 6(1), 48-54.
- 21) Mulchandani, K., Mulchandani, K., & Jasrotia, S. S. (2021, Juli 1). Does Gender Diversity on Firm's Board Affect Dividend Payouts? Evidence from India. *Future Business Journal*, 25(7), 1-11.

## The Effect of Liquidity, Investment Opportunity Set, Free Cash Flow, and State-Owned Enterprise on the Dividend Policy of Bank Listed in the Indonesia Stock Exchange

- 22) OCBC NISP. (2021, Juli 15). *Pengertian Bank, Jenis-Jenis, dan Fungsinya Bagi Masyarakat*. Diambil kembali dari ocbcnisp.com: <https://www.ocbcnisp.com/id/article/2021/07/15/pengertian-bank>
- 23) OCBC NISP. (2022, Januari 31). *Kenali Apa Itu Dividen Dalam Saham dan Cara Hitungnya*. Diambil kembali dari ocbcnisp.com: <https://www.ocbcnisp.com/en/article/2022/01/31/dividen-adalah>
- 24) Pradana, S. W., & Sanjaya, I. P. (2017, Januari). Dampak Profitabilitas, Aliran Kas Bebas, dan Kesempatan Investasi terhadap Pembayaran Dividen Perusahaan Perbankan. *Jurnal Keuangan dan Perbankan*, 21(1), 113-124.
- 25) Rijal, A., & Said, S. (2018, oktober 26). Efektivitas Modal Kerja dan Likuiditas serta Dampaknya pada Kebijakan Dividen Perusahaan Berbasis Syariah. *Jurnal Ekonomi, Keuangan, dan Perbankan Syariah*, 2(2), 1-18.
- 26) Setyani, A. Y. (2018, Februari). Pengaruh Kebijakan Hutang, Kebijakan Dividen, dan Profitabilitas terhadap Nilai Perusahaan. *Jurnal Riset Akuntansi dan Keuangan*, 14(1), 15-24.
- 27) Sumarni, I., Yusniar, M. W., & Juniar, A. (2014, Juni). Pengaruh Investment Opportunity Set terhadap Kebijakan Dividen. *Jurnal Wawasan Manajemen*, 2(2), 201-211.
- 28) Thanatawee, Y. (2014, Juli 25). Ownership Structure and Dividend Policy: Evidence from China. *International Journal of Economics and Finance*, 6(8), 197-204.
- 29) Trijayanti, D., & Suprihhadi, H. (2019, Maret). Pengaruh Profitabilitas, Likuiditas, dan Leverage terhadap Kebijakan Dividen pada Perusahaan Perbankan yang Terdaftar di Bursa Efek Indonesia. *Jurnal Ilmu dan Riset Manajemen*, 8(3), 1-21.
- 30) Triyono, Kusumastuti, A., & Palupi, I. D. (2019, Desember 3). The Influence of Profitability, Assets Structure, Firm Size, Business Risk, Sales Growth, and Dividend Policy on Capital Structure. *Riset Akuntansi dan Keuangan Indonesia*, 4(3), 101-111.
- 31) Tyastari, T. T., Rosidi, & Saraswati, E. (2017, Juli). Dividend Policy and Corporate Value (a Meta-Analysis). *Jurnal Keuangan dan Perbankan*, 21(3), 344-355.
- 32) Van Horne, J., & Wachowicz Jr, J. (2008). *Fundamentals of Financial Management* (13th ed.). New Jersey: Prentice Hall, Inc.
- 33) Wijaya, R. (2017, Juli). Kinerja Keuangan dan Ukuran Perusahaan terhadap Harga Saham dengan Kebijakan Dividen sebagai Variabel Intervening. *Jurnal Keuangan dan Perbankan*, 21(3), 459-472.
- 34) Wijayanti, R. I. (2022, Maret 23). *Bagaimana Pembagian Dividen Saham? Ini Penjelasan Lengkapnya*. Diambil kembali dari idxchannel.com: <https://www.idxchannel.com/market-news/bagaimana-pembagian-dividen-saham-ini-penjelasan-lengkapnya/2>
- 35) Wijayanti, R. I. (2022, Maret 22). *Mengenal Jenis-Jenis Dividen dalam Investasi Saham*. Diambil kembali dari idxchannel.com: <https://www.idxchannel.com/market-news/mengenal-jenis-jenis-dividen-dalam-investasi-saham/2>
- 36) Wuisan, F., Randa, F., & Lukman. (2018, November). Pengaruh Struktur Kepemilikan terhadap Kebijakan Dividen Perusahaan. *Jurnal Sistem Informasi, Manajemen, dan Akuntansi*, 16(2), 119-141.
- 37) Zainudin, R., & Khaw, K. L.-H. (2020, Desember 12). Dividend Payout Policies of Politically Connected Firms: Evidence from Malaysia. *Borsa Istanbul Review*, 21(4), 384-393.
- 38) Zelalem, B. A., & Abebe, A. A. (2022, Februari 20). Balance Sheet and Income Statement Effect on Dividend Policy of Private Commercial Banks in Ethiopia. *Cogent Economics & Finance*, 10(1), 1-16.



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# The Mediating Effect of Leadership Style in Relationship of Employee Motivation towards Employee Performance for Production Media in Oman



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**ABSTRACT:** Leadership and the different associated styles have an immense impact on how employees perform and grow through motivation. This research aims to explore the leadership style, mediate the relationship between employee motivation towards employee performance in Oman production media. In this descriptive study, the goal has been to discover the pattern of cause and effect, which can predict phenomenon. The area of study focuses on the non-managerial employees in Oman's production media industry (audio & video production). The estimation for data collection from this study is 312. The relationship between the variables was investigated by PLS-SEM. According to the findings, all proposed hypothesis significantly accepted. Academically, this study contributes to the knowledge on employee performance by providing empirical evidence that to improve the performance of the Oman's production media industry. In conclusion, the study framework can be used by adapting the variables that would measure improvement and success of then employee performance.

**KEYWORDS:** Employee Motivation, Employee Performance, Leadership Style, Oman's production media industry

## 1. INTRODUCTION

Production media industry in the Sultanate of Oman are working in response to global trends such as increased competition among corporations, particularly in TV and radio, as well as severe local competition. These factors have the greatest impact on production media industry in the Sultanate of Oman. Consequently, there is an urgent need for these companies to work in an environment that distinguishes them to ensure their survival and growth within the circle of competition by improving overall performance and the performance of its employees in particular to achieve high levels of performance management of individuals (Madbouly, Wakeel, & Shrivastava, 2020).

The employee is an essential part of the organisation. Employee performance determines whether the organisation succeeds or fails (Listiningrum, Wisetsri, & Boussanlegue, 2020). Performance is defined as the outcome of skilled workers in given settings. The performance is anything that has been prepared, or things that have been formed and offered by a group of individuals. When an employee is satisfied with his or her job, his or her performance improves and he or she executes duties more effectively (Ahmad et al., 2014). Günay (2018) defines performance as "the result of working efficiently with significant obligations for an organisation without violating any legislation or organisational goals." As a result, firms are investing significantly in employee development. Employee performance includes output quality and quantity, presence at work, accommodating and helpful demeanour, and production punctuality (Yuan, Nguyen, & Vu, 2018). According to research, various organisational characteristics have a substantial impact on employee performance (Awan, Habib, Shoaib Akhtar, & Naveed, 2020). It is critical to determine which aspects are important to employees (Saadouli & Maryam Yousuf Obaid Al-Khanbashi, 2020).

Employees are valuable assets to any firm, whether for profit or not. However, enhancing employee performance is a difficult topic with many interconnected variables. To provide a more manageable knowledge of the problem, research has focused on a few main areas of interest (Bhaskar, 2020). Employees must be given the assistance they require in order to remain with the firm. Otherwise, this will result in excessive employee turnover, which could jeopardise the organization's performance (Farrukh, Kalimuthuan, & Farrukh, 2019). To comprehend what elements influence employee performance in the Sultanate of Oman and the GCC in general (Saadouli & Al-Khanbashi, 2021; Saadouli & Al-Khanbashi, 2020). According to an Oman study, employees who are unable to obtain the necessary learning process for them to grow and learn new things will be more likely to leave the firm in search of a better one (Jalagat et al., 2017). Many factors influence employee performance, including contentment, motivation,



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stress, leadership, organisational commitment, corporate culture, and so on. As a result, correct usage or analysis of employee antecedents can result in improved employee performance (Nguyen, Yandi, & Mahaputra, 2020).

Leadership style is regarded as the most essential topic in management, particularly in terms of employee performance (Nasab & Afshari, 2019). Effective leadership is the most crucial pillar of an organisation, as it motivates individuals to achieve high levels of performance, which leads to the organization's success. In the face of new problems, effective leadership behaviour can increase and facilitate organisational performance (Sawaneh & Kamara, 2019). Individual attributes, methods of influencing others, habits, relationships, organisational positions, and ideas of lawful influence are all part of the definition of leadership (Clifton, 2017). Effective executives cultivate, build, and preserve a business culture, hence increasing employee productivity and performance (Yahaya & Ebrahim, 2016). The study also revealed that leaders take great effort to engage all team members in talks and are able to operate with a small but highly motivated group (Gandolfi, Stone, & Stone, 2018). A substantial focus has been placed on the value of leadership and the extent to which leaders are true to themselves (Krajcsák, 2019). This is a result of the growing interest among scholars and practitioners in studying an effective leadership method to solve this issue.

However, it is critical for organisational leaders to grasp not just the need of understanding the concept of motivation affects on employees, but also how to encourage people (Shin & Grant, 2019). Motivation is primarily meant to promote behaviour modification. It is a force that enables a person to act toward a certain objective (Jordan et al., 2019). According to research, motivated individuals are more oriented toward autonomy and independence and are more self-driven than less motivated employees, leading to more promotion opportunities (Sari, Aliyu, & Ahmad, 2017). Similarly, motivated workers are more devoted to their employment and work than less-motivated employees (Bachri et al., 2021; Hidayat, & Latief, 2018). Any organization's success depends on employee motivation more than any other variable. According to Alzahrani, Johnson, and Altamimi (2018), employee motivation research has gone unnoticed, so increasing employee motivation is necessary to increase the effect of employee performance in an organisation where compliance with leadership support needs to increase employee-to-employer relationship. An investigation was undertaken to investigate the relationship between employee motivation and employee performance, and the result was that if people are more motivated, their performance will increase (Abdi Mohamud, Ibrahim, & Hussein, 2017).

There was a lack of attention given to employees with different levels of experience, which shows employee motivation at work with the presences of leadership style. Despite the recent surge of interest, the understanding of leadership style between the relationship employee motivation towards employee performance remains limited, and several questions remain unanswered in the literature (Almawali, Hafit, & Hassan, 2021; AlUbaidi, AlLawati, AlZadjali, AlBalushi, & Porkodi, 2020; Paais, & Pattiruhu, 2020; Rondi, Überbacher, von Schlenk- Barnsdorf, De Massis, & Hülsbeck, 2022).

Moreover, there are several types of leadership styles such as transformational leadership, transactional leadership, autocratic leadership, democratic leadership, participative leadership and others. The leadership styles chosen for this study are Transformational and Transactional. The reason behind choosing these leadership styles is the fact that they are the most practiced leadership styles throughout the globe, and if any new ideology is developed through the research, it can improve these leadership styles further and bring further success to organizations. Past research, historical data, books in the library, catalogues, databases, Internet, were widely accessed to arrive at the gaps in the literature. The intensive review of the literature reveals that there is no dearth of researches focused on the subject of employee motivation and leadership style. However, in the Oman corporate sector, there are very limited studies on the impact of leadership style.

According to the literature, the understanding of leadership style between relationship of employee motivation for employee performance remains limited, the majority of studies have focused on the direct influence of leadership style in developed countries. Nonetheless, in Oman, a variety of studies on leadership style were performed in the contexts of insurance firms, SMEs, and banking sector. Additional research is clearly needed to determine how and why leadership style is important, in in Oman production media.

This study investigates the connection from a unique perspective by conducting it from the perspective of leadership style. The findings of this study will assist managers in the Oman production media industry in better understanding the managerial position in employee motivation, and will guide them in potential efforts to improve employee performance in their organisations. As a data gathering technique, this study will employ a quantitative way to examine correlations. As a result, the quantitative research technique is appropriate for this study because it necessitates hypothesis tests, statistical tests, variables, numerical data, and measurements of validity or reliability.

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## 2. EMPLOYEE PERFORMANCE

Performance is a person's total outcome in carrying out duties over a specified time period, such as standard results work, targets, or targets of previously agreed upon established criteria (Sagala & Rivai, 2013). According to Suwatno and Priansa (2014), performance is the outcome attained by a person in regard to work, behaviour, and actions within a given time frame. In some respects, performance is a result of a person's work in carrying out the responsibilities allocated to him and how much they can offer to the organisation. Performance also refers to the outcomes obtained by a person in an organisation, both statistically and qualitatively, in accordance with the obligations allocated to him. Individual employee performance is determined by a range of elements, including abilities, motivation, assistance received, the presence of the task they do, rewards or incentives, their relationship with the organisation, and many others. The performance of an organisation or firm is increasingly dependent on the performance of its individual workers. There are several methods to consider the type of performance that employees require for an organisation to be successful, including three elements: productivity, quality, and service. According to Wibowo (2017), performance can be regarded as a process or as a product of labour. The process of doing work in order to attain work results is referred to as performance. Employee performance is more than just data for the organization's promotion and wage determination. Organizations, on the other hand, can avoid a dip in performance by motivating employee and devising a plan to fix it.

In order for an organisation to calculate salary, provide promotions, and monitor employee conduct, it is necessary to evaluate employee performance with the intention of providing a great chance to top workers' career ambitions in terms of strengths and weaknesses. Evaluation of performance is also known as performance grading and performance appraisal. Suherman (2021) defines evaluation performance as "the process of analysing personality traits, work behaviour, and the job of a worker or employee (workers and employees), which is employed as a consideration in decision-making for employment-related activities." Performance is derived from the terms employee performance and is also known as actual performance, performance of employees, and an employee's actual accomplishment. Additionally, performance is defined as the degree to which an employee meets the set requirements (Bachri et al., 2021). Moreover, three elements affect this performance: effort, ability, and direction (Bachri et al., 2021). Effort relates to a person's devotion in work, or how much effort they exert to complete a task. Aptitude refers to a person's proficiency or competency in a given work area. Direction, on the other hand, refers to a leader's capacity to direct subordinates to accomplish predetermined objectives.

Employee performance is the result or degree of success of an employee as a whole during a given period of time in relation to other aspects, such as the agreed-upon work standard, objective, or criterion. Performance is the degree to which an employee does his or her assigned tasks, which indicates how well the individual meets the job's specific requirements (Anjum, Ramzani, & Nazar, 2019). Various elements, such as employee happiness, motivation, stress, leadership, organisational commitment, corporate culture, and so on, influence employee performance. Therefore, correct utilisation or study of employee antecedents might lead to enhanced employee performance (Nguyen, Yandi, & Mahaputra, 2020).

On the basis of the above definition, it is simple to conclude that performance is the manner in which a person carries out his or her responsibilities and management in order to meet the predetermined goals and standards. Positions that pay well should be available to employees. According to Bachri et al. (2021), the following factors must be addressed in performance evaluation: 1) work quality, 2) work quantity, 3) responsibility, 4) initiative, 5) cooperation, and 6) obedience.

### 2.1 Employee Performance in Organizations

It is vital to keep track of the people who contribute to the formation and upkeep of a good organisation. Employee performance is a critical component of any organization's success formula. However, boosting employee performance is a difficult topic with many interconnected variables. To provide a more tractable knowledge of the problem, research has focused on a few main areas of interest (Bhaskar, 2020). Employees are valuable assets in any firm, whether for profit or not. Several experts emphasised the importance of employees in building a competitive advantage for the firm. Employees must be given the assistance they require in order for them to remain with the firm. Otherwise, this will result in excessive employee turnover, which may jeopardise the organization's performance (Farrukh, Kalimuthuan, & Farrukh, 2019).

An analysis of primary data obtained from a random sample of employees was carried out to determine what factors affect employee performance in the context of employment in the Sultanate of Oman and the GCC in general. According to the findings, the most critical component is technology, followed by leadership and organisational structure. Despite considerable efforts by these countries to construct more efficient and accountable public employment systems, the research findings provide some indication that the public employment landscape in the GCC area has not altered dramatically. This is a concern because the ability

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to provide work as a social welfare mechanism is becoming increasingly difficult as a result of diminishing oil revenues and a significant growth in the national labour force (Saadouli & Al-Khanbashi, 2021; Saadouli & Al-Khanbashi, 2020).

According to an Oman study, employees who are unable to obtain the necessary learning process for them to grow and learn new things are more likely to leave the firm in search of a better one. While it is vital for employees to bet at various job duties in order for them to learn and use current skills, employees don't pay much attention to their location and posting as long as they are learning and receiving the appropriate assistance as part of their career development (Jalagat et al., 2017).

The objective of Jalagat's (2017) study in Oman was to examine the relationship between occupational stress and employee performance. It defines occupational pressures as position uncertainty, underutilization of talents, and task overload. While analysing the impact of workplace stress on employee performance, the majority of replies were neither agree nor disagree. However, a large number of replies suggests that there is a high likelihood of consensus about the impact of stress on employee performance.

### **3. LEADERSHIP STYLE**

Leadership is essential in organisational management. Individual characteristics, techniques of influencing others, habits, encounters, organisational roles, and legitimate influence beliefs are all characterised as leadership (Clifton, 2017). Leadership is the act of influencing or setting an example to followers via a communication process in order to accomplish corporate objectives. Leadership is the process of leading, directing, and influencing people's thoughts, emotions, behaviour, and activities in order to push them toward certain objectives. Leadership is required to achieve certain objectives (Mira & Odeh, 2019). Leadership is a process of social influence in which the leader seeks the willing participation of subordinates to achieve organisational goals. A leader is described as a person who delegated or encouraged others to act in order to achieve certain goals. Today's businesses need leaders who comprehend the complexity of a fast-changing global environment (Gandolfi, Stone, & Stone, 2018).

Leadership is the encouragement and direction of followers or subordinates to achieve common objectives by building a more authoritative, effective, directed, and controlled work environment (Abadiyah et al., 2020). Leadership is one of the abilities necessary for a business leader to manage the company (Bastari et al., 2020). Leadership is derived from the word "leading," which means "guide," and those who provide guidance are referred to as leaders (Bastari et al., 2020). Leadership is the capacity to influence, motivate, and empower people to contribute to the effectiveness and success of the company. This suggests that leadership is the capacity to influence, inspire, and empower others in order to contribute to the effectiveness and success of an organisation. Leadership is the process of persuading and motivating people to contribute to an organization's success. According to Ratnaningtyas et al. (2021), leadership is "a person's activity to influence individuals, groups, and organisations as a whole, with the ability to convince all members of groups and organisations to carry out activities or work to achieve group and organisational objectives."

According to Ivancevich (2008), leadership is the capacity to harness the power of an organization's environment or circumstance in order to have a major effect and environment impact on the accomplishment of challenging tasks. Leadership is the process of influencing people to act in order to accomplish certain goals (Shaturaev & Bekimbetova, 2021). A leader is usually required to influence the behaviour of one or more followers in a given situation. Robbins (2002) defines leadership as the power to influence the group's goals. According to Elqadri, Suci, and Chandra (2005), leadership is the power to control or persuade people or other civilizations toward a common goal. A leader, according to Priyono (2011), is someone who can persuade others to assist him accomplish his goals. Path The leadership goal theory (the theory of the destination route) discusses how the conduct of a leader affects the satisfaction and performance of subordinates. Evans (1970) first coined the word. Incorporate contextual elements into a more rigorous version of this idea. Several writers, such as Evans (1974), House and Dessler (1974), House and Mitchell (1975), and House (1974), elaborated on the notion. Elqadri, Suci, and Chandra (2015) describe leadership style as "the approach by which leaders influence others or subordinates such that the individual is willing to accept the leadership's ambition to accomplish organisational goals, even if it is personally unpopular."

According to Rifa, Sukidjo, and Efendi (2019), a leadership style is a skill that is utilised to exert a positive impact on others or to inspire them to collaborate in achieving certain objectives. Moreover, according to Pawirosumarto et al. (2017), a leader's style is a standard of behaviour that a person utilises while seeking to influence the behaviour of others, and it is commonly accepted that each leader employs unique patterns to stimulate, develop, and direct the potential of his followers. Thus, a leadership style may be utilised to direct or influence people by effectively and efficiently mobilising available resources throughout the management process to reach the desired goals. Kalangi et al. (2021) define leadership style as the way in which leaders engage with their subordinates. According to Sagala and Rivai (2013), a leader's leadership style is a combination of traits utilised to influence subordinates in order to accomplish organisational goals. Style of leadership may also be described as a leader's preferred and

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most frequently employed patterns of behaviour and strategies. Susita et al. (2020) describe leadership as the process of influencing others and aiding individual and community efforts to attain shared objectives.

According to Kalangi et al. (2021), leadership style relates to how leaders engage with subordinates. According to Sagala and Rivai (2013), leadership style is a collection of attributes used by leaders to influence subordinates in order to accomplish organisational objectives, or it may be defined as a pattern of behaviour and approaches that a leader prefers and utilises regularly. Susita et al. (2020) define leadership as the process of influencing others and supporting individual and community efforts to achieve shared goals. There are two types of leadership: (1) formal leadership, which is exercised by individuals chosen or elected to positions of official authority within an organisation, and (2) informal leadership, which is exercised by those who become popular due to their unique qualities that meet the needs of others. Attempts to analyse the leader's success or failure are done in part by monitoring and recording the features and characteristics of his behaviour, which serve as the criteria for assessing his leadership. A leader must have 1) physical and mental energy, 2) comprehension of purpose and direction, 3) excitement, 4) friendliness and affection, 5) integrity (wholeness, honesty, and sincerity), 6) technical mastery, 7) assertiveness in decision making, 8) intelligence, 9) teaching ability, and 10) faith. Based on the preceding conceptual explanation, it is possible to infer that leadership style is a leader's preferred and habitual pattern of behaviour and approach, which comprises of 1) attributes, 2) habits, 3) temperament, 4) character, and 5) personality.

Scholars have studied diverse leadership styles and their effects on organisational and people performance throughout the prior decades. Transformational leadership and transactional leadership are two examples of these leadership styles (Agarwal et al., 2021; Zhang, Nahrgang, Ashford, & DeRue, 2020). However, the essay does not address the destructive leadership style. Fiaz et al. (2017) also conducts research on the three basic types of leadership. The research discovered that autocratic leadership has a negative relationship with employee motivation, but democratic leadership has no good influence on employee motivation and laissez-faire leadership has a favourable effect on employee motivation. Abodunde et al. (2017) identified five leadership styles: charismatic leadership, transactional leadership, transformational leadership, visionary leadership, and culture-based leadership. Today's organisations need a leadership style that is more customer-centric and responsive to the dynamic changes in business settings. Organizational leaders have significant challenges in adjusting to new leadership styles and paradigms while managing people from diverse origins (Santos et al., 2021). Furthermore, the long-term performance of leadership development programmes is dependent on an organisational culture that prioritises the development of future leaders as a long-term strategic goal (Simon, Dole, & Farragher, 2019). Subordinates like to work more effectively and productively when their superiors have a certain leadership style (Heyler & Martin, 2018). Because managers create their leadership styles via education, training, and experience, leadership style is the most significant part of the leadership process. As a consequence, leadership has become the most researched social phenomenon, and it is critical to the success of commercial and non-profit organisation operations (Alvesson & Einola, 2019). Numerous managers contribute to a certain leadership style, and leadership style has a significant influence on the organization's operations. Effective management will, among other things, raise productivity, motivate, boost morale, encourage personnel, and make a positive contribution to the organization. This study will look at two different types of leadership. These are transformational and transactional leadership styles.

### **3.1 Transformational Leadership Style**

Transformational leadership is a style in which a leader collaborates with his or her teams to recognise the need for change and then develops a vision to drive that change. This is accomplished by their inspiring effect on their followers, and the change is accomplished in collaboration with their team members under their direction. Consequently, the majority of leaders today practise this style of leadership (Maamari & Saheb, 2018). Furthermore, the importance of recognising the characteristics that a transformational leader may offer to an organisation is clearly obvious, given that they are relatively powerful and flexible in a range of scenarios. Those who manage a group of workers may also share a collective consciousness, participate in self-management, and act as an inspiration to their followers (Pawar, 2019). Furthermore, transformational leaders often employ inspiration and motivation to push their followers both internally and publicly, as well as to clearly convey any future expectations (Amirullah, 2018).

According to prior researcher Bass and Bass Bernard (1985), the behaviour of a transformational leader stems from the leader's own beliefs and ideals and motivates subordinates to go above and beyond the call of duty. Transformational leadership is focused on developing followers and being mindful of their needs. Transformational leaders are mainly concerned with enhancing their workers' whole value system, which includes the development of skills, motivation, and morality (Ebrahim, 2018). Subordinates have entire trust, devotion, and loyalty for their superior under a transformative leader. Furthermore, they are motivated to outperform the initial expectations set upon them. The transformational leader then motivates subordinates by emphasising the

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importance of work results, encouraging people to look beyond their personal self-interest for the sake of the organisation, and stimulating their higher-order needs.

According to Conger and Kanungo (1998), charismatic/transformational leaders convey visions to generate new ideas and possibilities for the future during times of crisis and transition, often resulting in the establishment of new strategic routes. These goals involve exceedingly complicated strategic ideas. This assumes that transformative leaders would explain strategic aims that enable followers to see risk as having some good possibilities while also proposing a more optimistic vision of the future. Its strategic approach and aims should prioritise the potential benefits of change above the costs to its followers (Conger & Kanungo, 1998).

### **3.2 Transactional Leadership Style**

Transactional leaders are those that are continually willing to deliver something in return, such as a pay rise, promotion, greater responsibility, performance evaluations, and perk packages. The primary issue with this sort of leadership is the expectation. Longe (2014) discovered that transactional leadership has a favourable influence on organisational performance. According to Longe (2014), transactional leadership contributes to the creation and maintenance of an atmosphere in which organisational and human skills are maximised, since workers are always able to get both tangible and intangible rewards. This leadership style primarily results in the formation of an optimal performance environment and a clearly expressed vision, which contributes to the success of the organisation as a whole (Longe, 2014).

The performance of employees is affected by transactional leadership. This is congruent with the exchange relationship under transactional leadership, in which the subordinate is expected to supply a performance to the leader, in the form of a transaction, while the employer offers both abstract and real benefits (trust, commitment, and respect). This might be regarded a fee or a payment (Alkipsy & Raju, 2019). Rasool (2015) explore the influence of transactional leadership on employee performance and find that transactional leadership has a positive and significant impact on employee performance.

A transactional leader motivates subordinates by compensating them for their efforts. This leader specifies the objectives of subordinates and gives contingent prizes as inducements to achieve the goals. One could argue that transactional leaders have the most impact on patrol officers' productivity, such as the number of apprehensions, reports, or citations, because supervisors can set clear quantitative goals that are easily measured. Leadership behaviours that prioritise telling or controlling would be classed as transactional leadership since incentives and discipline are provided based on adherence or divergence from instructions.

## **4. EMPLOYEE MOTIVATION**

To attain their goals and priorities, organisations rely on motivation. Motivation is one of the most essential ideas in human resource management, and it is particularly crucial for managers who steer the development of their subordinates toward meaningful goals. In general, motivation is defined as an intrinsic or extrinsic condition that drives and directs behaviour toward a certain aim (Asiedu, 2017).

Motivation is defined as an inner sensation that exerts pressure, resulting in an individual undertaking actions to achieve organisational goals if the organisation meets and satisfies the individual's needs and desires (Nduka, 2016). An employee's motivation is defined as a feeling that compels a person to act in a particular manner in order to fulfil his or her duties (Shao et al., 2019).

There are three varieties of inspiration. The first category comprises of an individual's inner power, which drives all actions (Bawa, 2017). Each individual made a concerted effort to have a positive influence on others by succeeding in their activities and acquiring and inspiring works. The second category consists of a person's preferred behaviour decision and their attitude, regardless of what motivates them. The fourth category is concerned with how individuals maintain their activities so that their behaviour is compatible with the expectations and goals they wish to achieve (Khan, Wajidi, & Alam, 2020).

Motivation is affected by attitudes and actions. This explains why individuals adopt a specific style of action to choose a target and what actually motivates them to behave in a certain way. Numerous studies study the same topics about motivation, such as why people participate in different activities and how they attain their goals (da Cruz Carvalho, Riana, & Soares, 2020). It is viewed as a dynamic topic influenced by a number of factors. Motivation is defined as an internal judgement of a person that is influenced by various interests and goals.

Extrinsic motivation, according to Yang (2008), includes financial incentives (salary, bonus, etc.), whereas intrinsic motivation includes non-financial rewards such as respect, stability, title, advancement, gratitude, praise, participation in decision-making, flexible working hours, relaxation capacity in the workplace, feedback, job design, social rights, and so on. Both external (extrinsic) and internal (intrinsic) factors may have an impact on employee morale (Asiedu, 2017).

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## 4.1 Intrinsic Motivation and Extrinsic Motivation

Intrinsic motivation is the pursuit of employee ties and affinities that contribute to the organization's engagement as their own interest. Extrinsic motivation consists of factors that influence the performance and motivation of an individual. Extrinsic motivators include money, incentives, evaluations, and help from supervisors and administrators. Motivation is a combination of internal and external forces that improve the desire to perform something useful. Human behaviour is driven by motivation so that it can achieve its goals effectively and efficiently. Motivating individuals means pushing or persuading them to perform or operate in a particular manner (Legault, 2020).

Motivation is a system that involves enthusiastic and long-term behaviours aimed at accomplishing objectives. Extrinsic motivation focuses on prizes, incentives, and promotions, but intrinsic motivation is based on peer recognition and the employee's loyalty to the company and its clients (Kuvaas, Buch, & Dysvik, 2018). It also has a good impact on job creation. Wages and incentives are examples of extrinsic influences that have a negative impact on intrinsic drive. A review indicated that intrinsic motivation is dependent on extrinsic incentive. Employee motivation has been examined for its efficacy through internal and external elements, causing a person to make his/her best effort to attain specified objectives and goals that influence employee motivation as employee performance (Legault, 2020).

## 4.2 Components of Intrinsic Motivation

Intrinsic motivation is driven by a curiosity or delight in the role itself, rather than by any external pressure (Aduo-Adjei, Emmanuel, & Forster, 2016). Intrinsic motivation is described as "performing an action for its intrinsic incentive rather than for particular separate results" and "doing something because it is intrinsically interesting or delightful" (Ryan & Deci, 2000b). In contrast to extrinsic limitations, intrinsic reasons include enjoyment, excitement, curiosity, invention, artistic value, and competition. The following are the literature-extracted intrinsic motivation sub-components.

**Work Itself:** Individual development and evolution improve the inherent variables of work, such as obligation and performance. Intrinsic issues such as duty and employee performance arise from the human capacity to advance and develop individually (Lee & Hidayat, 2018). According to Herzberg, the intrinsic variables of a profession include the job itself, obligation, and progress or accomplishment. Job complexity, freedom, and breadth of variation are used in the computation of the job itself as a projection of total performance (Rockmann & Ballinger, 2017).

**Career Development:** Career planning is a systematic, organised, and planned attempt to achieve the alignment between employee career needs and company expectations. Individuals in the market will undoubtedly provide the company with a competitive advantage. HR professionals must be able to identify emerging strategies that can potentially recruit extra knowledge employees to their organisation while also retaining present future employees (Albert, Roberts, & Harder, 2017). The programmes must align employee involvement with the company's vision and values and keep employees engaged so that its people become its competitive advantage. Career advancement is critical for both the organisation and the employee. It is mutually beneficial for both the organisation and the person because job progression provides all parties with valuable consequences. This improves the employee's employability both within and outside of the company. The organisation requires talented employee to maintain a sustainable competitive edge, and people require resources for job growth to improve their talents (Ng & Park, 2017).

## 4.3 Components of Extrinsic Motivation

Extrinsic motivation motivates remuneration, incentives, fringe benefits, transit services, hospital facilities, health and life care, and advantages such as paid vacation. Extrinsic motivation, on the other hand, Kim (2018) defines as "doing something because it leads to a separate consequence". Extrinsic motivation, on the other hand, is commonly defined as the desire to perform an action in order to gain favourable outcomes such as a reward or to avoid negative consequences such as a punishment. Extrinsic motivation is motivation that originates from outside of the workplace. Extrinsic incentive includes tangible factors such as pay and fringe benefits, welfare, advancement, service contracts, job atmosphere, and terms of service. The following extrinsic motivation subcomponents are collected from literature:

**Co-workers Relationship:** In general, the intimate interaction between employees is referred to as the relationship between co-workers based on two concepts: the relationship between representatives and participants and the relationship of co-workers (Lourens et al., 2022). A study is being undertaken on the relationship between co-worker relationships and employee performance in order to address concerns such as employee performance issues affecting employees working in foreign locations. The research demonstrated that substantial employee performance connected favourably with the relationship variables of the work community and co-workers (Abdel Maksoud et al., 2022).

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## 4.4 Employee Motivation with Employee Performance

While some study has linked employee performance and employee motivation, the two have typically been studied separately (Putra et al., 2017). Putra et al. (2017) explored how employees in the sector viewed extrinsic and intrinsic motivation and how it influenced their job commitment using an extrinsic and intrinsic motivation model. According to the poll, both extrinsic and intrinsic motivational factors influenced employee work performance (Putra et al., 2017).

To the best of this study's knowledge, just a few papers have explored the link between job motivation and employee performance. Rich et al. (2010) studied a model in which both intrinsic motivation and employee performance were evaluated "vertically," that is, as mediators rather than two variables in a predictor-outcome relationship. This gives additional reason to investigate the link between internal and extrinsic job motivation and employee performance.

Recognizing the workplace as a place to fulfil various needs: external demands like money and status, as well as interior needs like fulfilment and personal challenge, is a fundamental notion underlying work motivation. This information strengthens the relationship between workers' incentive to work and the workplace or job itself, resulting in increased devotion and effort on the side of employees.

Nabi et al. (2017) examined the complete impact of motivation on employee performance and stated that it is about having the correct dosage of instruction, resources, direction, and motivation for your employee to keep them motivated to execute their work. The analysis method used in this study was a detailed survey employing a questionnaire. The SPSS technique of sampling was used to sample approximately 130 people from a selected demographic audience. The study determined that workplace morale had a significant impact on average employee performance. Another study on employee performance conducted in Kenya explains the various motivation theories; Abraham Maslow's hierarchy of needs, Herzberg's two factor theories, and Adams' equity theory and discovered that motivation is critical for the productivity, profitability, and sustainability of any institution - as employees are its movers. Motivation is an ongoing endeavour by management for as long as the organisation survives (Twalib & Kariuki, 2020). Motivation causes a surge in employee performance to a higher level, and the beneficial effect gradually spreads to the company's shareholders. To boost employee job satisfaction, the organisation should focus mostly on the incentive and reward structure rather than the motivating session (Ali & Anwar, 2021).

Based on literature studies on internal and extrinsic motivation, can detect the presence of specified motivational elements with the goal of determining how the influence of these intrinsic and extrinsic motivational factors on employee performance is viewed. To begin, according to Giancola (2014), the general distinction between intrinsic and extrinsic motivation is that "intrinsic motivation is motivated by forces within the individual, whereas extrinsic motivation is driven by forces outside the person." Furthermore, according to Ryan and Deci (2000), intrinsic motivation refers to doing something for the sake of doing something rather than for a measured end, and extrinsic motivation refers to doing something for a measurable reason (Ryan & Deci, 2000). Using these concepts, will determine that the intrinsic variables in this analysis include relationships with subordinates and employee well-being, all of which are factors that are unique to the individual and may drive internal behaviour. Extrinsic considerations in this study include the workplace environment, preparation and career growth, pay, and corporate practises; all are forces that are common to the individual and may hamper motivation extrinsically. As previously said, because each of these variables has different dimensions, there may be some differences between them.

## 5. CONCEPTUAL FRAMEWORK

This study will check leadership style have a mediating effect between the relationship of employee motivation towards employee performance in telecom sector of Oman. Where leadership style (transformational, transactional, autocratic, democratic, and laissez-faire leadership styles) is a mediating variable, while employee motivation (work itself, career development, wages, rewards, working environment, co-workers' relationship) is an independent variable. Figure 1 below shows the proposed conceptual framework

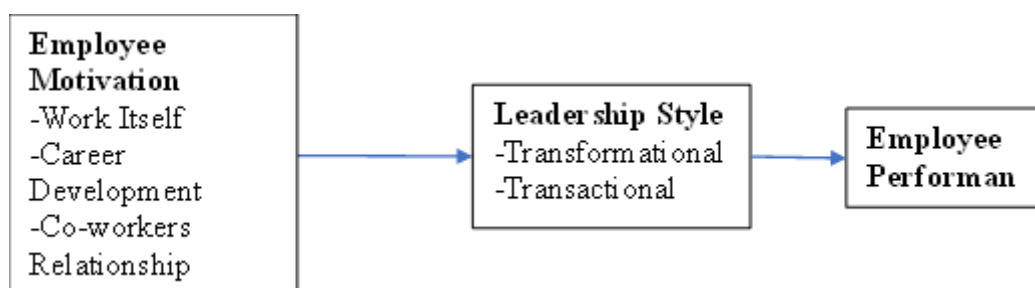


Figure 1: Proposed Conceptual Framework

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## 5.1 Research Hypothesis

The following research hypothesis will be evaluated through statistical analysis in this study:

### **Hypothesis 1: Employee motivation significantly influence the employee performance**

Employee motivation is very important so that employee turnover and under-performance issues can be mitigated (Steers, Porter et al. 1996). If the labor force is poorly motivated, it can be costly to the organization because less motivated work force will result in frequent absenteeism, low morale, increased expenses, high staff turn-over and low productivity (Jobber and Lee 1994). Demotivation is an important factor that contributes to high turn-over (Waiyaki 2017). Researches have shown that despite of above average salaries, there is high turnover rate in some organizations. This points out to the fact that only monetary rewards and benefits do not contribute in motivating employees (Aguinis & Glavas 2012). Therefore, it was suggested that increasing salary is not enough to get better and increased employee's performance (Jones, George et al. 2013). Every employee needs individual motivation plan and managers must not follow one-size-fits-all approach to motivate the employees (Jones, George et al. 2013). Most of the researches have shown that motivated employees perform better but some researchers argue that not only motivation but skills, supplies and equipment also contribute in the increased performance (Certo 2003).

It is evidenced from a study Waiyaki (2017) that employees need motivation based on reward and recognition and their performance is hindered in absence of motivation. But results are based on one entity with small sample size of 50 however that puzzle needs to be resolved with further investigation. It is important to study employees' motivation and its effects on their performance in a different demographic environment and specific sectors. Employers must assess the motivation level of all employees based on nature of industry and work environment such as motivation of employees with or without risk of job security, health and safety requirements. Kuranchie-Mensah, Amponsah-Tawiah et al. (2016) discussed the issue in mining industry where work environment is risky and employees need motivation but more studies needed to investigate the motivation factor in other contexts such as job security and intrinsic motivation. It can be done in qualitative or quantitative design. This will help to identify the antecedents of motivation and what impact they may cause on work performance (Kuranchie-Mensah, Amponsah-Tawiah et al. 2016). Previously another study has studied that extrinsic rewards-performance relationship in comparison to intrinsic rewards-performance relationship. In this study a comparative analysis was done in three different industries however it was suggested that intrinsic and extrinsic motivation should be studied simultaneously (Kuvaas, Buch et al. 2018).

### **Hypothesis 2: Leadership style significantly influence the employee performance**

Styles of leadership implemented by the leader in an organization significantly influence the relationship between the employee and the leader and also the efficiency of employees' performance (Jeremy et al., 2012). Hence, this reveals that the achievements or failure of an organization is dependent on implemented leadership attributes. Besides, Lewis & Gilman (2013) postulate that appropriate leadership styles raise employee performance, thereby, increasing the productivity of employees in various segments of economics. Rist (2020) added that prior covid-19, leaders concentrated mainly on strategic issues whereas, today on account of the existing pandemic, challenges are also inseparably associated to employees they lead. Hence, leaders during crisis should practice styles that demonstrate diligent care and empathy to employees in such times of uncertainty.

A substantial number of scholars have studied and presented evidence about different styles of leadership that any particular leader can adopt in order to influence employees to seek the highest level of commitment (Oladipo et al., 2016; Bogler, 2015). Consequently, these researches show the importance of leadership styles that stimulate employees to willingly exert effort to meet the organization's predetermined goals and objectives. Stimulation of employees is essential because human beings are motivated to join an organization not necessarily that they want to meet organizational goals but because they intend to meet leadership traits that are capable of influencing employees to accomplish or transcend organizational set goals. In support of the notion, Akpala (1998) added that lack of motivation, job dissatisfaction, and negative attitude at work are some of the factors that may cause a decline in employee efficiency which may lead to a reduction in company profits. Like manner, (Wolor et al., 2020) further states that due to current pandemic cultivating the development also supervision of subordinates remotely has become a great challenge to leadership. Therefore, the researcher made a thoughtful effort to identify the most appropriate styles of leadership that could encourage employees to become competent and committed to effectively escalating expected performance. It was considered prudent to engage a quantitative method for this study since the technique can fulfil the objective of the study by measuring statistically the relationship that exists between the variables.

### **Hypothesis 3: Employee motivation significantly influence the leadership style**

Good and effective leadership will be able to increase employee motivation so that ultimately it will create job satisfaction. Raimonda et al. (2015) which shows that leadership has a positive effect on job satisfaction. Zhonghua et al. (2016) also found that leadership has a positive effect on job satisfaction. Profita et al (2017) show that leadership influences job satisfaction.



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Leadership and motivation are the two topics that have got a significant amount of attention in the past two decades especially in the management literature (Schaffer, 2008). When defining leadership, the term 'motivation' is always incorporated with leadership (Orozi Sougui et al., 2017). Leadership is the ability to influence and motivate others to get an effective result from the group they are involved in as members (Schaffer, 2008). So, it is understandable that without motivating the follower's leadership in an organization be successful. In simple terms, motivation is an effort of individuals. People who are motivated are willing to exhibit a high level of effort in their daily work. Their effort is conditioned by satisfying individual needs. However, if we take an example of a newly joined employee in an organization and fairly old employee in an organization. The new employee could be high in motivation due to enthusiasm for work. But this new employee could be making mistakes in his work due to inexperience he possesses. But this would not be the same as related to a senior employee. They might be at a lower level of motivation compared to new recruitment. But with their experience, they could complete their day-to-day work without any complications. In that case, leaders should identify that motivation is one attribute for employee performance. But it is not all about employee motivation that contributes to employee performance. There are other factors like a person's ability to handle the task is also important.

### **Hypothesis 4: Leadership style mediating the relationship between employee motivation towards employee performance**

Previous studies were conducted to investigate the influence of various factors that might contribute to employee motivation. Among these factors, leadership styles have been found to be significant predictors of employee motivation. The phenomenon of globalization has made the concept of leadership in organizations become a very vital issue especially in developing countries since a great amount of daily competition pressures small companies to compete not only locally but also with adjacent market competitors. As a result, companies need to develop their skills and the ability of their leaders to have a more compatible company in the global competition through the motivation of their employees as a mediating factor. One of the ways to have a compatible company is to be considered as a productive and high-performance company (Ozorhon et al., 2014). Many issues are playing a role in reaching that stage which a leader must deal with. Those elements are including organizational culture, employee empowerment, leaders' charisma, employee motivation and others that have a direct impact on employee satisfaction, effectiveness, and extra effort in which as crucial elements of performance.

Besides that, another issue strongly influences the performance is leadership style. It is because the role of leadership in an organization is crucial in terms of creating a vision, mission, determination and establishment of objectives, designing strategies, policies, and methods to achieve the organizational objectives effectively and efficiently along with directing and coordinating the efforts and organizational activities. Leadership is one of the critical determinants associated with the success and failure of any organization. Leadership style is how people are directed and motivated by a leader to achieve organizational goals. Unfortunately, this element is not considered as important matters and some companies do not take account of the leadership style adopted by their managers. In current times, many companies are facing problems related to unethical practices, high labor turnover, poor financial performance, and others. This can cause severe consequences to the performance that may be due to the lack of effective leadership which can affect the organization's target.

## **6. METHODOLOGY**

This study applied a quantitative research method. This study developed the hypothesis using a cross-sectional design, which may be applied in future studies (Bougie & Sekaran, 2019). The cross-sectional approach allows the researcher to study two or more variables at the end of a period, which is beneficial for identifying the variables' connection (Fife-Schaw, Breakwell, & Hammond, 1995). This form of study is often accomplished rapidly and inexpensively, and the researcher may concurrently enrol a large number of volunteers of diverse ages (Salkind, 2010). Furthermore, it seeks to analyse the mediating influence of both independent and dependent elements. This study is explanatory because it utilised statistical tests to validate the validity and reliability of the correlations between dependent and independent variables, as well as the mediating aspects that support the theoretical framework.

The population for this study is the non-managerial employees in Oman's production media industry (audio & video production). According to table 3.1, a total of 3724 non-managerial employee in the production media industry in Oman have been designated the target population (<http://mediate-oman.com/>). To generalise the study findings for 3724 people, 349 samples were determined for the proposed study using Raosoft (<http://www.raosoft.com/samplesize.html>).

The measurement items for the proposed study are modified from existing scales in the recognised literature. There were two sections to the survey questionnaire. Section-A comprises all demographic profile questions, while Section-B has questions for

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measuring independent, dependent, and mediating variables. A cover letter was attached to the questionnaire, along with a brief explanation regarding the goal of the research and the respondent's anonymity.

## 7. DATA ANALYSIS

The primary purpose of utilising demographic data was to ensure that the information acquired was accurate. The data was gathered from 312 respondents, with 82 percent of them being male and 18 percent of them being female. Following that, the majority of their age group (48 percent) is between the ages of 41 to 50 years old, with a qualification level Bachelor (44 percent). In Table 1, find more information about the results of the descriptive analysis tests for each of the variable that were studied. According to the data in the Table 1, the mean values of all the variables were between 2.9856 and 4.0024. As a result of the descriptive analysis, the standard deviation was found to range between 0.60898 and 1.05424.

In this study, PLS is used to test the study model and evaluate PLS-SEM analysis, as Hair et al. (2016) cited.

Table 1 also shows the reliability, also known as Cronbach's Alpha, for each variable. Overall, the reliability of all variables is high and have above than 0.70 standard that is advised by researchers (Nunnally & Bernstein, 1994; Cronbach & Shavelson, 2004). As a result, the questionnaire that was employed in this study is trustworthy.

**Table 1: Results of Mean, Standard Deviation and Cronbach's Alpha**

Variables	Mean	Std. Deviation	Cronbach's Alpha
Transformational Leadership Style	2.9856	.71534	0.979
Transactional Leadership Style	4.0024	.60800	0.934
Work Itself	3.4925	.97821	0.953
Career Development	3.4083	.82349	0.937
Co-workers Relationship	3.3301	.80072	0.914
Employee Performance	3.3077	.88412	0.940

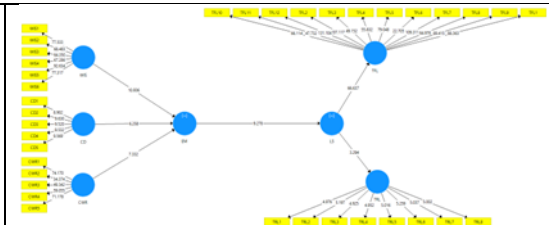

### 7.1 Hypothesis Testing

The primary goal of Smart PLS is to reduce error or to maximise the variation explained in all dependent variables by a given amount of information. As a result of the structural model, it is possible to determine the size and significance level of route coefficients. It is necessary to do bootstrapping in order to evaluate the structural model in PLS-SEM. The hypotheses developed were evaluated using the Smart PLS, which shows the results of the bootstrapping technique, including the significance level, and t-statistics, after the procedure has been completed. Table 2 presents the research hypotheses that analyzed in the structural model.

**Table 2: Hypothesis Results**

Hypotheses	Relationship	T- Statistics	P-Value	Results	Smart PLS Design
H1	EM → EP	4.660	0.000	Accept	
H2	LS → EP	4.197	0.000	Accept	

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<b>H3</b>	EM → LS	8.471	0.000	Accept	
<b>H4</b>	EM → EP LS → EP EM → LS	4.660 4.197 8.471	0.000 0.000 0.000	Accept	

P-Value < 0.001, P-Value < 0.01, P-Value < 0.05

**Note:** Employee Motivation (EM), Leadership Style (LS), Employee Performance (EP).

The research showed a statistically positive relationship between employee motivation towards leadership style and employee performance, thus validating the hypothesis. The P-value shows that the relationship is statistically significant, implying that the study hypothesis is accepted. On the other hand, the research showed a statistically positive relationship between leadership styles and employee performance, thus validating the hypothesis. The P-value shows that the relationship is statistically significant, implying that the study hypothesis is accepted. Finally for mediation analysis, the research showed a statistically positive mediated relationship between employee EP motivation and employee performance, thus validating the hypothesis. The P-value shows that the relationship is statistically significant, implying that the study hypothesis is accepted.

Based on the results of this study, conclusions can be drawn for the whole research work. The results of the study show that all proposed hypothesis accepted at significant level value is less than 0.05. Early studies found that motivation was a better motivator to improve employees' work performance, but recent studies revealed different results. Some studies have argued that today motivation works best for tasks that are complicated and require higher cognitive skills. Conversely, motivation works best for tasks that are simple, straightforward, and do not require high level of cognitive skills, such as tasks in the food service industry. However, the results of this study showed that motivation had significant impacts on performance of employees.

This study can further conclude that employees must feel psychologically safe and comfortable at work in order to be able to openly communicate with their co-workers and superiors. This open communication in turn will lead to meaningful interactions and connections, and the development of personal relationships. Despite the perceived importance of personal relationships on employee engagement, in order to feel psychologically safe at work it is also necessary for managers to clearly outline the professional expectations they have on employees and the abilities and boundaries that each employee has. This will decrease ambiguity, increase creativity and decision making, and ultimately it was perceived that clarity increases engagement levels in employees. Regarding the motivational factors, this study can conclude from findings that leadership style that they undoubtedly have a positive influence on employee performance and without them employees most likely would not be engaged.

### 8. CONCLUSION

This study is considered to be one of the very few studies conducted to improve employee performance in Oman production media. The contributions from this study include a novel concept of validated research framework. This study significantly contributes to the knowledge and practice of management through highlighting the determinants of employee performance. The study highlights the importance and positive contribution of different factors towards employee performance.

The findings obtained from the present study provide several useful practical implications for managers and researchers in different industries but specifically the education industry. The findings of this study have important implications for managers in terms of the relations with employees. Psychological top management support has been linked to many important attitudinal outcomes in addition to motivation and behavioural outcomes.

Furthermore, employees are the most important resource of any given organization and it is not only right but also legally and morally corrected to pay workers fairly. Commensurate to their performance, experience and qualifications, employees should be well compensated. This will enhance employee performance and consequently productivity and profitability are archived. The media industry needs to ensure fairness should be in terms of in relation to what job one is doing as well as their level of skill and

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education. Equity relates to what one gets compared to colleagues in similar roles either within the same organization or those doing similar jobs in other organizations in the same sector.

Managers should also work to establish employee perceptions of supportive, trustworthy relations with their employees. Specifically, it is important for managers to encourage employees to solve work-related problems, develop new skills, treat employees fairly, be consistent in their actions, demonstrate integrity between their words and actions, use open communication and demonstrate genuine concern for employees.

Lastly, the study results identified effective leadership style in the Oman production media. This knowledge enables managers and leaders to enhance their leadership style, consequently, drive positive social change. The results of this study might affect social change by revealing leadership style that will lead managers to improve employee motivation in the Oman production media. Motivated employees could be inspired to effect social change through various mediums within their communities and their organizations. Private organizations' leaders who practice leadership style with their employees will actively improve employee motivation in different measures.

### REFERENCES

- 1) Abadiyah, R., Eliyana, A., & Sridadi, A. R. (2020). Motivation, leadership, supply chain management toward employee green behavior with organizational culture as a mediator variable. *International Journal of Supply Chain Management*, 9(3), 981-989.
- 2) Abdel Maksoud, M. I. A., Fahim, R. A., Bedir, A. G., Osman, A. I., Abouelela, M. M., El-Sayyad, G. S., Elkodous, M.A., Mahmoud, A.S., Rabee, M.M., Al-Muhtaseb, A.A.H., & Rooney, D. W. (2022). Engineered magnetic oxides nanoparticles as efficient sorbents for wastewater remediation: a review. *Environmental Chemistry Letters*, 20(1), 519-562.
- 3) Abdi Mohamud, S., Ibrahim, A. A., & Hussein, J. M. (2017). The effect of motivation on employee performance: Case study in Hormuud company in Mogadishu Somalia. *International Journal of Development Research*, 9(11), 17009-17016.
- 4) Abodunde, S. M., Ayo-Oyebiyi, G. T., & Unachukwu, J. C. (2017). Leadership style of managers in insurance firms and its impact of employee's job satisfaction. *World Journal of Entrepreneurial Development Studies*, 1(1), 13-22.
- 5) Aduo-Adjei, K., Emmanuel, O., & Forster, O. M. (2016). The impact of motivation on the work performance of health workers (Korle Bu Teaching Hospital): Evidence from Ghana. *Hospital Practices and Research*, 1(2), 47-52.
- 6) Agarwal, U. A., Dixit, V., Nikolova, N., Jain, K., & Sankaran, S. (2021). A psychological contract perspective of vertical and distributed leadership in project-based organizations. *International Journal of Project Management*, 39(3), 249-258.
- 7) Ahmad, N., Iqbal, N., Javed, K., & Hamad, N. (2014). Impact of organizational commitment and employee performance on the employee satisfaction. *International Journal of Learning, Teaching and Educational Research*, 1(1), 84-92.
- 8) Albert, B., Roberts, T. G., & Harder, A. (2017). Faculty perception of students' extension competency needs within Haiti's agricultural universities. *Journal of International Agricultural and Extension Education*, 24(3), 67-79.
- 9) Ali, B. J., & Anwar, G. (2021). An empirical study of employees' motivation and its influence job satisfaction. *Ali, BJ, & Anwar, G. (2021). An Empirical Study of Employees' Motivation and its Influence Job Satisfaction. International Journal of Engineering, Business and Management*, 5(2), 21-30.
- 10) Alkipsy, E. I. H., & Raju, V. (2019). Exploring the mediating effect of work ethics on the relationship between organizational culture and managerial efficiency. *International Journal of Psychosocial Rehabilitation*, 24(06).
- 11) Almawali, H., Hafit, N. I. A., & Hassan, N. (2021). Employee engagement as a mediator in the relationship between motivational factors and job performance. *International Journal of Social Science and Human Research*, 11(4).
- 12) AlUbaidi, A., Allawati, J., AlZadjali, S., AlBalushi, M., & Porkodi, S. (2020). Impact of Emotional Intelligence on Job Performance of Paramedical Employee's in Public Vs Private Hospitals: A Comparison. *American Journal of Multidisciplinary Research & Development (AJMRD)*, 2(10), 38-45.
- 13) Alvesson, M., & Einola, K. (2019). Warning for excessive positivity: Authentic leadership and other traps in leadership studies. *The Leadership Quarterly*, 30(4), 383-395.
- 14) Alzahrani, A., Johnson, C., & Altamimi, S. (2018, May). Information security policy compliance: Investigating the role of intrinsic motivation towards policy compliance in the organisation. In *2018 4th International Conference on Information Management (ICIM)* (pp. 125-132). IEEE.
- 15) Amirullah, M. (2018, October). Gang Action and Shifting Patterns of Patron-Client Relations in Southeast Gowa 1958-1961. In *1st International Conference on Social Sciences (ICSS 2018)* (pp. 1033-1038). Atlantis Press.
- 16) Anjum, T., Ramzani, S. R., & Nazar, N. (2019). Antecedents of entrepreneurial intentions: A study of business students from universities of Pakistan. *International Journal of Business and Psychology*, 1(2), 72-88.

## The Mediating Effect of Leadership Style in Relationship of Employee Motivation towards Employee Performance for Production Media in Oman

- 17) Asiedu, R. (2017). Impact of Intrinsic Motivation on Health Workers: A Case Study of Suntreso Government Hospital in Kumasi, Ghana. In *1st International Conference on Competency-Based Training and Research (ICCBTR)* (pp. 245-253).
- 18) Awan, S. H., Habib, N., Shoaib Akhtar, C., & Naveed, S. (2020). Effectiveness of performance management system for employee performance through engagement. *SAGE open*, *10*(4), 2158244020969383.
- 19) Bachri, S., Susono, J., Alethea, M., Habibah, S., & Darwis, I. (2021). The Effect of Leverage, Profitability, Agency Cost, and Inflation Rate in Predicting Company Factor. *The International Journal of Social Sciences World (TIJOSW)*, *3*(01), 86-97.
- 20) Bass, B. M., & Bass Bernard, M. (1985). Leadership and performance beyond expectations.
- 21) Bastari, A., Eliyana, A., & Wijayanti, T. (2020). Effects of transformational leadership styles on job performance with job motivation as mediation: A study in a state-owned enterprise. *Management Science Letters*, *10*(12), 2883-2888.
- 22) Bawa, A. C. (2019). South Africa's higher education system in crisis... in a state in crisis. *Social Research: An International Quarterly*, *86*(1), 253-277.
- 23) Bhaskar, H. L. (2020). Establishing a link among total quality management, market orientation and organizational performance: an empirical investigation. *The TQM Journal*.
- 24) Bougie, R., & Sekaran, U. (2019). *Research methods for business: A skill building approach*. John Wiley & Sons.
- 25) Clifton, J. (2017). Leaders as ventriloquists. Leader identity and influencing the communicative construction of the organisation. *Leadership*, *13*(3), 301-319.
- 26) Conger, J. A., & Kanungo, R. N. (1998). *Charismatic leadership in organizations*. Sage Publications.
- 27) da Cruz Carvalho, A., Riana, I. G., & Soares, A. D. C. (2020). Motivation on job satisfaction and employee performance. *International research journal of management, IT and social sciences*, *7*(5), 13-23.
- 28) Ebrahim, S. (2018). Multi-professional approved clinicians' contribution to clinical leadership. *The Journal of Mental Health Training, Education and Practice*, *13*(2), 65-76.
- 29) Elqadri, Z. M., Suci, R. P., & Chandra, T. (2015). Effect of Leadership Style, Motivation, and Giving Incentives on the Performance of Employees--PT. Kurnia Wijaya Various Industries. *International Education Studies*, *8*(10), 183-192.
- 30) Evans, R. G. (1974). Supplier-induced demand: some empirical evidence and implications. In *The economics of health and medical care* (pp. 162-173). Palgrave Macmillan, London.
- 31) Farrukh, M., Kalimuthuan, R., & Farrukh, S. (2019). Impact of job satisfaction and mutual trust on employee loyalty in Saudi hospitality industry: A mediating analysis of leader support. *International Journal of Business and Psychology*, *1*(2), 30-52.
- 32) Fiaz, M., Su, Q., Ikram, A., & Saqib, A. (2017). Leadership Styles and Employees' motivation: Perspective from An Emerging Economy. *The Journal of Developing Areas*, *51*(4), 143-156.
- 33) Fife-Schaw, C., Breakwell, G. M., & Hammond, S. (Eds.). (1995). *Research methods in psychology*. Sage.
- 34) Gandolfi, F., & Stone, S. (2018). Leadership, leadership styles, and servant leadership. *Journal of Management Research*, *18*(4), 261-269.
- 35) Giancola, F. L. (2014). Should HR professionals devote more time to intrinsic rewards?. *Compensation & Benefits Review*, *46*(1), 25-31.
- 36) Günay, G. Y. (2018). Relationship between job satisfaction, organizational citizenship behavior and employee performance: Sample of Edirne financial office employees in Turkey. *American International Journal of Contemporary Research*, *8*(1), 64-74.
- 37) Hair Jr, J. F., Sarstedt, M., Matthews, L. M., & Ringle, C. M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I—method. *European Business Review*.
- 38) Heyler, S. G., & Martin, J. A. (2018). Servant leadership theory: Opportunities for additional theoretical integration. *Journal of Managerial Issues*, 230-243.
- 39) Hidayat, M., & Latief, F. (2018). The influence of developing human capital management toward company performance (The evidence from developer companies in south Sulawesi Indonesia). *SEIKO: Journal of Management & Business*, *2*(1), 11-30.
- 40) House, R. J., & Dessler, G. (1974). The path-goal theory of leadership: Some post-hoc and a priori tests. in Jg hunt & Il larson (eds.), Contingency approaches to leadership. *Carbondale: Southern Illinois University Press*.
- 41) Ivancevich, K. Matteson. (2008) Organizational Behavior and. *Management*. New York: McGraw-Hill International.
- 42) Jalagat, R. (2017). Determinants of job stress and its relationship on employee job performance. *American Journal of Management Science and Engineering*, *2*(1), 1-10.

## The Mediating Effect of Leadership Style in Relationship of Employee Motivation towards Employee Performance for Production Media in Oman

- 43) Jalagat, R., Dalluay, V., Al-Zadjali, A. K., & Al-Abdullah, A. (2017). The impacts of job satisfaction on employee turnover: A case study of Oman Air in Sultanate of Oman. *European Academic Research*, 5(1), 1-45.
- 44) Jordan, S. L., Ferris, G. R., Hochwarter, W. A., & Wright, T. A. (2019). Toward a work motivation conceptualization of grit in organizations. *Group & Organization Management*, 44(2), 320-360.
- 45) Kalangi, S., Weol, W., Tulung, J., & Rogahang, H. (2021). Principal Leadership Performance: Indonesian Case. *The International Journal of Social Sciences World (TIJOSSW)*, 3(2), 74-89.
- 46) Khan, M. R., Wajidi, F. A., & Alam, S. (2020). Effects of Communication on Employee Motivation: Study of Pakistan's State-Owned Oil Company. *Journal of Business & Economics*, 12(1), 77-84.
- 47) Kim, J. (2018). The contrary effects of intrinsic and extrinsic motivations on burnout and turnover intention in the public sector. *International journal of manpower*.
- 48) Krajcsák, Z. (2019). Implementing open innovation using quality management systems: The role of organizational commitment and customer loyalty. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(4), 90.
- 49) Kuvaas, B., Buch, R., & Dysvik, A. (2018, August). Individual variable pay for performance, incentive effects, and employee motivation. In *annual meeting of the Academy of Management, Chicago, USA*.
- 50) Lee, C. W., & Hidayat, N. (2018). The influence of transformational leadership and intrinsic motivation to employee performance. *Advances in Management and Applied Economics*, 8(2), 1-12.
- 51) Legault, L. (2020). Intrinsic and extrinsic motivation. *Encyclopedia of personality and individual differences*, 2416-2419.
- 52) Listiningrum, H. D., Wisetsri, W., & Boussanlegue, T. C. (2020). Principal's entrepreneurship competence in improving teacher's entrepreneurial skill in high schools. *Journal of Social Work and Science Education*, 1(1), 87-95.
- 53) Longe, O. J. (2014). Leadership style paradigm shift and organisational performance: A case of the Nigerian Cement Industry. *African Research Review*, 8(4), 68-83.
- 54) Lourens, M., Indradevi, R., Tambvekar, S. E., & Negi, S. (2022). Role Of Emotional Intelligence Employment Engagement: An Empirical Study. *Journal of Pharmaceutical Negative Results*, 1130-1134.
- 55) Maamari, B. E., & Saheb, A. (2018). How organizational culture and leadership style affect employees' performance of genders. *International Journal of Organizational Analysis*.
- 56) Madbouly, A., Al Wakeel, W., & Shrivastava, P. (2020). The Economic Determinants for the Competitiveness of the Sultanate of Oman. *NOVYI MIR Res J*, 5(10), 135-151.
- 57) Mira, M., & Odeh, K. (2019). The mediating role of authentic leadership between the relationship of employee training and employee performance. *Management Science Letters*, 9(3), 381-388.
- 58) Nabi, M. N., Ahmed, A. A. T., & Rahman, M. S. (2017). The empirical study on human resource management practices with special reference to job satisfaction and employee turnover at Investment Corporation of Bangladesh. *Human Resource Management Research*, 7(1), 54-64.
- 59) Nasab, A. H., & Afshari, L. (2019). Authentic leadership and employee performance: mediating role of organizational commitment. *Leadership & Organization Development Journal*.
- 60) Nduka, O. (2016). Employee motivation and performance. *Unpublished thesis. Centria University of Applied Sciences*.
- 61) Ng, O. L., & Park, M. (2021). Using an Enhanced Video-engagement Innovation to Support STEM Teachers' Professional Development in Technology-Based Instruction. *Educational Technology & Society*, 24(4), 193-204.
- 62) Nguyen, P. T., Yandi, A., & Mahaputra, M. R. (2020). Factors that influence employee performance: motivation, leadership, environment, culture organization, work achievement, competence and compensation (A study of human resource management literature studies). *Dinasti International Journal of Digital Business Management*, 1(4), 645-662.
- 63) Paais, M., & Pattiruhu, J. R. (2020). Effect of motivation, leadership, and organizational culture on satisfaction and employee performance. *The Journal of Asian Finance, Economics and Business*, 7(8), 577-588.
- 64) Pawar, B. S. (2019). Transformational leadership for employee performance and well-being. In *Employee Performance and Well-being* (pp. 70-96). Routledge India.
- 65) Pawirosumarto, S., Sarjana, P. K., & Gunawan, R. (2017). The effect of work environment, leadership style, and organizational culture towards job satisfaction and its implication towards employee performance in Parador Hotels and Resorts, Indonesia. *International journal of law and management*.
- 66) Priyono. (2011). *Human resources management 2. Surabaya*. Dharma Science Press.
- 67) Putra, E. D., Cho, S., & Liu, J. (2017). Extrinsic and intrinsic motivation on work engagement in the hospitality industry: Test of motivation crowding theory. *Tourism and Hospitality Research*, 17(2), 228-241.

## The Mediating Effect of Leadership Style in Relationship of Employee Motivation towards Employee Performance for Production Media in Oman

- 68) Ratnaningtyas, H., Handaru, A. W., & Eryanto, H. (2021). Transformational leadership and work motivation on work productivity mediated by work engagement: An introductory analysis. *The International Journal of Social Sciences World (TIJOSW)*, 3(2), 25-32.
- 69) Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of management journal*, 53(3), 617-635.
- 70) Rifa, M. N., Sukidjo, S., & Efendi, R. (2019). The Performance of Employees Influenced by Leadership Styles and Compensation. *International Journal of Multicultural and Multireligious Understanding*, 6(6), 581-587.
- 71) Robbins, T. (2002). The 5-choice serial reaction time task: behavioural pharmacology and functional neurochemistry. *Psychopharmacology*, 163(3), 362-380.
- 72) Rockmann, K. W., & Ballinger, G. A. (2017). Intrinsic motivation and organizational identification among on-demand workers. *Journal of Applied Psychology*, 102(9), 1305.
- 73) Rondi, E., Überbacher, R., von Schlenk-Barnsdorf, L., De Massis, A., & Hülsbeck, M. (2022). One for all, all for one: A mutual gains perspective on HRM and innovation management practices in family firms. *Journal of Family Business Strategy*, 13(2), 100394.
- 74) Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, 25(1), 54-67.
- 75) Saadouli, N., & Al-Khanbashi, M. (2021). Evaluation of factors affecting employee performance: The case of government employees in Oman. *Management Science Letters*, 11(5), 1443-1450.
- 76) Saadouli, N., & Al-Khanbashi, M. Y. O. (2020). Factors affecting performance of government employees in Oman. *International Journal of Management (IJM)*, 11(11).
- 77) Sagala, R. D. E., & Rivai, V. (2013). Manajemen sumber daya manusia untuk perusahaan. *Rajawali Pers, Jakarta*.
- 78) Salkind, N. J. (Ed.). (2010). *Encyclopedia of research design* (Vol. 1). sage.
- 79) Santos, G., Sá, J. C., Félix, M. J., Barreto, L., Carvalho, F., Doiro, M., ... & Stefanović, M. (2021). New needed quality management skills for quality managers 4.0. *Sustainability*, 13(11), 6149.
- 80) Sari, A. M., Aliyu, A., & Ahmad, S. (2017). Motivational influence on the satisfaction and performance of employees at work place. *International Journal of Recent Research and Review X*, 2, 21-27.
- 81) Sawaneh, I. A., & Kamara, F. K. (2019). An effective employee retention policy as a way to boost organizational performance. *Journal of Human Resource Management*, 7(2), 41-48.
- 82) Shao, D., Zhou, E., Gao, P., Long, L., & Xiong, J. (2019). Double-edged effects of socially responsible human resource management on employee task performance and organizational citizenship behavior: Mediating by role ambiguity and moderating by prosocial motivation. *Sustainability*, 11(8), 2271.
- 83) Shaturaev, J., & Bekimbetova, G. (2021). The Difference Between Educational Management and Educational Leadership and The Importance of Educational Responsibility. *InterConf*.
- 84) Shin, J., & Grant, A. M. (2019). Bored by interest: How intrinsic motivation in one task can reduce performance on other tasks. *Academy of Management Journal*, 62(2), 415-436.
- 85) Simon, S., Dole, S., & Farragher, Y. (2019). Custom-designed and safe-space coaching: Australian beginning principals supported by experienced peers form pipeline of confident future leaders. *School Leadership & Management*, 39(2), 145-174.
- 86) Suherman, A. (2021). The effect of human agility, digital literature, curriculum and the role of the family on the interest of the millennial generation in entrepreneurship through capabilities as intervening variables. *Journal of Economics and Business Letters*, 1(2), 4-17.
- 87) Susita, D., Saptono, A., Susono, J., & Rahim, A. (2020). The Effect of Career Development and Work Environment on Employee Loyalty with Work Satisfaction as Intervening Variables. *The International Journal of Social Sciences World (TIJOSW)*, 2(2), 20-31.
- 88) Suwatno, H., & Priansa, D. J. (2014). Manajemen SDM dalam organisasi Publik dan Bisnis.
- 89) Twalib, M. H., & Kariuki, M. M. (2020). Influence of motivation on employee performance at Telkom Kenya limited. *International Journal of Business Social Sciences & Education*, 2(11), 421-431.
- 90) Wibowo, G. (2017). Comparison of the Models of Organizational Behavior: A Review. *Manag Econ Res J*, 2(2016), 1264.
- 91) Yahaya, R., & Ebrahim, F. (2016). Leadership styles and organizational commitment: literature review. *Journal of management development*.

## The Mediating Effect of Leadership Style in Relationship of Employee Motivation towards Employee Performance for Production Media in Oman

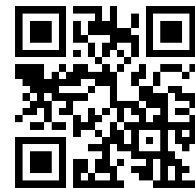
- 92) Yuan, L., Vu, M. C., & Nguyen, T. T. N. (2018, January). Ethical leadership, leader-member exchange and voice behavior: Test of mediation and moderation processes. In *Proceedings of the 2018 2nd International conference on management engineering, software engineering and service sciences* (pp. 33-42).
- 93) Zhang, C., Nahrgang, J. D., Ashford, S. J., & DeRue, D. S. (2020). The risky side of leadership: Conceptualizing risk perceptions in informal leadership and investigating the effects of their over-time changes in teams. *Organization science*, 31(5), 1138-1158.



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## Determinants of the Proper Functioning of School Canteens: Case of the Municipality of Athiémé



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**ABSTRACT:** Many learners drop out of school because parents find it difficult to provide them with lunch or because of the long distances between their homes and the schools they attend. The objective of this study is to analyze the determinants of the proper functioning of school canteens in the municipality of Athiémé. The collection of data was based on an important work of exploration made of literature review and interviews. The central model used is similar to multi-criteria analysis, but carried out by consulting the actors for the weightings: this is a property of the Delphi method. The data was collected from 341 actors including 121 households, 84 teachers, 74 members of the CGCSI, 47 schoolchildren and 15 administrative staff from school districts and educational regions. The results reveal the existence of a trilogy on which the proper functioning of canteens depends, namely: learners, cooks and dry rations of food. The involvement and strong participation of parents and members of the management committee are essential for the success of school canteens, all of which allow a substantial improvement in the meals offered to learners. The effectiveness of learners' daily subscriptions and accessibility to water are essential for the success of school canteens.

**KEYWORDS:** Determinants, functioning, Canteens, Schoolchildren, Athiémé.

### INTRODUCTION

Benin, like other countries, has had the opportunity to be supported for many years in the field of education, nutrition and sustainable development. Despite the efforts made, obstacles remain in terms of access to primary education for all. In rural areas, enrollment and attendance rates have remained low due to several factors, the most important of which is food insecurity, especially among children in basic primary schools.

Although Benin's score on the Global Hunger Index improved from 31.7 in 2008 to 24.4 in 2017, food insecurity remains severe in the country (Grebmer, 2017). An in-depth food security and vulnerability analysis carried out in 2017 showed that 9.6 percent of the population (or 1 million people) were food insecure (WFP 2019). Food insecurity worsens during the lean season, affects rural areas more (13 percent) than urban areas (9 percent) and highlights regional disparities: the department of Atacora in the northwest ( 24 percent of households) is the most affected, followed by Couffo (16 percent), Collines (15 percent) in the center of the country and Zou (12 percent) in the south. The regions most affected by food insecurity are characterized by both higher poverty and lower human development (WFP, 2019). In 2017, households spent on average 46 percent of their overall budget on food (59 percent in Atacora), which is a sign of their vulnerability to food insecurity (AGVSAN, 2017). Low agricultural productivity, seasonal fluctuations and price volatility, as well as natural hazards related to climate change, only aggravate this phenomenon. Detrimental coping strategies, such as selling livestock and other assets at unfavorable terms, reducing food consumption, and increasing consumption of poor quality food are common during crises, as is the increased migration to cities, especially among young people (WFP, 2019). This situation has an impact on agricultural production and also compromises food security. Rural women are more affected by shocks because they own fewer productive assets and have limited adaptive capacities (UNDP, 2015). According to the WHO, childhood and adolescence are characterized by particularly high nutritional needs to cover the needs related to growth, maintenance of the body and development of the intellect (WHO, 2003). To effectively meet these needs, it is essential to adopt good dietary practices. Dietary habits acquired early in life tend to persist into adulthood and condition the present and future state of well-being and health of the individual (WHO, 2003). An adapted diet during childhood and

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adolescence thus makes it possible to reduce the risks of infectious or nutritional pathologies in children and contributes to the prevention of the onset of chronic diseases such as type 2 diabetes or cardiovascular disease in adulthood (WHO 2003, Mikkila et al., 2004). It contributes to the quality of school performance, by improving learning and concentration abilities and by limiting absenteeism for medical reasons (Bellisle 2004, Belot et al., 2011).

Even if food and nutrition education is mainly a matter for the family environment, school remains a privileged place to promote better eating habits in children and adolescents (WHO, 2003). In addition, many children are captive to the food offered by the school at lunchtime. The quality of the food supply at school is therefore essential to guarantee many children a diet adapted to their needs and to promote the acquisition of good eating habits in order to facilitate access to education in all schools. The Government of Benin has, for about five years, developed strategies to increase the enrollment rate, retention and success in primary schools through the provision of hot meals to children every school day. It should therefore be emphasized that the Government's efforts in terms of providing school meals to pupils in public primary schools fall within this framework in order not only to make it possible to consolidate efforts to improve access but also and above all the retention of pupils until the end of their primary cycle. It is therefore a question of creating favorable conditions to attract and keep children in school by creating a learning environment conducive to the acquisition of knowledge and skills. Thus, in the current school context, what are the foundations of the operation of school canteens in Athiémé (Benin)? What is the modus operandi of school canteens? Does the functioning of the canteen depend on the existence of key elements?

This article analyzes the basic elements on which depends the proper functioning of school canteens in the municipality of Athiémé (Benin). It is structured in four parts, namely the study framework, the methodology adopted, the results obtained and the theoretical and practical implications through the discussion.

### 1. MATERIAL AND METHOD

#### 1.1. Study zone

Located in the Mono department (south-west of Benin), the town of Athiémé is about 8 km from the city of Lokossa (via the Lokossa, Athiémé, Cotonou axis) and 104 km from the city of Cotonou. Due to its proximity to the Togolese Republic, schoolchildren in search of sustainable livelihoods drop out of school in favor of income-generating activities. Given its position, it is subject to migration of young people and children, especially of school age, to other municipalities with a particular character (Lokossa) and country (Togo) in search of social well-being. It has 05 districts which are subdivided into 47 villages and city districts. According to the results of the General Population and Housing Census (RGPH4-2013), the population of the municipality of Athiémé is estimated at 56,483 inhabitants, including 27,562 males (48.79%) and 28,991 females ( 51.21%). There are 14,535 people between 5 and 14 years old (average age for primary education) or 25.73% of the population. The town is essentially rural and animated by the activities of the primary sector (agriculture, livestock and fishing) and tertiary. It is crossed by the Mono river which experiences a flood in the rainy season. The districts are mostly invaded by water during the flood period.

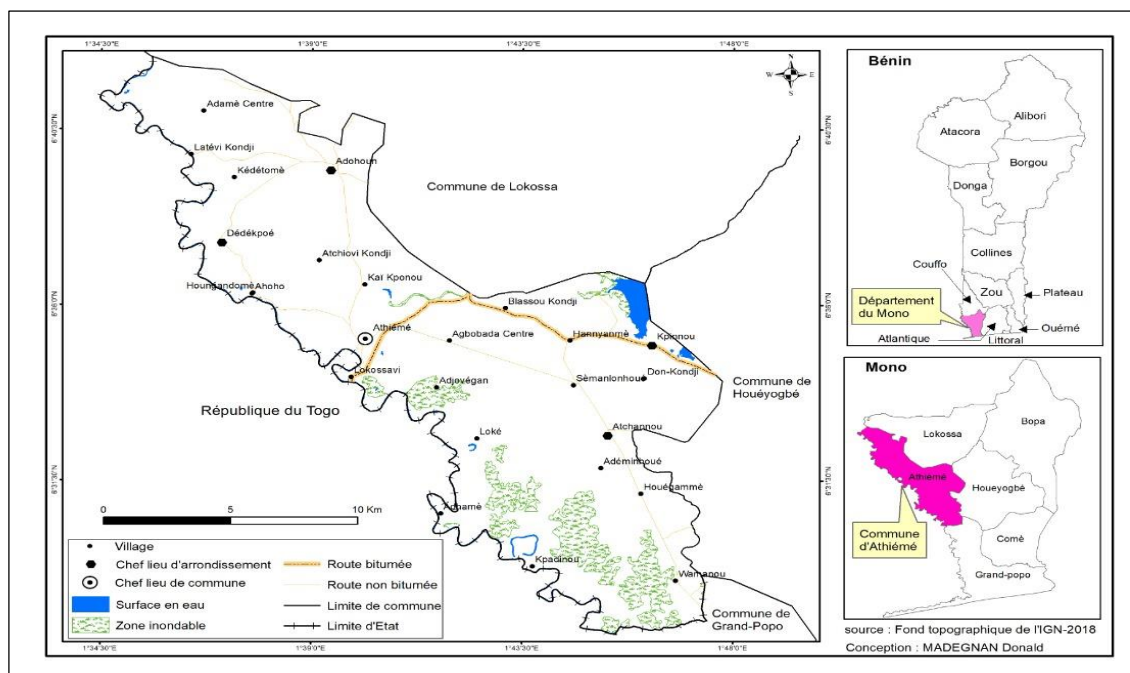


Figure 1: Geographical location of the municipality of Athiémé

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## 1.2. Methodological approach

The sample used is determined by reasoned choice and based on the representative character of the various actors concerned by the issues of school feeding and schooling in the Commune of Athiémé.

**Table 1: Distribution of respondents**

Groups/targets	Number surveyed	Proportion in %
Households surveyed	121	35%
Canteen school teachers	74	22%
Teachers of schools without canteens	10	3%
CGCSI members	74	22%
Canteen schoolchildren	37	11%
Non-canteen schoolchildren	10	3%
Administrative staff	15	4%
<b>Total</b>	<b>341</b>	<b>100%</b>

Source: Authors, based on data collected

## 1.3. Data collection tools

The main tools used for collecting information are essentially the observation guide, the interview guide and a questionnaire. The observation guide was used for field observation. It has helped to understand the socio-economic realities of the parents of pupils, particularly those in the localities benefiting from the school canteen initiative, the related modus operandi, the adequate infrastructures capable of supporting the school canteen initiative, the environment work, the family living environment, the important socio-cultural and anthropological particularities. The interview guide is the main tool for collecting data in the field. The questionnaire for administrative staff facilitated the collection of qualitative and quantitative data on the impacts of the school canteen in the education system of the study area. Thanks to the questionnaire, we obtained data with a higher level of precision.

## 1.4. Data collection technique

Data is collected through desk research and fieldwork. Thus, this documentary review provided statistical data, information relating to the education system, food security in the municipality of Athiémé on the one hand and the management of the school canteen on the other. The documentary research was supplemented by the information collected during the fieldwork. As part of this research, the surveys were carried out using respectively direct interviews, direct observation in the field, focus groups and questionnaires in order to cast a wide net and obtain a very high level of consistency of data.

## 1.5. Data analysis method

In order to obtain diverse data and representing all points of view, all actors involved in school canteens in the study area were included in the sample. It should be noted that this flexible method of data collection makes it possible to "adapt the interview plan during its course" while allowing direct access to the experiences of individuals (Gauthier, 2009, pp89-106). The sampling of respondents was carried out randomly taking into account all the districts having benefited from school canteens.

Two fundamental methods were used: a method close to multi-criteria analysis

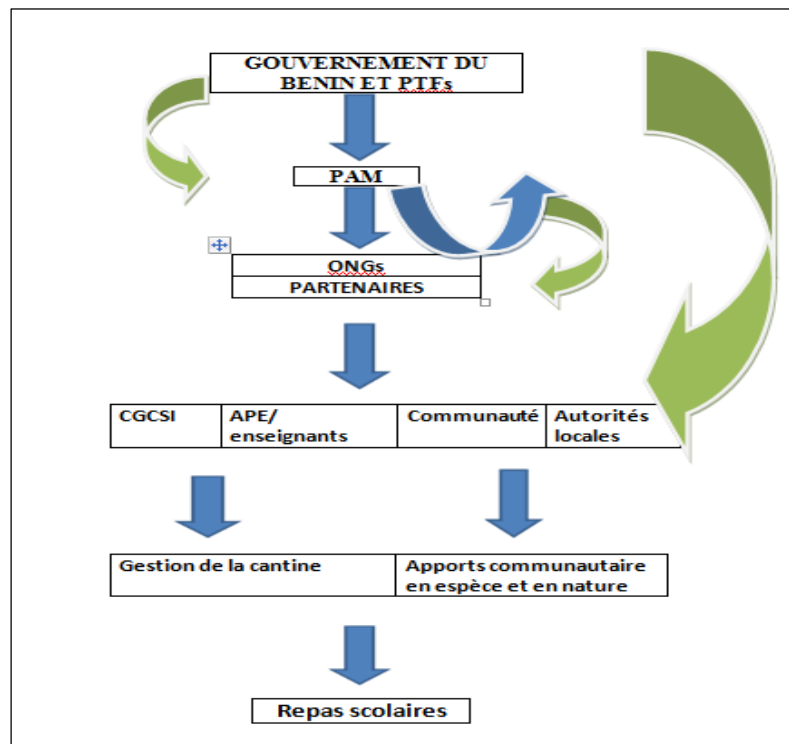
(analysis of actions and interactions between actors) and an application of the Delphi method. The central model used is similar to the multi-criteria analysis, but carried out by consulting all the actors (beneficiaries of school canteens, municipal and local authorities, heads of parents' offices, members of the canteen management committee) for the weightings : it is a property of the Delphi method. It was a question, after an analysis of the field information as well as the literature, of setting up criteria by family of constraints/domains (socio-cultural, economic, pedagogical). Three families of criteria are thus constituted. These are families of socio-cultural, economic and cyclical constraints. The weighting is done by constraint families on a scale of 1 to 10 per family. It was first a question of verifying that the judgments are expressed in a homogeneous way (ex: the canteen requires a contribution per child and allows the parents to go about their business).

## 2. RESULTS

Beyond proposing an answer to the question "how to (better) feed the pupils", the results obtained reveal that school canteens are at the heart of a development process which affects as much the right to food, agricultural development (supply, composition and frequency of meals) access to education, water and sanitation, hygiene and health but also the environment (waste management, cooking fuels). The additional activities to raise awareness and empower children are an opportunity to transmit know-how and life skills that can be used later according to the data collected.

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For a good management of the school canteen, the data collected reveal that in the Commune of Athiéomé, the World Food Program to which the Government of Benin entrusted the implementation of the initiative, associates the organizations of the civil society which implement activities to facilitate regular operation of the school canteen in all beneficiary schools. The flowchart shown in Figure 2 gives more details on the operating mode of canteens for rational and inclusive management around school canteens.



**Figure 2 : School canteen management model**  
**Source:** Authors, October 2021

Figure 2 explains how school canteens work. The Government of Benin finance from its own budget and with the help of Technical and Financial Partners the program called "PNASI". The WFP weaves partnership agreements with civil society organizations (NGOs) to support the management of canteens and social intermediation. Community radios are used for close communication about the activities of the school canteen program. NGOs support the establishment in schools of Integrated School Canteen Management Committees (CGCSI). Each committee, generally made up of 5 members, under the control and supervision of field agents from the partner NGOs, works in close collaboration with the Parents' Association, the communities and the local authorities so that the latter participate in the management by providing community aid (first necessity products for cooking on the one hand and financial aid for the purchase of said products on the other). According to the data collected, the commune of Athiéomé has a total of 59 public primary schools. For the 2022-2023 school year, the number of schools benefiting from school canteens is 57, i.e. nearly 97% in terms of coverage. Only two schools are not yet taken into account, i.e. around 3%.

The data collected reveals that school canteens improve school performance through the daily supply of healthy, nutritious and balanced meals. The canteens make it possible (i) to ensure the regular supply of school meals to pupils in public primary schools and to increase school performance ; (ii) to use the school as an entry point to bring together support for education, agriculture and health. According to the data collected, the school canteen, in its operational phase, uses a series of activities governed by two (02) main levers which serve as a code of conduct facilitating de facto the proper functioning of school canteens in the commune of Athiéomé. This is basically the "Monitoring the management of the school canteen" component and that of "community mobilization".

### 2.1. Monitoring the management of school canteens

The implementation of school canteens encompasses a series of steps from the development of the food allocation plan for schools to the service of quality meals to the beneficiaries of the 57 public primary schools in the municipality of Athiéomé. . The successful monitoring of the management of school canteens calls for a series of activities which, as a whole, are carried out efficiently and guarantee the success of this component. It is :

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### 2.1.1. Development of the food allocation plan

This task is of paramount importance in that it conditions the provision of food in schools and their coverage until the end of each term. It must therefore be carried out according to the quarterly needs of each school on the basis of (i) the number of children who actually eat (taking into account the socio-economic considerations of each school), (ii) the period of coverage of food to be put in place and (iii) the existing stock (remainders of food) or not. It is a capital and rigorous exercise whose execution is ensured by the WFP via its partner NGOs. It emerges from the data collected that poor planning of food needs could cause early shortages (which could hinder the daily operation of the canteen), significant remainders likely to cause damage to food if they are not consumed in the deadlines. The food basket allows schools to offer a balanced diet to children so that they can optimally develop their cognitive potential. According to the data collected, the daily food basket provides each child with 745/Kcal/day/child, including 12% of Kcal of protein origin. It is made up of the 4 food groups mentioned above. Thus, the WFP ensures the quantity and quality of food that each child needs to grow normally. The food basket put in place is basically made up of cereals (maize and rice), legumes (beans or yellow peas) rich in vegetable protein, vegetable oil enriched with vitamins A and D and salt rich in iodine in the proportions described below:

**Table 2: Food basket set up by WFP per child per school day**

<i>Commodities</i>	<i>Cereals (Maize and Rice)</i>	<i>Legume (Yellow pea/cowpea)</i>	<i>Vegetable oil (vitamins A and D)</i>	<i>Iodized salt</i>
<b>Quantity</b>	150 g	30 g	10g	3 g

Source: Field survey, October 2021

### 2.1.2. Reception measures

The reception of food remains the responsibility of the school director and the beneficiary community, more particularly the management committee set up. It is done on the basis of a formal document serving as proof called a "consignment note". This document, which attests to this receipt by the beneficiary school, will only be signed by the director after verification of the quality and quantity of the foodstuffs mentioned therein. Thus, upon receipt, it is imperative to check that the packages received are not torn, wet or do not present a risk of damage or very close expiry. If necessary, it is important to specify in the observations part of the LV, the quantities actually received as well as the state of the quality of the foodstuffs received before signing it. It is essential to sew up or repackage torn and damaged packages and to carry out, if necessary, maintenance operations on damaged foodstuffs or at risk of damage before they are consumed. During unloading, certain strict rules must be respected for better conservation of the quality of the food received. This includes moving the products with care (not dragging them, dropping them or moving them with hooks or sharp objects), avoiding unloading the products in the rain (risk of embossing the corn for example) or at night (which could prevent quality control of the food received).

### 2.1.3. Stowage of food

The data collected shows certain logistical requirements in terms of food storage and maintenance. These are essentially the following no less important aspects:

- The pallets must be used as a support for the storage and stacking of food;
- A spacing of 0.7 to 01 meters must be respected between the food and the wall;
- A spacing of 1 to 02 meters must be maintained for the main aisle;
- The stowage of food is done commodity by commodity and it must preferably respect the method of alternating layers where all the layers of the pallet have the same number of bags;
- Each batch of foodstuff must be clearly identified by signs which clearly mention the foodstuff concerned and the quantity available.

### 2.1.4. Store maintenance

The store must be cleaned daily or failing that at least 03 times a week. A complete cleaning (wall, floor and roof) of the store is necessary at the end of each quarter when the food is almost exhausted. In addition, it is also necessary to ensure that the store which serves as storage for food is ventilated (windows and doors regularly open), that non-food items or packaging (bags, empty cans) are stored in such a way that they cannot serve as refuges for rodents and that the roof and the wall of the building do not show any cracks.

### 2.1.5. Compliance with direct debits (daily and weekly)

The CGCSI put in place, more precisely the storekeeper must be trained and scrupulously follow the prescriptions in relation to the samples and daily rations defined by child.

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### **➤ The good performance of management tools**

Training, refresher sessions and strict and continuous monitoring of the filling of management tools (menu book, stock book, general cash book, fund collection book by class, visit/mission book, etc.) must be done with the CGCSI, more particularly the master/mistress secretary who is responsible for maintaining the management tools. He must ensure compliance with the rules for filling in the various tools, the punctuality and quality of the documented data and also ensure the conformity of the information between the theoretical stock and that available in the store.

### **➤ Compliance with hygiene rules**

Cooks must be made aware of and followed up on compliance with hygiene rules, in particular on the 05 M (Method, Environment, Equipment, Labor and Raw materials) and the essential notions of hygiene. The installation of modern Hand Washing Devices (DLM) and tippy-taps, the awareness of learners on regular hand washing with soap and water, and moreover on personal and clothing hygiene, must be priorities. with regard to hygiene issues.

### **➤ Student catering**

Awareness and follow-up are essential for cooks and teachers on the punctuality of the service (at 12 noon), the variation of the menus, the conformity of the meals served to each learner on the basis of the defined rations and the meal service in the classrooms in order to guarantee healthy catering conditions for the beneficiaries.

### **➤ Nutrition education**

Regular sensitization on the essential notions in nutrition education, based on approved endogenous knowledge and local production are essential for cooks and AMEs for a substantial improvement in the nutritional quality of meals offered to learners.

### **➤ Culinary demonstrations**

Culinary demonstration sessions are of paramount importance in the acquisition of nutritional know-how insofar as they constitute practical cases making it possible to apply and master the nutritional notions received and essential to the offer of nutritious meals and quality. They are therefore not to be neglected.

## **2.2. Community Mobilization (Social Intermediation)**

Community mobilization encompasses all awareness-raising and advocacy and/or lobbying actions carried out to encourage and obtain the involvement of communities and authorities at various levels, for a considerable improvement in community contributions which are of various kinds (species or donation in kind). This component also allows for close collaboration between the various actors involved in the success of the school canteen: this is what justifies the integrated aspect of the program. This involvement of all stakeholders also requires the availability and day-to-day functionality of a dynamic management committee, each member of which properly plays the role assigned to it by the texts.

### **2.2.1. The Management Committee**

It is set up at the end of an elective general assembly where the community designates from among its members the persons able to assume the responsibilities related to the three positions out of the five available to the community in the committee. This committee, set up at the beginning of each school year and which has a renewable one-year term, is conventionally made up of a CGCSI President, a master secretary, a storekeeper, a treasurer and a student representative. It must consist of at least 02 women and can be expanded, always after a general assembly with the agreement and participation of the community. The role of each committee member must be clearly defined during the GA and each elected member must commit to being available and to properly assuming his responsibilities for the proper functioning of the school canteen.

### **2.2.2. Community contributions**

They are essential and remain an essential indicator of the involvement of communities and authorities at various levels (mayors, district chiefs, village chiefs, religious authorities) in the smooth running of school canteens. They are of various kinds and can be triggered at the end of a general assembly, door-to-door awareness-raising, advocacy, etc. Community contributions include:

- (i) Intakes in kind such as protein of animal origin (fry, meat, egg cheese, etc.), condiments, firewood, water, construction materials, gardening tools;
- (ii) Cash contributions such as daily subscriptions from parents, cash donations from the community (opinion leaders, local elected officials, people of good will);
- (iii) Labour contributions include volunteering cooks, cleaning the store, maintaining and securing food, involving communities in setting up gardens and/or school fields, livestock units and building infrastructure dedicated to the canteen (kitchens, improved stoves, shelf, gate, etc.).

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**Photo 1: Community sensitization by representatives of CARITAS (WFP's NGO partner) in canteen schools for inclusive management.**

Photography, Authors, October 2021



**Photo 2: Establishment of school gardens by representatives of CARITAS (WFP's NGO partner) in the canteen schools of Athiémé.**

Photography, Authors, October 2021

Photos 1 and 2 illustrate the results of the activities of the NGO partner of the WFP in the implementation of the school canteen program in the commune of Athiémé in order to offer a quality meal to the children. These actions include raising the awareness of parents of students for sustainable support and the establishment of infrastructure dedicated to the canteen such as school gardens.

### 2.2.3. Integrated approach to school canteens

School canteens require close monitoring by the educational authorities (DDEMP, CSAS, CRP, CP) for regular and adequate operation. Good collaboration between NGO agents, education authorities and teachers is very important for the success of school canteens. It happens that teachers lack the will and motivation to accompany the canteen, some teachers may be absent from school, thus causing the non-functioning of the canteen. The involvement of school administration authorities facilitates the peaceful resolution of conflicts.

The proper functioning of school canteens in Athiémé requires discussion and advocacy sessions with the municipal authority to encourage the establishment of essential infrastructure such as kitchens with permanent equipment, food storage warehouses (non-existent in some schools), water points, the construction of canteens as far as possible, the construction of appropriate classroom modules in schools that need them, the construction (or repair) of roads serving beneficiary schools and also the establishment of a budget line to support the operation of the canteen.

Awareness and advocacy towards the Departmental Health Directorates (DDS) and Health Centers must also be carried out to ensure the management of the medical examination of cooks in school canteens, and guarantee hygiene in all schools. As a priority, the schools benefiting from the canteen, through sensitization and follow-up carried out by the hygiene agents for the cooks, pupils and teachers. Health centers should also be called upon for the deworming of learners if necessary and also for the management of the nutritional status of malnourished people (moderate and acute cases).

Like the DDS, the Departmental Directorate for the Family through the Social Promotion Centers (CPS) supports destitute or needy schoolchildren or their parents (micro-grant). The Territorial Agricultural Development Agencies (ATDA) support in school canteens in the implementation of sustainability activities (fields, garden, fish farming, breeding, etc.). The water department is also a resource to be exploited to take full advantage of the integrated approach taken by school canteens. For the realization of long-range sensitization in order to have a greater impact on the target communities, interactive programs, round tables, reports and press releases on the provision of food or other activities, radio stations are privileged partners.

It should be noted on the basis of the data collected that the proper functioning of school canteens is dependent on a trilogy, namely: learners, cooks and dry rations of food. The involvement and strong participation of parents and members of the management committee are essential for the success of school canteens in Athiémé, all things allowing a substantial improvement in the meals offered to learners. The effectiveness of learners' daily subscriptions, the installation of school fields and gardens and accessibility to water are essential for the success of school canteens.

## 3. DISCUSSION

The results reported in this study reveal that school canteens are a gateway to local development with an emphasis on improving the living conditions of beneficiaries. Our work shows that the school, a pl

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together all the forces with a view to instilling the necessary dynamics for harmonious and inclusive development. The learner spends most of his day at school, and is supposed to find there all the conditions required for his development. These results confirm the words of Ban Ki Moon (2015), for whom education is a fundamental right and the basis of progress in all countries. The development of the different components, standards and principles of school canteens allows us to see that a good organization reigns throughout the process of operation of school canteens. Nevertheless, the results achieved still leave challenges to be met (availability of water in all schools, involvement of communities, consistency of daily subscriptions, etc.). It is important to emphasize certain levers for the proper functioning of school canteens in the municipality of Athiémé.

With regard to the preparation and distribution of meals, a series of actions are carried out and relate respectively to (i) the proposal of balanced meals through the choice of suitable products taking into account food habits but also local agricultural resources, specific sanitary conditions in the area, nutritional balance (energy, proteins, micronutrients), current and future availability of foodstuffs, preparation time, water and fuel consumption and the impact on the environment ; (ii) the use of suitable equipment (utensils and furniture are necessary for cooking and serving meals) and the availability of drinking water and fuel, the nature of which may or may not limit the impact of the canteen on its environment (improved stove, biochar, gas, photovoltaic, etc.); (iii) inventory management based on the planning of weekly purchases (fresh products), monthly or quarterly (dry products). The use of properly stored dried or processed fruits and vegetables helps to guarantee nutritional intake out of season. Despite the existence of land and fruit species, the consumption of fruit during school meals is not systematic in all schools. It therefore requires a great deal of diagnostic work, in order to find an operational, urgent, rapid, reliable and lasting solution.

It would therefore be advisable to encourage the setting up of canteens on the basis of endogenous specificities as much as possible in Athiémé. This will mean that the communities will have to demonstrate self-sacrifice and unconditional determination to gradually dispense with the dry rations of food put in place. The objective will be to make the canteens autonomous through a better supply of local foodstuffs, a guarantee of inclusive, sustainable development.

For Ananga (2014), in Africa, many students drop out of school before completing the primary cycle and the educational problems and the way to address them vary according to the objectives of each country. The African Union (AU) through CESA Strategic Objective 2 aims to “build, rehabilitate, preserve educational infrastructure and develop policies that ensure a lifelong, healthy and supportive learning environment across all sub-sectors and for all, with a view to widening access to quality education”. To achieve this goal and with a firm resolve to strengthen school feeding as a critical action, AU Heads of State and Government established March 1 as Africa School Feeding Day, by Assembly Decision/AU/Dec.589(XXVI). These continental arrangements reflect the level of commitment of African states and their operationalization should be a source of joy for African communities. By implementing a social protection policy aimed at providing social safety nets and, with this in mind, the Government of Benin is making the school meals program the main instrument of social transfer in the education sector and an important factor of improving and maintaining access to education (WFP, PSP 2019-2023).

The multisectoral (integrated) approach taken by school canteens allows different ministerial departments to come together to work in perfect harmony to provide quality education to children based on (i) a policy dedicated to school canteens; (ii) the definition of the objectives and the design of a school feeding initiative which will have to be examined to ensure that they can respond to the real concerns of the beneficiaries; (iii) useful pilot programs to assess the feasibility of local food supply aimed at improving producers' access to markets and (iv) cost analyzes to identify localities requiring basic infrastructure (classrooms) essential for a school canteen program.

In some countries, school meals are combined with take home rations for the most vulnerable schoolchildren such as girls and orphans. The combination of the two methods has a greater impact on student enrollment and retention rates, cognitive abilities and nutrition. Take-home rations work like conditional cash transfers, since their value offsets the costs of sending children to school. These rations are also an effective mechanism for protecting the rights of children, particularly for young girls in localities where they are still denied access to education. Take-home rations increase their school attendance and attendance. A school meal promotes learning, and allows children to focus on their studies rather than on where their next meal will come from. But wanting to rely entirely on the school canteen as the only way to educate children is considered insufficient. One thing is to have the canteen, but another is to manage it well because of its demands. It is certain that good management is a factor of growth and development and therefore good results. Thus, good management of the school in general, and of food in particular, can influence the effect that the school canteen can have on keeping children in school. If the canteen service is of poor quality, it alone cannot play its role and the objective of getting children to attend school and staying there will not be achieved.

Teachers and cooks are key to the proper functioning of canteens. Due to the impoverishment of certain communities in Athiémé, these actors are called upon without necessarily wanting to, to use their own financial resources to buy condiments, in order to better serve the children who do not give their desired participation. Water is an essential input for cooking meals. Without water,



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the garden, hygiene, drinking for children are impossible. The availability of water and the strengthening of communities in the construction of fields and gardens are no less important aspects for the proper functioning of canteens.

### CONCLUSION

School feeding policies are an essential component of an effective education system as children's health and nutrition influence their school attendance, learning ability and overall development.

The proper functioning of school canteens in the 57 beneficiary schools of the municipality of Athiémé is conditioned by the existence of key elements (dry rations of food, the availability of cooks, daily subscriptions, the availability of water) . A dynamic organization is implemented from the design of food allocation plans to the service of meals for children (from farm to fork).

Also, is it enough to have the presence of these key elements to speak of the proper functioning of school canteens? Is the proper functioning of school canteens in the municipality of Athiémé synonymous with nutritious meal offers?

### REFERENCES

- 1) Ananga, P. (2015). Schooling through school canteen systems, harmatan edition.
- 2) Bellisle, F. (2014). Meals and snacking, diet quality and energy balance. *Physiology & behavior*, 134, 38-43.
- 3) Fauliau, C. (2018). Establishment and management of school canteens: Capitalization of experiences. 4 p.
- 4) INSAE, (2014). Global Analysis of Vulnerability and Food Security (AGVSA), 146 p.
- 5) Magee, M. (2008). School canteens in Benin to improve inspection and student retention in partnership with parent-teacher associations. 16p.
- 6) Meuret, D. (2000). Research on the efficiency and equity of educational establishments, lessons for inspection, University of Burgundy-IREDU, 12 p.
- 7) MISD, (2006). Communal Development Plan of the Commune of Athiémé, 140 p.
- 8) Moumouni, G.I. & Abdourahamane, M.M. (2020). Impact of the school canteen on retention: a study of the WFP experience at the school in the village of Banikosseye, rural commune of Tagazar, *Annales de l'Université de Moundou*, Série A-FLASH, 7(3), 171 -193.
- 9) UN, (2015). State of food insecurity in the world, 66 p.
- 10) WFP, (2018). Study on sustainable school feeding in the African Union, ADDIS ABABA, January 2018, 158 p.
- 11) WFP, (2018). Zero Hunger Strategic Review, 192 p.
- 12) WFP, (2019). Country Strategic Plan 2019-2023, 37 p.
- 13) WFP, (2019). Benin School Feeding Programme: Cost-Benefit Analysis, 32 p.
- 14) UNDP. (2015). "Human Development Report 2015", 1UN Plaza, New York, NY 10017, USA.
- 15) Saka, A. (2019). Effects of the school canteen program on the performance of learners in public primary schools in Adjarra in Benin, Professional master's thesis, INJEPS/CEREID, UAC, 40-58.



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## Stock Market Effects of Covid'19 in India

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**ABSTRACT:** The outbreak of the Covid-19 virus, which began in Wuhan, China, and has since spread throughout China and the rest of the world has had a significant and detrimental effect on economies and stock markets everywhere. The outbreak began in Wuhan, China, and has since spread throughout China and the rest of the world. The first known case of the virus was discovered in Wuhan, China, and since then, it has been found throughout the rest of China and the rest of the world. The preliminary phase of the Covid wave had a sizeable impact on the activity in the Indian stock market. At this point in time, the effect of this factor had a significant impact. This study employs a wide variety of statistical analysis techniques to gauge the effect that COVID-19 will have on the BSE Top 30 companies during the period beginning in January 2020 and ending in September 2020. This period covers when COVID-19 will become effective until it takes no longer. The investigation was conducted during the time which was previously. The period that is being considered here begins in January of the year 2020 and continues all the way through the September of that same year.

**KEYWORDS:** Indian Stock Market, Covid-19, and BSE.

### INTRODUCTION

Coronavirus disease, also referred to as COVID-19, is an infectious disease that was found for the first time on the 31st of December, 2019, in Wuhan, China. The discovery was made as a result of a man eating bats. The World Health Organization was made aware of this particular case (WHO). The outbreak of respiratory disease that was caused by the coronavirus has resulted in a pandemic, which has caused significant disruptions in people's day-to-day lives and random acts of indecorousness. Not only was the pandemic a major cause for concern regarding public health, but it was also a major cause of concern regarding the economy of the entire world. The World Health Organization (WHO) made the official announcement that an outbreak had taken place on February 11, 2020. On March 11, a global pandemic was declared after the disease was found to have spread throughout 110 countries. There are 176 million people in India who are living in deplorable conditions, despite the country having the world's second-largest population. In addition, the nation's sanitation system is terrible, and its medical facilities are in a pitiful state. Because of the growing number of COVID cases, the government of India, which is led by Minister Narendra Modi, has announced that the entire country will be placed under a complete lockdown beginning on March 22, 2020. This decision was made because of the rising number of COVID cases. However, the new date for this event is going to be in May of 2020. Following the confirmation of a decline in the number of COVID cases, the government has started reintroducing some previously suspended essential services. Then, in April 2021, a strain of the Delta subtype of coronavirus that was more severe than previous strains appeared. This caused the second wave of the disease to be more dangerous than the first wave in 2020. January of 2022 marked the arrival of the third wave, which did not have any significant impact. India has reported 4.29 billion cases and 5.14 million deaths for every one million people up until this point (1 March 2022).

The response of the Indian stock market was very robust when it was first announced that there would be a lockdown in the country. This announcement came from the government of India. The Sensex experienced the most significant loss on the first day of the lockdown, finishing 3,934 points lower than it had started, while the Nifty fell 1,110 points. Both indices were affected by the lockdown. In addition, by the end of the trading session, both the Sensex and the Nifty had finished the day with a loss. When businesses everywhere started to feel the effects of the pandemic's impact, companies in the pharmaceutical, telecommunications, and technology industries noticed an increase in demand for the goods and services they offered. This increase in demand was primarily caused by the fact that we are now better equipped to stop the pandemic from spreading. During the time frame that was being investigated by these pieces of evidence, there was a rise in the total amount that was being invested.

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### RESEARCH QUESTIONS

- What are the factors impacting BSE top 30 companies during Covid-19?
- Does the investing pattern change after Covid-19?
- 

### LITERATURE REVIEW

Due to the adverse reaction that the outbreak of COVID-19 caused in the global stock markets, there was a significant amount of uncertainty in the market during its early days. One can count on one hand the number of studies that have been carried out to investigate the effects of Covid -19 on the stock market. Earlier research that was published came to a variety of conclusions regarding the effect that Covid-19 had on economies and the stock market.

The combined market capitalization of the companies that were trading on the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) experienced a decline of 23% during the month of March 2020. The value of the overall stock market continued to decline throughout the entirety of March 2020, as indicated by the numerous indices that track the performance of the stock market. This trend was observed across all indices. Singh and Neog (2020) enumerated the trend of the Sensex and the NIFTY, and it can be seen that the decline is more rapid after the first week of March 2020. This information can be found in their research. The results of this study are in line with the bearish patterns that have been spotted on the Indian stock market over the course of the past few years. In addition, they demonstrated that the Financial, Real Estate, and Banking industries were nearly entirely extinguished as a result of the estimated loss of 2.81 lakhs Crore. This setback is a direct consequence of the worldwide financial crisis that started in 2008.

According to the results of an investigation that Jindal carried out himself. According to A, Chahal. B, and Parshsar. R. (2020), the impact of COVID-19 on India's stock market varies from sector to sector because it has a significant effect; nevertheless, the overall volume of trade has increased in comparison to before, and a great deal more money is being invested in the market, which demonstrates that people have faith in the Indian economy.

Dhillon. A. and Tyagi. V. (2020) came to the conclusion that the circumstances would have been even more dire if the Indian government had not imposed the early lockdown so quickly. This prevented India's situation from becoming even more hopeless. According to Gupta, Srinivasa, and Gosali, even during the most difficult times, businesses such as TCS, Infosys, and HCL technologies were able to maintain a healthy level of operations (2020). This is because of the rise in demand for technology, which is caused by the fact that nearly all businesses on a global scale now permit employees to work from home and that a growing number of educational programs are also delivered via the internet.

According to Taneja. E., Arora.S, and Tandon. C (2021), the majority of industries have experienced a significant reduction in their market share, with the exception of the pharma, telecom, and a little bit of that product industries. The market had undergone a dramatic transformation, with an increased emphasis placed on the utilization of voice-based applications and telecommunications platforms, such as Google Meet and Zoom. Gold and other precious metals have also improved, and it is anticipated that they will continue their upward trend as the most reliable safe asset.

The Indian stock market notched up smart gains on the last day of 2019-2020, but it ended up with record-shattering sell offs in March due to the global coronavirus pandemic that was triggered as the country was crossing the third stage of the pandemic. This provides a ray of hope for India. According to the findings of Bhat. R and Suresh.V (2021), the Indian stock market recorded significant gains on the final trading day of 2019-2020.

According to the findings of a study that was carried out by Bora.D and supported by Basistha (2021), it was found that the COVID outbreak had an effect on the stock prices, increasing the volatility in Indian stock markets, and had an impact on the financial system. This was found to be the case.

According to Sahoo.M (2021), the primary factors that contribute to the movement of stock prices are demand and supply. Prices have a tendency to decrease when there is a greater interest in selling stock than there is in purchasing it, because this causes a seller's market. As a direct result of COVID, this will have an impact in the immediate future, but in the longer term, the market will self-correct in the appropriate direction.

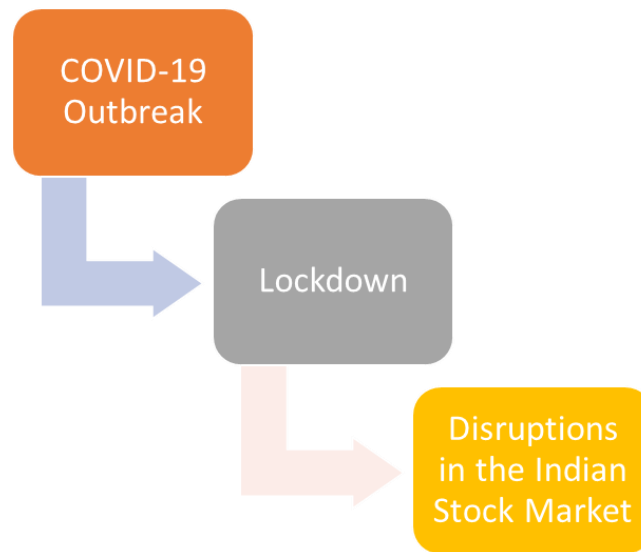
There has been a substantial amount of research carried out to investigate the effects of covid on a variety of industries, such as health and agriculture. On the other hand, the number of studies on the effects of covid 19 on the stock market is still very low at this time. There is also a paucity of research that compares the returns of the stock market before and during the COVID-19. In addition, the data that was gathered for the earlier study only spanned a period of three to four months, so its conclusions should be interpreted with caution. Additional study and some additional amount of time are going to be necessary in order to carry out an in-depth analysis of the effect that the valuations will have.

In our research, we attempted to determine the effect that COVID-19 had on the BSE top 30 companies that are included in the Sensex index by comparing the stock market before and during COVID-19 for a longer period of time. This comparison covered a

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longer period of time. Regarding this matter, we have decided that the time period beginning in January 2020 and ending in September 2020 will work best for us.

### CONCEPTUAL FRAMEWORK



### RESEARCH OBJECTIVES

1. To provide an explanation of how the Indian Stock Market is influenced by the coronavirus.
2. To investigate the effects of the Coronavirus on the 30 most valuable companies on the BSE.

### Variables

COVID-19 is an additional name that can be used to refer to the Corona Virus Disease that occurred in 2019. The meaning of the abbreviation COVID-19 is as follows. This virus was discovered for the very first time in Wuhan, China, and was reported to the World Health Organization (WHO) for the very first time on December 31, 2019. It is the cause of a previously unidentified form of pneumonia. The World Health Organization (WHO) has revealed that the official name of this potentially fatal virus will be disclosed on February 11, 2020. Since the announcement was made exactly one year ago, this date marks the anniversary. On March 11, the World Health Organization (WHO) announced that the COVID-19 virus had reached pandemic proportions. As supporting evidence, the World Health Organization (WHO) cited the fact that there have been more than 118,000 confirmed cases of the coronavirus illness in 110 countries and territories around the world and that there is a continuing risk of further global spread.

**LOCKDOWN:** In the month of March 2020, an announcement of a nationwide lockdown was made, which resulted in the stock market experiencing a significant amount of activity.

The Bombay Stock Exchange (BSE) in India makes extensive use of the SENSEX as the primary indicator of the performance of the market. It is a gauge of India's economy and is made up of 30 of the most actively traded stocks on the BSE. These stocks are the largest ones by market capitalization. At the same time, market capitalization and float adjustment are taken into consideration for it.

The NIFTY is the name of the benchmark index that is used by the National Stock Exchange of India (NSE) (NSE). Nifty, much like Sensex, is comprised of the 50 stocks that are both the most actively traded on the NSE and have the highest market capitalization. These are the stocks that make up the index.

### Hypothesis

This research paper includes hypotheses to be tested by using SPSS. The hypothesis of this study is:

1. **H0:** COVID-19 has no significant impact on India's stock market.
2. **H1:** COVID-19 has significantly impacted India's stock market.

### RESEARCH METHODOLOGY

The BSE database was mined for secondary source information. The data was collected on a weekly basis, and the most recent share prices were used. The range of January 1, 2020 through September 30, 2020, was taken into account. To show the impact of the lockdown and the initial covid wave on the Indian stock market, we chose this time frame.

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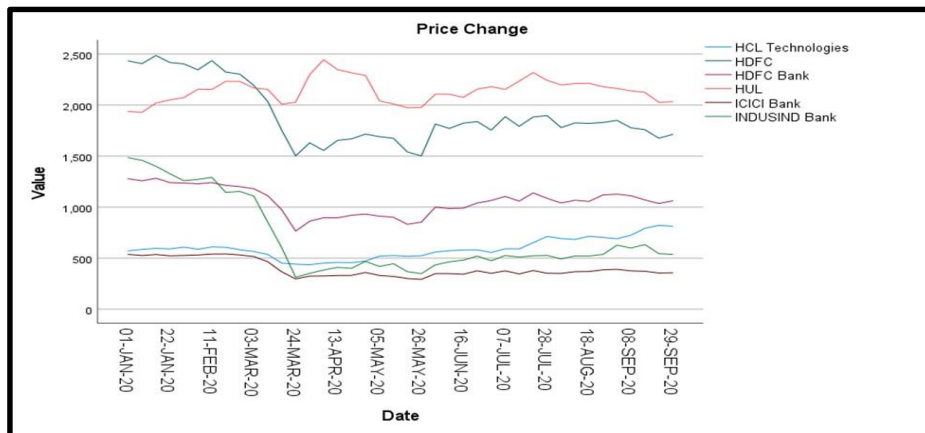
The SENSEX index components—the BSE Top 30 Companies—are analyzed by looking at their stock price movements over time. The average daily volume of trades for each of these 30 stocks was also studied. Covid's impact on specific industries like fast-moving consumer goods (FMCG), banking, information technology (IT), pharmaceuticals, and automobiles was also investigated.

### Findings

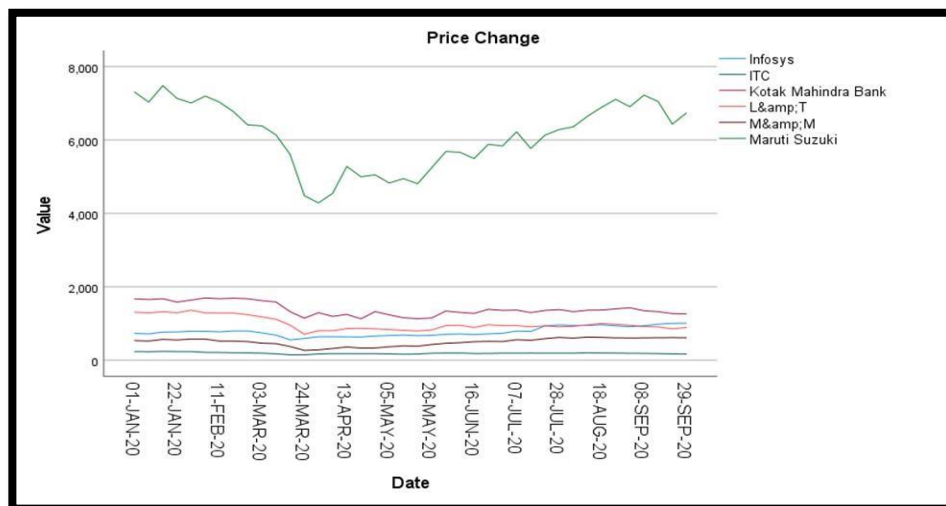
Our analysis of the data gathered showed that the prices of stocks in the majority of the companies chosen experienced a precipitous drop in price (Graph 1.1–Graph 1.5) and a general downward trend after the announcement that the World Health Organization had classified covid as a pandemic and that a 21-day lockdown would be implemented. This news came shortly after the announcement that a lockdown would be implemented for 21 days. However, as COVID continued and people started to adjust to the new normal, the prices of these stocks began to rise and have nearly returned to the levels at which they had been trading prior to COVID. This occurred even though the COVID continued.



Graph 1.1

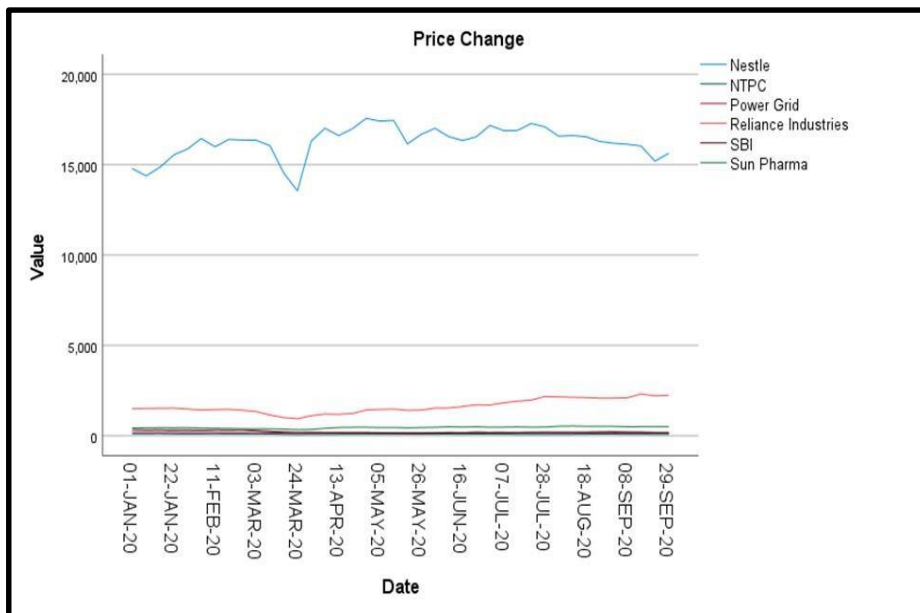


Graph 1.2

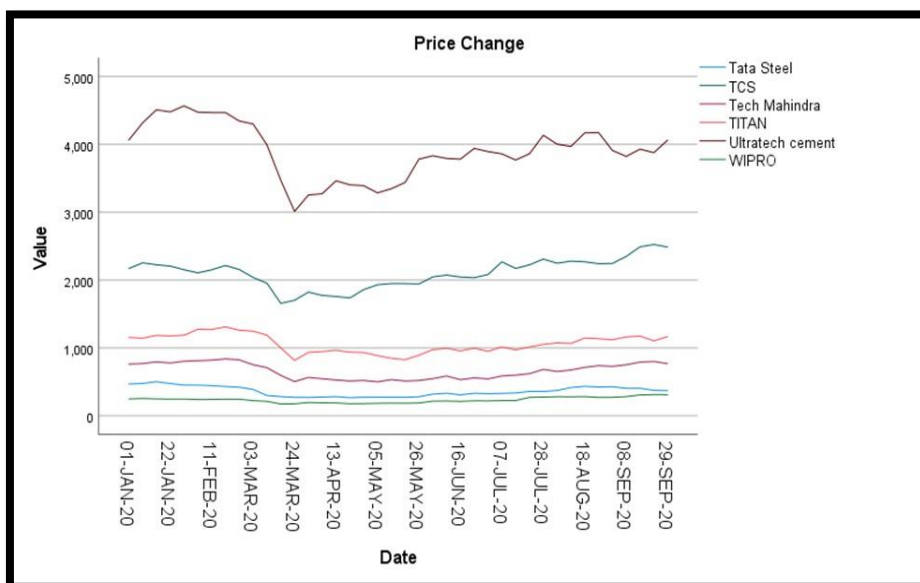


Graph 1.3

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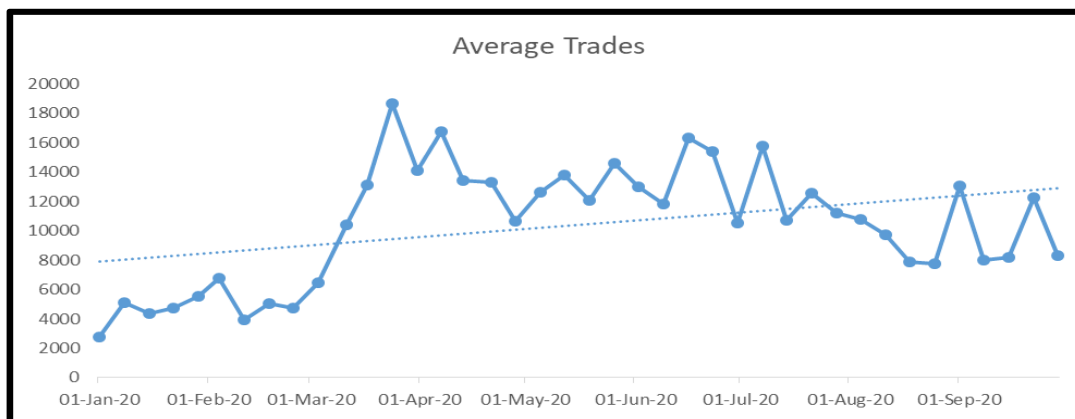


Graph 1.4



Graph 1.5

Graph 2 depicts the typical number of transactions that took place over the period of time that was chosen. As the prices went down, we were able to see from the trendline that it was going in an upward direction, which indicated an increased participation of participants and investors.



Graph 2

## Stock Market Effects of Covid'19 in India

### FINDINGS

The effects of Covid were not felt in the same way throughout all of the different industries. According to the findings of the study, a significant decline was observed in the share prices of stocks within the banking industry, the energy industry, the automotive sector, and financial institutions.

There was not a significant impact on the stocks of companies operating in the fast-moving consumer goods or pharmaceutical industries. Actually, during that time period, the prices of some of these stocks were going up while others were going down.



Graph 3.1 (IT Company Stocks)

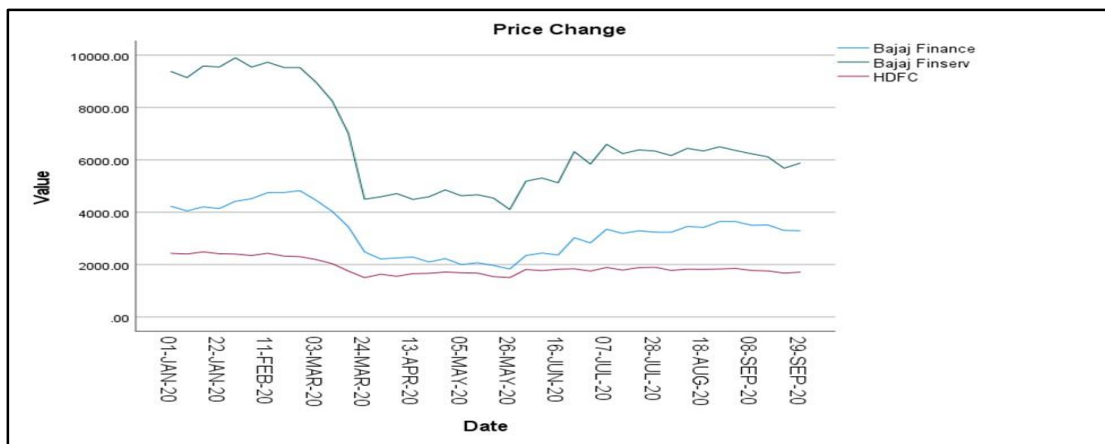


Graph 3.2 (Banking company Stocks)



Graph 3.3 (FMCG Company Stocks)

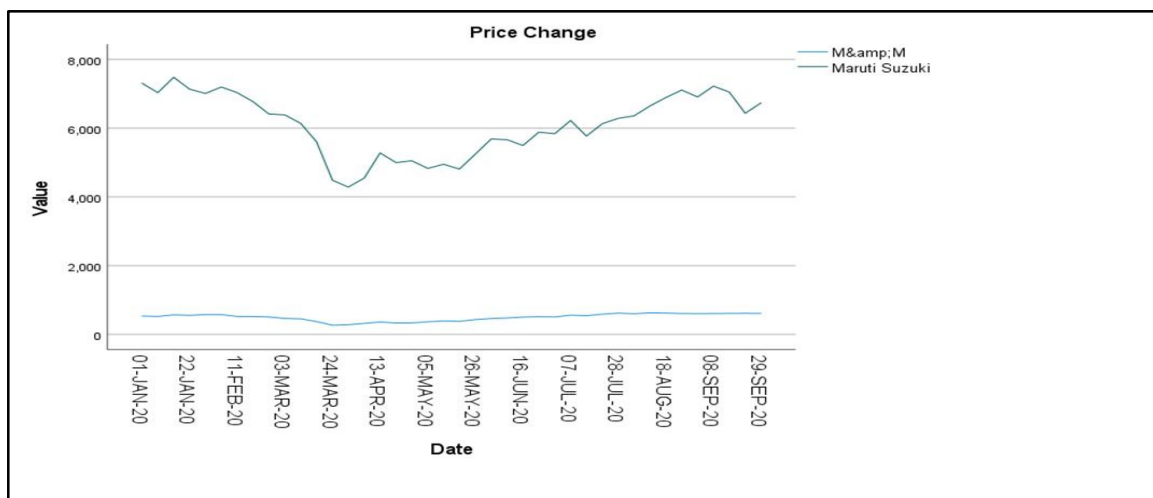
## Stock Market Effects of Covid'19 in India



Graph 3.4 (NBFC company stock)



Graph 3.5 (Energy Company Stocks)



Graph 3.6 (Automobile Company Stocks)



## Stock Market Effects of Covid'19 in India



Graph 3.7 (Pharmaceutical Company Stocks)

### CONCLUSION

The significant amount of uncertainty in addition to the fear that was induced by covid and lockdown were the primary contributors to the selling pressure that was exerted by investors. The value of the majority of the stocks went down as a direct consequence of the same factor. As a result, the effect of the covid had a significant influence on the first phase. As more time passed and people became more skilled at adjusting their lifestyles to work around the covid, the effects of the covid became less severe. In addition to this, the impact was not the same across all different types of businesses. To the best of our knowledge, the businesses that make up the pharmaceutical industry were not affected in any way. In point of fact, the prices of shares in such companies either stayed the same or increased over the past few months.

During this time period, there was also a continuous upward trend in the number of average daily trades. Despite the fact that the share prices of many different companies went down, there was still an increase in the overall level of participation from the investors. This can be seen from the fact that this result was achieved. In addition, a report that was printed in a newspaper confirmed that there was a notable increase in the number of new demat accounts that were opened during that time period. This finding was included in the report.

### LIMITATIONS AND FUTURE DIRECTIONS FOR RESEARCH

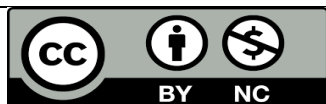
There are some issues with the study that should be taken into account before any conclusions are drawn. The study's sample data collection started on January 1, 2020, and ended on September 30, 2020, a shorter time frame. This was done so that the overall effect of Covid-19 on the Indian stock market could be calculated. The effects of the other two waves, such as the development of vaccines, are ignored here. We can say that vaccines contributed to this study because it includes some pharmaceutical sectors that have been positively impacted by the introduction of vaccines. Second, because of their outsized effect on the market, international portfolio investments must be considered in any comprehensive analysis of the financial system's overall impact.

### REFERENCES

- 1) Taneja, E.Arora, S Tandon,C(2021).Impact of Covid 19 on the Indian Stock Market and Mergers
- 2) Jindal,A.Chahal,B.Parashar,R (2020).Impact of Covid-19 on India's Stock market
- 3) Gupta,P. (2020) Impact of COVID-19 on Indian Stock Market
- 4) Shankar.R, Dubey.P(2021) Indian Stock Market during the COVID-19
- 5) Singh.N, Goel.H, Kumari.S(2021) Impact of the COVID-19, lockdown and unlock the Indian Stock market and its international linkage with the chinese stock market
- 6) Sarkar,S. (2020) COVID-19 Impact On Stock Market and Economy of India
- 7) Sahoo, M. (2020) COVID-19 impact on stock market: Evidence from the Indian stock market
- 8) Bora, D. Basistha, D. (2021). The outbreak of COVID-19 pandemic and its impact on stock market volatility
- 9) Suresh, V. Bhat,R. (2021) Impact of Covid-19 on Indian Stock Market

## Stock Market Effects of Covid'19 in India

- 10) Dhilon, A. Tyagi, V. (2020) Impact of COVID-19 On Indian Stock Market
- 11) Singh, B. Impact of COVID -19 on Rural Economy in India
- 12) Alam, M Noor. Alam, Md Shabbir. Chavali,K. (2020) Stock Market Response during
- 13) Covid- 19 Lockdown period in India
- 14) Nasrin Sultana (2021) New demat accounts jump to a record high in FY21. Mint. 09/03.  
<https://www.livemint.com/news/india/new-demat-accounts-jump-to-a-record-high-in-fy21/amp11615229292551.html>



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## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool



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**ABSTRACT:** This research aims to determine the feasibility of a modified a water rescue tool. This research was conducted in a swimming pool. The number of respondents are for about 35 people (5 lifeguards and 3 pool attendants, 12 trainers in the swimming pool, 10 students, and 5 swimming pool visitors). The results of this study are expected to be one of the contributions of researchers to realize a modification tool for water rescue that is simple, safe, and feasible to use.

The stages in this research were using the ADDIE research model in which there were 5 stages: analysis, design, development, implementation, and evaluation. The research method used the quantitative and qualitative approach with the type of research of development research. The data collection technique used the observation, interviews, questionnaires, and documentation. The data analysis was conducted through the recapitulation of expert and respondent validation data in the form of percentage scores.

The results of the assessment of 35 respondents from the buoyancy aspect obtain a score of 95% (in the "Very decent" category), the target accuracy aspect gains a score of 95% (in the very feasible category), the aspect of the use of the tool gains a score of 96% (in the "Very decent" category), the effectiveness aspect obtains a score of 95% (in the "Very decent" category), the durability aspect obtains a score of 92% (in the "Very decent" category). the physical aspect gains a score of 90% (in the "Very decent" category), and the design aspect gains a score of 96% (in the "Very decent" category), while the average total score of the five aspects is at 96.% (in the "Very decent" category). The conclusion is that the feasibility of the Water rescue modification tool is included in the "Very decent" category.

**KEYWORDS:** Drowned, water rescue, modification

### I. INTRODUCTION

Swimming is a sport carried out in water, therefore it takes the ability to glide, float, adjust your breath in order to be able to perform some skills in activities in water (Narlan et al., 2023). Swimming is a sport that is carried out in water (Kristiaputra & Sugiarto, 2023). Swimming has many benefits and can be said to be a favorite sport for people of all ages and from all walks of life (Kabonga et al., 2023; Sanjaya & Rediani, 2022). In doing swimming sports of all ages can have many benefits for health and to understand and adapt to the environment (Widiastuti & Hamamah, 2017).

Events that often occur in swimming pools are drowning cases. Drowning is an injury due to submersion/immersion that can result in death in less than 24 hours (Simamora & Alwi, 2020). Drowning is an accidental death and due to negligence in swimming (Girasek & Hargarten, 2022). In the last ten years, more than 50,000 people in the world have died from drowning and occurring in swimming pools worldwide (Bierens & Hoogenboezem, 2022; Simamora & Alwi, 2020; Vignac et al., 2022).

In the case of drowning or drowning, it does not always occur due to the entry of fluid into the entire respiratory tract or lungs but can occur due to the closure of the nostrils or mouth by fluid so that this does not only occur in deep waters such as the sea but can also occur in swimming pools (Romadhoni, 2021; Yunus et al., 2023). The occurrence of drowning accidents in swimming pools is of special concern, where the incidence can be minimized (Vignac et al., 2015). From the results of a survey in the swimming pool of the Faculty of Sports and Health Sciences Yogyakarta State University through interviews with lifeguard officers, cases that often occur drowning accidents in teenagers. From 2020 there were 21 cases of drowning victims. Where almost all victims who will drown are adults. The incidence of drowning has a major impact on adults and this incidence continues to increase, so that drowning cases are part of the top ten causes of death worldwide (Nurjanah & Suparti, 2022). Of the many drowning cases that occur, socialization and tools are needed for rescue (Suhairi et al., 2021).

## **Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool**

Water rescue is one of the rescue techniques carried out in water or a rescue action effectively and efficiently. Water rescue is rescue by preparing treatment and rescue before medical action in the aquatic environment (Esler et al., 2019). Safety is the most important factor in managing a swimming pool, which will have an impact on comfort and tranquility for visitors. The existence of rescue workers who have been used as a way to prevent drowning, little is known about the basic knowledge mastered by professional rescuers (Moran et al., 2017). The capacity to carry out effective and efficient rescue measures is critical (Petrass & Blitvich, 2018). The ability of helpers who are full of calculation and consideration in choosing and determining the abilities and skills possessed, as well as the methods that must be done.

Good and correct rescue techniques not only make it easier for helpers to make rescues but also can guarantee the safety of the helper himself. Based on rescue priority, rescue measures that require the rescuer to be in the water come last. Therefore, put the safety of the helper first and then save others (victims). Techniques in general can be divided into two, namely rescue techniques from land and direct rescue techniques (taking victims in water) (Suhairi et al., 2021). It has been recognized worldwide that a lifeguard will do the fastest, safest, both for himself and the victim, if using equipment in a rescue (Barcala-Furelos et al., 2016). How to help victims without having to be in the water by mastering rescue techniques such as, grabbing, throwing and approaching victims with equipment (Szpilman et al., 2014).

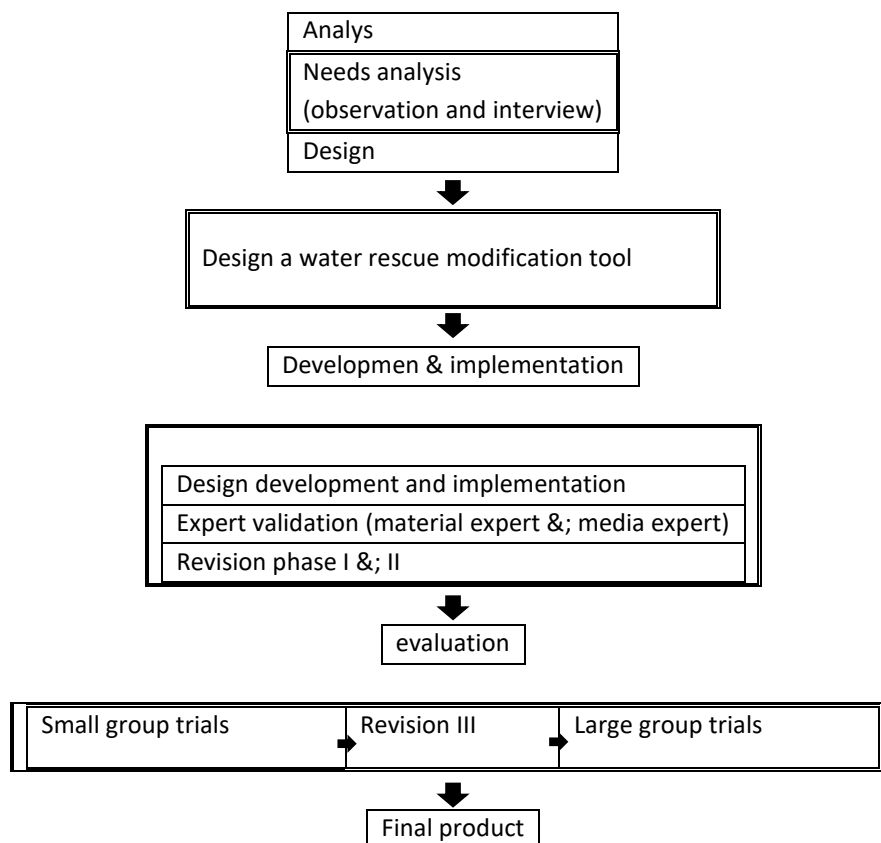
Efforts to prevent drowning victims are by applying safety equipment. Some existing water rescue equipment can provide security for rescuers and be more effective for rescue victims (Barcala-Furelos et al., 2016). One of the safety equipment in the swimming pool is a ring buoy. Ring-buoys are specifically designed to help victims (Szpilman et al., 2014). Able to withstand a load of 150 kg. Survey at the Swimming Pool of the Faculty of Sports and Health Sciences Yogyakarta State University with the size of the main pool with a width of 25 meters which has water rescue equipment including ringbuoys, sticks and buoys. There is one Water rescue tool by utilizing used jerry cans from car engine oil. The tool that is often used has a drawback when used, which is that it still looks simple, only jerry cans are tied with rope. But it has a drawback, which is at risk of injury if it is hit by victims who will drown. So that when thrown it must exceed the direction of the victim so as not to injure if it is not appropriate in catching. Less effective in time to save. A tool is needed that makes it easier for rescuers to help victims who are about to drown. A tool that can reach victims right at a distance of 12.5 meters (half the width of the pool), easy to reach by victims, victims are easy to evacuate, minimal injury and can withstand loads of up to 150 kg.

Modified buoyancy aids such as empty plastic bottles/containers, bodyboards, surfboards, driftwood, ice crates, etc. can be used as alternatives as water rescue tools. This modified tool is expected to float when held by an adult, easy to use because the thighs are lightweight, and have accuracy in reaching the target of victims who are about to drown. Using jerry cans measuring 5 liters. Rope to pull the victim that has previously been tied to jerry cans. The nylon mine rope measures 8 mm in diameter with a length of 13 meters, and is coated with Styrofoam as a cushion to withstand impact and reduce the risk of injury. It is hoped that this example of modifying a water rescue device to help victims who are about to drown can be used as a water rescue tool. which has the advantage of reducing the risk of injury when thrown, on target, effective, and able to withstand loads up to 150 kg.

## **II. METHOD**

The type of research used in this research is research and development. It is called research-based development. In this research and development is focused on producing modified products for Water rescue equipment to help victims who will drown. The model used is the development of the ADDIE model. The ADDIE development model is one of the development models that aims to develop a new product, or perfect an existing product and can be accounted for the results (Fitri et al., 2021).

## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool



**Figure 1. Flow Diagram Development of Water rescue tool modifications according to theory ADDIE**

Source: Instructional Media Design (Lee & Owens)

This research will be carried out at the swimming pool of the Faculty of Sports and Health Sciences, Yogyakarta State University which is located at Jalan Kuningan no.9 Caturtunggal, Depok, Sleman, Yogyakarta. The study was conducted in July 2022. The subjects of this study were 2 (two) material experts consisting of 2 material expert lecturers, 2 (two) media experts consisting of 2 media expert lecturers, 3 trial people, and 35 respondents consisting of 8 swimming pool officers of the Faculty of Sports and Health Sciences, Yogyakarta State University and 12 Swimming Club Coaches at the swimming pool of the Faculty of Sports and Health Sciences, Yogyakarta State University. 10 students of the Faculty of Sports and Health Sciences, Yogyakarta State University and 5 general visitors. The data collection used in this study used observation, interviews, dokumentation and questionnaires that have been validated by expert validators and have a reabelitivity value of 0.853 which can be declared reliability. There are two types of data that.

### III. DISCUSSION


Development of modified water rescue tools to help victims who are about to drown, the technique carried out in this study uses the ADDIE development model. The development model includes 4 stages, namely: Analysis, Design, Development and Implementation, Evaluation. At the design stage of the modification form of the water rescue tool the design for the modification of the water rescue tool is as follows:



**Figure 2. Water rescue equipment installation design**

## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool

At the development and application stage, water rescue equipment modifications are developed by applying the product frame design that has been made at the beginning. After the initial product is completed, the next product is validated by experts. The following are the stages of development and implementation carried out and require tools such as scissors, aibon glue, markers, cutter knives, tape and G glue.

No.	Material	Information
1	PE mine rope 	<p>This type of PE rope is made from synthetic fibers named Polyethylene fibers. This type of rope has the characteristics of more flexible (Not Rigid), low breaking load value, resistant to chemicals, resistant to sunlight and lighter because it is smaller in size.</p> <p><a href="https://seoasmrines.com/">(https://seoasmrines.com/)</a></p> <p>Light and not easily sinking into the water so that it can make it easier for victims to reach the tool, if you can't immediately reach the jerry can, you can also grab the rope</p> <p>The length of the rope of 13 meters aims to reach to the middle of the width of the swimming pool. Where the width of the international standard swimming pool size according to the Federation Internationale de Nation (FINA) is 25 meters.</p> <p>The diameter of the rope measuring 8 millimeters aims not to be too big and not too small. Too large makes the rope heavier and sinks easily into the water. And if it is too small, the rope becomes difficult to roll.</p> <p>Mine rope roll pattern with circular roll pattern so that it does not wrap around when thrown. So that the evacuation process can be effective and efficient in terms of time.</p> <p>Easy to get at building stores, plastic stores, home furnishings stores and others at a fairly cheap price of Rp. 2.500,-/ meter or Rp. 32.500 for a length of 13 meters.</p>
2.	5-liter jerry cans 	<p>Raw Material for making jerry cans is a polymer where the polymer has a very strong strength structure</p> <p>It measures 33 cm high, 12 cm thick, and 17 cm wide</p> <p>Easy to get at building stores, plastic stores, home furnishings stores and others at a price of Rp. 8.500,-</p>
3.	Water 350 cc 	<p>Water is used as ballast which is inserted into empty jerry cans.</p> <p>Water uses clean water, can use well water, pond water, and others.</p> <p>The size of the volume of water is 350 milliliters, aiming that when put into the jerry can, it can make the jerry cans remain stable when thrown and make it easier to reach the right target.</p> <p>When filled with more than 350 ml, the jerry cans become heavier and more difficult when thrown, and vice versa when less than 350 ml, the jerry cans become too light and easy to float so that the accuracy of hitting the target is reduced.</p>
4.	Styrofoam PE	<p>Styrofoam is a material from polytrene packaging which is generally white used to safety non-food items such as electronic goods to withstand light impacts</p> <p>Can be used as a cushion to reduce the risk of injury to victims</p> <p>Painted using acrylic paint, special paint for Styrofoam and also</p>

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		resistant to water. The paint color is orange for easy viewing.
5.	Polyster fabric 	Polyester under the trade name Dacron is made from terephthalic acid and ethylene glycol, while Terylene is made from dimethyl terephthalate and ethylene glycol. Water resistant Strong but light. Easy to dry. Not broken quickly.

Figure 3. Materials for making water rescue modification tools



Figure 4. Installation of water rescue modification tools

Instructions for use are intended to be how to use the water rescue modification tool. The contents of the instructions are as follows:

1. Handle the rope reel with the left hand.
2. A thumb finger clamped the end of the mine rope.
3. Right hand holds jerry cans on the upper handle on jerry cans
4. Aim at the target and throw it with an arm swing from below
5. Pull the victim to the edge.



1. Styrofoam installation



2. Wrapping process



3. Strap mounting

Figure 5. Stages of manufacturing modification tools

### Process

After product validation is complete, media experts and material experts get advice from validators. Then refine the modification tools according to the suggestions and inputs of the media expert team and material experts and so that there is a comparison of the initial product and the product after revision. The comparison of initial and post-revision products is as follows:

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Initial product



Products after revision



Figure 6. Comparison of modifications of water rescue equipment

At the evaluation stage, revisions are carried out before small-scale tests are carried out on products developed based on suggestions and student input given during the implementation stage. After the revision of the product is completed, it is carried out by the advice of the respondent. Then improve the product to make it better than the previous revision. The comparison of initial and post-revision products is as follows:



Figure 7. Final Product

Material feasibility assessment is carried out by material expert validators and is assessed based on 5 aspects, namely aspects of buoyancy, target accuracy, effectiveness of use, ease of use and product durability.

Table 1. Data from assessment by 2 material experts

No.	Aspects	Average score	Category
1.	Buoyancy	100%	Very decent
2.	Target accuracy	100%	Very decent
3.	Tool use	87,5%	Very decent
4.	Effectiveness	87,5%	Very decent
5.	Durability	87,5%	Very decent
<b>Average score</b>		92,5%	Very decent

The table above can be seen that the assessment results of two material experts from the buoyancy aspect obtained a score of 100% (with the category "Very decent"), the aspect of target accuracy obtained a score of 100% (with the category Very decent), the aspect of using the tool obtained a score of 87.5% (with the category "Very decent"), the aspect of effectiveness obtained a score of 87.5% (with the category "Very decent"), and the durability aspect obtained a score of 87.5% (with the category "Very decent"). While the average total score of the five aspects is 92.% (with the category "very decent"). The conclusion is that the material in the Water rescue modification tool is included in the category of "Very decent"

Media feasibility assessment is carried out by media expert validators and assessed based on four aspects, namely physical aspects, content, writing, and color.



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**Table 2. Assessment data from 2 media experts**

No.	Aspects	Average score	Category
1.	Physical	95%	Very decent
2.	Fill	97%	Very decent
3.	Writing	81,5%	Very decent
4.	Color	100%	Very decent
<b>Average score</b>		93,5%	Very decent

The table above can be seen that the assessment results of two media experts from the physical aspect obtained a score of 95% (with the category "very decent"), the content aspect obtained a score of 97% (with the category very decent), the writing aspect obtained a score of 81% (with the category "very decent"), the color aspect obtained a score of 100% (with the category "very feasible"), while the average total score of the four aspects was 93.% (with the category "very decent"). The conclusion is that the media in the water rescue modification tool is included in the category of "very decent".

This small group trial produced response data from 5 respondents. This respondent response questionnaire contains product assessments in terms of buoyancy, target accuracy, ease of use, effectiveness, durability, physical, and design.

**Table 3. Small-scale test result data**

No.	Aspects	Average score	Category
1.	Buoyancy	95%	Very decent
2.	Target accuracy	95%	Very decent
3.	Tool use	96%	Very decent
4.	Effectiveness	95%	Very decent
5.	Durability	92%	Very decent
6.	Physical	90%	Very decent
7.	Design	96%	Very decent
<b>Rerata skor</b>		94%	Very decent

The table above can be seen that the assessment results of five respondents from the buoyancy aspect obtained a score of 95% (with the category "Very decent"), the aspect of target accuracy obtained a score of 95% (with the category Very decent), the aspect of using the tool obtained a score of 96% (with the category "Very decent"), the aspect of effectiveness obtained a score of 95% (with the category "Very decent"), the durability aspect obtained a score of 92% (with the category "Very decent"). The physical aspect obtained a score of 90% (with the category "very decent"), and the design aspect obtained a score of 96% (with the category "very decent"), while the average total score of the five aspects was 94.% (with the category "very decent"). The conclusion is the feasibility of water rescue modification tools included in the "Very decent" category.

This large group trial produced response data from 35 respondents. This respondent response questionnaire contains product assessments in terms of buoyancy, target accuracy, ease of use, effectiveness, durability, physical, and design.

**Table 4. Large-scale test result data**

No.	Aspects	Average score	Category
1.	Buoyancy	96%	Very decent
2.	Target accuracy	95%	Very decent
3.	Tool use	96%	Very decent
4.	Effectiveness	94%	Very decent
5.	Durability	97%	Very decent
6.	Physical	96%	Very decent
7.	Design	97%	Very decent
<b>Rerata skor</b>		96%	Very decent

The table above can be seen that the assessment results of 35 respondents from the buoyancy aspect obtained a score of 95% (with the category "Very decent"), the aspect of target accuracy obtained a score of 95% (with the category Very decent), the aspect of using the tool obtained a score of 96% (with the category "Very decent"), the aspect of effectiveness obtained a score of 95% (with the category "Very decent"), the durability aspect obtained a score of 92% (with the category "Very decent"). the

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physical aspect obtained a score of 90% (with the category "very decent"), and the design aspect obtained a score of 96% (with the category "very decent"), while the average total score of the five aspects was 96.% (with the category "very decent"). The conclusion is the feasibility of water rescue modification tools included in the "Very decent" category.

So far, the water rescue tools in Faculty of Sports and Health Sciences, Yogyakarta State University swimming are ring buoys, sticks, modified tools from used jerry cans of car oil. Researchers try to make a product in the form of water rescue equipment that is effective, efficient, cheap, easy to obtain, and the risk of injury to victims can be minimized. As revealed by Fitri et al., (2021), the initial idea that utilizes materials from used fabrics. Researchers also used used goods and adapted from a water rescue tool, namely a rescue tube, researchers tried to make a tool from a 5-liter jerry can coated with Styrofoam and given a cover and given a rope to pull the victim after holding on to the tool. which aims as a water rescue tool to be thrown at victims accurately, minimal injuries and can still float to be used as a relief tool. such as the purpose of research (Fantiro et al., 2021) to make it easier for students to experience the material. By using such modification tools it is believed to be able to.

In this developed product will be carried out according to the procedure that has been developed by Lee & Owens (2004), namely the ADDIE model. The stages of the model are clearer so that researchers choose to use the model in this development research. The stages of developing this product go through several stages, starting from making the initial design and produced with 5-liter jerry cans filled with 350 ml of water and the jerryen cans tied to the mining rope. Research conducted (Fantiro et al., 2021; Usman et al., 2019; Widowati & Decheline, 2020) on initial product validation. This research also validated the initial product to material and media experts obtained the first revision. In the first revision there was the addition of cushions from Styrofoam and painted. After revising the product, it is assessed by validators and gets the second stage of revision. That is by changing the appearance to remove the original shape of the jerry can, changed so that it is not like a jerryen.

The second product revision was done by adding Styrofoam pads to the jerry cans and shaped to resemble a rescue tube. To make it look neater, the product is wrapped in a cover of polyster fabric. The second phase of product revision has received approval from validators for small-scale testing. At this stage, there is a product revision in the third stage according to the suggestions and input from respondents, namely by adding pads to the cover to make it more precise and the cover does not get water. The revisions that have been carried out in the third stage are then tested on a large scale. The results obtained in the product become more perfect. Research results (Usman et al., 2019; Widowati & Decheline, 2020) suggestions and inputs from large-scale respondents become revisions for the final product. Researchers also revise the fourth stage or final product such as suggestions and input from large-scale test respondents. At this stage researchers made improvements to the cover to make it more precise and without angles, the addition of a handle at the end of the throwing rope and the addition of a rescue logo on the product.

## IV. CONCLUSIONS

Based on the results of research from data analysis, it can be concluded that: 1). Development of modified water rescue equipment products to save victims who will drown in a design resembling a rescue tube. From the initial design to the final product which went through the stages of design revision for the modification of this water rescue tool got a score of 97% with the category "very decent", 2). The feasibility of modified water rescue equipment products to save drowning victims after being validated by 4 validators, namely two material experts by 90%, and two media experts by 93% and scores from 35 respondents by 96%, which means that the modification of water rescue equipment is "very decent" to use. 3). The effectiveness of modified water rescue equipment products in helping the safety of victims who will drown with data analysis from two material experts by 87%, and scores from 35 respondents of 95% which means that water rescue equipment modifications are "very effective" to use and have buoyancy that can exceed ringbuoys of 155 kg or two adults.

## REFERENCES

- 1) Barcala-Furelos, R., Szpilman, D., Palacios-Aguilar, J., Costas-Veiga, J., Abelairas-Gomez, C., Bores-Cerezal, A., López-García, S., & Rodríguez-Nuñez, A. (2016). Assessing the efficacy of rescue equipment in lifeguard resuscitation efforts for drowning. *The American Journal of Emergency Medicine*, 34(3), 480–485. <https://doi.org/10.1016/j.ajem.2015.12.006>
- 2) Barcala-Furelos, R., Szpilman, D., Palacios-Aguilar, J., Costas-Veiga, J., Abelairas-Gomez, C., Bores-Cerezal, A., López-García, S., & Rodríguez-Nuñez, A. (2016). Assessing the efficacy of rescue equipment in lifeguard resuscitation efforts for drowning. *The American Journal of Emergency Medicine*, 34(3), 480–485. <https://doi.org/10.1016/j.ajem.2015.12.006>
- 3) Bierens, J., & Hoogenboezem, J. (2022). Fatal drowning statistics from the Netherlands – an example of an aggregated demographic profile. *BMC Public Health*, 22(1), 339. <https://doi.org/10.1186/s12889-022-12620-3>
- 4) Ela, Rochmawati, & Selviana. (2016). Ela,Rochmawati, Selviana. Faktor-Faktor Yang Mempengaruhi Penggunaan Wadah Styrofoam Sebagai Kemasan Makanan Pada Penjual Makanan Jajanan Di Kota Pontianak Tahun 2016, 1–10.

## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool

- 5) Esler, A., Goodman, A. C. H., & Wood, A. J. (2019). Water Rescue within UKSAR: consent, capacity and necessity. *Journal of Search & Rescue*, 3(2).
- 6) Fantiro, F. A., Utami, I. W. P., Muzakki, A., & Widyatama, E. A. (2021). Modifikasi Model Pembelajaran TGT Dengan Permainan Modifikasi Ball Throwing Jump Games Pada Materi Gerak Lokomotor Kelas 3 SD. *Jurnal Pemikiran Dan Pengembangan Sekolah Dasar (JP2SD)*, 9(2), Article 2. <https://doi.org/10.22219/jp2sd.v9i2.18021>
- 7) Fitri, A. N. G., Nayoan, J. R., Umaroh, C. F., Maharani, D. A., Farhan, F., & Irianti, A. H. S. (2021). Pengembangan Teknik Upcycle pada Proses Modifikasi Busana Secondhand Menjadi Produk Berkualitas. *Prosiding Pendidikan Teknik Boga Busana*, 16(1), Article 1. <https://journal.uny.ac.id/index.php/ptbb/article/view/44595>
- 8) Girasek, D. C., & Hargarten, S. (2022). Prevention of and Emergency Response to Drowning. *New England Journal of Medicine*, 387(14), 1303–1308. <https://doi.org/10.1056/NEJMra2202392>
- 9) Kabonga, I., Zvokuomba, K., Nyagadza, B., & Dube, E. (2023). Swimming Against the Tide: Young Informal Traders' Survival Strategies in a Competitive Business Environment in Zimbabwe. *Youth & Society*, 55(2), 280–299. <https://doi.org/10.1177/0044118X211044524>
- 10) Kristiaputra, P. S., & Sugiarto, S. (2023). Hubungan Kekuatan Otot Lengan Dan Otot Tungkai Terhadap Kecepatan Renang Gaya Dada Atlet Oasis Swimming Club. *Journal of SPORT (Sport, Physical Education, Organization, Recreation, and Training)*, 7(1), Article 1. <https://doi.org/10.37058/sport.v7i1.6584>
- 11) Moran, K., Webber, J., & Stanley, T. (2017). The 4Rs of Aquatic Rescue: Educating the public about safety and risks of bystander rescue. *International Journal of Injury Control and Safety Promotion*, 24(3), 396–405. <https://doi.org/10.1080/17457300.2016.1224904>
- 12) Narlan, A., Priana, A., & Gumilar, R. (2023). Pengaruh Dryland Swimming Workout Terhadap Peningkatan Vo2max Dalam Olahraga Renang. *Journal of SPORT (Sport, Physical Education, Organization, Recreation, and Training)*, 7(1), Article 1. <https://doi.org/10.37058/sport.v7i1.6665>
- 13) Nurjanah, D. S., & Suparti, S. (2022). Pengaruh Edukasi Bantuan Hidup Dasar dengan Media Audio Visual terhadap Pengetahuan Pengawas Kolam Renang di Kabupaten Purbalingga. *Faletehan Health Journal*, 9(01), Article 01. <https://doi.org/10.33746/fhj.v9i01.371>
- 14) Petrass, L. A., & Blitvich, J. D. (2018). A Lack of Aquatic Rescue Competency: A Drowning Risk Factor for Young Adults Involved in Aquatic Emergencies. *Journal of Community Health*, 43(4), 688–693. <https://doi.org/10.1007/s10900-018-0472-6>
- 15) Romadhoni, L. (2021). Sosialisasi Pertolongan Pertama (Management Airway) Korban Tenggelam Di Kolam Renang Gunung Merah, Bandar Jaya, Kecamatan Terbanggi Besar, Kabupaten Lampung Tengah. *Jurnal Perawat Indonesia*, 5(2), 684–691.
- 16) Sanjaya, P. M. D., & Rediani, N. N. (2022). Pembelajaran Berbantuan Video Model Latihan Renang Gaya Bebas Terhadap Penguasaan Gaya Bebas dan Kecepatan Renang Siswa Sekolah Dasar. *Jurnal Penelitian Dan Pengembangan Pendidikan*, 6(2), Article 2. <https://doi.org/10.23887/jppp.v6i2.50248>
- 17) Simamora, F. A., & Alwi, F. (2020). Sosialisasi Pertolongan Pertama pada Korban Tenggelam bagi Petugas Penjaga di Kolam Renang Siharang-Karang, Kota Padangsidempuan. *Jurnal Pengabdian Masyarakat Aufa (JPMA)*, 2(1), Article 1.
- 18) Sitorus, R. L., & Arumsari, A. (2019). Optimalisasi Redesign Pakaian Secondhand Berbahan Kain Polyester Optimazition of Redesign Secondhand Clothing Made of. *E-Proceeding of Art and Design*, 6(2), 1840–1854.
- 19) Suhairi, M., Lauh, W. D. A., Hardika, N., Yane, S., Abdillah, A., Effendi, A. R., Rajidin, R., Sari, S., & Wardani, R. (2021). Sosialisasi Penanganan Keselamatan Di Air Untuk Lifeguard Pada Objek Wisata Air Kota Pontianak. *Prosiding Seminar Nasional Penelitian Dan Pengabdian Kepada Masyarakat (SNPP)*, 1(1), Article 1.
- 20) Suranto, P. J., & Sudjasta, B. (2018). Perahu Nelayan Menggunakan Jerigen Plastik Bekas Untuk Meningkatkan Kesejahteraan Nelayan. *Bina Teknika*, 14(2), 193. <https://doi.org/10.54378/bt.v14i2.364>
- 21) Szpilman, D., Webber, J., Quan, L., Bierens, J., Morizot-Leite, L., Langendorfer, S. J., Beerman, S., & Løfgren, B. (2014). Creating a drowning chain of survival. *Resuscitation*, 85(9), 1149–1152. <https://doi.org/10.1016/j.resuscitation.2014.05.034>
- 22) Usman, K., Aditya, R., & Helmi, B. (2019). Pengembangan Peralatan Modifikasi Atletik Pada Pembelajaran Pjok Tingkat Sekolah Dasar. *Jurnal Ilmiah STOK Bina Guna Medan*, 7(1), Article 1. <https://doi.org/10.55081/jsbg.v7i1.162>
- 23) Vignac, É., Lebihain, P., Guignard, B., Heutte, N., Minor, L. L., & Soulé, B. (2022). Ability of Lifeguards to Detect Submerged Manikins in Public Swimming Pool Environments. *International Journal of Aquatic Research and Education*, 13(4), 1–22. <https://doi.org/10.25035/ijare.13.04.10>

## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool

- 24) Vignac, E., Lebihain, P., & Soulé, B. (2015). Tracking Fatal Drownings in Public Swimming Pools: A Retrospective Multiscale Investigation Within France. *International Journal of Aquatic Research and Education*, 9(2). <https://doi.org/10.25035/ijare.09.02.09>
- 25) Widiastuti, W., & Hamamah, F. (2017). Model Pembelajaran Renang (Fh) Bagi Siswa Prasekolah. *Jurnal Pendidikan Usia Dini*, 11(2), Article 2. <https://doi.org/10.21009/JPUD.112.13>
- 26) Widowati, A., & Decheline, G. (2020). Modifikasi Senjata Anggar Untuk Meningkatkan Kekuatan Otot Lengan Pada Atlet Anggar Pemula. *Physical Activity Journal (PAJU)*, 2(1), Article 1. <https://doi.org/10.20884/1.paju.2020.2.1.3331>
- 27) Yunus, P., Damansyah, H., & Lihu, I. (2023). Tingkat Pengetahuan Pengawas Kolam Renang Tentang Pertolongan Pertama Pada Korban Tenggelam Di Kolam Pemandian Kota Gorontalo. *Jurnal Riset Rumpun Ilmu Kesehatan (JURRIKES)*, 2(1), Article 1. <https://doi.org/10.55606/jurrikes.v2i1.908>



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## The Effect of the Covid 19 Pandemic on Bank Performance Cases of Regional Development Bank in Indonesia



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**ABSTRACT:** The Covid 19 pandemic that occurred at the beginning of 2020 in Indonesia caused a decline in the economy in all countries, including Indonesia. Banks as financial intermediaries that accept public deposits and provide loans to the public are also affected. Based on the law, the banking structure in Indonesia consists of Commercial Banks and Rural Banks. One of the commercial banks that has different characteristics compared to other commercial banks is the Regional Development Bank (BPD). Regional Development Banks play a strategic role in becoming partners with the Government, in addition to that BPDs function as motors for accelerating regional development by carrying out the Bank's function as a banking intermediary (Haeri, 2021). This research is to examine the effect of Covid 19 on the performance of Regional Development Banks in Indonesia. The bank performance that will be tested consists of non-performing loans (NPL), loan to deposit ratio (LDR), return on equity (ROE), return on assets (ROA), capital adequacy ratio (CAR), and operating expense to operating income ratio (OEIR). The population of this study were all regional development banks in Indonesia, consisting of 27 banks with a sample of 20 banks using purposive sampling technique, namely those with complete data. Observation period for two years before and two years during Covid-19 (2018 to 2021) with quarterly data. To test the hypothesis used independent t test. The results showed that Covid-19 had a significant effect on NPL, while it did not have a significant effect on LDR, ROE, ROA, and OEIR.

**KEYWORDS:** COVID 19, non-performing loan, loan to deposit ratio, capital adequacy ratio, bank performance

### 1) INTRODUCTION

The Covid pandemic in early 2019 made changes to human life, both behavior and activities. The COVID 19 pandemic is one of the outbreaks of the corona virus disease that has hit the world, commonly called COVID-19. The existence of this epidemic greatly impacted the social and economic conditions of the community. Various risks must be faced by the community as a result of the Covid-19 pandemic, not only health risks, but also creating economic risks (Hasan, 2021). COVID-19 has slowed down the global economy. As a result, financial institutions face increased liquidity risk, default and loss of intermediation revenue (Rizwan, 2020).

The Covid-19 pandemic has made the economy, including banking, experience a decline in performance. Banking is one of the financial institutions that greatly influences the economic condition of a country. The level of banking liquidity is a reflection of national economic conditions (Candera et.al., 2021). When financial institutions lack cash or assets that are easily converted into cash to meet their short-term obligations, the situation is called a liquidity crisis (Chappelow, 2020). The greater the exposure of a bank to the sector, the greater the impact. The magnitude becomes much larger when all economic sectors are negatively affected as happened during COVID (Choudhary, 2022). Poor financial health that can lead to bankruptcy, has a negative impact on stakeholders such as creditors, employees, investors, suppliers, consumers and local communities. It is an integral part of the functioning of a company (Karim, 2021).

The Covid 19 pandemic gave preference to banking behavior in providing bank loans to the public. The Covid 19 pandemic has affected the financial performance of banks. Bank performance is very important for various parties such as investors, managers, employees, customers, as well as regulators and examiners (Balboula, 2021). The research conducted by Darjana (2022) shows that the COVID-19 outbreak has affected the banking sector with a decrease in lending or disbursing credit to the real sector. Banks will be more careful about extending credit to the public because the existence of activity restrictions will certainly affect MSMEs where business is disrupted so that banks in extending credit will be more careful so that credit quality does not decrease and increase non-performing loans (NPL).

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Financial performance is part of the bank's overall performance that needs to be evaluated in order to determine the right rational decisions within the company (Insani, 2021). Analysis of financial ratios used by a company to determine company performance can be seen from the Profitability Ratio, Solvency Ratio and Liquidity Ratio. Profitability is very important for the long-term survival of commercial banks, especially in a changing banking industry environment (Lee, 2018). Profitability ratios can be shown by ROA (Return on Assets) and ROE (Return on Equity). Profitability ratios are used to measure a bank's ability to generate income. Typical measures include return on assets, return on equity and net interest margin (Abugamea, 2018). The ratio that has a strong and representative banking business model is ROA, because the bank performs its function as an intermediary between borrowers who receive loans from the bank and savers who keep money in the bank. A positive Return On Assets (ROA) indicates that the Bank can use assets effectively to generate income (Rahmi, 2021). Return On Assets (ROA) is an important indicator because shareholders and potential investors will measure the extent to which a bank's ability to obtain net profit which will be linked to dividend payments. ROA which represents the level of profitability shows the amount of net profit that the bank gets compared to the value of the assets it controls. The higher ROA owned indicates that the bank can generate greater profits, and indicates that the bank is more efficient. Besides ROA, ROE is also used to see profitability ratios. Return on Equity (ROE) is often referred to as the profitability of own capital, meaning that it calculates how much profit will be the right of the owner of the capital itself (Azis et al., 2018).

The presence of COVID-19 will certainly have a negative impact on the operating performance of companies in all industries, and there may be an effect that will occur on banks, which will increase their credit risk exposure. This will jeopardize their stability and place some constraints for future intermediation with some potential spillover into the real economy. Banking performance since the outbreak of COVID-19 has experienced the same structure as the global financial crisis (Aldaroso et al., 2020). While all banks' balance sheets could potentially suffer negative consequences such as COVID-19, some banks are unlikely to be affected as much. In addition, the pandemic has resulted in non-performing loans due to arrears in payments by debtors as a result of many people losing their jobs and having difficulty paying credit, which will increase non-performing loans (NPL). The potential for an increase in NPLs makes the Bank careful in extending its credit. Banking prudence in lending will certainly have an impact on the bank's LDR. The decline in lending to the public has reduced bank LDR. In addition, an increase in NPL at the Bank will certainly result in an increase in Operational Costs so that it will increase the OEIR ratio. A low OEIR level indicates the more efficient a bank is in controlling its operational costs, with cost efficiency the income earned by the bank will increase, and the bank's performance will be better. An increase in NPL or a decrease in credit quality at a bank certainly affects a company's CAR. The existence of a pandemic will certainly have an impact on credit quality which will affect the risk of loss to the Bank. The existence of bank risks that arise makes the bank have to provide funds that will be used to overcome possible risk of loss so that the company's CAR decreases.

## **2) THEORY AND HYPOTHESIS**

### **Non-performing loan**

Non-performing loan (NPL) is a comparison between the amount of credit extended by the Bank and the collectibility level in the form of non-performing loans compared to the total loans extended by the bank. NPL to measure and find out customers who have difficulty paying off credit payments or often referred to as bad loans at banks. The higher the NPL, the worse the performance of the banking company. NPL is a comparison between bad loans and total loans. This ratio shows that the higher the NPL ratio, the worse the credit quality. The existence of the COVID - 19 Pandemic certainly affects the income or income of the debtor so that it will affect the ability of the debtor to pay his obligations to the Bank. The problem that has arisen as a result of the COVID-19 pandemic in the banking sector is that debtors, including debtors of micro, small and medium enterprises (MSMEs), have difficulties in carrying out their credit obligations, thereby disrupting banking performance (Disemadi & Shaleh, 2020). The inability of the debtor affects the level of non-performing loans in banks thereby increasing the NPL ratio so that the hypothesis in this study is:

**H<sub>1</sub>: There was an increase in bank NPLs during the COVID 19 pandemic**

### **Loan Deposit Ratio**

The Loan Deposit Ratio (LDR) is a ratio that measures a bank's ability to meet its short-term obligations or commonly known as liquidity. LDR divides the total credit or distribution of funds to the total third-party Funds (TPF). The liquidity of a bank really needs to be managed in order to meet the needs when customers withdraw funds and distribute funds to borrowers (debtors). If the LDR value is too high, it means that the bank does not have sufficient liquidity to cover the bank's obligations to customers who have Third Party Funds (DPK). Likewise, if the LDR is too low, it means that the bank has sufficient liquidity. However, if the LDR is low, it is likely that the bank will have lower income, because the banking world obtains income through channeled credit.

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The existence of the Covid-19 Pandemic has certainly affected the Bank's ability to channel credit or the Bank's LDR to decrease so that the hypothesis in this study is:

**H<sub>2</sub>: There was a decrease in bank LDR during the Covid-19 pandemic**

### **Return On Assets**

Return on assets (ROA) is a ratio to measure profitability, namely the ratio of net income to total assets. ROA is used to measure a bank's ability to generate profit or profits by comparing net income with resources or total assets owned. ROA describes the return on company assets or tires on all assets that have been used by banks so that the higher the ROA, it can be concluded that the company's performance is better (Sofyan, 2019). ROA is considered capable of providing an overview of financial performance. Korompis (2020) supports this, which uses ROA as a description of a bank's financial performance. The existence of the Covid-19 pandemic has significantly reduced bank income, this can be caused by the large number of bank customers who have difficulty fulfilling their obligations to pay credit resulting in a decrease in ROA so the hypothesis in this study is:

**H<sub>3</sub>: There was a decreased in bank ROA during the Covid 19 pandemic**

### **Return On Equity**

Return on equity (ROE) is a ratio to measure profitability. ROE compares with own capital. Return on Equity (ROE) is a ratio that measures how much return the company's shareholders receive on paid-up capital (Jusuf, 2014). Return On Equity (ROE) is a profitability ratio which is useful for measuring the ability of a bank or company to generate profit or profit in accordance with the bank's or company's share capital (Chowdhury & Nehal, 2020). Deanta (2016) argues that the ROE ratio serves to measure the success of management in order to maximize the rate of return to shareholders. ROE is a profitability ratio which is useful for measuring a company's ability to generate profits based on the company's share capital (Chowdhury & Nehal, 2020). The higher the ROA value, the better the company's performance in generating net profit after deducting taxes. ROE describes how much profit or profit is generated by the company from each fund invested by shareholders. The existence of the Covid-19 pandemic has significantly reduced bank income, this can be caused by the large number of bank customers who have difficulty fulfilling their obligations to pay credit resulting in a decrease in ROE so the hypothesis in this study is:

**H<sub>4</sub>: There was a decreased in bank ROE during the Covid-19 pandemic**

### **Operating Expense on Operating Income Ratio**

Operating Expenses to Operating Income ratio (OEIR) is a ratio that can be used to see the efficiency of companies or banks in carrying out their activities. Operational costs are interest costs given to customers while the definition of operating income is interest earned from customers. If the OEIR value is smaller, it can be interpreted that the bank is more efficient in operating activities. The OEIR ratio is used to measure how efficient a company is in using its assets. OEIR is a ratio of operating costs to operating income which is used to measure the efficiency level of the Bank. The results of Li's research (2021) show that non-interest income is positively related to performance but inversely related to risk. The COVID 19 pandemic has had an impact on customer credit quality so that if credit quality deteriorates it will have an impact on reducing bank income so that it will affect OEIR so that the hypothesis in this study is:

**H<sub>5</sub>: There was a increased in bank OEIR during the Covid-19 pandemic**

### **Capital Adequate Ratio**

Capital adequacy ratio (CAR) is a ratio that describes the ability of banks to provide funds to overcome possible risks of losses that may arise. This ratio is important because maintaining the CAR ratio at a safe limit of at least 8% means that the company also protects its customers and also maintains the stability of the financial system as a whole. If the CAR value is greater, it will reflect the better ability of the banking system to deal with the potential or possible risk of loss. CAR is obtained by dividing the amount of capital compared to risk-weighted assets (RWA). The existence of a pandemic will certainly have an impact on credit quality which will affect the risk of loss to the Bank. This will affect the company's CAR ratio so that the hypothesis in this study is:

**H<sub>6</sub>: There was a decreased in bank CAR the Covid-19 pandemic**

## **RESEARCH METHODS**

### **Research data**

The population of this study is Regional Development Banks registered with the Financial Services Authority (OJK), with a sample of 20 banks taken by considering the completeness of the data. Research data is taken from quarterly financial reports for 4 years, namely two years before the pandemic and two years after the Covid-19 pandemic (2018 to 2021).

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### Research variable

In this study there are 6 variables used as indicators of banking performance. Here are the variables and their measurements:

**Table 1: Variable Measurement**

No	Variable	Symbol	Measurement
1	Non-performing loan	NPL	Non-perform loan/Total Loan
2	Loan deposit ratio	LDR	Total loan/Total deposit
3	Return on assets	ROA	Earning After Tax/Total assets
4	Return on equity	ROE	Earning After Tax/Total equity
5	Operating expense to operating income ratio	OEIR	Operating expense/operating income
6	Capital Adequacy Ratio	CAR	Total equity/Weighted assets by risk

### Data analysis

The analytical method used is descriptive analysis and statistical tests. Descriptive analysis to provide an overview of the performance of regional development banks obtained in research and also statistical testing to determine its significance. The statistical test that will be used is the independent sample t-test.

## RESULTS AND DISCUSSION

After the data was processed using SPSS versi 23, descriptive statistics were obtained for the bank's performance groups before and during Covid in Table 2, and the results of different test bank performance before and during Covid in Table 3.

**Table 2. Statistik Kelompok Sebelum dan Selama Pandemi**

	COV	N	Mean	Std. Deviation	Std. Error Mean
NPL	Before	160	.031405	.0216550	.0017120
	During	160	.029238	.0164302	.0012989
ROA	Before	160	.023677	.0079833	.0006311
	During	160	.022993	.0067334	.0005323
ROE	Before	160	.159136	.0548882	.0043393
	During	160	.156059	.0470060	.0037161
LDR	Before	160	.824067	.1200231	.0094887
	During	160	.812957	.1156082	.0091396
CAR	Before	160	.212607	.0373769	.0029549
	During	160	.221515	.0342227	.0027055
OEIR	Before	160	.780588	.0699582	.0055307
	During	160	.770504	.1120655	.0088596

**Source:** Data processed

Based on table 2, it is known that during the Covid-19 period, bank NPLs have decreased, while profitability as measured by ROA and ROA has decreased slightly. LDR also decreased, while CAR increased and OEIR decreased.

**Table 3. Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
NPL	Equal variances assumed	5.746	.017	1.008	318	.314	.0021668	.0021490
	Equal variances not assumed			1.008	296.496	.314	.0021668	.0021490



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ROA	Equal variances assumed	1.818	.179	.830	318	.407	.0006850	.0008256
	Equal variances not assumed			.830	309.206	.407	.0006850	.0008256
ROE	Equal variances assumed	2.304	.130	.539	318	.591	.0030769	.0057131
	Equal variances not assumed			.539	310.652	.591	.0030769	.0057131
LDR	Equal variances assumed	1.543	.215	.843	318	.400	.0111104	.0131745
	Equal variances not assumed			.843	317.554	.400	.0111104	.0131745
CAR	Equal variances assumed	.608	.436	- 2.223	318	.027	-.0089078	.0040064
	Equal variances not assumed			- 2.223	315.560	.027	-.0089078	.0040064
OEIR	Equal variances assumed	3.407	.066	.965	318	.335	.0100836	.0104441
	Equal variances not assumed			.965	266.586	.335	.0100836	.0104441
<b>Source:</b> Data processed								

Table 3 shows that the risk of lending during the COVID pandemic was measured using the NPL ratio which resulted in a significance value of 0.017 where the result was below the 0.05 significance level. This can be interpreted that there is a significant difference in NPL values before and during the pandemic. The results of the study can be seen that the NPL value before the pandemic was 3.14% and during the pandemic it was 2.92%, so the hypothesis in this study was rejected. The decline in NPLs was due to government programs related to credit restructuring policies by regulators so that MSMEs were given payment leeway. The research results are in contrast to the results conducted by Barua & Barua (2020) where the presence of Covid - 19 resulted in an increase in non-performing loans (NPL), decreased interest income and capital adequacy ratio (CAR). The research results are not in line with research conducted by Riftiasari & Sugiarti (2020), showing that the performance of Conventional BCA and Syariah BCA in NPL and OEIR does not have a significant difference.

The Loan Debt Ratio (LDR) in this study resulted in a significance value of 0.215 above the significance level of 0.050, which means that there was no significant difference in LDR before and during the pandemic. This result is different from the results of research by Sutrisno et.al. (2020) where FDR for Islamic banks experienced a significant decline before and during the pandemic. The results of this study resulted in an average LDR value before the pandemic of 82.40% and during the pandemic of 81.29% so that the hypothesis was accepted. From these figures it can be concluded that the COVID 19 pandemic resulted in a decrease in LDR where the LDR before the COVID 19 pandemic was 82, 40% before the pandemic and the result after Pandemic Covid 19 was 81.29%.

One of the measuring tools for profitability in this study is return on assets (ROA). ROA produces a significance value of 0.179 where the value is above the 0.050 significance level so that it means that there was no significant difference in ROA before and during the pandemic. The average ROA before the pandemic was 2.36% and during the pandemic it was 2.29% so that the hypothesis is accepted. The results of the study are in line with the results of research conducted by Slamet Ristanto & Sutrisno (2021) where profitability as measured by return on assets (ROA) has a significance value of 0.179, above the 0.050 significance level, which means that there is no significant difference in ROA before and during a pandemic.

Besides ROA, the measuring tool for assessing profitability is ROE (Return On Equity). ROA produces a significance value of 0.130 where the value is above the significance value of 0.050 which means there is no significant difference in ROE before and during the pandemic. The average value of ROE before the pandemic was 15.9% and during the pandemic was 15.6% so that the hypothesis was accepted. The results in this study where there is no significant difference are supported by research conducted by Slamet Ristanto & Sutrisno (2021) at Conventional Banks in Indonesia which produces a significance value of 0.212. This value is greater than the significance level of 0.05 so that it can be interpreted that there is no difference in ROE between before and during the pandemic. These results are in line with the research results of Surya & Aziyah (2020).

The results of the study on the OEIR variable yielded a significance value of 0.066 above the 0.050 significance level, so this meant that there was no significant difference in OEIR before and during the pandemic. The average OEIR before the pandemic was 78% and during the pandemic it was 77% so the hypothesis was rejected. The decline in OEIR was due to a regulatory policy

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related to a reduction in the BI reference rate, which resulted in a decrease in interest costs. The results in this study where the results were not significant were supported by research conducted by Riftiasari & Sugiarti (2020) where these results found that before and during the pandemic there was no significant difference in OEIR.

Whereas the Capital Adequacy Ratio (CAR) produces a significance value of 0.436 percent above the significance level of 0.050, which means that there was no significant difference in CAR before and during the pandemic. The average CAR before the pandemic was 21.2% and during the pandemic it was 22.1% so the hypothesis was rejected. The increase in CAR was due to policies related to reducing the risk weight calculation of RWA for certain businesses so that it affected the bank's RWA value. This research is in line with the results of research conducted by Ristanto & Sutrisno (2021) where the results of the capital adequacy ratio (CAR) yield a significance value of 0.989 greater than 0.050 which indicates that there was no difference between before and during the pandemic. Different results were shown by research conducted by Riwandari Juniasti (2022) where there were differences in CAR before and after the Covid 19 Pandemic.

## CONCLUSIONS AND RECOMMENDATIONS

In general, there was a decline in company performance due to the Covid-19 pandemic, but in this study, based on the results of the t test, it can be concluded that only NPL was significantly affected, while other variables, namely LDR, ROA, ROE, OEIR and CAR, had no significant effect. There was a decrease in ROA, ROE and LDR but the effect was not significant. The results of this study can be concluded that Conventional Development Banks are still able to control their financial performance during the COVID 19 Pandemic. This is different from research conducted on banks listed on the Indonesia Stock Exchange by Slamet Ristanto & Sutrisno (2021) where the OEIR Variable has significant differences while for the variables LDR, ROA, ROE, CAR have the same results as the research conducted, which has insignificant differences.

Benefits For banking management, especially Conventional Regional Development Banks in Indonesia, this research can be used as information in making decisions and used as an evaluation of banking performance in dealing with the impact of the COVID 19 pandemic.

As for Academics as an additional reference for knowledge about the Effect of COVID 19 on Conventional Regional Development Banks in Indonesia. For further research, this study used the variables NPL, ROA, ROE, LDR, CAR, and OEIR so that for further research research could be carried out on other financial variables.

## REFERENCES

- 1) Abugamea, G. (2018). Determinants of Unemployment: Empirical Evidence from Palestine. *Munich Personal RePEc Archive*, 1-11.
- 2) Aldaroso, I., Fender, I., Bryan, H., & Tarashev, N. (2020). Effects of Covid-19 on the banking sector: the market's assessment. Bank for International Settlements No 20.
- 3) Azis, M. I., Rohansyah, M., Muthalib, D. A., Rosikah, & Prananingrum, D. K. (2018). Effects of return on asset, return on equity, earning pershare on corporate value. *The International Journal of Engineering and Science (IJES)*, 7(3),06-14
- 4) Balboula, Mohamed, Z & Metawea, M, S. (2021). The Impact of Covid-19 pandemic on Bank Performance: Evidence from Listed Banks on the Egyptian Stock Exchange. *Delta University Scientific Journal Volume 4 Issue 1 April (2021)*
- 5) Barua, B & Barua, S. (2020). *COVID -19 Implications for Banks: Evidence from an Emerging Economy*. SN Business& Economic, a Springer Natur Journal, 30 November 2020
- 6) Candra, M., Muslimin, A., Permatasari, D (2021). Banking Financial Performance Before and During the Covid 19 Pandemic in Indonesia: Analysis of Comparison Between Islamic and Conventional Banking. *IT in Industry, Vol. 9, No.1, 202*
- 7) Chappelow J. (2020), "Liquidity crisis", *Investopedia*, 6 Desember, tersedia di: <https://www.investopedia.com/terms/l/liquidity-crisis.asp> (diakses 5 Februari 2021).
- 8) Choudhary, N (2022). Performance Of Banks In India During The Covid-19 Pandemic. *International Journal Of Creative Research Thoughts Volume 10, Issue 3 March 2022 | ISSN: 2320-2882*
- 9) Chowdhury, A.H.M.Y and Nehal, N.M. (2020). *Effect of Corporate Social Responsibility Expenditures on Financial Performance in Banking Sector of Bangladesh*. Journal Of Economics, Business and Management, Vol.8, No.1, Februari 2020.
- 10) Darjana, D., Wiryono, S. K., & Koesrindartoto, D. P. (2022). The COVID-19 Pandemic Impact on Banking Sector. *Asian Economics Letters, 3(Early View)*.
- 11) Deanta (2016). Memahami Pos-pos dan Angka-angka dalam Laporan Keuangan untuk Orang Awam. Yogyakarta : Gavamedia.

## Modification of Water Rescue Tool for Saving the Drowned People at the Swimming Pool

- 12) Disemadi, H. S., & Shaleh, A. I. (2020). Banking credit restructuring policy amid COVID-19 pandemic in Indonesia. *Jurnal Inovasi Ekonomi*, 5(02), 63–70. <https://doi.org/10.22219/jiko.v5i3.11790>
- 13) Haeri, R (2021). Kinerja Bank Pembangunan Daerah (BPD) di Indonesia Di Masa Pandemi Covid 19. eL\_Huda, Volume 12, Nomer 01/2021.
- 14) Hasan, H, A., Mansyur , S., Mustamin, S, W., (2021), Dampak Pandemi COVID -19 terhadap pertumbuhan dana pihak ketiga pada Bank Syariah. *Jurnal Keuangan dan Perbankan Syariah Volume 9, No. 1, Tahun 2021*
- 15) Insani, Denti, Sri., (2021), How Liquidity, Bank Efficiency, and NPF Ratio Impact on Islamic Commercial Bank Performance During the Covid-19 Pandemic?, *Advances in Engineering Research, volume 207*
- 16) Juniasti, Riswandari (2022). Analysis of the Financial Performance of National Rural Banks (BPR) before and during Covid-19 pandemic. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*
- 17) Jusuf, J. (2014). *Analisis Kredit Untuk Credit (Account) Officer*. Jakarta: Penerbit Pustaka Utama.
- 18) Karim, M, R., Shetu, S, A., & Razia, S (2021). COVID-19 liquidity and financial health: empirical evidence from South Asian economy. *Asian Journal of Economics and Banking Vol. 5 No. 3, 2021 pp. 307-323*
- 19) Korompis, RR, Pure, S., & Untu, VN (2020). The Effect of Market Risk (NIM), Credit Risk (NPL), and Liquidity Risk (LDR) on Banking Financial Performance (ROA) at Banks Registered in LQ45 for the 2012-2018 Period. *Journal of Research in Economics, Management, Business and Accounting*, 8(1), 175-184.
- 20) Lee, M. (2018). Profitability Determinants of Commercial Banks: in the Context of Bangladesh. Korea: Inha University.
- 21) Li, X., Feng, H., Zhao, S & Carter, D. A.,. (2021). The effect of revenue diversification on bank profitability and risk during the COVID-19 pandemic. *Finance Research Letters*
- 22) Rahmi, Yulia & Sumirat, Erman. (2021). A Study Of The Impact of ALMA To Profitability During The Covid -19 Pandemic, *International Journal of Business, Economics and Law, Vol. 24, Issue 3.*
- 23) Riftiasari & Sugiarti (2020). Analisis Kinerja Keuangan Bank BCA Konvensional Dan Bank BCA Syariah Akibat Dampak Pandemi Covid-19. *Jurnal manajemen bisnis (Jmb)*, Volume 33 No 2, Desember 2020
- 24) Ristanto,S dan., Sutrisno 2021, Does Pandemic Covid-19 affect Bank Performance? Case Study on Conventional Banks In Indonesia, *International Journal of Economics, Business and Management Research*.
- 25) Rizwan, Muhammad, Suhail., Ahmada, Ghufran., & Ashraf, Dawood. (2020). Systemic risk: The impact of COVID-19. *Finance Research Letters*
- 26) Sofyan, M. (2019). Analysis of Financial Performance of Rural Banks in Indonesia. *International Journal of Economics, Business and Accounting Research*, 3(3), 255-262.
- 27) Surya, Y.A. dan Aziyah, B.N. (2020) Analisis Perbandingan Kinerja Keuangan Bank BNI Syariah Dan Bank Syariah Mandiri Di Masa Pandemi Covid-19. *Iqtishadia: Jurnal Ekonomi & Perbankan Syariah Vol.7 No.2 Desember 2020*
- 28) Sutrisno, Panuntun, B. & Adristi, F.I. (2020). *The Effect Of Covid-19 Pandemic on The Performance of Islamic Bank in Indonesia*. *Jurnal EQUITY*Vol. 23, No.2, 2020, page 125-136



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## Exploring the Feasibility of the Taking Sides Strategy in Southeast Asian Countries -- Malaysia's Response to the US-China Conflict as an Example



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**ABSTRACT:** Although it has been widely accepted in international relations discourse that Southeast Asian states generally adopt hedging strategies when faced with conflicts from external powers, however, this paper argues that when the intensity of confrontation and conflict between major powers exceeds the capacity threshold of small states, they tend to adopt either direct or ambiguous taking sides strategies in order to maintain their security by actively adhering to or being forced to follow a major power. According to Robert Putnam's two-level games theory, leadership characteristics, capability threshold, state trust, structural pressure and system stability are the main factors that influence whether a small Southeast Asian country adopts a strategy of taking a side. Malaysia, for example, has adopted either direct or ambiguous taking sides strategies in response to the Sino-US conflict. By siding ambiguously with China or the US at different times, Malaysia has effectively consolidated its economic cooperation with major powers such as China and the US and gained actual economic benefits, reducing the risks and uncertainties posed to Malaysia by the great power game.

**KEYWORDS:** taking sides strategy, hedging strategy, big power conflict, small power response, two-level games theory, Malaysia

### 1. INTRODUCTION

For other non-conflicted states in the international political system, how to choose their own position and side when two or more states are in conflict becomes a crucial issue. In international relations (IR), competition and conflict between states are inevitable political phenomena in international politics. The repercussions of violent conflicts and collisions between these countries greatly threaten and influence the interests of other small and medium-sized countries and pose great hazards to their security, particularly when the two or more countries involved are all major ones. Hence, in order to deal with such competitions and confrontations between large powers and to better safeguard their own security and interests from threats and infringements, small and medium-sized countries in international relations need to think carefully about what strategy to pursue. In response to rivalry from big powers, these nations have evolved to choose the "taking sides" strategy rationally and appropriately. The "taking sides" approach does not appear to be the best option for many small countries in Southeast Asia when dealing with big power conflicts because it is challenging for Southeast Asian nations to pick a particular side in the big power game because of the relatively close ties brought on by the compound interdependence between nations. To mitigate the risks caused by significant power struggles, they frequently employ "balancing" or "hedging." Because of its unique geographic location and complex international environment, Southeast Asia is a conflict-prone and resource-intensive region in international politics. Many countries rely on Southeast Asia's location and resources to develop their import and export trade and foreign economies, which is why it has been extensively discussed and noted by scholars of international relations.

While studying the confrontation between powers in Southeast Asia, scholars have typically focused on two views, according to a literature review. The first viewpoint is founded on the well-established "balancing" method. The so-called "balancing" strategy describes how Southeast Asian nations support or disagree with the foreign policies of powerful nations in order to formulate their own reactions to great power competition. From a realism standpoint, academics have offered two contrasting interpretations on the "balancing" technique. Realists like John Mearsheimer (2014) stresses that as China becomes more powerful, it will challenge the US's right to be the world's leader. This would lead to a violent struggle between the US and China, with Southeast Asian nations eventually joining the US to resist China's growth. The opposing viewpoint is anti-realist, like that of

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Samuel Huntington (1996), who contends that the supremacy and maintenance of Chinese tribute civilization in East Asian culture is why so many Southeast Asian nations have decided to endure and advance in the face of China's growth. The second viewpoint originates from a hedging tactic. A single "balancing" strategy does not appear to be able to adequately explain the external strategies of all countries in international relations as international politics becomes more complex. This is especially true when some small and medium-sized countries adopt a hazy stance between balancing and follow in order to protect their own security and interests in the face of the great powers. To categorize these instruments as "hedging" methods, some academics have established the idea of "hedging" in finance. The prevalent perspective on the term "hedging," however, bases its meaning on that of finance and suggests a different one for use in international relations, highlighting that it is more of a weapon for tiny governments facing out against powerful nations. Hedging is a relatively independent policy and method of avoiding being forced to take sides and maintaining relative independence in order to avoid the impact and harm to small countries' national interests caused by the great powers' fierce competition in the face of the uncertainty and instability caused by the rise of the great powers (Kuik,2008). Nonetheless, other academics have varied perspectives on "hedging" because of the process. Some scholars investigate the use of hedging methods in Southeast Asia from a risk viewpoint and suggests two logics: "risk offsetting" and "risk transformation" (Shi,2016). Wang Yuzhang (2021), for instance, claims that hedging is a delayed-following strategy. He argues that hedging strategy is a type of strategic behavior used by small and medium-sized strategic players to transform and offset risks based on a variety of difficulties and their own vulnerability. The factors and tools that affect how tiny governments deploy "hedging methods" outside have also been discussed by certain academics. In contrast to other researchers, they have suggested five tools for implementing hedging strategies: engagement, restraint, prevention, containment, and checks and balances (Wang,2018; Yang,2020). Yang (2020) also claims that structural pressures and national capabilities are the primary factors influencing the implementation of hedging strategies. The Australian National University's Evelyn Goh is a representative foreign expert on "hedging strategy," and her main point of view on "hedging" is that the basic goal of "hedging" is for a nation to take a number of steps to avoid picking one side over the other too early in the great power conflict, keeping a reasonably neutral stance in the process. She also outlines three "hedging" strategies used in Southeast Asia. The first is a non-directive or soft balance, focusing on collaboration with other powers like the US as a deterrent to the growing expansion of Chinese power in the region; the second is the hope that Chinese leaders will act more in accordance with inherent international principles when drafting China's foreign strategy, avoiding the imposition of more Chinese power on international cooperation and countering offensive Chinese dominance with a constructive hive mind(Goh,2016). On the other hand, is of the opinion that "hedging" is primarily used by Southeast Asian nations to avoid Chinese hegemony, US withdrawal from the region, and an unstable regional order. Goh contends that "hedging" in Southeast Asia is based on the interaction and linkage between these three factors or checks and balances. Wu's research is more concerned with the threat or significant challenge posed by China's rapid expansion than with the need for minor nations to decide which side to support in the face of rivalry between superpowers. Cheng Chwee Kuik, a renowned Malaysian expert in the subject of "hedging," is another notable researcher. He contends that Malaysia's "hedging strategy" is not a reaction to China's rise but rather a reflection of the Malaysian political elite's assessment of whether China's ascent represents a threat or an opportunity for the governing class. In order to avoid five outcomes—the risk of becoming involved in Sino-US conflicts, the uncertainty of long-term US commitments, the risk of alienating recent rising powers, the risk of dependence on the dominant power, and the deterioration of domestic authority—Malaysia should instead develop a comprehensive partnership with China while reducing its military reliance on the US (Kuik,2008; Kuik,2016). Goh 's study considers the growth of great powers as an important indicator of whether it is a threat or an opportunity, whereas Kuik's view is more from the standpoint of the domestic governing elite.

However, some academics have used the term "balanced diplomacy" in a more general sense to define the methods and tools required for some Southeast Asian states to deal with the development of big powers as well as the "hedging" strategy. Scholars of international relations have concentrated more on studies of "balanced diplomacy" by minor governments, such as those in Southeast Asia or Central Asia, or on "balanced diplomacy" dominated by a single state. The effectiveness of "balanced diplomacy" is also emphasized, highlighting the degree to which the presence of ongoing international events or interstate rivalries can positively impact the application of "balanced diplomacy" by minor governments. The following categories can be used to categorize the mainstream viewpoints:

One school of thought, some scholars contend that terminology such as "great power," "balanced," and "diplomacy" must be defined in order to distinguish it from "balanced" and "controlled" diplomacy. However, they underline that protecting national interests is the primary goal of "balanced diplomacy" for tiny states, and they suggest four the elemental approach, systemic determinism, the wide demand perspective, and the survival and development perspective are the key study philosophies (Jin&Sun, 2017). According to Li (2016), there are numerous ways to implement the "balance of great power diplomacy" for tiny states,

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including balances, following, hedging.

The second category is supported by academics like Qie Qingliang, who contends that the dynamic balance of major powers in a given area—a relative dynamic balance that is always evolving and changing over time—is the essence of the balance of power. (Qie,2005; Shekhar,2012)

The third classification is based on academics like Wang Chuanjian, who proposed the concepts of "symmetrical balance" and "asymmetrical balance" under "balanced diplomacy of great powers" and used the seesaw principle to examine the two dynamic balances of "dominant factors" and "additive factors" (Wang&Zhang,2021).

The fourth type is dominated by academics like Wang Shuchun and Wang Hongchun(2016) who emphasize the role of the international system in influencing state behavior from a theoretical and practical point of view, further examining the nature and characteristics of sub-systems or regional systems within the state system and analyzing the differences between the multilateral and bilateral alliance systems under the influence of geopolitical trends.

In conclusion, it is widely believed by scholars of international relations that Southeast Asian nations frequently adopt hedging strategies as a necessary reaction to the rise of great powers and conflicts, while the strategy of taking sides is not thought to be applicable to the current state of international politics, and relatively little research has been done in this area. In light of Robert Putnam's two-level game theory, the research question of this paper is whether Southeast Asian nations will use the strategy of taking sides in order to resolve great power disputes. Additionally, it explores and analyzes potential influences on this strategy in Southeast Asian nations.

### 2. DIFFERENT MODELS FOR THE DEVELOPMENT OF RELATIONS BETWEEN SOUTHEAST ASIAN COUNTRIES AND MAJOR POWERS

The Southeast Asian nations have been working and developing towards integration since 1967, when Malaysia, the Philippines, and Thailand founded the Association of Southeast Asian Nations (ASEAN) in Bangkok, and since 1976, when ASEAN was established, in the hopes of establishing a reliable management mechanism to coordinate the external policies and directions of the member states. Nonetheless, because states are logical actors in international politics, they will choose the best strategies to advance their own interests. There are three distinct models, including the friendly and supportive type, the conflictive and contradictive type, and the cooperative and pragmatic type, but due to each country's unique historical growth and national conditions, the specific performance in handling big power disputes is also diverse (Zhang,2020).

#### 2.1 Friendly and supportive

When dealing with large powers, these nations are more likely to support one another. They are also more likely to take a major power's side and adopt that power's mindset as their own position and focus while negotiating and expressing their opinions on crucial international issues. Since China has provided significant economic and financial support to Burma, Laos, and Cambodia during both their historical development and the establishment of their modern economies, these nations—including Burma, Laos, and Cambodia—have generally more favorable and trusting attitudes toward China than other Southeast Asian nations. Particularly, a sizable number of Chinese multinational corporations have entered the countries and assisted in enhancing the infrastructure requirements for their economic development, so boosting the economies of these nations. Also, China has frequently stated that it stands with these nations fully in the international arena, and this political mutual trust has assisted them in building a foundation for beneficial and cooperative relations with China.

#### 2.2 Conflictive and contradictive

The vast disparity between these countries' comprehensive power and that of the major powers has resulted in certain structural contradictions between them and the major powers, which will always prevent these countries from putting aside their concerns about the rise of major powers, directly affecting their practical cooperation with the major powers. As a result, these countries are more cautious and concerned when developing relations with the major powers. The continuance of contradictions may potentially result in direct conflict and confrontation between the two countries as well as an unstable foundation for the development of ties with major powers. The two most significant Southeast Asian nations in this group are Vietnam and the Philippines. Due to direct disputes with China over territory disputes in the South China Sea, which resulted in discussions and even direct armed battles with China, both Vietnam and the Philippines are very circumspect and conservative in their interactions with China. This fundamental contradiction has made it so that Vietnam and the Philippines will not readily side with China in particular international negotiations but will instead follow other powers like the United States or insist on their own positions to express their attitudes and views. Such differences and contradictions have since turned into obstacles and factors affecting the development of these nations as well as China.

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### 2.3 Cooperative and pragmatic

These nations are characterized by the fact that, despite having some contradictions and differences with major powers, these issues are not the primary barrier to or influence preventing the development of relations with major powers. Instead, these nations give more thought to the benefits and interests that developing relations and cooperation with major powers can provide to themselves, and this has evolved into the primary driving force for their interaction with major powers. Indonesia, Singapore, Malaysia, Thailand, and Brunei make up the majority of these nations. They occasionally have disagreements with China, such as over the South China Sea, but unlike Vietnam or the Philippines, who perceive China differently, these nations do not use coercive measures to engage in direct war with China over the South China Sea. The cooperative and pragmatic nations of Southeast Asia are more cautious not to let the differences between the two nations obstruct the growth of their relations with China and emphasize the significance of real economic collaboration. maximize financial gains.

In short, while dealing with great powers like China, Southeast Asian nations exhibit three distinct patterns of behavior, and these patterns of behavior will also affect their attitudes and positions toward great powers like China.

**Table 1 Three patterns of treatment of great powers in Southeast Asian countries**

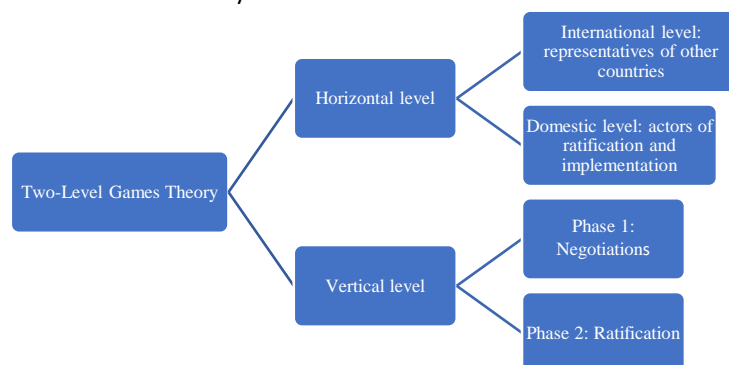
Three models for dealing with great powers	Specific countries
Friendly and supportive	Laos, Cambodia, Myanmar
Conflictive and contradictive	Vietnam, Philippines
Pragmatic and cooperative	Indonesia, Singapore, Malaysia, Thailand, Brunei

Source: Zhang,2020

### 3. THE STRATEGY OF "TAKING SIDES" IN SOUTHEAST ASIAN COUNTRIES FROM THE PERSPECTIVE OF TWO-LEVEL GAME THEORY

Since it is the main method of establishing contacts with other nations, any country's choice of external strategy is crucial to its development plan. Correct implementation can effectively encourage the growth of bilateral ties between the nation and other nations. A badly planned external policy, on the other hand, can result in strained ties with foreign nations or even enmity or violent war between the two sides. The state must therefore carefully evaluate which foreign policy to implement in order to further its objectives. Many academics have examined the decision of a state's foreign policy from many angles in the field of international relations. Instead of analyzing the implications for foreign strategy in terms of domestic politics alone, as scholars of international relations have done in the past, Robert Putnam is keen to observe that there is a link between domestic and international politics and that this link has implications for foreign strategy. Robert Putnam, on the other hand, has studied how foreign strategy is conducted from the perspective of how domestic and international politics interact. He proposed his classic Two-Level Games Theory "powerfully explains how a state's external strategy is influenced by both domestic and international politics.

In Figure 1, Putnan divides the "two-level game theory" into vertical and horizontal levels. Putnan assumes that negotiators on behalf of the state play a two-way game at both the domestic and international levels, with the horizontal level being the level at which negotiators negotiate with representatives of other states to negotiate specific issues at the international level, and with those actors who ratify and implement at the domestic level(Putnan,1988).The first phase of the game and the second phase's full acceptance by the domestic electorate hold the key to a "winning set." Only if the game is well played and accepted by the majority of voters will the negotiations' outcome be noteworthy.



**Figure 1. Models for Two-Level Games Theory**

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According to the "two-level game theory," as nations formulate their foreign and domestic policies, they are impacted by both internal and external influences. The "choosing sides" approach is still seen as an alternative national strategy, despite the fact that Southeast Asian nations currently have a relatively excellent strategic option in the "hedging strategy" given the current state of world politics. A country will choose its own strategy to protect its security and interests based on changes and developments in the actual situation as a rational actor in international politics, and only when the conditions are met will the "hedging strategy" become a viable alternative for Southeast Asian nations. Domestically, these conditions include leadership qualities, capability thresholds, and state trust. Internationally, these conditions include structural pressure and system stability, as indicated in Figure 2, and each limitation is discussed below.

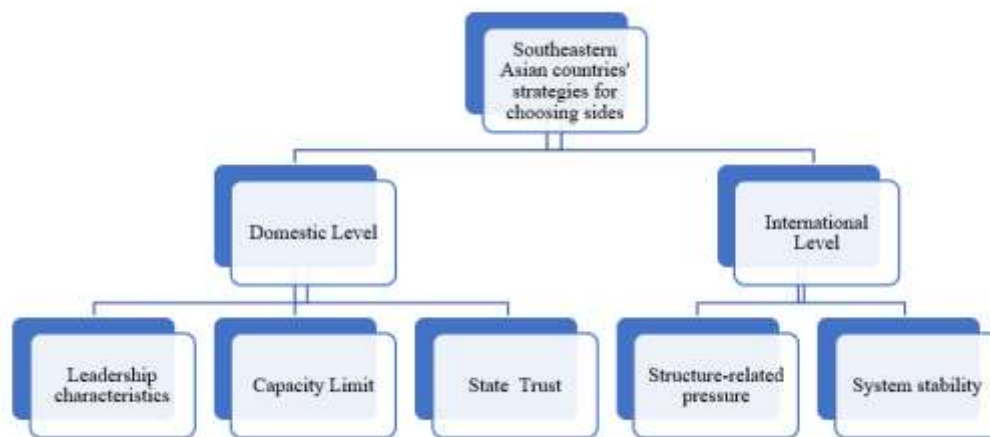


Figure 2. Influencing Factors of the "taking sides" approach.

### 3.1 Leadership characteristics

Leadership characteristics often refer to the temperament or character of the head of state or government. The formation of national policies and directives as well as the political life of the nation are both slightly impacted by this temperament or character. Max Weber distinguished three formal types of political dominance and authority: legal, traditional (patriarchal, patriarchal, and feudal), and charismatic (family and religion) (modern law and state, bureaucracy). Charismatic authority, also known as charisma, highlights the outstanding talent and reputation of the leader, attracting people to follow him and even live by him, relying in his own power to lead them to a wonderful life based on his reputation. The general policy or foreign policy of a state is not decided by strict elections, etc., but rather by the personality of the leader if the political figurehead is of the Karisma variety. In the case of the taking sides strategy, this implies that the Southeast Asian nation must adhere to or depend on one of the major powers in order to survive. If the leader of a country in Southeast Asia has gained the people's trust through his high political prestige and strong personal skills, he can establish friendly relations with the leaders of the major powers by virtue of this trait. The "pick a side" strategy can thus be applied in this situation, with smaller states choosing whether or not to adhere to the larger state with which they have a friendly relationship based on the traits of their leaders. As a result, this personal friendship based on the political leader can somewhat be transformed into friendship and cooperation between states.

### 3.2 Capability Limit

A higher capability threshold means the state is better prepared and equipped to handle external crises and risks, and that it can take better action to resolve emergencies quickly and lessen their negative effects. A lower capability threshold means the state is not sufficiently ready to handle external crises and events. The country is less equipped to handle external crises and events the lower the capacity threshold, and the riskier the situation, the greater the possibility that it would endanger national security. A nation's overall strength determines its capacity threshold. A nation will be better able to protect its own security and its many interests if its economic, military, and cultural strengths are strong. This will also give it a stronger foundation and more diverse tools with which to confront external crises. Similar to this, if an external crisis is more severe than a country can handle, that country will lack the tools necessary to handle it and will need to rely on other nations with higher capacity thresholds to assist it in managing the crisis safely; otherwise, it will be in danger. In the case of ASEAN, which is characterized by an alliance of small states with varying capacities, the use of hedging strategies is still common in Southeast Asian countries because they continue to believe that international political conflicts have not escalated to a serious level or have not passed the threshold of their capacity and that they have enough capacity to handle such emergencies. They prefer to rule Southeast Asia as little states and limit the influence of other forces. This structural stability is predicated on their capability threshold, therefore if a political incident occurs



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in the future that sparks a regional or world war, the little nations of Southeast Asia won't be able to stop it or deal with the aftermath.

### **3.3 State trust**

A nation's level of goodwill toward another nation based on political and economic concerns is referred to as its "national trust." A country's high level of national trust in another country indicates solid bilateral relations between the two nations, and the two will continue to communicate and keep close touch as a result. A country will be cautious and concerned about establishing bilateral connections owing to potential disputes with the other country if it has a low degree of state trust in that country, which will have an impact on the sustainability of the relationship. National trust is typically measured by the level of interaction between nations (economic, political, military, and diplomatic). The more frequently two nations cooperate and communicate with one another on an economic, political, and military level, the more stable the foundation of their mutual trust will be, and the more national trust will grow. Nonetheless, the degree of trust only has a limited impact on a nation's foreign policy and does not fundamentally dictate it. When it comes to following or depending on tiny countries in Southeast Asia, major countries that have regular and close ties with them will always take precedence; yet huge countries who lack state trust with small countries won't be the target or the object of their selecting sides.

### **3.4 Structure-related pressures**

Little states are subject to external pressures in addition to domestic ones. Pressure on structures is the first. It is sometimes referred to as "structural pressure" when conflicts between the comparatively stronger states within a structure result in varied degrees of threat and oppression for the relatively weaker states. This is how nations and countries form their bilateral interactions with one another. Small and medium-sized countries share the same international political structure as a very small number of large countries. As a result, the game and conflict between some of these large countries will pose significant risks and concerns for other small and medium-sized countries as well as exert significant structural pressure on small countries. Due to this pressure, tiny countries in the major power clash will be forced to make wise decisions and take them into account; if they don't, their combined overall might would make them weak. Small states cannot afford to face the expenses and penalties of failure to take sides in the event of failure due to their combined weakness. The benefits of the dominant power's dominance of the international order will instead be enjoyed by the small state as a result of this relationship of dependence if a small state is successful in siding with a major power and that power is successful in defeating another major power in the international political contest to become the dominant power. The risk of taking sides is therefore equal, and for small states, in addition to domestic factors, the structural pressures brought about by the competition of the great powers make it necessary for them to carefully consider whether they can cope with and bear such structural pressures. If they are unable to do so, they must adjust their foreign policy and positioning, for example by surviving in dependence on the great powers in order to maintain the state. Yet, if a small state rejects dependence, it may need to change its foreign policy and positioning in order to survive and sustain the stability of the entire system, such as by relying on a major state (Wen,2022). On the other hand, if a small state rejects dependence on or support from a large state, the large state will unavoidably take steps to restrain the small state's development for the stability and growth of the entire structure in order to prevent interfering with its management and dominance of international politics.

### **3.5 Systemic stability**

Furthermore, systemic stability refers to the notion that governments and countries create a hierarchical system in international politics through certain interactions, in which various states interact and preserve the stability of the system in accordance with particular laws. There will be an effect on the system once several states are engaged in conflict and struggle within it, which will damage the system's stability. In modern international politics, systemic stability is vital because, as the division of labor has become more intense, there is a certain amount of reliance between nations, and this connection helps to keep the system stable to some extent. But, if there is a fundamental lack of stability in international politics, wars and battles between nations will occur much more frequently, and as anarchy develops, international politics will become chaotic. There are large systems and small systems in contemporary cultures; the former is composed of regional interstate cooperation groups or alliances, while the latter are composed of international multilateral institutions with the United Nations or the World Health Organization at their core. The smaller systems must be integrated into the bigger systems in order to preserve their stability because they are interdependent and rely on one another for survival. There are sporadic conflicts and battles in international politics since it is not always stable. For instance, some strong countries employ certain methods to incite regional wars and struggles in order to profit from them in order to control world politics, which gravely jeopardizes the stability of the system in which they are situated. If the other little countries in the system don't work with the large powers and start impeding them, the big powers will take action to get rid of this

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unstable element. As a result, in order to maintain their own system's security and stability through the strong might of the large powers in the system, they must either be compelled or take the initiative to side with those forces.

The rationale behind the "taking sides" strategy for Southeast Asian nations as a whole is that the small states and the big states there share a common structure and system, and that when the big states clash and fight with other big states for their own political purposes, the small states will be subject to structural pressure from the big states' games and conflicts. The system in which the tiny nations are situated is also subject to the effects of disputes between powerful states, thus it is unavoidable that they will need to take certain measures to lessen the structural strain and instability of the system. The tiny states can no longer maintain their neutrality as before and must choose a side among the great powers when the conflict between the major powers escalates beyond their ability to handle it. In a nutshell, "taking sides" is a strategy for boosting one's resilience to danger and defending one's security and interests. In other words, when faced with the issue of survival, small governments will inevitably choose the "take a side" option. It allows tiny states another way to think when deciding how to respond to competition from major states and gives them another way to advance their national security and interests (Zhang&Hu,2021).

### 4. CASE STUDY: MALAYSIA'S RESPONSE TO THE US-CHINA CONFLICT

In order to retain its own security or advance its own greater national interests, a small or medium-sized country will often take the initiative to follow or be forced to follow the side of a rival power when it is involved in conflict with or competing with a major external power. Direct taking sides and ambiguous taking sides are the two main divisions in the approach of choosing sides. The so-called "direct siding strategy" describes how small and medium-sized countries directly show their support for a major power in times of competition and conflict, use the major power's foreign policy as a model for their own foreign policy, and engage in international politics in accordance with its coordinated planning. For instance, as agents of Nazi Germany during the Second World War, Bulgaria, Romania, and Hungary participated actively in the armed war against the Soviet Union. In order to curb China's ascent and overseas development, traditional US allies like the UK, Australia, New Zealand, and Japan have frequently adopted the opinions or negotiating tactics of the world's superpower. The ambiguous taking sides strategy, as opposed to the direct taking sides strategy, is more frequently employed by small and medium-sized countries that do not express direct views or attitudes when confronted with a conflict with a major power but instead adopt a relatively ambiguous or neutral attitude to express their position. This avoids direct pressure and resentment from the rival power and can maintain national security in a manner that is reasonably effective (Emmers,2018;Feng,2021;Fan,2021). As participants in international politics, small states' combined power and influence are constrained, making ambiguous siding more effective in protecting their actual security and interests. Direct siding carries greater political risk and expense, and if a small state chooses to side with a large state that loses a competition or conflict with its rival power, the small state as a subordinate state will suffer. Being a subordinate state, the small state will undoubtedly incur significant costs if it chooses to align with a great power that loses a battle or struggle with its rival power. As a result, ambiguous siding strategies lower the risks and risks related to siding and are a safer and more sensible way to preserve national security than direct siding strategies. Yet, abrupt crises are a feature of international politics, and small governments' uncertain policies are founded on their ability to survive them. Small states are obliged to pick a side among contending powers when the international scene becomes tense and polarized, and their choice of strategy shifts from ambiguous to direct. For small states, the actual international political environment will determine whether they should take a clear or ambiguous stance.

Due to Malaysia's regular engagements and exchanges with both China and the United States, an examination of Malaysia's siding strategy will also shed light on the circumstances under which Southeast Asian nations use siding methods in the face of significant power disputes. Malaysia's stance-taking method consists of two primary stages. The direct selection of sides was the first stage, which lasted from 1957 to 1974. The phase of picking uncertain borders lasts from 1981 until 2023.

From 1957 to 1974 made up the first phase. Malaysia primarily used a direct strategy of taking sides at this time. Tunku Abdul Rahman, the country's first prime minister, was instrumental in helping Malaya free itself from British colonial rule. Abdul Rahman adopted the capitalist political system and ideology of Western nations, which were influenced by the political philosophy of the former British colonialists, as a means of establishing Malaysia's political foundation. Abdul Rahman, who was influenced by the Cold War between the United States and the Soviet Union, had little faith in and good will for socialist nations like China and the Soviet Union and saw socialism as a major threat to Malaya's security. He also believed that the Communist Party of Malaya (CPM) was responsible for the long-running insurgency in Malaya. China is assisting with the Colombo Plan's development. In light of this, Malaysia officially forbade the country from establishing diplomatic ties with communist nations like China while drawing a firm line between the US-led capitalist camp and the Soviet-led socialists. Because to the US-Soviet Cold War, Malaysia's siding policy during this time was therefore more of a forced siding (Liu,2020;Li,2021). Due to capacity limitations, Malaysia was compelled to support the US in order to offer collective security by depending on military alliances like NATO to protect Malaysia's

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national security and interests (Selat,2014).

The second phase then came after this (1981–2023). The then-Malaysian Prime Minister, Mahathir bin Mohamad, had a significant influence on this phase's strategic change from directness to ambiguity. Mahathir recognized Malaysia's true status as a small nation in the international political arena and understood that Malaysia could not afford the price and repercussions of deteriorating relations with the major powers (Gerstl,2020). Mahathir was a visionary and politically astute leader during Malaysia's history. Malaysia's role in international politics and its response to significant power struggles now primarily rely on this ambiguity. Several experts in international relations, however, believe that Malaysia's equilateral distance diplomacy under Mahathir is more of a hedging tactic than a policy of taking sides (Krishnan,2020). They contend that Malaysia rarely adopts a clear position or chooses a side in the contemporary international political arena but rather relies on ASEAN as a group voice of interest, advocating a principle of neutrality and non-interference in international affairs to engage in international politics, highlighting its role as a participant and builder rather than a dominant player in international politics(He,2014), and amplifying its voice in the international sphere (Haacke, 2019; Chen,2020). Hedging, in the author's opinion, is the most significant facet of global politics. The hedging strategy emphasizes the idea of equidistant diplomacy between small and medium-sized countries and the development of two-way interaction with major powers, not directly participating in the competition and contestation between major powers but maintaining a neutral position to maintain their own security (Roy,2005; Rosjadi,1976). While the hedging strategy is different from the strategy of choosing sides but is also inextricably linked. The hedging technique can be viewed in part as a unique form of ambiguity of choosing sides because the equidistance diplomacy it employs aligns with the ambiguity of choosing sides. For instance, Malaysia's stance toward major nations was different both before and after the 2018 general election. Malaysia under Najib was more pro-China and distant from the United States because Malaysian leaders like Najib were more inclined towards China at the time and thought that economic cooperation with China may provide greater real benefits to Malaysia. To support its own economic development, Malaysia thus chose a nebulous strategy of avoiding specific questions about China's relationship to the US, etc. In 2018, the coalition of hope led by Mahathir started to re-examine the economic cooperation with China under former Prime Minister Najib, who believed that Malaysia was trapped in a debt trap with China and that such economic cooperation was inappropriate and unfair to Malaysia (Zhang,2019). As a result, he suspended some projects with China and demanded that the cooperation with China end. He asked that collaboration with China be more in line with the true interests and expectations of the Malaysian population, and he suspended some economic cooperation projects with China. In the meantime, in 2022, with Ismail Sabri as Prime Minister, Malaysia has increased its participation in a number of US-led initiatives, such as the Indo-Pacific Economic Framework (IPEF) and the US-ASEAN Special Summit, reflecting the fact that Malaysia has started to skew more to the US side and take a relatively cautious and prudent approach to China (Su,2020; Tan,2020). It currently seems unlikely to recreate Najib's close ties to China. Hence, rather than openly supporting one side or the other, Malaysia has employed various ambiguous leaning strategies at various points in time, favoring China or the US, respectively. This has proven to be more effective in preserving its own security and advancing its own development (Ren,2019; Oxford Analytica,2020).

Although Malaysia has in the past adopted a strategy of taking sides in the face of conflict and rivalry between major powers, this ambiguous siding strategy is constrained by the fact that, as was previously mentioned, small and medium-sized countries can only take sides with those countries that have a higher level of trust in them when the system is no longer stable and structural pressures exceed the country's capacity threshold(Luo,2018;Li,2021). The world's political and economic order has become more unstable after the Russia-Ukraine conflict started in early 2022. It will be very challenging for small nations like Malaysia to take an ambiguous side in future wars between the main powers in international politics or to ensure their own security. They are compelled to take a clear stance in order to follow the powerful nations and protect their own interests. Hence, for small states like Malaysia, taking a side still has a lot of practical significance.

### 5. CONCLUSION

Through the before mentioned analysis, this paper comes to the conclusion that the strategy of taking sides is not only highly practical and applicable, but it is also not viewed by previous international relations scholars as being inapplicable to current international politics or at odds with what ASEAN countries have been advocating. The main goals are to protect national security, advance national growth, and lessen the effects of great power struggles on tiny states like Malaysia. The example of Malaysia also demonstrates how small states can rationally modify their foreign policies and strategies to better suit the evolution of international politics in accordance with changes in internal and external circumstances, while the choice of sides offers Southeast Asian nations an alternative strategy to balancing, providing a way for small states to survive and cope with their national challenges.

Small nations must reevaluate and modify their foreign policies as the dangers of international politics mount, the crisis

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between Russia and Ukraine is still unsolved, and great power tensions and contradictions are only becoming worse. The discussion and analysis of the strategy of taking sides in this paper can offer Southeast Asian nations a unique perspective on how to handle major power conflicts, which in turn enriches the conversation and helps small and medium-sized nations deal with the escalating tensions on the global stage.

### REFERENCES

- 1) Amitav Acharya, "Containment, Engagement, or Counter-Dominance? Malaysia's Response to the Rise of China", in Alastair Iain Johnston and Robert S. Ross, eds., *Engaging China: The Management of an Emerging Power*, London and New York: Routledge, 1999, Chapter 6.
- 2) Ahmad Mokhtar Selat (2014): Malaysia-China Relations: The Winds of Change in the Early Seventies. *The Malaysian Journal of International Relations*, 2(1). <https://doi.org/10.22452/mjir.vol2no1.5>
- 3) BRADFORD, J. F. (2011). The Maritime Strategy of the United States: Implications for Indo-Pacific Sea Lanes. *Contemporary Southeast Asia*, 33(2), 183–208. <http://www.jstor.org/stable/41288826>
- 4) Chen, S. C. (2020). Committed to hedging: Southeast Asia and the United States' Free and Open Indo-Pacific Strategy. *Studies in South Asian Issues* (02), 28-42. doi: 10.14073/j.cnki.nywtyj.2020.02.003.
- 5) Cheng-Chwee, K. (2008). The Essence of Hedging: Malaysia and Singapore's Response to a Rising China. *Contemporary Southeast Asia: A Journal of International and Strategic Affairs* 30(2), 159-185. <https://www.muse.jhu.edu/article/256501>.
- 6) Cheng-Chwee Kuik (2016) : Malaysia Between the United States and China: What do Weaker States Hedge Against?, *Wiley Online Library*, 8(1), 155-177. <https://doi.org/10.1111/aspp.12240>
- 7) Emmers, R. (2018). Unpacking ASEAN neutrality: The quest for autonomy and impartiality in Southeast Asia. *Contemporary Southeast Asia*, 40(3), 349-370.
- 8) Feng Zhennan. (2021). ASEAN's perception and response to the US "Indo-Pacific strategy". *Journal of the Party School of the Corps* (01), 61-70. doi: CNKI: SUN: BTDB.0.2021-01-010.
- 9) Fan Gaoyue. (2021). US Indo-Pacific Strategy and its implementation and impact. *Northeast Asian Economic Research* (02), 99-112. doi: 10.19643/j.cnki.naer.2021.02.008.
- 10) Gerstl, A. (2020). Malaysia's Hedging Strategy Towards China Under Mahathir Mohamad (2018–2020): Direct Engagement, Limited Balancing, and Limited Bandwagoning. *Journal of Current Chinese Affairs*, 49(1), 106–131. <https://doi.org/10.1177/1868102620964219>
- 11) Goh, E. (2016). Southeast Asian strategies toward the great powers: still hedging after all these years?
- 12) Jürgen Haacke\* (2019): The concept of hedging and its application to Southeast Asia: a critique and a proposal for a modified conceptual and methodological framework, *International Relations of the Asia-Pacific*, 19(3), 375-417. DOI: [10.1093/irap/lcz010](https://doi.org/10.1093/irap/lcz010)
- 13) He, K. (2014). Facing the challenges: ASEAN's institutional responses to China's rise. In *China's Power and Asian Security* (pp. 181-198). Routledge.
- 14) John J. Mearsheimer "Can China Rise Peacefully?" *The National Interest*, April 8, 2011, <http://nationalinterest.org/commentary/can-china-rise-peacefully-10204>.
- 15) Krishnan, T. (2020). Malaysia's Posture in the Indo-Pacific Construct. *Journal of Asian Economic Integration*, 2(2), 180–191. <https://doi.org/10.1177/2631684620945190>
- 16) Li Bing. (2021). The characteristics and driving factors of the evolution of geographic relations between China and Southeast Asian countries from 1979 to 2019 (master's thesis, Liaoning Normal University). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202102&filename=1021640486.nh>
- 17) Luo Yaqi. (2020). Research on the relationship between the Communist Party of China and the National Front of Malaysia (master's thesis, China Foreign Affairs University). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202002&filename=1020734077.nh>
- 18) Li Jie & Wang Lu. (2016). Alliance or balance: a review of Sri Lanka's foreign policy towards major powers. *South Asian Studies* (03), 70-91+158-159. doi: 10.16608/j.cnki.nyyj.2016.03.05.
- 19) Liu Qing. (2020). U.S. Southeast Asia Policy Turn and Prospects. *China International Studies* (06), 83-107+3. doi: CNKI: SUN: CISO.0.2020-06-007

## Exploring the Feasibility of the Taking Sides Strategy in Southeast Asian Countries -- Malaysia's Response to the US-China Conflict as an Example

- 20) Liu Ruonan. (2020). The strategic competition between China and the United States and the transformation of order in Southeast Asia. *World Economy and Politics* (08), 20-44+155-156. doi: CNKI: SUN: SJZ.0.2020-08-003.
- 21) Li Chenyang. (2021). Will ASEAN countries choose sides between China and the United States. *World Knowledge* (20), 73.
- 22) Liu Ruonan. (2020). Security cooperation between the United States and Southeast Asian countries under the framework of the Indo-Pacific strategy. *Research on South Ocean Issues* (02), 43-57. doi: 10.14073/j.cnki.nywtyj.2020.02.004
- 23) Oxford Analytica. (2020). ASEAN states will avoid taking sides in US-China rows. *Emerald Expert Briefings*, (oxan-es).
- 24) Qin Wenbo. (2021). Review and prospects of China-Malaysia economic and trade relations from the perspective of "Indo-Pacific strategy". *Jiangsu Business Forum* (07), 49-52. doi: 10.13395/j.cnki.issn.1009-0061.2021 .07.013
- 25) Ren Yuanzhe. Analysis of Trump Administration's Southeast Asia Policy [J]. *American Studies*, 2019, 33(01): 49-70+6.
- 26) Roy, D. (2005) 'Southeast Asia and China: balancing or bandwagoning', *Contemporary Southeast Asia*, 27 (2), 305–322.
- 27) Rosjadi, I. (1976). non-alignment: dissemination and understanding. *India International Centre Quarterly*, 3(3), 121-124.
- 28) Putnam, R. D. (1988). Diplomacy and domestic politics: the logic of two-level games. *International organization*, 42(3), 427-460.
- 29) See Seng Tan (2020) Consigned to hedge: south-east Asia and America's 'free and open Indo-Pacific' strategy. *International Affairs*, 96(1) , 131-148. <https://doi.org/10.1093/ia/iiz227>
- 30) Shida I. (2016). Regional Risks and Hedging Strategies in ASEAN Countries. *World Economics and Politics* (05), 74-102+158-159.
- 31) Sun, X. F. & Jin, C. R. (2017). Mechanisms of "Balanced Diplomacy of Great Powers" in Small States and Malaysia's "Balanced Diplomacy" with China and the United States. *Contemporary Asia-Pacific* (02), 4-35+156.
- 32) Su Yingying. (2020). Malaysia's response to the U.S. Indo-Pacific strategy: Maintaining the centrality of ASEAN as the core. *Research on Southeast Asian Issues* (02), 58-70. doi: 10.14073/j.cnki.nywtyj.2020.02. 005.
- 33) Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order*, New York: Simon & Schuster, 1996, pp.233-236
- 34) Shekhar, V. (2012). ASEAN's response to the rise of China: Deploying a hedging strategy. *China Report*, 48(3), 253-268.
- 35) Wang Chuanjian & Zhang Song. (2021). A study on the conditions of formation and the effectiveness of the implementation of "big power balancing diplomacy" in small countries: the Philippines' practice of China-US relations as an example. *Pacific Journal* (05), 28-41. doi: 10.14015/j.cnki.1004-8049.2021.05.003.
- 36) Wen, Y. (2022). ASEAN states' hedging against the China question: Contested, adaptive, transformative. In *The China Question: Contestations and Adaptations* (pp. 247-268). Singapore: Springer Nature Singapore.
- 37) Wang Shuchun & Wang Hongbo. (2016). Different outcomes of balanced diplomacy pursued by small states after the Cold War - A comparative analysis based on small states in Eurasia and Southeast Asia. *Strategic Decision Research* (03), 3-21+105.
- 38) Wang Dong. (2018). A study of hedging behavior in international relations - the case of Asia-Pacific countries. *World Economy and Politics* (10), 21-49+157.
- 39) Wang, Yu-zhu. (2021). Hedging Strategies and Implications for China-ASEAN Relations. *World Economics and Politics* (01), 22-50+156-157.
- 40) Wen Yao. (2016). Southeast Asian countries' hedging against China: a theoretical exploration. *Contemporary Asia-Pacific* (06), 4-33+155-156.
- 41) Yang, Meijiao. (2020). Exploring hedging strategies in the post-Cold War period: the Philippines, Malaysia, and Laos as examples. *International Political Studies* (06), 105-126+7-8.
- 42) Qie Qingliang. (2005). The Formation and Evolution of Singapore's Great Power Balancing Strategy. *Southeast Asia* (01), 7-11.
- 43) Zhang Yi. (2019). On the trend of foreign economic relations of the Mahathir government. *Pearl River Forum* (Z1), 51-60. doi: CNKI: SUN: LCZJ.0.2019-Z1-004
- 44) Zhang, L. & Hu, D.I. (2021). On "choosing sides" in international games. *Contemporary Asia-Pacific* (05), 75-104+167.
- 45) Zhang Weiyu. (2020). Changing trends of hedging strategies in Southeast Asian countries. *International Political Science* (02), 184-192. doi: 10.16513/j.cnki.qjip.2020.0014.



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## The Effect of Traditional Games on the Level of Physical Fitness of Class XII Students of SMA Negeri 1 Semarang



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**ABSTRACT:** Physical fitness is very important and is needed by students to carry out activities every day. The purpose of this research is to know the influence given from the application of traditional games to class XII students of SMA Negeri 1 Semarang. The method used in this study is experimental. Population in this research is all students of class XII and the number of samples used were 36 students who were selected using the purposive sampling method. The results of the data analysis using the paired samples test obtained information on the actual value significance of  $0.000 < 0.05$  which can be concluded that there is a significant effect of traditional games on the level of physical fitness of class XII students at SMA Negeri 1 Semarang.

**KEYWORDS:** Traditional Games, level of physical fitness

### INTRODUCTION

Education is a process that people do their whole lives. It helps them grow and learn. Physical education is an important part of school because it helps people learn. Physical education tasks can help people move more, which is important because movement is a part of life [1]. [2] Through participation in athletics and other physically active pursuits, Indonesian society as a whole can expect to see improvements in its overall health as well as in its rate of growth and development. It is imperative that schools provide students with access to physical education because engaging in physical activity in the form of activities helps students maintain both their physical fitness and their overall health [3]. Traditional games passed down from generation to generation have many benefits besides preserving culture and as a national character, also for the pleasure of playing for the players, then they are also beneficial for psychological development, increasing creativity, agility, motivation, and also as a means of sport to increase physical fitness [4]. On the basis of the opinions of a number of specialists, it is possible to make the assertion that physical activity is very essential for everyone to engage in in order to support the physical health of each individual and enable them to participate in the full range of activities that make up a typical day, from the least active to the most active.

From the results of observations in the field in class XII SMA Negeri 1 Semarang in physical education, students are in warm-up before entering the material learning lack of enthusiasm and laziness because they have to run around the field 3 times round and in the core material many students are silent because they feel tired when they have warmed up. Students' physical health may suffer as a result of these issues, and students' ability to follow the learning process of others may be impeded.

It is essential to have differences in the warm-up that is provided by the instructor so that it is diverse, creative, and innovative so that it can sufficiently meet the requirements of students in terms of exercise and physical fitness by providing warm-up activities. This is necessary as a result of the problems that were discovered by researchers. Students will be more interested in participating in the activity if it begins with a game, which can increase the amount of exercise activities that students engage in. In this particular instance, the researcher has the notion to utilize the conventional gobak sodor game.

Traditional games are an important component of a country's cultural heritage and should be protected, researched, and developed. This is because, in addition to their value as games, traditional games have the potential to be further developed as sports, which can help participants improve their overall physical health [3]. [5] As well as being a form of creativity, it is intended that traditional sports can also serve as a form of physical exercise. Pedagogical uses of classic games are warranted. Beyond that, it's an Indonesian folk game based on his own creative output and cultural norms, from which he expects players to glean some sort of moral or spiritual lesson [6]. Based on the expert's description, it can be said that the game traditional is an original Indonesian cultural heritage that can be applied in the physical education learning process and must be preserved because

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it has many benefits for the physical fitness of every human being because in the modern era like today the millennial generation does not know traditional games.

From the results of the explanation above, the researcher is interested in giving the traditional game of gobak sodor to class XII students of SMA Negeri 1 Semarang, so the theme of this research is: "The Influence of Traditional Games on the Level of Physical Fitness of Class XII Students of SMA Negeri 1 Semarang".

### RESEARCH METHOD

This study employs the Pre-Experimental Designs method, with the experimental outcomes serving as the dependent variable. This is possible because there are no control variables and the sample was not selected at random [7]. The design of this study was the One-Group PretestPosttest Design, i.e., there was an initial test before treatment was administered, and treatment can be determined more precisely by comparing conditions before and after administration of treatment [8]. The population for this study consists of all students in class XII at SMA Negeri 1 Semarang, with 35 students serving as the sample. For data analysis, the Hypothesis Test (mean comparison analysis) Paired-Samples T-test was utilized.

### RESULTS AND ANALYSIS

The data collected and analyzed were the results of physical fitness evaluations administered to students using the Indonesian Physical Fitness Test (TKJI). Pretest data and posttest data are to be evaluated. The data description will be categorized according to the TKJI category. Following is a description of the data based on the pre- and post-testing categories.

**Table 1. TKJI frequency distribution pretest**

Interval Class	Category	Frequency	Percent Cumulative
22-25	Very Good	0	0%
18-21	Good	8	23%
14-17	Currently	22	63%
10-13	Poor	5	14%
5-9	Very Poor	0	0%
Amount		35	100%

From the data in table 1, we can deduce that eight pupils scored in the "good" range, twenty-two in the "medium" range, and five in the "less than" range on the first exam. There were no students who scored extremely well on the researcher's first exam, and there were also no students who scored exceptionally poorly.

**Table 2. TKJI frequency distribution Posttest**

Interval Class	Category	Frequency	Percent Cumulative
22-25	Very Good	3	9%
18-21	Good	26	74%
14-17	Currently	6	17%
10-13	Poor	0	0%
5-9	Very Poor	0	0%
Amount		35	100%

From the results of the exposure in table 2 posttest there were results of improvements that occurred in students with the results of 3 students in the very good category, 26 students in the good category, 6 students in the medium category and in the less and very poor category there were 0 students.

#### 1. Normality Test Results

**Table 3. Data normality test results pretest-posttest**

Group	Sig	$\alpha = 0,05$	Information
Pretest	0,152	0,05	Normal
Posttest	0,160		Normal

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According to the findings of the test for uniformity found in table 3, Shows the results of data analysis where in the group pretest there is a significance value of  $0.152 > 0.05$  while in the group posttest there is a significance value of  $0.160 > 0.05$  from the results of the analysis of the data that is in value pretest and posttest greater than 0.05 then get concluded that the data is normally distributed.

### 2. Homogeneity Test

Table 4. Homogeneity test results

Levene Statistic	df1	df2	sig	Information
1,915	1	70	0,171	Homogen

Based on the findings of the homogeneity test in table 4, it can be inferred that the data is uniform because the sig value is  $0.171 > 0.05$ .

### 3. Hypothesis Testing

Table 5. Paired Samples Test

Group	Mean	Std. dev	t	df	sig
Pretest-	-3.417	2.020	-10.151	35	0.000

Based on the results of hypothesis testing in table 5 withuse Paired Samples Test on groups pretest and posttest with a mean value of -3.417, valuestd. deviation of 2.020 at a t value of -10.151 while at a Sig value of  $0.000 < 0.05$  which can be concluded that there is a significant influence of traditional games on the level of physical fitness of class XII students at SMA Negeri 1 Semarang.

According to the results of the performed data analysis, it is consistent with previous research conducted by [1] arguing that freshmen can benefit from an increase in their fitness levels if they participate in more conventional activities while they learn about physical fitness. In that case, based on the findings of an investigation by [9] The benefits of using a conventional game to improve pupils' exercise levels were elucidated. Next, based on the findings of a study by [10] Not only can the implementation of the traditional gobak sodor game improve students' physical fitness, but it can also enhance children's problem-solving skills.

## CONCLUSIONS

Based on the background of the problems found and the theory supported by experts and the methods and data analysis carried out by researchers to solve themproblem exist, then the research conducted can be concluded that there isinfluence significantly giving traditional games to the level of physical fitness of class XII students of SMA Negeri 1 Semarang.

## REFERENCES

- 1) L. T. Arifin and I. N. Haris, "Pengaruh Penerapan Permainan Tradisional Terhadap Kebugaran Jasmani Siswa Kelas VIII SMPN 1 Ciasem Kabupaten Subang (Studi eksperimen Pada Siswa Kelas VIII SMPN 1 Ciasem)," *J. Biomekanika*, vol. 4, no. 1, pp. 1– 7, 2018, [Online]. Available: <http://ejournal.unsub.ac.id/index.php/FKIP/article/view/222>
- 2) M. S. Taufik, "Meningkatkan Teknik Dasar Dribbling Sepakbola Melalui Modifikasi Permainan," *Maenpo*, vol. 8, no. 1, p. 26, 2018, doi: 10.35194/jm.v8i1.914.
- 3) K. Kusnandar, D. U. Purnamasari, P. J. Nurcahyo, and E. Darjito, "Pengaruh Permainan Tradisional Banyumas Gol-Golan Terhadap Tingkat Kebugaran Jasmani Siswa Sekolah Dasar Di Kabupaten Banyumas," *Phys. Act. J.*, vol. 1, no. 1, p. 18, 2019, doi: 10.20884/1.paju.2019.1.1.1996.
- 4) D. O. Mudzakir, "Pengaruh Permainan Olahraga Tradisional Terhadap Motivasi Belajar Dalam Pembelajaran Penjas Kelas V Sekolah Dasar Negeri Dadap 2 Indramayu," *J. MAENPO J. Pendidik. Jasm. Kesehat. dan Rekreasi*, vol. 10, no. 1, p. 44, 2020, doi: 10.35194/jm.v10i1.941.
- 5) Gatot Margisal Utomo and Harwanto, "Penerapan Permainan Tradisional Dalam Upaya Meningkatkan Kebugaran Jasmani Pada Mahasiswa Penjas Angkatan 2019 Universitas PGRI Adi Buana Surabaya," *J. Kejaora (Kesehatan Jasm. dan Olah Raga)*, vol. 6, no. 1, pp. 197–202, 2021, doi: 10.36526/kejaora.v6i1.1153.
- 6) M. Nur and F. A. Widiyatmoko, "Implementasi Permainan Tradisional Untuk Meningkatkan Keaktifan Gerak Siswa," *Jendela Olahraga*, vol. 4, no. 1, pp. 61–65, 2019, doi: 10.26877/jo.v4i1.3028.
- 7) Sugiyono, *Metode Penelitian Pendidikan*. Bandung. 2015.



## The Effect of Traditional Games on the Level of Physical Fitness of Class XII Students of SMA Negeri 1 Semarang

- 8) Nurdiansyah, Sofyan, M. Surya, and M. Yani, "Peningkatan kebugaran jasmani melalui permainan tradisional pada remaja daerah pesisir pantai desa pagatan besar kecamatan takisung tanah laut," *J. Pendidik. Olahraga*, vol. 11, no. 2, pp. 293–299, 2022.
- 9) W. Aulia, S. Suryansah, and O. B. Januarto, "Pengaruh Permainan Tradisional Terhadap Tingkat Kebugaran Jasmani Siswa SMP: Literature Review," *Sport Sci. Heal.*, vol. 4, no. 1, pp. 94–102, 2022, doi: 10.17977/um062v4i12022p94-102.
- 10) Gustira, Y. Nurani, and S. Wulan, "Permainan Tradisional Petualangan Gobak Sodor dan Kemampuan Pemecahan Masalah," vol. 7, no. 1, pp. 1173–1185, 2023, doi: 10.31004/obsesi.v7i1.4071.



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## Estimation of the Electricity Supply and Demand of Türkiye Employing Deep Learning Networks



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**ABSTRACT:** Electrical energy, one of the indispensable elements of the economic and social life, is an energy source that has to be provided without interruption in order to ensure the continuity of development. In this work, the monthly electricity supply and demand of Türkiye for the period of 2016-2022 are modelled using advanced machine learning techniques. An autoregressive deep learning network consisting of four hidden layers is developed for the modelling of the electricity supply and demand data having the form of multilayer perceptron artificial neural network. The electricity supply and demand data of Türkiye is gathered from the official sources and then investigated utilizing the seasonality analysis. Then, the deep learning network is developed in Python programming language. The 70% of the available electricity supply and demand data are used as the training data whereas the remaining 30% of the data is the test data. The randomized selection of the train and test data are performed using the classes available in the SciKit-Learn library of the Python programming language. The performance of the developed deep learning network model is evaluated both by plotting the actual and the modelled data on the same axis pair and by using performance metrics of the coefficient of determination, mean absolute error, mean absolute percentage error and the root mean square error. The mean absolute percentage errors of the models have the values of 2.29% and 2.17% for the electricity supply and demand data, respectively, indicating the success of the developed deep learning model for the modelling and the estimation of the electricity supply and demand data. The developed model is considered to be useful for the economic and technical energy planners.

**KEYWORDS:** Electricity supply, electricity demand, machine learning, deep learning, multilayer perceptron.

### I. INTRODUCTION

Electrical energy is a clean energy resource which can be transmitted using electrical networks to distant points without significant loss. In addition, electricity can be transformed to other forms of energy such as the thermal, light and mechanical rotation energies which are used in both household appliances and also in the production industry. The wide usage and the dependency on the electricity leads to its critical status such that even short-term discontinuities of electricity supply and transmission cause social and economic problems. Therefore, the supply and demand chain of electricity should be planned in advance in order not to cause electricity cut-offs or inactive electricity. The high price of the electricity production investments and also the long completion durations of the construction of electricity power plants increase the importance of the planning of the electricity supply and demand.

One of the key components of the electricity supply and demand planning is the short-term and long-term forecasting of the supply and demand. The planning activities are performed according to the electricity supply and demand estimations therefore these estimation studies should be carried out in a realistic manner. On the other hand, Türkiye is a rapidly developing country whose economic growth is well above the World average and the population of Türkiye is also on the rise continuously therefore the electricity consumption of both the industrial facilities and the household are on the rise. This leads to the increased significance of the electricity power supply and demand forecasting for Türkiye. The official electricity supply and demand of Türkiye is performed by the Ministry of Energy and Natural Resources.

There are several methods for the estimation of the electricity supply and demand in the literature. These models utilize linear or nonlinear functions which have their unique performance merits. Linear methods include the simplest least squares approximation to the autoregressive integrated moving average schemes. However, nonlinear methods are also taking great attention recently due to their ability to model seasonal and nonlinear data with high performance. On the other hand, the studies

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regarding the electricity supply and demand forecasting can also be classified into three groups being the short term, medium term and long term forecasts. The short term forecasts deal with the electricity supply and demand estimation for the next hours, days and weeks while the medium term forecasts try to calculate the electricity supply and demand for on a monthly or tri-monthly basis. The long term forecasts model the electricity supply and demand for the upcoming years. Considering the fact that the electricity energy can not be stored in high quantities, the forecasting of the electricity supply and demand also has impacts on the real time price of the electricity energy market and these types of forecasts require short-term estimation performance. The medium term and the long term estimation quality is needed for the planning of the construction of new electricity power plants and power transmission networks. Therefore, the estimation of the electricity supply and demand has impacts on both the continuity and the price of the electricity energy.

The monthly electricity supply and demand data of Türkiye for the 2016-2022 period are modelled using autoregressive deep learning networks in this work. The past values of the supply and demand data are utilized as inputs of the autoregressive deep learning networks which are developed in Python programming language. The performance metrics of the electricity supply and demand data models are then evaluated which indicate the high accuracy of the developed models.

## II. LITERATURE ANALYSIS

There are vast number of studies in the literature regarding the modelling and forecasting the electricity supply and demand. Some of these studies employ traditional linear methods such as least squares approximation while more recent studies utilize nonlinear methods such as machine learning models. Moreover, the results and the performance of linear and nonlinear models are also compared in some of the existing studies. For example, the electricity consumption data of Türkiye for the period of 1970-2002 is modelled in a study using regression and artificial neural networks where it is shown that the artificial neural networks enable the estimation of the electricity demand with high accuracy (Hamzacebi and Kutay, 2004). The optimized Grey model was used in another work for the estimation of the electricity demand of Türkiye employing the electricity consumption data for the 1945-2010 period (Hamzacebi and Es, 2014). A new machine learning method named tree-seed algorithm is used in another study for the modelling of the electricity energy demand data of Türkiye for the period of 1992-2016 and it is concluded that the electricity demand data can be modelled by 3.6% error using the tree-seed algorithm (Kiran and Yunusova, 2022). In another work, the electricity demand of Türkiye on a sectoral basis is investigated for the period of 1970-2004 using artificial neural networks and it is shown that the artificial neural network model provides better performance compared to the linear models (Hamzacebi, 2007). The net electricity generation and demand of Türkiye is modelled in another study for the period of 1979-2006 using the ant colony optimization algorithm where an estimation deviation of 3% to 5% is determined (Toksari, 2009). In another work, the electricity demand of Türkiye is predicted for the 2015-2018 period employing four different artificial neural network models and the seasonal autoregressive integrated moving average (SARIMA) method and it is concluded that the seasonal artificial neural network method has better modelling performance compared to the SARIMA method (Hamzacebi et al., 2019). The electricity load of Türkiye for the period of 1970-2007 is considered in another study using adaptive network based fuzzy inference systems (ANFIS) and autoregressive moving average (ARMA) models where the mean absolute percentage error of the ANFIS model is determined to be 0.474% compared to that of the ARMA model having the value of 5.315% indicating the superiority of the ANFIS model (Demirel et al., 2010). The net energy demand of Türkiye for the period of 1970-2010 is modelled for the estimation of the energy demand of 2011-2025 in another work in which an artificial neural network structure having the input data of gross domestic product (GDP), population, import, export and number of vehicles is used and it is shown that the developed artificial neural network has the mean absolute percentage error between 1.75% to 4.21% demonstrating the effectiveness of the artificial neural networks for the modelling of the energy demand (Es et al., 2014). The energy demand of the industry sector of Türkiye is modelled for the period of 1970-2016 in another study using artificial neural networks and it is concluded that the artificial neural network has the coefficient of determination value of  $R^2=0.94$  proving the effective modelling of the energy demand (Pence et al., 2019). The seasonality Grey model (SGM) is proposed in another work for the modelling of the energy demand forecasting of Türkiye in which the mean absolute percentage error of 5.18% is achieved (Hamzacebi, 2016).

The electricity demand of Türkiye for the 2009-2018 period is considered in another study in which the artificial neural networks and the multivariate regression analysis are used where the population, average household size, GDP, imports, exports and the education level are the inputs (Ulku and Yalpir, 2021). In another work, the hourly electricity demand forecasting of Türkiye is performed employing the long short-term memory (LSTM) and the gated recurrent unit (GRU) models (Biskin and Cifci, 2021). The artificial neural networks is used in another study for the modelling of the electricity consumption of TR81 region (Zonguldak, Karabuk and Bartın provinces of Türkiye) where the population, import, export and the building areas data are taken as inputs and forecasts are performed for the 2016-2020 period (Kocadayi et al., 2017). A hybrid model employing the combination of the multiple linear regression and the artificial neural networks is used in another work for the modelling of the electricity demand of

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Türkiye and it is shown that the hybrid model achieves 2.25% forecast error (Aydogdu and Yildiz, 2017). The market clearing price regarding the electricity demand of Türkiye is performed in another study where artificial neural networks is used to predict the hourly electricity demand and the mean percentage error of 0.10 is reached (Ertaylan et al., 2021). The gross electricity demand of Türkiye is modelled in another work using three methods namely the trend analysis, fuzzy logic and the linear regression and the modelling error of these methods are found to be 2.75%, 4.81% and 7.64%, respectively (Yavuzdemir, 2014). The monthly electricity supply from conventional and renewable resources is modelled in another study using a seasonal autoregressive integrated moving average (SARIMA) model for the 2001-2020 period and it is shown that the SARIMA model successfully models the electricity supply data (Kurt et al., 2022). In another work, the regional electricity demand of Türkiye is investigated in the period of 1986-2013 using autoregressive integrated moving average model and it is shown that the utilized model has the root mean square error of 0.11 (Akarsu, 2017). Grey forecasting methods with rolling mechanism is utilized in another study for the modelling of the electrical energy demand forecasting of Türkiye for the 2015-2030 period where it is shown that nonhomogeneous Grey model with rolling mechanism increases the forecasting accuracy (Kusakci and Ayvaz, 2015). In another work, the electricity demand of Türkiye is modelled employing regression and adaptive-network based fuzzy inference systems (ANFIS) and it is shown that both models can be used successfully for the electricity demand estimation (Zengin et al., 2022).

The electricity consumption in Mus Alparslan University campus in Türkiye for the 2014-2019 period is modelled in another study employing classical and deep learning methods and it is shown that the error of the deep learning methods is smaller (Unluk and Pala, 2019). Similarly in another work, the electricity supply of Türkiye for the 2010-2019 is modelled using artificial neural networks and bidirectional long-short term memory where it is shown that both methods can be utilized for forecasting the electricity supply from traditional and renewable resources (Aylak et al., 2021). The peak electricity demand in Kutahya, Türkiye is modelled in another study for the 2000-2004 period using artificial neural networks and it is demonstrated that artificial neural networks can be utilized for the modelling of the electricity demand (Aslan et al., 2006). The relationship between the electricity demand and the development status is investigated in another work for Eskisehir, Türkiye for the period of 1999-2009 and it is shown that the multiple regression analysis can be used to model the demand (Senel et al., 2012). In another work, the electricity load estimation is performed for the Kutahya province of Türkiye in the period of 2000-2004 using linear, quadratic and exponential methods and it is concluded that the exponential model gives the best results (Nalbant et al., 2005). Another machine learning method, the particle swarm optimization algorithm, is utilized in another study for the modelling of the electricity demand of Türkiye for the period of 1970-2015 and it is concluded that the electricity demand can be modelled using both linear and nonlinear equations (Bogar and Bogar, 2017). A regressive model is utilized in another work for the estimation of the electricity demand of the Antalya, Isparta and Burdur provinces of Türkiye for the 1992-2017 period and it is demonstrated that the regressive model can successfully model the electricity demand (Baltas and Akbay, 2021). An elastic net regression model is used in another study for the electricity demand forecast for Türkiye and it is shown that nonlinear autoregressive-based neural network model can be used for the electricity demand forecasting with high accuracy (Tutun et al., 2016). The energy consumption of Türkiye is modelled utilizing autoregressive integrated moving average and regression analysis for the period of 1999-2014 in another work where it is concluded that the autoregressive integrated moving average model provides better accuracy (Ervural et al., 2015). The monthly electricity demand of Türkiye for the 2000-2019 period is modelled in another study where artificial neural networks is utilized and it is shown that the artificial neural network provides high performance modelling reaching 99% accuracy (Yumusak et al., 2019).

The installed power supply capacity of Türkiye is modelled in another study for the 1960-2014 period using machine learning algorithms and it is shown that the machine learning algorithm provides over 95% accuracy (Demir and Aydin, 2017). In another work, an exponential mathematical model is used for the modelling of the electricity demand of Türkiye until 2037 with the Mittag-Leffler functions (Calik and Sirin, 2017). The daily electricity demand of Türkiye for the period of 2003-2010 is also modelled utilizing regression analysis and least squares method in another study (Balci et al., 2012). The energy deficit estimation of Türkiye for the period of 2012-2020 is modelled employing artificial neural networks in another work where it is estimated that domestic electricity production would increase in the mentioned period (Esen, 2013). The modelling methods for the electricity supply and demand of Türkiye are summarized in another study in which it is shown that feedforward neural networks, recursive models, swarm intelligence, fuzzy logic, autoregressive models, regression models and Grey prediction models are used for the modelling and forecasting the electricity supply and demand of Türkiye (Ozkurt et al., 2021). In another work, the recursive multilayer perceptron model is utilized to model the hourly electricity demand of Türkiye in which the average error of 10.65% is achieved (Topalli and Erkmén, 2003). Multilayer perceptron based artificial neural networks is used also in another study for the modelling and estimation of the electricity demand of Türkiye for the period of 1991-2005 where daily and monthly demand are modelled and the error values of 3.12% and 2.21% are reached for daily and monthly estimations (Yalcinoz and Eminoglu, 2005). The model analysis for energy demand, multilayer perceptron and radial based artificial neural network models are employed in

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another work for the modelling of the electricity demand of Türkiye for the period of 1981-2007 and it is observed that radial based neural networks provide the best accuracy (Cunkas and Altun, 2010). The electricity demand of Türkiye for the 1970-2014 period is modelled dependent on the GDP using fuzzy logic and regression methods in another study where it is shown that the fuzzy logic provides better accuracy (Kucukali and Baris, 2010). The hourly electricity demand of Türkiye for the 2001-2002 period is modelled in another work using radial based neural network and autoregressive moving average models in which the load and the temperature are taken as the inputs of the models and it is shown that the radial based neural network has better results compared to the autoregressive moving average model (Topalli et al., 2006).

The electricity demand of Türkiye for the period of 1975-2010 is modelled using artificial neural networks taking economic indicators as inputs in another work and it is observed that the relative root mean square error of 1.15% is reached (Kavaklioglu et al., 2009). Similarly in another study, the monthly electricity demand is modelled using seasonal autoregressive integrated moving average and nonlinear autoregressive artificial neural networks and it is concluded that the mean absolute percentage error of the artificial neural network is below 2% (Tutun et al., 2015). The electricity demand of Türkiye for the period of 1976-2006 is modelled in another work employing ant colony optimization and artificial bee colony algorithm where it is shown that the artificial bee colony algorithm models the electricity demand more accurately (Kiran et al., 2012). In another study, the electricity demand of Türkiye for the period of 2009-2010 is modelled utilizing autoregressive integrated moving average and multilayer perceptron neural networks and it is concluded that the multilayer perceptron neural network performs better than the autoregressive integrated moving average method (Kolmek and Navruz, 2015). The least squares support vector machines model and the multilayer perceptron artificial neural network are used for the modelling of the electricity demand of Türkiye for the 1970-2009 period in another work and it is shown that least squares support vector machines has better accuracy (Kaytez et al., 2015). The multilayer perceptron artificial neural network approach is used also in another study where the electricity demand of Türkiye is modelled for the period of 1975-2013 and it is shown that the root mean square error of less than 5% is achieved (Gunay, 2016). Ant colony optimization algorithm is utilized in linear and quadratic equations in another work for the modelling of the electricity demand of Türkiye for the 1990-2013 period and it is demonstrated that the mean absolute percentage error lower than 5% is achieved (Toksari, 2016). Similarly in another study, the artificial bee colony algorithm is utilized for the linear, quadratic and exponential equations for the modelling of the electricity demand of Türkiye for the 1970-2013 period where it is shown that the linear model has the best accuracy (Sonmez et al., 2017). In another work, the electricity demand of Türkiye for the 2013-2014 period is modelled employing the seasonal ARIMA and multilayer perceptron neural network model and it is shown that the multilayer perceptron neural network has the mean absolute percentage error of less than 1% (Bozkurt et al., 2017). The hourly electricity demand of Türkiye for the 2005-2016 period is forecasted in another study using artificial neural networks when the input data of historical load and economic factors are taken into account and it is concluded that the developed model reaches the mean absolute percentage error of 1% (Basoglu and Bulut, 2017).

Particle swarm optimization based modelling is performed in another study for the electricity demand of Türkiye for the period of 1979-2013 in which economic indicators are used as inputs and it is shown that a coefficient of determination value of 0.99 is achieved (Gulcu and Kodaz, 2017). Historical electricity consumption, socio-economic factors and the weather are taken as inputs in another work for the modelling of the electricity demand of Türkiye for the period of 2012-2016 using multilayer perceptron neural networks and it is concluded that the mean absolute percentage error of less than 2% is reached (Aydin and Toros, 2018). Similarly, past values of the demand are used as inputs in another study for the estimation of the hourly electricity demand of Türkiye for the period of 2018-2019 utilizing multilayer perceptron based neural networks where it is shown that high accuracy is achieved (Arslan et al., 2018). Historical temperature and consumption are used as inputs in another work for the multilayer perceptron and nonlinear artificial neural network based modelling of the electricity demand of an industrial region of Türkiye for the period of 2014-2016 where it is concluded that the multilayer perceptron based neural network performs better (Ozden and Ozturk, 2018). Similarly, the lagged electricity price, temperature and the economic factors are used to model the hourly electricity demand of Türkiye in another study for the 2013-2015 period using multilayer perceptron, long short-term memory and the gated recurrent unit based models and it is shown that the gated recurrent unit based model gives accurate results (Ugurlu et al., 2018a). Long short-term memory is also used in another work for the estimation of the hourly price of the electricity demand of Türkiye for the period of 2017-2018 and the mean absolute percentage error of 0.24 is achieved (Ugurlu et al., 2018b). Similarly, modelling the hourly electricity demand of Türkiye for the 2012-2014 period is investigated in another study using multilayer perceptron, gradient-descent momentum, Levenberg–Marquardt algorithm and Broyden–Fletcher–Goldfarb–Shanno algorithm and it is concluded that the Broyden–Fletcher–Goldfarb–Shanno algorithm provides accurate results (Gokgoz and Filiz, 2020). The long-short term memory method is utilized in another work for the estimation of the hourly electricity demand of Türkiye for the 2016-2020 period and it is observed that mean absolute percentage error lower than 5% is reached (Ozkurt et al., 2020). In another study, artificial neural network with improved genetic algorithm is used for the modelling of the hourly

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electricity demand (Srinivasan, 1998). Similarly, the radial based neural networks, dynamic neural networks and autoregressive models are used for the hourly electricity demand estimation in another work (Kodogiannis and Anagnostakis, 1999).

In this study, the monthly electricity supply and demand of Türkiye for the 2016-2022 period are modelled using autoregressive deep learning networks consisting of four hidden layers. The electricity supply and demand data of Türkiye is taken from the official sources and then the seasonality analysis is performed on the data. The deep learning network is developed in Python programming language where 70% of the available data are used as the training data and 30% of the data is utilized as the test data. The performance of the developed deep learning network models are investigated by plotting the data and also by using figure of merits such as the coefficient of determination, mean absolute error, mean absolute percentage error and the root mean square error. The developed model is considered to be useful for the electricity supply and demand planners.

### III. MATERIAL AND METHODS

The electricity supply and demand data of Türkiye have been taken from the official sources (EDDS, 2023). As it can be observed from Figure 1, the electricity supply and demand data move very close which is needed for two reasons: i) to prevent electricity interruptions and, ii) to eliminate excessive supply which causes power waste. The electricity supply and demand data is highly nonlinear and seasonal as expected however in order to investigate the seasonality of these data, the seasonal-trend decomposition with Loess method (Cleveland et al., 1990) is utilized in Eviews where the seasonal and trend components of the electricity supply and demand data are observed. The seasonal decomposition of the electricity supply and demand data are given in Figure 2 and Figure 3, respectively.

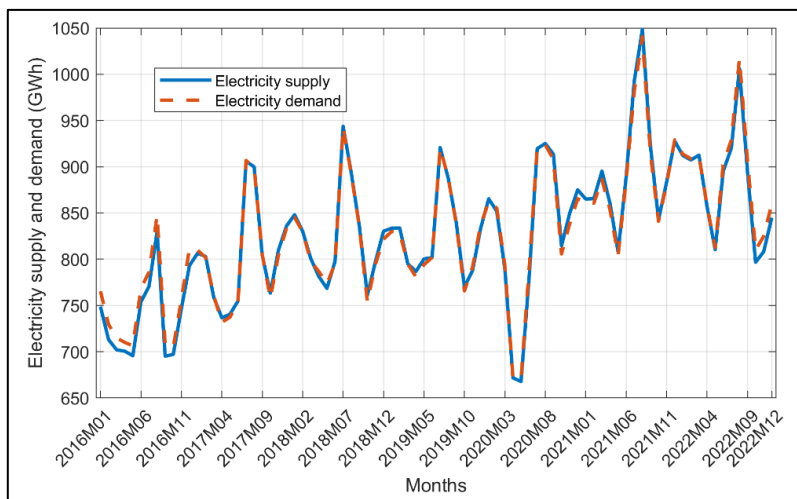


Figure 1. Monthly electricity supply and demand data of Türkiye for the period of 2016-2022 (EDDS, 2023)

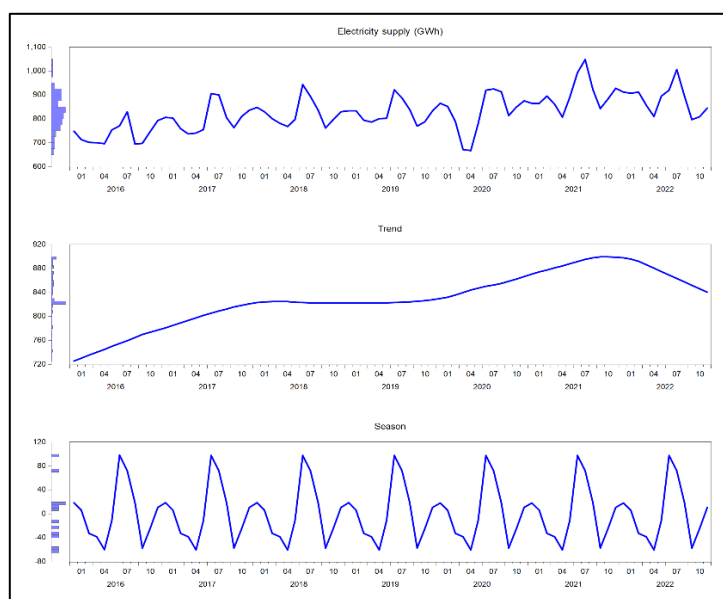


Figure 2. Seasonal and trend decomposition of the electricity supply data of Türkiye for the period of 2016-2022

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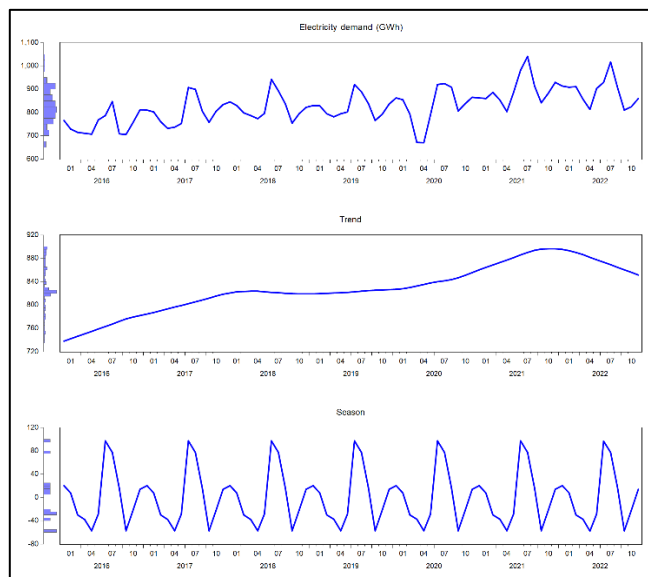


Figure 3. Seasonal and trend decomposition of the electricity demand data of Türkiye for the period of 2016-2022

The seasonal components observed from Figure 2 and Figure 3 verify that the monthly electricity supply and demand data are highly seasonal therefore their modelling obviously require nonlinear methods such as machine learning. In this study, an autoregressive deep learning network is developed for the modelling of the electricity supply and demand data. The structure of the developed deep learning network is shown in Figure 4.

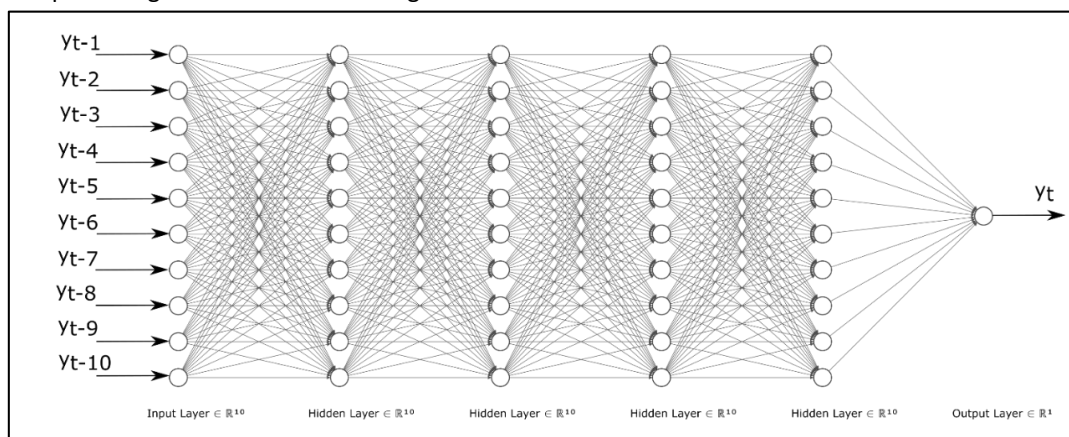


Figure 4. The structure of the implemented deep learning network

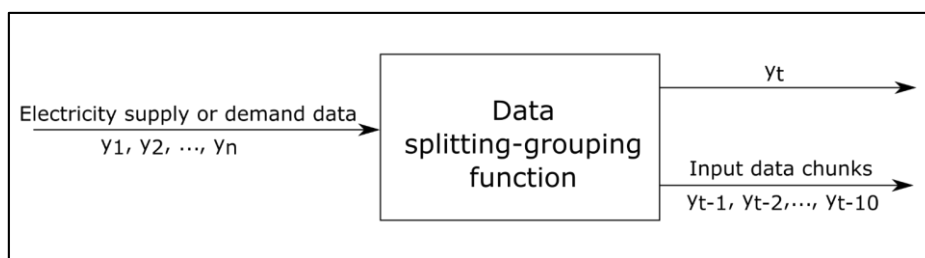
The structure of the developed autoregressive deep learning network is shown in Figure 4 and it can be observed from this figure that the previous ten values of the output variable is fed as inputs to the deep learning network hence making it an autoregressive deep learning model. Moreover, there are four hidden layers in the multilayer perceptron structure such that the developed model is a deep learning network. The autoregressive deep learning model shown in Figure 4 is developed in Python programming language using the MLPRegressor class of the SciKit Learn library (Geron, 2022). The 70% of the available data is used as the training data while the remaining 30% of the data is utilized as the test data. The modelling results and their performance assessment are presented in the next section.

### IV. RESULTS AND DISCUSSION

The electricity supply and demand data are classified as the training and the test data using the test\_train\_split class of the SciKit-Learn library and then the developed autoregressive deep learning network is trained for the electricity supply and demand data separately.

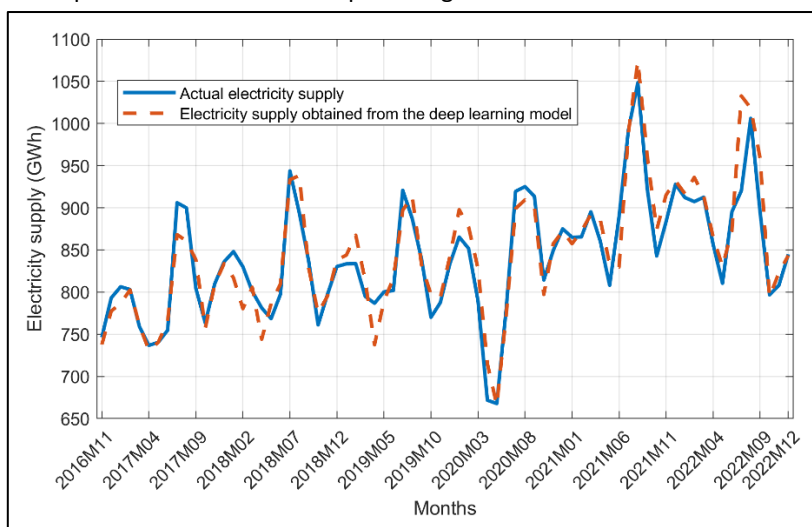
In order to provide autoregression, the previous values of the electricity supply and demand data are split and grouped in Python programming language using a custom coded function. In this way, the inputs of the electricity supply and demand data are prepared. The concept of the data splitting and grouping function is shown in Figure 5.

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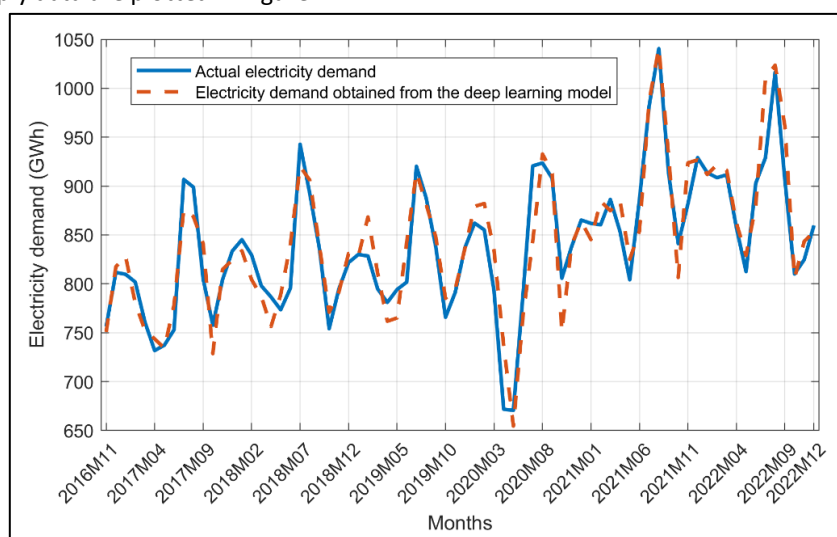
**Figure 5. The concept of the implemented data splitting-grouping function**

The implemented autoregressive deep learning network is trained using the electricity supply data as the next step after splitting and grouping the data input. The obtained electricity supply data from the trained autoregressive deep learning model and the actual electricity supply data are plotted on the same axis pair in Figure 6.



**Figure 6. The actual electricity demand data and the data obtained from the developed deep learning model.**

Similarly, the developed deep learning network is trained for the electricity demand data and then the obtained model data and the actual electricity supply data are plotted in Figure 7.



**Figure 7. The actual electricity demand data and the data obtained from the developed deep learning model.**

As it can be observed from Figure 6 and Figure 7, the developed autoregressive deep learning network successfully models both the electricity supply and the demand data for Türkiye in the 2016-2022 period. The performance merits namely the coefficient of determination ( $R^2$ ), mean absolute error (MAE), root mean square error (RMSE) and the mean absolute percentage error (MAPE) of the autoregressive deep learning model are also calculated in Python programming language for the electricity supply and the demand data and these performance metrics are given in Table 1.



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**Table 1. Performance metrics of the developed electricity supply and demand models**

Model	R <sup>2</sup>	MAE	RMSE	MAPE
Electricity supply model	0.850	19546.543	26935.801	2.294%
Electricity demand model	0.855	19745.846	26266.918	2.179%

The performance metric values shown in Table 1 also verify the accuracy of the developed autoregressive deep learning model considering that the models that have MAPE values lower than 10% are considered to be highly accurate (Cuhadar, 2013).

### V. CONCLUSIONS

The electricity supply and demand of Türkiye for the period of 2016-2022 are modelled in this work. The monthly electricity supply and demand data are taken from official sources and then the seasonality and nonlinearity of these data are investigated in Eviews software. The seasonal-trend decomposition using Loess method is used for separating the trend and seasonal components of the data. Then, it is observed that the electricity supply and demand data have strong seasonal components indicating that the modelling of these data has to be performed using nonlinear methods. For this aim, an autoregressive deep learning model is developed in Python programming language where the inputs of the deep learning model are the past values of the output. In order to use the developed model, the electricity supply and demand data are split and grouped utilizing a custom function written in Python. Then, the developed autoregressive deep learning model is trained using electricity supply and demand data separately. The actual electricity supply and demand data and the results of the developed deep learning model are plotted in order to visually inspect the model performance. The plots indicate that the developed model can be used for the estimation of both the electricity supply and demand data. Furthermore, the performance metrics of the electricity supply and demand models such as the coefficient of determination, mean absolute error, root mean square error and the mean absolute percentage error are calculated. The MAPE values less than 3% also verify the accuracy of the developed autoregressive deep learning model for the representation of the electricity supply and demand data. It can be argued that the developed autoregressive deep learning model can be used to model and forecast electricity supply and demand data of other countries and regions.

### REFERENCES

- 1) Akarsu G. (2017). Forecasting regional electricity demand for Turkey. *International Journal of Energy Economics and Policy*. 7, 275-282.
- 2) Arslan Y., Dilbaz A. S., Ertekin S., Karagoz P., Birturk A., Eren S. and Kucuk D. (2018). Short-term electricity consumption forecast using datasets of various granularities. *International Workshop on Data Analytics for Renewable Energy Integration*. 1, 116-126.
- 3) Aslan Y., Yasar C. and Nalbant A. (2006). Electrical peak load forecasting in Kütahya with artificial neural networks. *Journal of Science and Technology of Dumlupinar University*. 11, 63-74.
- 4) Aydogdu G. and Yildiz O. (2017). Forecasting the annual electricity consumption of Turkey using a hybrid model. *25th Signal Processing and Communications Applications Conference*. 1, 16995662.
- 5) Aylak B T., Ozdemir M. H., Ince M. and Oral O. (2021). Prediction of Turkey's electricity generation by sources using artificial neural network and bidirectional long short - term memory. *Journal of Engineering Sciences and Design*. 9, 423-435.
- 6) Balci H., Esener I. I. and Kurban M. (2012). Short-term load forecasting using regression analysis. *Electrical-Electronics and Computer Engineering Symposium*. 1, 796-801.
- 7) Baltas M. E. and Akbay C. (2021). Electric consumption demand estimation for mediterranean electricity distribution region (Antalya - Isparta - Burdur) in Turkey. *Journal of Management and Economics Research*. 19, 222-238.
- 8) Biskin O. T. and Cifci A. (2021). Forecasting of Turkey's Electrical Energy Consumption using LSTM and GRU Networks. *Bilecik Seyh Edebali University Journal of Science*. 8, 656-667.
- 9) Bogar E. and Bogar Z. O. (2017). Modeling net electricity energy consumption of Turkey based on particle swarm optimization. *Academia Journal of Engineering and Applied Sciences*. 3, 40-47.
- 10) Bozkurt O. O., Biricik G. and Taysi Z. C. (2017). Artificial neural network and SARIMA based models for power load forecasting in Turkish electricity market. *PLOS ONE*. 12, e0175915.
- 11) Bulut M. and Basoglu B. (2017). Development of a hybrid system based on neural networks and expert systems for shortterm electricity demand forecasting. *Journal of the Faculty of Engineering and Architecture of Gazi University*. 32, 575-583.

## Estimation of the Electricity Supply and Demand of Türkiye Employing Deep Learning Networks

- 12) Calik A. E. and Sirin H. (2017). A mathematical model of electricity energy demand in Turkey. *Sakarya University Journal of Science*. 21, 1475-1482.
- 13) Cleveland R. B., Cleveland W. S., McRae J. E. and Terpenning I. (1990). STL: A seasonal-trend decomposition procedure based on Loess. *Journal of Official Statistics*.6: 3-73.
- 14) Cuhadar M. (2013). Modeling and forecasting inbound tourism demand to Turkey by MLP, RBF and TDNN artificial neural networks: a comparative analysis. *Journal of Yasar University*. 8, 5274-5295.
- 15) Cunkas M. and Altun A. A. (2010). Long term electricity demand forecasting in Turkey using artificial neural networks,. *Energy Sources Part B: Economics, Planning, and Policy*. 5, 279-289.
- 16) Demir C. and Aydin F. (2017). Estimate of Turkey's installed capacity by 2023 with artificial learning. *International Engineering Research Symposium*. 1, 52-60.
- 17) Demirel O., Kakilli A. and Tektas M. (2010). Electric energy load forecasting using ANFIS and ARMA methods. *Journal of the Faculty of Engineering and Architecture of Gazi University*. 25, 601-610.
- 18) EDDS, Electronic Data Distribution System of the Central Bank of Türkiye. 2023.
- 19) Ertaylan A., Aktas O. and Dogan Y. (2021). *Market Clearing Price Prediction With Artificial Neural Networks*. Dokuz Eylul University Journal of Engineering Faculty. 23, 67-93.
- 20) Ervural B. C., Evren R. and Demirel O. F. (2015). Forecasting energy consumption in Turkey using regression analysis and Arima models. *2<sup>nd</sup> Global Conference on Engineering and Technology Management*. 1, 24-35.
- 21) Es H. A., Kalender Y. and Hamzacebi C. (2014). Forecasting the net energy demand of Turkey by artificial neural networks. *Journal of the Faculty of Engineering and Architecture of Gazi University*. 29, 495-504.
- 22) Esen O. (2013). Turkey's problem of energy deficit with regards to sustainable growth: energy deficit projection for the period of 2012-2020. *Ataturk University Institute of Social Sciences*.
- 23) Geron A. (2022). *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems*. O'Reilly Media. ISBN: 9781098125974.
- 24) Gokgoz F. and Filiz F. (2020). Electricity load forecasting via ANN approach in Turkish electricity markets. *Information Management*. 3, 170-184.
- 25) Gulcu S. and Kodaz H. (2017). The estimation of the electricity energy demand using particle swarm optimization algorithm: A case study of Turkey. *Procedia Computer Science*. 111, 64-70.
- 26) Gunay M. E., Forecasting annual gross electricity demand by artificial neural networks using predicted values of socio-economic indicators and climatic conditions: Case of Turkey. *Energy Policy*. 90, 92-101.
- 27) Hamzacebi C. (2007). Forecasting of Turkey's net electricity energy consumption on sectoral bases. *Energy Policy*. 35, 2009-2016.
- 28) Hamzacebi C. (2016). Primary energy sources planning based on demand forecasting: The case of Turkey. *Journal of Energy in Southern Africa*. 27, 2-10.
- 29) Hamzacebi C. and Kutay F. (2004). Electric consumption forecasting of Turkey using artificial neural networks up to year 2010. *Journal of the Faculty of Engineering and Architecture of Gazi University*. 19, 227-233.
- 30) Hamzecebi C. and Es H. A. (2014). Forecasting the annual electricity consumption of Turkey using an optimized grey model. *Energy*, 70, 165-171.
- 31) Hamzecebi C., Es H. A. and Cakmak R. (2019). Forecasting of Turkey's monthly electricity demand by seasonal artificial neural network. *Neural Computing and Applications*. 31, 2217-2231.
- 32) Kavaklioglu K., Ceylan H., Ozturk H. K. and Canyurt O. E. (2009). Modeling and prediction of Turkey's electricity consumption using artificial neural networks. *Energy Conversion and Management*. 50, 2719-2727.
- 33) Kaytez F., Taplamacioglu M. C., Cam E. and Hardalac F. (2015). Forecasting electricity consumption: A comparison of regression analysis, neural networks and least squares support vector machines. *International Journal of Electrical Power and Energy Systems*. 67, 431-438.
- 34) Kiran M. S. and Yunusova P. (2022). Tree-seed programming for modelling of Turkey electricity energy demand. *International Journal of Intelligent Systems and Applications in Engineering*, 10, 142-152.
- 35) Kiran M. S., Ozceylan E., Gunduz M. and Paksoy T. (2012). Swarm intelligence approaches to estimate electricity energy demand in Turkey. *Knowledge-Based Systems*. 36, 93-103.
- 36) Kocadayi Y., ErKaymaz O. and Uzun R. (2017). Estimation of Tr81 Area Yearly Electric Energy Consumption By Artificial Neural Networks. *Bilge International Journal of Science And Technology Research*. 1, 59-64.
- 37) Kodogiannis, V.S. and Anagnostakis, E.M. (1999). A study of advanced learning algorithms for short-term load forecasting. *Engineering Applications of Artificial Intelligence*. 12, 159-173.

## Estimation of the Electricity Supply and Demand of Türkiye Employing Deep Learning Networks

- 38) Kolmek M. K. and Navruz I. (2015). Forecasting the day-ahead price in electricity balancing and settlement market of Turkey by using artificial neural networks. *Turkish Journal of Electrical Engineering and Computer Sciences*. 23, 841-852.
- 39) Kucukali S. and Baris K. Turkey's short-term gross annual electricity demand forecast by fuzzy logic approach. *Energy Policy*. 38, 2438-2445.
- 40) Kurt E., Kasap R. and Celik K. (2022). Forecasting of monthly electricity generation from the conventional and renewable resources following the corona virus pandemic in Turkey. *Journal of Energy Systems*. 6, 420-435.
- 41) Kusakci O. A. and Ayvaz B. (2015). Electrical energy consumption forecasting for Turkey using grey forecasting technics with rolling mechanism. *2<sup>nd</sup> International Conference on Knowledge-Based Engineering and Innovation*. 1, 15870963.
- 42) Nalbant A., Aslan Y. and Yasar C. (2005). Electric puant load estimation for Kutahya province. *2<sup>nd</sup> National Congress on Electrical, Electronics and Computer Engineering*. 1, 211-214.
- 43) Ozden S. and Ozturk A. (2018). Electricity energy demand forecasting for an industrial region (Ivedik) by using artificial neural network and time series. *Journal of Information Technologies*. 3, 255-261.
- 44) Ozkurt N., Oztura H. S. and C. Guzelis. (2020). 24-hour electricity consumption forecasting for day ahead market with long short term memory deep learning model. *12<sup>th</sup> International Conference on Electrical and Electronics Engineering*, 1, 173-177.
- 45) Ozkurt N., Oztura H. S. and Guzelis C. (2021). Electricity energy forecasting for Turkey: A review of the years 2003–2020. *Turkish Journal of Electrical Power and Energy Systems*. 1, 118-128.
- 46) Pence I., Kalkan A. and Csmeli M. S. (2019). Estimation of Turkey industrial electricity consumption with artificial neural networks for the 2017-2023 period. *Journal of Applied Sciences of Mehmet Akif Ersoy University*. 3, 206-228.
- 47) Senel M., Senel B., Blir L. and Zeytin V. (2012). The relation between electricity demand and the economic and demographic state: a multiple regression analysis. *The Journal of Energy and Development*. 38, 257-274.
- 48) Sonmez M., Akgungor A. P. and Bektas, S. (2017). Estimating transportation energy demand in Turkey using the artificial bee colony algorithm. *Energy*. 122, 301-310.
- 49) Srinivisan D. (1998). Evolving artificial neural networks for short term load forecasting. *Neurocomputing*. 23, 265-276.
- 50) Toksari M D. (2009). Estimating the net electricity energy generation and demand using the ant colony optimization approach: Case of Turkey. *Energy Policy*. 37, 1181-1187.
- 51) Toksari M. D.. (2016). A hybrid algorithm of Ant Colony Optimization (ACO) and Iterated Local Search (ILS) for estimating electricity domestic consumption: Case of Turkey. *International Journal of Electrical Power and Energy Systems*. 78, 776-782.
- 52) Topalli A. K. and Erkmen I. (2003). A hybrid learning for neural networks applied to short term load forecasting, *Neurocomputing*. 51, 495-500.
- 53) Topalli A. K., Erkmen I. and Topalli I. (2006). Intelligent short-term load forecasting in Turkey. *International Journal of Electrical Power and Energy Systems*. 28, 437-447.
- 54) Toros H. and Aydin D. (2018). Prediction of short-term electricity consumption by artificial neural networks using temperature variables. *European Journal of Science and Technology*. 14, 393-398.
- 55) Tutun S., Bataineh M., Alaademy M. and Khasawneh M. (2016). The optimized elastic net regression model for electricity consumption forecasting. *5<sup>th</sup> Annual World Conference of the Society for Industrial and Systems Engineering*. 1, 14-21.
- 56) Tutun S., Chou C. A. and Caniyilmaz E. (2015). A new forecasting framework for volatile behavior in net electricity consumption: A case study in Turkey. *Energy*. 93, 2406-2422.
- 57) Ugurlu U., Oksuz I. and Tas O., (2018a). Electricity price forecasting using recurrent neural network. *Energies*. 11, 5-15.
- 58) Ugurlu U., Tas O. and Yorulmus H. (2018b). A long short term memory application on the Turkish intraday electricity price forecasting. *Pressacademia*. 7, 126-130.
- 59) Ulku H. and Yalpir S. (2021). Developing methodology for energy demand estimation: 2030 year case of Turkey. *Niğde Ömer Halisdemir University (NOHU) Journal of Engineering Sciences*. 10, 188-201.
- 60) Unluk I. H. and Pala Z. (2019). Prediction of monthly electricity consumption used in Muş Alparslan University Complex by means of Classical and Deep Learning methods. *International Conference on Data Science, Machine Learning and Statistics*. 1, 237-239.
- 61) Yalcinoz T. and Eminoglu U. (2005). Short term and medium term power distribution load forecasting by neural networks. *Energy Conversion and Management*. 46, 1393-1405.
- 62) Yavuzdemir M. (2014). Estimating the short term gross electricity energy demand of Turkey. MSc. Thesis. Ankara University Institute of Social Sciences.

## Estimation of the Electricity Supply and Demand of Türkiye Employing Deep Learning Networks

- 63) Yumusak R., Ozcan E. C., Danisan T. and Eren T. (2019). 2<sup>nd</sup> Global Conference on Engineering and Technology Management. International Conference on Data Science, Machine Learning and Statistics. 1, 31-33.
- 64) Zengin S., Yuksel F. S. and Antmen Z. F. (2022). Enerji Kaynakları ve Elektrik Tüketim Talep Tahmin Yöntemleri: Regresyon ve ANFIS Uygulaması. Akademisyen Kitabevi. ISBN: 9786258259360.



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## Micro-Economic Analysis of the Drivers of Under-Five Mortality in Kano Metropolis, Nigeria



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**ABSTRACT:** Nigeria is among the major countries contributing a significant quarter to death of children under the age of five in the world. This study was designed to analyze the drivers of child mortality in Kano Metropolis, Nigeria. Survey data was used, sourced via a structured questionnaire. Simple percentage and Negative Binomial Poisson Regression Model were used in the analysis of the data. It was found that education level of the household head, years of marriage experience, income level of the household, location, and vaccine are the significant drivers of child mortality in the study area. The results further revealed that, education level, years of marriage experience and location negatively influence under-five child mortality, while income of the household head and vaccine influence the under-five mortality of the household positively. The study recommends that, government should subsidize medical services and made it affordable to all individuals in the State, and that both government, NGOs and health institutions should embark on public enlightenment to educate the public on the importance of vaccines, natal care, and nutrition.

**KEYWORDS:** Poisson regression; HDI; Child mortality; Under-5 mortality

### 1. INTRODUCTION

Under-five mortality is a fundamental indicator of socioeconomic development as well as quality of life of every nation. This could be the reason why it appears to be a major aspect of the global development agenda. Child mortality serves as a vital component of Human Development Index (HDI) which is the famous instrument for measuring development used by international community particularly United Nations Development Program (UNDP) in its annual report.

Many developing countries particularly sub-Saharan Africa were unable to achieve the target of reducing under-five mortality rate by two-third, as targeted by the immediate past global development agenda popularly known as Millennium Development Goals (MDGs). A significant progress in the reduction of child mortality was recorded at a global level looking at some recent statistics. In 1990, about 12.7 million under 5 years children died, the figure reduced to 6.3 million in 2013 (World Health Organization, 2022). However, it was revealed that the children of Sub-Saharan Africa are 14 times more likely to die before the age of five than children of developed regions (WHO, 2022). This could be attributed to the failure of such countries to improve their medical care services resulting from poor budgetary allocation to the sector coupled with mismanagement of funds. It was reported that every year, 3 million children in developing countries die for lack of clean water (UNDP, 2015).

Nigeria is currently regarded as the worlds' largest contributor to death of children under the age of five. It was estimated that, there was an average of 858,000 under-five death in Nigeria out of 5.2 million under-five death global (UNICEF, 2001). Similarly, in 2000 World Health Organization (WHO) ranked Nigeria as 187<sup>th</sup> in term medical care out of 191 countries of the world (Federal Ministry of Health, 2004). This could be attributed to lack of access to medical care by a large portion of households in the country, coupled with unavailability of the service providers especially in rural areas. Other problems include distance to health facilities, lack of money for the treatment and unavailability of drugs (NPC, 2008). National Health Insurance Scheme failed to cover a significant portion of the Nigeria's population. About ninety percent of Nigerians are not in any kind of health insurance (Muanya, 2020). This implies that 90% of Nigerian are paying-of-pocket to access medical care services, which increases the household's expenditure and decreases their propensity to save.

In Nigeria many children are under-nourished, various research confirmed that there is food insecurity in the country. Malnutrition remains one of the major challenges to children's health in the country owing to the economic situations in the country ranging from inflation, rising poverty and inequality. As a result of this, many children suffer from diseases that could

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have otherwise been prevented by eating good food and proper sanitation. Diseases increase children's probability of death before reaching five years of age which invariably deteriorates human capital in the country.

Nigeria government has been coming up with programs aimed at reducing child mortality in line with global development agenda (MDGs and SDGs). This includes National Immunization Program, Maternal and Child Health Project, National Health Insurance Scheme among others aimed at reducing the child and maternal death in the country. Despite the high incidence of child mortality in Nigeria over the years, though a marginal reduction was witnessed, yet it was not enough to achieve the target set by MDGs. Nigeria constitutes just 1% of the world population, but accounts for 10% of the world's maternal and under-five mortality rates in 2010 (Adeyele and Ofoegbu, 2013). The country had been ranked second in the world in terms under-five mortality rate until recently when it overtook India and emerged as number one (UNICEF, 2021).

The under-five mortality rate is highest in north-western region than any other geopolitical region in the country (NPC, 2020). The current security situation in the region is one of the major challenges for addressing the issue of child mortality. For half of the decade many villages (towns) in the region have been devastated by the activities of bandits. This displaced many households and rendered them in a state of famine and destitution. Moreover, rising poverty, unemployment and climatic factors (flood) could aggravate the menace in the north-western region.

The objectives of this paper are to identify the incidence of child mortality among households in the study area and to investigate the major micro-economic drivers of infant mortality in Kano State, Nigeria. Therefore, the outcome of this study is expected to shed light on the appropriate micro economic factors that affects child mortality to policymakers to come up with appropriate policy on human capital in Kano State or Nigeria at large. It is hoped that the study will contribute to the ongoing debate on the health economics. The rest of the paper was organised as follows. Section two centered on the literature review, section three focused on methodology, section four presented the result and discussions, and section five captured the conclusion and recommendations.

## 2. LITERATURE REVIEW

The mortality of children is an undesirable phenomenon in every country, as it reflects negatively in the human capital development of the economy. Conceptually, children mortality is categorized into five categories: Neonatal mortality, Post neonatal mortality, Infant mortality, Child mortality and Under-5 mortality. The mortality is explained by what is called mortality rate, that is, the probability of a child dying out of one thousand live births. According to the National Population Commission (2022), neonatal mortality is the likelihood of dying within the first month of life. Post neonatal mortality is the likelihood of dying between the first month of life and the first birthday. Infant mortality is the likelihood of dying between birth and the first birthday. Child mortality is the likelihood of dying between the first and the fifth birthday. Finally, Under-5 mortality is the likelihood of dying between birth and the fifth birthday. This implies that under-five mortality comprises all the categories of children mortality. This could be the reason why it is used as a socioeconomic development indicator globally.

Empirically, many studies have tried to reveal the determinants of under-five mortality. The determinants range from numerous socio-economic factors. For instance, Bhatti, Shahzad and Shaukat (2019) investigated the socioeconomic determinants of child mortality in Punjab, Pakistan using binary logit approach. The independent variables that are found to be significant are location of the household, level of mothers' education, wealth quantity, awareness, and access to clean water. Similarly, Ghosh and Bharati (2010) examine the determinants of child mortality in Kolkata city of India based on two distinct communities. The result of their study reveals that high prevalence of child death was found in community with poor medical facility. Another study was carried out by Kusneniwar, Mishra, Balasubramania and Reddy (2013) on Determinants of Infant Mortality in Developing Region of India. The study found that education of the mother, socioeconomic status of the household and sanitation were the significant determinants of child mortality in the regions. High standard of living was also associated with lower infant mortality. Similar study was conducted in Bangladesh by Awan and Khan (2017) on the determinants of child mortality rate using binary logistic regression model. The independent variables that were found be significant in model include mothers working status, parental educational level, and maternal age at first birth.

However, in African countries some studies were conducted to investigate the socioeconomic determinants of child mortality. For instance, Nyaaba, Dadzie and Aymga (2020) analyzed the determinants of under-five mortality in Ghana. Sequential logit regression was employed in the study. The dependent variable was the probability of child died before fifth birthday in the household. While the independent variables are of three groups: socioeconomic, maternal and environmental factors. Three models were analyzed (model I, II and III) in which model III which comprises all the three factors was found to be the best model that explained the contribution of the covariates to under-five mortality. The result reveals that education and wealth status were significantly associated with under-five mortality. Under maternal factors, age at first birth, birth order, place of delivery was found to be significant. While environmental factors that were significantly associated with under-five mortality include toilet facility

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and source of drinking water. Similarly, Ayele, et al (2022) investigated the determinants of under-five mortality in Ethiopia using Ethiopian Demographic and Health Survey data. Semi-parametric nested shared frailty survival analysis was employed to identify the determinants of under-five mortality in the study. The result reveals that sequence of birth, birth interval and age at first delivery are significantly associated with under-five mortality in Ethiopia.

Similarly, in the studies conducted in Nigeria, the association between household socioeconomic attributes and under-five mortality was also established. Olusegun, Abdullahi and Adamu (2016) analyze under-five mortality in Zaria using simple regression and correlation analysis. Deliveries were considered as independent variable while under-five mortality was the dependent variable. Both results reveal that there was a strong association between under-five mortality and delivery rate. Although the study doesn't investigate the socioeconomic factors. Onatunji and Adesina (2016) investigated the determinants of child mortality in Nigeria using National Demographic and Health Data. Logistic regression was used to examine the determinants of child mortality and COX regression was used to find out effect of the explanatory variable and survival of child in Nigeria. The logit results show that the variables that are significant determinant of child mortality are educational level of parents, household income and location of the household. The result of cox regression shows that household income and location of the residence significantly decrease the risk of death, while delivery at home significantly increase the risk of death. Another study was carried out by Ayodele and Ofoegbu (2013) which analyses the infant mortality in Nigeria using national demographic and health data. Regression analysis was used to analyze the socioeconomic variable as determinants of child mortality in Nigeria. Variables that were found to be significant in the model include mother's educational level and mother's ability to make decision and control resources in the house. These factors reduce the risk of child mortality according to the study.

The foregoing reviews enable us to know that education of parent has a great influence on probability of child survival. Research carried out in different part of the world emphasize the influence of education and standard of living in reducing under-five mortality. However, the common instrument of data analysis used in the works reviewed was binary logit model. For instance, Bhatti, Shahzad and Shaikat (2019); Ghosh and Bharati (2010); Kusneniwar, Mishra, Balasubramania and Reddy (2013) they used binary logit to conduct the study in Pakistan and India respectively. Awan and Khan (2017) used the same in Bangladesh. On the contrast, the studies conducted in Africa used different models to analyze the determinants of child mortality. This includes Nyaaba, et al (2020) which used sequential logit model. In the work explanatory variable was categorized into three groups. Onatunji and Adesina (2016) used Cox model to analyze the risk of child mortality in Nigeria. This study fills the gap by employing Poisson Regression to analyze the major drivers of child mortality in Kano State, Nigeria.

### 3. METHODOLOGY

#### 3.1 Data Description

The study uses a cross sectional survey design to enable effective data management and generalization in attempt to determine the drivers of child mortality in Kano State, Nigeria. The population of the study comprises all the households living in Kano Metropolis. A total of two hundred and fifty (250) households were drawn as a sample of the study. A two-stage cluster sampling technique was utilized, in which five local government areas in the Kano metropolis were randomly selected. The selected local government areas include Dala, Gwale, Kano Municipal, Kumbotso and Fagge Local Government Area. In the second stage of the sampling, 50 households were selected from each of the selected Local Government Area, using probability sampling. Thus, the sample size was selected in accordance with Bryman and Bell (2007) who opined that, the decision about sample size represents a compromise between the constraint of time and the need for precision. Furthermore, structured questionnaire was used as instrument of data collection after its contents were validated by some senior academic advisors and was designed to include both open and close ended questions guided by the objective of the study. The instrument was administered directly by the researchers themselves who waited to retrieve it instantly to avoid high instrument mortality.

The data collected for the study was analyzed using descriptive statistics particularly for assessing the demographic information of the respondents and Poisson Regression Model to determine the drivers of the child mortality among the households living in Kano State.

#### 3.2 Model Specification

The Poisson Regression Model was adopted for this study following the work of Aku (2017). The rationale was due to the count and intensity nature of the dependent variable, that is, prevalence of under five children under five in a household. The probability distribution that is specifically suited for the count data is the Poisson probability distribution (Gujarati, 2005), and that the Poisson model meets the classical assumptions except that the dependent variable assumes Poisson distribution. Therefore, the following model is specified for Poisson distribution:

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$$\Pr(Y = y_i) = \frac{e^{-\mu}(\mu)^{y_i}}{y_i!} \dots \dots \dots 3.1$$

From equation 3.1,  $Y$  is a discrete variable that can only take one value  $y_i$  at any given time  $t$ .  $\mu$  is the mean value representing the prevalence, intensity, or rate parameter, and it is non-negative i.e  $\mu > 0$ . The prevalence of the under-five children mortality in this study were defined as the number of times an under-five child died over the past 5 years in a household in Kano. Therefore, if the prevalence of the mortality is analyzed as a function of other explanatory variables ( $x_i$ ), and is measured as a count variable denoting the rate or intensity of the mortality in five years ( $y_i$ ), the Poisson regression may be re-specified as

$$\Pr(Y = y_i|x_i) = \frac{e^{-\mu(x_i\beta)}\mu(x_i\beta)^{y_i}}{y_i!} \dots \dots \dots 3.2$$

From equation 3.2,  $y_i$  is the rate of the child mortality in a household,  $\mu$  is the mean level of the mortality which must be positive, and is a function of  $x_i$ , where  $x_i$  represents the explanatory variables,  $\beta$  is the estimated parameter, and  $e$  is the exponential function with a value of 2.71. Therefore, in the context of this study,  $y_i = 0, 1, 2, \dots, n$ , where zero means no under-five mortality is recorded in the household in the past 5 years, while numbers  $1, 2, \dots, n$  represent the number of time an under five child dead is recorded in a household in the past 5 years.

Assuming a Poisson distribution, there is a defined likelihood function that warrants the possibility to develop the Maximum Likelihood Estimator (MLE). Within the Poisson model, unknown regression parameters  $\beta_0, \beta_1, \beta_2, \beta_k$  could be estimated as the case is with other regressions, to explain the distribution of  $y_i$  or the expected value  $y_i$  by the set of explanatory variable  $x_i$ .

From the Poisson regression model,  $\mu$  being the intensity or rate parameter is expressed as:

$$\mu = \exp(x_i'\beta) \dots \dots \dots 3.3$$

There are two important properties of the Poisson distribution that must be observed, that is, the equality of conditional variance of  $y_i$  and the mean  $\mu$ , and this condition is referred to as equi-dispersion express as follows:

$$E(y_i|x_i) = \text{var}(y_i|x_i) = \mu \dots \dots \dots 3.4$$

If the above property (3.4) is violated, that may lead to problem of over-dispersion or under-dispersion given as  $\text{var}(y_i|x_i) = \mu + \alpha\mu^2$  or  $\text{var}(y_i|x_i) = \mu + \alpha$  respectively. In such a situation, Normal Poisson Model (NPM) could not be effective, instead Negative Binomial Model (NBM) is most appropriate. The second property however was the issue of excess zero which if presence in the model only the use of Zero Inflated Poisson (ZIP) is necessary.

In a count data models, given  $x_i$ , the count variable  $y_i$  has a Poisson distribution with expectation  $\mu_i = \exp(X'\beta)$ . Thus the marginal effect or probability mass function of  $y_i$  conditional upon  $x_i$ , is given by

$$\frac{\partial E(y_i|x_i)}{\partial X_i} = \Omega_j \exp(x_i'\beta) \dots \dots \dots 3.5$$

However, the empirical model used in the study to analyze the drivers of under-five mortality in Kano State is expressed in mathematical functional form as below:

$$\text{UFM} = f(\text{educ, mexp, incm, loct, vacn, care, nutr}) \dots \dots \dots 3.6$$

Specifically, the model is further re-specified econometrically as follows:

$$\text{UFM} = \beta_0 + \beta_1 \text{educ} + \beta_2 \text{mexp} + \beta_3 \text{incm} + \beta_4 \text{loct} + \beta_5 \text{vacn} + \beta_6 \text{care} + \beta_7 \text{nutr} + \varepsilon_i \dots \dots \dots 3.7$$

Where:

UFM = Under-five mortality in a household

Educ = Level of education of the household head

Mexp = Years of marriage experience

Incm = Income of the household head

Loct = Location or area of residenc

Vacn = Child vaccine

Care = Ante natal and post-natal care

Nutr = Nutrition and food security



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**Table 3.1 Variables Description**

S/N	Variable Name	Variable Measurement
1	Under-five mortality	Number of children below five years of age that died in the last six month
2	Level of education of the household head	1= no formal education, 2= primary education, 3=secondary education, 4=
3	Years of marriage experience	Quantitative and continuous variable
4	Income of the household head	Monthly earning of the household head from all the sources
5	Location or area of residence	1= household reside in the city, while 2 represents household reside outside the city
6	Child vaccine	1 if children in the household are vaccinated, zero otherwise.
7	Antenatal & postnatal care	1 if mother attend antenatal care and give birth at hospital, zero otherwise
8	Nutrition & food security	Intake of balanced diet and three-square meals in a typical day. Ordinal scale: ranges from 1 to 4 (represents daily, twice a week, weekly and occasionally)

**Source:** Authors conception

### 4. RESULT AND DISCUSSION

The result of the analysis is presented in this section. Two hundred and fifty (250) questionnaires were administered to the respondents, only eight (13) were not returned or returned with an incomplete response. This marked a returned rate of 94.8%, and therefore the analysis is conducted on the returned questionnaires.

#### 4.1 Demographic Characteristic of the Respondent

Socio-economic and demographic information of the respondents were especially important in the conduct of empirical analysis as it provides useful features of the respondents in the study area. The profiles were examined under some variables that include location, level of education, years of marriage experience and size of the family.

**Table 4.1: Socio-economic and Demographic Characteristics of the Respondents**

s/n	Variable(s)	Frequency	Percentage (%)
<b>1.</b>	<b>Location</b>		
	within the city wall	128	54.01
	Outside the city wall	109	45.99
	Total	237	100.00
<b>2.</b>	<b>Level of Education</b>		
	Primary education	79	33.33
	Secondary education	71	29.96
	Tertiary education	46	19.41
	Post graduate education	41	17.30
	Total	237	100.00
<b>3.</b>	<b>Years of Marriage Experience</b>		
	3 years and below	17	7.17
	4 – 7 years	60	25.32
	8 – 12 years	52	21.94
	13 – 16 years	47	19.83
	17 – 20 years	26	10.97
	Above 20 years	35	14.77
	Total	237	100.00
<b>4.</b>	<b>Size of the Family</b>		
	Less than 2 children	36	15.19
	2 – 5 children	124	52.32
	6 – 9 children	54	22.78
	10 and above children	23	9.70
	Total	237	100.00

**Source:** Field survey, 2022.

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Table 4.1 presents the socioeconomic and demographic information of the respondents. The result shows that most of the households (54.01%) in the metropolitan resides or are located within the old-Kano city wall and 45.99% outside the city wall. Furthermore, 33.33% of the household acquired primary education, 29.96% secondary, 19.41% tertiary (diploma and undergraduate) and 17.30% possessed post graduate education; this shows that, most of the household in Kano metropolitan have at least primary education. On the part of years of marriage experience of the respondent, majority of them representing 25.32% had 4 – 7 years of marriage experience, followed by 21.94% with 8 – 12 years of marriage experience and 19.3% with 13-16 years. Lastly, the number of children born by the household revealed that 52.32% of the respondents had 2 – 5 children and 22.78% had 6 – 9 children, while 15.19% and 9.70% have less than 2 and 10 to above children respectively. This shows that much of the household in Kano Metropolitan have an average of 2 – 5 children.

### 4.2 The Incidence of Under-five Mortality among Households

In the study area, the incidence of child mortality or rate at which an under-five child died in the household in the past 5 years is measured using descriptive statistics and the result is presented in table 4.2 below.

**Table 4.2: Weekly returns of the small-scale industries**

S/N	Item (#)	Frequency	Percentage (%)
1.	No Under-five mortality recorded	89	37.55
2.	1 under-5 mortality recorded	66	27.84
3.	2 Under-5 mortality recorded	33	13.92
4.	3 Under-5 mortality recorded	16	6.75
5.	4 Under-5 mortality recorded	11	4.64
6.	5 and above Under-five mortality recorded	19	8.02
<b>TOTAL</b>		<b>237</b>	<b>100.00</b>

Source: Field Survey, 2022.

From the result of incidence of under-five child mortality presented in table 4.2, it shows that only 37.55% of the household in the study area did not experience any case of child mortality during the past five years while about 62.55% experience 1 or above number of under-five child death. Precisely, 27.84% had only 1 child mortality, 13.92% experience 2 child mortality, 6.75% experience 3 child mortality, 4.64% had 4 number of child death and 8.02% had 5 and above under-five children that died in the past five years. The result therefore revealed that, majority of the respondent experience child mortality in their household.

### 4.3 Poisson Result for Drivers of Child Mortality in Kano State

The drivers of under-five mortality are fundamental indicators of socioeconomic development and quality of life in a country and among its inhabitants as it can be used for appropriate policies and planning. The Poisson regression model was used to analyze the drivers or factors influencing children mortality rate among households in the Kano metropolis. The number of times household losses his under-five child for the past 5 years was used as a dependent variable against independent variables as shown in table 4.2 below.

**Table 4.3: Results of the estimated Poisson regression model**

Child Mortality	Poisson Model			Negative Binomial Model		
	Coeff.	P-value	Marginal effect	Coeff.	P-value	Marginal effect
Education	-0.243	0.000	-0.259	-0.243	0.001	-0.258
Years of Marriage Experience	0.196	0.000	0.208	0.194	0.000	0.207
Marriage Experience Squared	-0.375	0.193	-0.040	-0.331	0.329	-0.035
Household Income Level	0.236	0.023	0.251	0.253	0.038	0.269
Location	-0.243	0.095	-0.258	-0.242	0.163	-0.258
Vaccine	0.372	0.017	0.397	0.363	0.064	0.386
Heal care (anti natal)	0.270	0.075	0.288	0.271	0.150	0.289
Food and Nutrition	-0.047	0.408	-0.050	-0.049	0.473	-0.052
Alpha (Over-dispersion parameter)				Chi <sup>2</sup> = 12.86	p-value = 0.000	

Source: Authors Computation using STATA 14

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In table 4.3, both the result of normal poisson and negative binomial poisson regression were presented. Looking at the significant value of Alpha (0.000), the null hypothesis of Alpha = 0 or the equi-dispersion property is rejected at 1 percent, this shows that there is problem of over-dispersion and hence the result of the Negative Binomial Model (NBM) is most appropriate and will be reported in the analysis although the two model coefficients are very much close and they may give the same prediction. Moreover, from the result of the NBM, the following variables were found to have significant influence on under-five mortality in Kano state: education level of household head, years of marriage experience, income level of the household, location, and vaccine. The number of years of formal education of the household head was found significant at 1 percent and its influence on child mortality is negative. The coefficient of education shows that a 1-year increase in the household education level, the intensity of child mortality will decrease by 0.24 units. This concurs with findings of Awan and Khan (2017); Awan et al (2017); Nyaaba et al (2020); Onatunji et al (2016), and it is in line with the priori expectation that education would create more awareness and adoption of appropriate medical care and advice.

Years of marriage experience of the household was found to positively influence child mortality of the household and was statistically significant at 1 percent level. However, to model the influence of age more accurately in the analysis, the function age squared was included. This was necessary because the results show that household higher age of marital experience was more likely to have better family education. The result showed that at much higher marriage experience the rate of child mortality was negative and this is consistent with a priori expectation.

The level of the household income was also found to positively affect the rate of child mortality and is significant at 5 percent. The coefficient reveals that, a ₦1000 increase in the income of the household, under-five child mortality increases by 0.04 unit. However, this is contrary to the finding of Nyaaba et al (2020), and it is contrary to the expectation. The results here suggest that most of the households do not spend much of their additional income on their family health but other luxury items to compete with people in the city.

Location of the household was found positive and significant at 10 percent that is place of living of the household is negatively and significantly affecting child mortality in Kano Metropolis. This is in line with the finding of Onatunji et al (2016), and it's consistent with expectation that people living in the city or within the city wall of Kano are educated and aware of the importance of medical services and improve family lifestyle. It revealed that as a household live within the old city of Kano, the rate of his child mortality decreases to 0.24 as against those living outside the city wall.

Vaccines is another significant variable that affect the rate of child mortality in Kano state. However, the variable is contrary to a priori expectation as it positively affects the under-five child mortality of the household in the study area. This could be attributed to the way and way the vaccines are taken. The vaccines required to be taken at a right time and required dose has to be taken for any vaccine to be effective. Some parents due to ignorance skip doses of vaccines and still claim they vaccinate their children.

### 4.3 Post-estimation Test Result

The chi-squared value from the result of both models were significant at 1%, thus implying that all the variables jointly determine the dependent variable. Pseudo  $R^2$  of 11.68%, is sufficiently high. However, the Poisson Model produces no natural counterpart to the  $R^2$  in linear regression model, (Greene, 2012). It is therefore difficult to assess the goodness of fit of the model based on the  $R^2$  therefore GOF test was conducted, and the result of the Deviance and Pearson goodness of fit rejected the null hypothesis at 1%.

Similarly, the test for over dispersion was conducted using the Negative Binomial Regression command, and the result of the Alpha proves the rejection of equal-dispersion property, hence the Poisson regression will not be correctly applied. Therefore, the need to report the result for the Negative Binomial Regression.

## 5. CONCLUSION AND RECOMMENDATIONS

Child mortality, being a vital component of human development index serves as a major tool for assessing development. However, the rate is high in developing countries particularly sub-Saharan Africa compared to their developed countries counterpart, likely due to increasing poverty, poor health, and nutritional services; and this was indicated in the analysis that, income, health care and vaccine positively influence child mortality.

The study found that, the intensity of child mortality in Kano metropolis is high given that only 37.55% of the respondent did not experience any case of child mortality in their household in the past five years, and that its rate is most especially and strongly influenced by socioeconomic characteristics of the household. The results revealed that education level, years of marriage experience, and location have negative significant influence on the under-five child mortality, while income of the household head and vaccine have positive significant influence on the under-five child mortality of the household in Kano State. Therefore, socioeconomic characteristics of households in Kano are major drivers of child mortality in the state.

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Based on the findings of the study, and in tandem with the importance of child mortality as an indicator of development, the following recommendations were drawn:

- i. Government should subsidize medical services and make it affordable to all individuals in the State so that poor households can have access to improved health care facilities. An effective health insurance scheme could really help less privileged families to access medical care facilities in the state.
- ii. Government, NGOs, and health institutions should embark on massive public awareness and enlightenment to educate the public on the importance of vaccines, natal care and nutrition.

### FUTURE STUDY

This investigates the socioeconomic factors that affect the likelihood of under-five mortality in Kano State using household survey data. However, the survey was conducted only in five Local Government Areas located in the Kano Metropolis. These local government areas are in urban areas of the state. However, the local government areas in the rural area of the state were not studied due to limited resources at the disposal of the researchers. The future study should be conducted in both rural and urban areas of the state. The further study should consider sanitation as well as health insurance among the explanatory variables of under-five mortality.

### REFERENCES

- 1) Adeleye, I. T. and Ofoegbu, D.I. (2013) Infant and Child Mortality in Nigeria: An Impact Analysis. *International Journal of Economic Practices and Theories*, Vol. 3 (2)
- 2) Akinwande, M.O, Ibrahim, A. I. and Abubakar A. (2016) Analyzing Infant and Child (Under-five) Mortality in Zaria: A Regression Analysis Approach. *African Research Review. A Multidisciplinary Journal*, Ethiopia 10(3)
- 3) AKU, A. O. (2017) Influence of Farmer Organizations as a Market Information System on Market Access and Income of Smallholder Vegetable Farmers in Babati District, Tanzania. An unpublished Master of Science Degree Thesis Submitted to the Graduate School, Department of Agricultural Economics, Egerton University
- 4) Ayele, B.A, Tiruneh, S.A, Azanaw, M.M, Hailemeskel, H.S, Akalu, Y. and Ayele, A.A. (2022). Determinants of Under-Five Mortality in Ethiopia. *Archive of Public Health*.
- 5) Bryman, A. & Bell, B. (2007). *Business Research Method 2<sup>nd</sup> Edition*. Oxford: Oxford University Press.
- 6) Ghosh, R. and Bharati, P (2010) Determinants of Infant and Child Mortality in Periurban Areas of Kokata City, India. *Asia-Pacific Journal of Public Health*. 1(22)
- 7) Greene, W. H. (2012). *Econometric Analysis*. United States: Prentice Hall.
- 8) Jumbo, D, Ogbale, J. and Mangbon, L. (2018) Analysis of Child Mortality Rates in Kaduna State. *International Journal of Scientific Research and Technology* Vol 4 (9)
- 9) Khan, J. R. and Awan, N. (2017) A Comparative Analysis on Child Mortality and Its Determinants in Bangladesh. *Archives of Public Health*
- 10) Kusneniwar, G.N, Mishra, A.K, Balasubramanian, K. and Reddy, P.S. (2013) Determinants of Infant Mortality in a Developing Region in Rural Andhra, India. *National Journal of Integrated Research in Medicine* 4(4)
- 11) Muanya, C. (2020) Over 170 Million Nigerians without Health Insurance. *The Guardian News Paper* 25<sup>th</sup> September, 2020
- 12) Nyaaba, A.A, Tanle A, Dadzie, L.K. and Aymga, M. (2020) Determinants of Under-five Mortality in Ghana: Evidence from Ghana Demographic and Health Survey. *International Journal of Translational Medical Research*. 4 (2)
- 13) Okwuwa, C.O. (2020) Infant Mortality, Access to Primary Health Care and Prospects for Socio- Economic Development in Bwari Area Council, Nigeria. *Journal of International Women's Studies* Vol. 21 (1)
- 14) Onatunji, A.P. and Adesina, O.A. (2016) Effect of Determinants of Infant and Child Mortality in Nigeria: Hazard and Odds Ratio Models. *West African Journal of Industrial & Academic Research* Vol.16 No.1
- 15) Rafique, D, Bhatti, M A, Shahzad I and Shaukat, S. (2019) Socioeconomic Determinants of Child Mortality (Under Age One): Reported by Mothers of Reproductive Age in Punjab, Pakistan. *Journal of Economics* 8(4)
- 16) UNICEF (2021) Child Mortality Estimates. [www.data.unicef.org](http://www.data.unicef.org)
- 17) World Health Organization (2022) Child Health. [www.who.afro.int/health-topics/child-health](http://www.who.afro.int/health-topics/child-health)



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## Principals' Integration of ICT in Curriculum Implementation for Sustainable Development



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**ABSTRACT:** The integration of ICT in secondary school curriculum has been widely advocated as much needed in the 21<sup>st</sup> century skills to improve the standard of education. However, this can be promoted through acquiring ICT skills in several ways such as software development, programming, networking, web design, cloud computing, Augmented Virtual Reality (AVR), Internet-of-Things (IoT), and artificial intelligence (AI) are effectively leading tools and ICT environments to help worldwide leadership, facilitators, and learners with quick, effective, and healthy interaction towards a sustainable development. This study investigated the principals' integration of ICT in curriculum implementation for sustainable development. The respondents of the study consisted of 263 principals in public secondary schools in Anambra State. The study used descriptive survey design. The findings of the study revealed among others that lack of modern ICT facilities, poor internet network, poor maintenance culture, budgetary constrain of ICT personnel are the challenges. Based on the findings, it was recommended among others that Government should equip schools with ICT facilities, provides fund for training of ICT personnel for sustainable development.

**KEYWORDS:** ICT Integration, curriculum implementation and sustainable development

### INTRODUCTION

Globalization and rapid changes in technology have created a knowledge based economy in the 21<sup>st</sup> Century. Consequently, governments have invested in the integration of ICT in education at all levels to equip the learners with what are needed for sustainable development (Wambiri and Ndani, 2016). In furtherance, Information and Communication Technologies (ICTs), which include radio and television, as well as newer digital technologies such as computers and the internet have been touted as potentially powerfully enabling tools for educational change and sustainable development. When used appropriately, different ICTs are said to have helped expand access to sustainable development. Strengthening the relevance of ICT in education; organization (both private and public sectors) will lead to the success of achieving goals and objectives for self-reliance.

According to Blurton (2018), Information and Communication Technologies (ICT) can be defined as a "device set of technological tools and resources used to communicate, to create, disseminate, store, and manage information". In agreement with the above, International Institute for Sustainable Development (2007) added these technologies to include computers, the internet, broadcasting technologies (radio and television), and telephone. Also, the term ICT refers to: information channels such as the World Wide Web, online database, electronic documents, management and accounting systems, intranet, etc. communication channels such as e-mail, electronic discussion groups, electronic conferences, the use of cell phones, etc. hardware and software used to generate, prepare, transmit, and store data, such as computers, radio, TV, computer programmes/tools etc. All these technologies, when applied into the curriculum implementation in schools will enhance sustainable development.

Sustainable development according to Ayodele (2007) can be broadly defined as the ability of the economy to support the needs of the people of a country over a time, taking into consideration the economic, social and ecological constraints of the country. The fundamental concept is "sustainable requirement," namely that the fulfillment of the needs of the present generation should not compromise the ability of future generations to meet their own needs. Explaining further, ICT for sustainable development on the other hand represents a catalytic process for social change that seeks to foster through education training and public awareness-the values, behaviours and lifestyles required for sustainable future. It is about learning needed to maintain and improve our quality of life of generations to come. Also, it is about individuals, communities, groups, business and government to live and act sustainably; as well as giving them an understanding of the environmental factor, good moral behaviours, economic and cultural issues involved.

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It becomes obvious that principals cannot adequately apply ICT in curriculum implementation without considering teachers' perception on the integration of ICT in the classroom. On this note, Wambiri and Ndani (2016) argued that what teachers think about the use of technology affect their acceptance and subsequent integration in their teaching and learning activities in the classroom. In addition, Weiss and Barth (2019), opined that curriculum is mostly perceived as an educational project that is developed in a specific historical, social and political context and has the ability to form identities in the "knowledge," "action" and "self" area.

Nevertheless, Karmasin and Voci (2021) argued that ICT does not only play a central role in the transfer of knowledge and information or creating awareness on sustainability by placing it on the political and public agenda, rather it initiates a social change process towards a sustainable society and lifestyle, as ICT and behavior are interrelated, and behavior cannot change without proper communication. They further stated that sustainability ICT, therefore, faces the challenge of improving its information and knowledge sharing process, as well as linking the idea of sustainability to different educational levels. This could be done by initiating and establishing ICT process on what kind of values should lead societal development and, therefore, encourage and stimulate teachers' engagement.

Similarly, Hwang, Yang and Kim (2010) added that since digital literacy is considered as an important skill to cope with the 21<sup>st</sup> century for sustainable development, the teacher is a crucial player in the successful ICT curriculum implementation in the classroom and should be well prepared through adequate training. Thus, the vision of the basic education curriculum reforms is to equip learners with world class standards and skills needed to thrive in the 21<sup>st</sup> Century such as digital literacy. To achieve this, the integration of ICT in the curriculum implementation by the principal becomes a paramount.

The Education for Sustainable Development of student entails that students competence framework be based on generic and disciplinary competences structured along five clusters which should be used as a guide for curriculum design (Makrakis, 2012). Transformative learning focuses on learning-based change that involves 'learning to know', 'learning to do', 'learning to live together' and 'learning to be'. It is a shift of consciousness that alters: our way of being in the world (learning to be), our way for discovering others by discovering ourselves (learning to live together), our way of learning how to learn as well as acquiring, constructing, disseminating and managing knowledge (learning to know) and our way of putting knowledge into action (learning to do). It is above all learning that "transforms problematic frames of references – sets of fixed assumptions and expectations – to make them more inclusive, discriminating, open reflective and emotionally able to change" Learning to transform oneself and society has been added by UNESCO as a fifth pillar of learning along with the previous four pillars advocated sustainable development.

Furthermore, when principals integrate ICTs in the curriculum implementation, it can go a long way in transforming learning experiences, depending the considerable extent the curriculum is conceived and enacted through the processes of teaching and learning (Makrakis, 2012). Consequently, Tilbury (2011) argued that if principals are willing to make a meaningful contribution to sustainable development, such relevant ICTs have to be integrated in teaching content in school's curricula, as teaching together with the use of technology form the core of the learning experience. Traditionally, Etse and Ingley (2016) stated that curricula are more likely formulated to impart specific knowledge than to convey knowledge and skills that contribute to designing a sustainable development. Thus, Garraway, (2010) noted curricula should be designed in such a way that both academic and work-related knowledge is considered and the requirements of both areas are adequately met. Also, Mintz and Tal (2013) argued that one of the key challenges of the 21st century sustainability needs is to find a place in curricula of secondary education, namely not only within the field of environmental sciences or those disciplines included in the area of sustainability sciences but rather has to be integrated into all fields of study and be made accessible to all students.

Accordingly, it is of fundamental relevance to impart basic knowledge of sustainability to secondary students and raise their awareness about their crucial role as ICT professionals in relation to communicating sustainability to achieve sustainable development so that they can take responsibility in their duty. Similarly, Ordieres-Mere et al (2020) stated that if ICT is understood as a core dynamic of social behavior and take into account the importance of communication in the attempts to achieve attitude and behavioral change, as well as to convey inconvenient truths, then the investigation of how ICT is integrated into the curriculum implementation should be seen as essential. When ICT is integrated in the curriculum implementation in secondary schools, it will bring about digital changes which are one of the fundamental driving forces behind social change. Thus, change toward sustainable development is only achievable if both risks and opportunities, as well the dynamics of digitization are brought into harmony with the SDGs of the 2030 Agenda.

On the other hand, digitization as a driver for societal changes, potentially carries strong disruptive power. Therefore, if digitization is not designed, structured appropriately in the school curriculum, in line with the SDGs and the principles of sustainability not handled with caution and innovativeness, it could exacerbate existing problems in society, such as inequalities related to the digital divide and even multiply the alarming trends of a degraded social cohesion. Accordingly, courses and lectures

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dealing with issues of sustainability have the potential not only to convey relevant sustainability-related knowledge, but they also create a basis of knowledge and understanding of and for its concepts and principles, which students can apply in their later professional fields (Etse and Ingley 2016). Thus, both the demand for a curricula reorientation and the examination of the extent of such restructuring are essential in schools. The principal has major responsibility, though critical for initiating and implementing integration of ICT in the curriculum, to facilitate simple to complex decisions about its integration with real practice of learning and teaching, which effectively can improve and change the school system.

Consequently, there are many challenges that could hinder principals integration of ICT in curriculum implementation, like Wi-Fi connectivity, security and privacy of data of students or school's infrastructure, IT equipment and devices, cost, professional ethics, quality of digital courses and delivery modes such as audio video, and the necessary fundamental and advanced training of teachers (Dwivedi and Joshi 2019). Thus, transformation and survival of personal to professional life has become dependent on ICT and the digital environment, such as, health, sports, tourism, research, entrepreneurship, transportation, fashion, entertainment, automobile industry and education. In as much as the integration of ICT in the curriculum implementation could be hindered by some factors, the advantages according to Weinstein and Hernández (2015) supersede those factors in that ICT integration in the curriculum will stimulate the students' critical thinking, problem solving, collaborative communication skills and synthesizing reliable information, and creating valuable cognitive ability that motivates social and individual sustainable productive progress in schools. Would principals' integration of ICT in the curriculum implementation not be a panacea for sustainable development?

### Purpose of the study

1. To investigate principals' computer operational skills for integrating ICT in the curriculum implementation in public secondary schools in Anambra State.
2. To identify principals' networking skills in the ICT integration in the curriculum implementation in the public secondary schools in Anambra State.
3. To investigate the principals' ICT safety skills in ICT integration in the curriculum implementation in public secondary schools in Anambra State.

### Research questions

1. What are the principals' computer operational skills for sustainable development in public secondary schools in Anambra State.
2. What are the principals' networking skills for sustainable development in public secondary schools in Anambra State.
3. What are the principals ICT safety skills for sustainable development in public secondary school in Anambra State.

### Hypotheses

- Principals of public secondary schools do not differ in their computer operational skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.
- Principals of public secondary schools do not differ in their social networking skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.
- Principals of public secondary schools do not differ in their ICT safety skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.

## METHODS

The research design was a descriptive survey research design. The sample size was 263 teachers in the public secondary schools in Anambra State. The instrument for data collection was a questionnaire titled "Principals' Integration of Information and Communication Technology Questionnaire (PIICTQ)" which was a 4 points rating scale of 'Strongly Agree', 'Agree', Disagree, Strongly Disagree. The data collected were analyzed using mean and standard deviation and t-test for testing the null hypotheses. The decision rule for the research questions is that mean rating of 2.50 and above was taken as 'Agree', while below 2.50 was taken to indicate 'Disagree'. The decision rule is if the p-value is equal or greater than the level of significance 0.05, the difference was adjudged not to be significant and then the null hypothesis was not rejected. On the other hand, if the p-value is less than 0.05 level of significance, the difference was adjudged to be significant and null hypothesis was rejected.

### Presentation and data analysis

The results are presented in the following tables in relation with the research questions and hypotheses.

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**Research Question One:** What are the principals' computer operational skills for sustainable development in public secondary schools in Anambra State.

**Table 1: Mean ratings on Principal's computer operational skills for sustainable development in public secondary schools in Anambra State.**

S/N	Item	Mean	SD	Decision
1	Installing an application	3.28	0.89	Agree
2	Connecting scanner	3.60	0.59	Agree
3	Inserting and ejecting external storage devices	3.64	0.56	Agree
4	Using computer aided design	2.12	1.02	Disagree
5	Copying from hard disk to external storage drives	2.37	1.15	Disagree
6	Using word processors	3.21	1.12	Agree

**Criterion mean= 2.5**

**Grand Mean = 3.03**

From table 1, item 1, item 2, item 3, and item 6 have a mean above the criterion mean hence agree from the respondents response and item 4 , item 6 were disagree by respondents because its mean is below the criterion mean. Therefore, the Grand Mean is 3.03 shows that principals of public schools in Anambra State have Good knowledge of computer skills which will enhanced sustainable development in public schools.

**Research Question 2: What are the principals' networking skills for sustainable development in public secondary schools in Anambra State.**

**Table 2: Summary of Principal's networking skills for sustainable development in public secondary schools in Anambra State.**

S/N	Item	Mean	SD	Decision
7	Choosing a suitable connection method to access the internet	3.03	1.09	Agree
8	Creating e-mail account for exchanging information with others	2.34	1.23	Disagree
9	Downloading and saving data	2.23	1.21	Disagree
10	Purchasing materials online	1.43	0.71	Disagree
11	Customizing browser settings to improve performance	1.35	0.65	Disagree
12	Creating website's and publishing material on the web	2.95	1.06	Agree
13	Selecting suitable hardware and software for different network	1.39	0.49	Disagree

**Criterion Mean: 2.5**

**Grand Mean: 2.10**

From table 2, items 8, 9, 10, 11, and 13 indicated disagreed, because their mean is below the criterion mean and only items 7 and 12 were agreed because its mean is above the criterion mean. Therefore, the Grand Mean which is 2.10 shows that principals of public schools has no networking skills for sustainable development of public secondary schools in Anambra State .

**Research Question 3: What are the principals ICT safety skills for sustainable development in public secondary school in Anambra State.**

**Table 3: Summary of the Principal's ICT safety skills for sustainable development in public secondary schools in Anambra State.**

S/N	Item	Mean	SD	Decision
14	Blocking students access to irrelevant websites and materials	2.93	1.10	Agree
15	Preventing unauthorized network connections being created	3.19	0.92	Agree
16	Preventing opportunities for online abuse and exploitation	2.95	0.92	Agree
17	Guarding against digital theft and plagiarism	2.14	0.99	Disagree
18	Identifying inappropriate online contact	2.63	1.14	Agree
19	Changing private settings to protect personal information online	3.11	0.95	Agree
20	Using antivirus to protect computer from network attacks	2.00	0.98	Disagree

**Criterion Mean: 2.5**

**Grand Mean: 2.77**



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From table 3: items 14, 15, 16, 18 and 19 indicated agreed because its mean is above the criterion mean while items 17 and 20 were disagreed. Therefore the Grand Mean which is 2.77 shows that principals of public secondary schools in Anambra State are very conscious of the ICT safety skills.

### Hypothesis One

H0: There was no significant difference on the responses of teachers on principals' computer operational skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.

**Table 4: t-test results of respondents on the response of teachers on Principals' computer operational skills on ICT integration.**

N	STD	df	p	t-cal	t-crit	Decision
263	0,88	262	0.05	0.037	1.965	Accept null hypothesis

From table 4, the null hypothesis was tested using t-test for the mean of a population. The result showed that t calculated is less than critical T- value when tested at 0.05 alpha level at 262 degree of freedom. Hence we accept the null hypothesis that there was no significant difference on the responses of teachers on principals' computer operational skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.

### Hypothesis two:

H0: There was no significance difference on the responses of teachers on the principals' networking skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.

**Table 5: t-test results on respondents of teachers on the principals networking skills on ICT integration in the curriculum.**

N	STD	df	p	t-cal	t-crit	Decision
263	0.92	262	0.05	-0.03	1.965	Accept null hypothesis

Since the t calculated is less than critical t-value, we accept the null hypothesis that there was no significant difference on the response of teachers on the Principals networking skills on ICT integration in the curriculum.

### Hypotheses three:

H0: There was no significance difference on the responses of teachers on Principals' ICT safety skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State.

**Table 6: t test results of teachers on Principals ICT safety skills on ICT integration.**

N	STD	df	p	t-cal	t-crit	Decision
263	0.92	262	0.05	-0.03	1.965	Accept null hypothesis

Therefore from table 6, the t calculated is less than critical t-value we accept the null hypothesis that there was no significance difference on the response of teachers on Principals ICT safety skills on ICT integration in the curriculum implementation.

## DISCUSSION OF RESULTS

The grand mean of 3.03 on table 1 indicated that principals of public schools in Anambra State have good knowledge of computer skills which will enhanced sustainable development in public schools. This points to the fact that more awareness needs to be created on the acquisition of ICT skills by the public secondary school principals. From research hypothesis one, the t test calculated is 0.037, and the t test critical value is 1.965 at 5% level of significance. Since the t test calculated is less than t-test table, we accept the null hypothesis. This finding concurs with the study of Toomey, (2001) whose results indicated that ICT leadership of school principals is the critical element in establishing technology as a part of school culture.

Table 2 with the grand mean of 2.10 also demonstrates that principals of public secondary schools has little or no networking skills for sustainable development. This could as a result of some factors like, lack of interest, inadequate facilities, high cost of ICT. This corroborates with the findings of Adomi and Kpangban (2010) which reported that poor perception, high cost of ICT facilities among administrators are cause for low ICT usage in schools. Therefore, it is necessary that this knowledge gap be filled to achieve the goals of sustainability. From research hypothesis, the t -test calculated at -0.03 is less than t -test critical value which is 1.965 at 5% level of significance. Therefore we accept the null hypothesis based on the responses of principals on the principals' networking skills on ICT integration in the curriculum implementation in public secondary schools in Anambra State is not significant.

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Table 3 with grand mean of 2.77, items 14, 15, 16, 18 and 19 indicated agreed because its mean is above the criterion mean while items 17 and 20 indicated disagreed. In testing the hypothesis, the t- test calculated is 0.017 and the t- test critical value is 1.965 at 5 % level of significance. Therefore we accept the null hypothesis.

### REFERENCES

- 1) Adomi, E. E., and Pkangban, E. (2010). Application of ICTs in Nigerian secondary schools. *Library Philosophy and Practice*. ISSN 1522-0222
- 2) Ayodele O.O. (2007), Building Sustainability Science Curriculum in Nigeria: Accommodating Local Adaptation Leveraging Technology and Enhancing Areas of Improvement for Quality Assurance. Paper presented at the proceeding of the Science Teachers Association of Nigeria.
- 3) Blurton C, "New Directions of ICT-use in Education", availability online, <http://www.unesco.org/education/educprog/lwf/dl/edict.pdf>; accessed 7 August 2002 volume I, Number 7, 2011, porto Novo, Republic of Benin
- 4) Dwivedi, Vedvyas J. & Joshi, Yogesh C. (2019). Productivity in 21st century Indian Higher Education Institutions, *International Journal of Human Resource Management and Research* ISSN (P):2249-6874,(E):2249-7986, vol. 9, no. 4, pp. 61-80, <https://doi.org/10.24247/ijhrmraug2019>
- 5) Etse, D., and Ingley, C. (2016). Higher education curriculum for sustainability. *International Journal of Sustainability in Higher Education*. 17(2): 269-280. DOI: [10,1108/IJSHE-07-2015-0121](https://doi.org/10.1108/IJSHE-07-2015-0121)
- 6) Hwang, D.J., Yang, H., and Kim, H. (2010). E- learning in the Republic of Korea Moscow; UNESCO Institute for Information Technology in Education, <https://iite.unesco.org/pics/publications/en/files/3214677.pdf>
- 7) International Institute for Sustainable Development, (2007) "ICT for sustainable Development" [Online] Available <http://www.iisd.org/> accessed 4 August 2002
- 8) Garraway, J. (2010). Knowledge boundaries and boundary-crossing in the design of work-responsive university curricula. DOI: [10, 1080/13562511003620035](https://doi.org/10.1080/13562511003620035)
- 9) Karmasin, M., and Voci, D. (2021). Sustainability and Communication in Higher Education. DOI: [10.4995/HEAD21.2021.12831](https://doi.org/10.4995/HEAD21.2021.12831)
- 10) Makrakis, V. (2011b). ICT-enabled education for sustainable development: Merging theory with praxis. In M. Youssef & S. Aziz Anwar (Eds.), *Proceedings of the 4th Annual Conference on e-Learning Excellence in the Middle East 2011 – in Search of New Paradigms for re-engineering Education* (pp. 410–419). Dubai, UAE: Hamdan Bin Mohammed e-University
- 11) Mintz, K., and Tal, T. (2013). Sustainability in higher education courses: multiple learning outcomes. *Studies in Educational Evaluation*, 41, 113-123
- 12) Ordieres-Mere, J., Remon, T.P., and Rubio, J. (2020). Digitalization: An Opportunity for Contributing to Sustainability from Knowledge Creation.
- 13) Tilbury, D. (2011). Higher Education for Sustainability: A Global Overview of Commitment and Progress. *Higher Education in the World*, 4(1), 18-28.
- 14) Toomey, R. (2001). Information and communication technology for teaching and learning (schooling Issues Digest 2). Canberra: Department of education, Training and Youth Affairs.
- 15) Wambiri, G., and Ndani, M.N (2016). Kenya primary school teachers' preparation in ICT teaching; Teacher beliefs, attitudes, self - efficacy, computer competence, and age. *African Journal of Teacher Education*.
- 16) Weinstein, J., and Hernández M. (2015). Birth pains: emerging school leadership policies in eight school systems of Latin America, *International Journal of Leadership in Education: Theory and Practice*, DOI: [10.1080/13603124.2015.1020344](https://doi.org/10.1080/13603124.2015.1020344). URL: <http://dx.doi.org/10.1080/13603124.2015.1020344>



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## Development of A Football Physical Training Model through A Holistic Approach



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**ABSTRACT:** The purpose of this study was to develop a model of physical exercise with a holistic approach in football. This research is a development research with a model design adapted from Borg & Gall. The subjects of the study were junior soccer player SSB Adiyaksa Rejang Lebong age 17 and three football experts as assessors. The development of this training model was carried out by piloting the model on SSB Adiyaksa athletes using a small group test of 10 athletes and a large group test of 20 athletes where the method used was an expert validity method with assessment using questionnaire instruments and pre-test and retest methods for product reliability tests (physical training models) which were analyzed using the correlational  $r$  formula. The process of developing this holistic training model is carried out through the first stages, namely looking for potential problems, data collection, product design, design validation, design revision, product trial, product revision, usage trial, and product revision. The instruments used in the study, namely: 1) Questionnaire for model development, 2) Physical exercise test with Yo-Yo Intermittent Recovery Test (Yo-Yo IR test) VO2Max test development to determine the endurance ability of an athlete. Then an expert validation test was carried out with a questionnaire assessment so that 89.6% validity was obtained in the "Very Good/feasible" category and a small group reliability test of 0.999 with the "High" category and a large group of 0.997 with both reliability categories "High".

**KEYWORDS:** Development, Physical Training, Football and Holistic

### I. INTRODUCTION

Currently, football is a sport included in the draft of the National Sports Grand Design (DBON) in accordance with Presidential Regulation number 86 of 2021 (Fatoni et al., 2021). However, football is not a sport for priority achievement, but a sport that enters the sports industry which is indeed with its characteristics as the most popular sport throughout the world, including Indonesia. Based on Presidential Instruction No. 3 of 2019 in order to accelerate the improvement of football achievement, ministries or institutions are instructed to take steps to improve national and international football achievements in accordance with their duties, functions, and authorities.

The popularity of football is not only for the general public, but also belongs to the intellectual community. Many researches conducted by academics and intellectuals related to football, especially in the analysis of how football can be more developed and advanced in terms of athlete performance (Gantois et al., 2019). Therefore, the existence of football gets more attention from various circles, so that achievements are always sought through learning and training in football schools and football clubs (Naspendra, 2020; Syahroni et al., 2019; Widowati, 2015).

Football itself is a game played by 11 players from each team consisting of 2 teams or commonly called the team (Morgans et al., 2014). Each team must try to put as much ball as possible into the opposing team's goal and also defend the team's own goal so as not to concede the ball. Sports led by a referee and assisted by 2 linesmen aim that all rules in this game sport can be carried out properly in the hope of upholding the value of sportsmanship (Vargas González et al., 2017). In order to achieve the goals of the team, a strong, solid and tough team with a compact game is needed to be filled by players who have advantages in playing football who are able to master all parts and various basic football techniques so that they can play the ball in all positions and situations carefully, precisely and quickly, meaning not to waste opportunities and spend energy and time (Akmal & Lesmana, 2019; Irfan et al., 2020; Rahman & Padli, 2020). Therefore, with various rules of the game and of course the abilities that must be mastered by a football athlete, the key to the success of football sports achievements is coaching from an early age, to find superior seeds for the progress of Indonesian football.

## Development of A Football Physical Training Model through A Holistic Approach

Football coaching in Indonesia is currently far behind compared to other countries, especially in coaching young players (Risdiyanto et al., 2020). So to produce reliable soccer players, it is necessary to have young coaching. The coaching pattern must be planned systematically, tiered, continuous and there is competition as evaluation material for coaches (UU Keolahragaan, 2022).

Some of the existing platforms as places for coaching young soccer players are the Student Sports Education and Training Center (PPLP), Regional Student Sports Education and Training Center (PPLPD), Sports Talent School (SKO), Football Academy, Football Club, and Football School (SSB). The existence of all these coaching places already exists in various regions in Indonesia, although not evenly distributed. These places are expected to be able to produce reliable and outstanding football players later, both at the regional, national, regional and international levels (Hermawan et al., 2022; Tanzila & Febriani, 2019; WEDA, 2021).

Kurniawan, (2018); Tanzila & Febriani, (2019); Widowati, (2015) Increased achievement is supported by various factors such as physical condition, technique, tactics, mental, facilities and infrastructure, athlete status, motivation, nutrition, and others. This illustrates that physical, technical, tactical, and mental are important aspects in an effort to achieve maximum achievement. It is based on the athlete's good technical and tactical ability if not supported by his physical ability (Nugroho, 2017), Then it tends not to be able to last long in the match, because it will experience fatigue so that it will interfere with technical ability. However, there is one more thing that plays a role, namely mental. If the physique and technique are disturbed, then any tactics applied by the coach will be useless and the unyielding mentality will fade, so that the appearance and achievements become less than optimal. This means that these four aspects are a unity that determines each other in achieving maximum achievement (Jamalong, 2014; Nugroho, 2017; Susanto & Lismadiana, 2016).

Physical condition in football has a very vital role. Without good physical condition, technical and tactical skills cannot be applied optimally. It will even affect the mentality of football players on the field. We often see frictions that occur between players due to fatigue that causes players to be emotional. This reality suggests that physical condition is fundamental in football coaching (Basrizal et al., 2020; WEDA, 2021; Wijaya, 2021).

Widowati, (2015); Yulifri, (2018) The development of youth football in Bengkulu Province is very potential, it can be seen in every district / city has clubs, academies and football schools (SSB) that carry out coaching. One of them is Rejang Lebong Regency. Adyaksa football school is a forum for young soccer players in Rejang Lebong Regency. SSB Adyaksa Curup Rejang Lebong Regency was established in 2014 as for the age level trained, namely 09-13 years old, 14-17 years old. Every year SSB Adyaksa Curup regularly participates in competitions held by the Indonesian Football Association (PSSI). Some of these competitions include, Liga 3, Soeratin U-17 Cup, Soeratin U-15. This competition is an official competition and a fixed agenda of PSSI. Starting from the regional level, regional level to the National level.

One of the competitions regularly participated in by SSB Adhyaksa Curup is the Soeratin U-17 cup. Throughout his participation in this competition. SSB Adyaksa Curup has never achieved maximum achievement or champion. In the past three years SSB Adyaksa Curup could not speak much in this competition. Based on an interview with SSB Adyaksa Curup coach Mr. Riskan Efendi, SSB Adyaksa Curup always loses in the first round, meaning it never makes the group. In the Soeratin cup in 2020 and 2021, SSB Adyaksa Curup fell in the group stage. Meanwhile, in the Soeratin cup in 2022, SSB adyaksa Curup managed to qualify for the round of 8 as the best 3rd place by winning 4 points from one win, one draw, one loss.

The author tried to make observations and interviews on December 20, 2022 to coach Adyaksa Curup Coach Riskan Efendi regarding the causes of the many defeats his team suffered. From his information, one of the factors is the physical condition of the player. Players can play a fight in the first half, but in the second half it decreases and looks tired so that the opponent easily controls the game. There is a possibility that causes fatigue is a decrease in the player's endurance ability. Then he explained that the endurance physical training given to players only ran 20-30 minutes on the field then he still applied an isolated training approach, where the training carried out still used a separate training approach, Conditions like this often see players bored and lazy in carrying out the training process and seen from every time they train the coach does not develop a physical training model, technique, tactics and mentality. When related to PSSI coaching, PSSI applies a holistic form of training instead of isolation, this is inversely proportional to what happens in the field.

Data from this interview illustrates that resilience is a problem that must be solved. Endurance is one of the most important physical conditions in the game of football. In general, endurance can be interpreted as a person's ability to overcome fatigue due to doing physical and psychological labor for a long time. Endurance is the body's ability to perform physical activity with a certain intensity and within a certain period of time. Based on this quote, it can be concluded that endurance is the body's ability to overcome fatigue after physical activity (Hughes et al., 2018; Lamotte et al., 2015).

Reflecting on the data and theories above, it is very important to improve the physical condition of football players. Improve the ability of physical condition should be carried out systematic and continuous exercise (Subarjah, 2013). The training carried out must be in accordance with the rules of physical condition training to improve all components of physical condition needed

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by soccer players (Handoko, 2018). In addition, the selection of exercise methods should be in accordance with the purpose of the exercise to be achieved, namely improving physical condition. Some physical condition training methods that are usually used, among others: continuous training, interval training, fartlek training, cross country, and others.

However, the selection of training methods should be in accordance with the characteristics of sports and athletes. Because each branch has different endurance needs. In addition, the exercises carried out have more varied forms so that athletes or players are not saturated and bored undergoing the training process. This is because most athletes, especially young ones, still tend to be labile and inconsistent in undergoing physical exercise, especially endurance.

Football coaches today are required to continue to innovate to provide training models that will be given. In order for athletes to improve their performance well, coaches must master coaching science or basic principles of coaching (Sibarani, 2018). For this reason, it is necessary to play the role of a professional coach or a reviewed coach who can provide a comprehensive training model according to the needs of athletes, which is tailored to the situation and condition of the athlete (Hermawan et al., 2022; Rahman & Padli, 2020; Zulfikar, 2019).

One of the factors that determine and support success in playing soccer is the training program. The training aspect of physical condition plays an important role in the training program of various sports including football. The physical condition exercise program must be well designed and systematic so that it is possible to get good achievements. In planning a program, it will not be separated from the name periodization of the exercise program. Training program planning generally contains the division of time at each stage which is determined in a matter of time. At each stage, targets are arranged that will be divided at each stage. The preparation phase is one of the phases of exercise planning in the exercise period. This phase is very important because it will be a determinant of success in undergoing the real match (Emral, 2016; Putra et al., 2022).

Based on the problems and data and facts described above, it is necessary to make an update in training the physical condition of players, especially endurance abilities. The breakthrough that the author did is expected to answer all the problems that have been described. This developed model is something new and different from existing models. The characteristics of this developed endurance training model are carried out thoroughly not separately, meaning that the endurance training carried out is integrated between physical, technical, tactical and mental.

In situations when playing football, there are four moments, namely possession of the ball, transition from attack to defense and vice versa. When the opponent has the ball, the transition from defense to attack, when defensive transition other players must find positions as quickly as possible to find empty areas to create moments where passes can be given and similarly from transition to attack players must look for empty gaps so that opportunities are created to score against the opponent. In these four moments are attack, transition, defense, transition there are several actions such as passing, supporting, dribbling, pressing, mobility marking and others. Of course, every action contains a component of the physical condition needed by football players. Thus, it is necessary to develop a physical condition training model with a holistic approach developed to be applied in athletes' training sessions.

Training models based on the needs of current matches use many training models with a holistic approach, where these exercises are integrated (interrelated) into a complete unity between physical, technical, tactical and mental, where in every football training there is always a situation of communication, perception and execution of movements (Danurwinda, 2014). Of course, these four aspects are the main support for athletes in their implementation (competition) to be maximized. But in its implementation, what is the basis for a match in order to continue to do the maximum is the physical aspect. Therefore, this study focuses on physical condition training with a holistic approach, because it focuses on the needs when the match where all components of physical condition are applied simultaneously.

Based on the description above, the holistic approach is a method of playing training like a real match, where in the game players are physically active in moving, running after the ball, running with the ball, playing the ball, competing with the opponent, picking up the ball, and blocking the opponent's movement. So players are required to always move with the situation of playing football, in addition to being physical can also develop technical, tactical, and mental skills to achieve maximum achievement. Based on a holistic approach, all components of physical condition can be implemented thoroughly (not separately) such as during match conditions that require all existing aspects in order to support in showing maximum performance. This will be a factor that determines the success of the team in conducting the match. Based on the background described above, researchers are interested in taking the research title "Development of Football Physical Training Model through a Holistic Approach to SSB Adiyaksa Players".

The development product to be produced will be planned named "Sefphyt (Seftrio Physical Training)". This Sefphyt is the development of physical training with a holistic approach so that all components of physical condition can be applied in one physical exercise, especially as in the form of a real football game. The resulting uniqueness is of course based on the concept of

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playing training, so young soccer players who are still in the world of games will be more enthusiastic when practicing this Sefphyt Exercise. This is because the goal is to develop physical exercise but still fun.

The novelty of this research is an original concept or new findings from previous studies from existing ones such as the concept of exercise with a holistic approach. However, this study focuses more on physical condition training as a whole on the components of physical condition needed by young football players. In addition, another aspect of the new findings is the concept of physical condition training that is fun because it is game-based, so that when young players train physically do not feel bored, and will feel more enthusiastic. Therefore, of course, the Sefphyt training will be very useful for people who are interested in football, especially young people who want to improve their performance in football.

### II. MATERIAL AND METHODS

This research aims to develop a model of football physical training through a holistic approach, so that the research method used is a research and development method (Research and Development). Research and development is a research method used to produce certain products, and test the effectiveness of those products (Sugiyono, 2017). So that the final product of this research produces the novelty of the football physical training model. A physical exercise model with an intended holistic approach that aims to produce efficient exercises that can be applied. An instrument is a device used to collect data in drawing legitimate, or valid, conclusions about the characteristics (abilities, achievements, attitudes, and so on) of the individual being studied (Fraenkel dkk., 2012).

Quantitative instruments, namely: (1) expert validation value scale questionnaires on variations of football physical training models through a holistic approach, (2) physical measurement tests (endurance). Data in this stage is data in the form of information obtained used as material for planning training models that are expected to be able to develop existing potential. This stage contains several activities, namely (1) Making observations by analyzing the physical training model applied, (2) Conducting a literature review related to observation and theories related to physical training in football, (3) Discussing with coaches and experts related to physical training models in football.

Data analysis is a method used to process data that has been obtained using certain formulas, which later the results of data processing will show the effect or not of a form of exercise. This type of data analysis is carried out to test already formulated hypotheses. Anuraga et al., (2021) said "hypothesis testing becomes important in studies that have hypotheses, such as experimental research, he also said "to test further hypotheses it takes some further analysis, which one with another can be related and can also be one with another unrelated" From the above opinion can be concluded is for data analysis using hypothesis analysis where it is used for experimental research to see the relationship with each other.

The normality test aims to see samples from normally distributed populations. "Normality testing is an analysis to test whether data comes from a normally distributed population or not. Testing normality is important because most inferential statistical analyses require that the data to be processed should be norm-distributed, and normality tests, also called lilliefors tests, are generally used for single data. Variant homogeneity testing aims to see whether the variant sample has homogeneous variants or not. "Homogeneity testing is an analytical technique to test whether data comes from a homogeneous population or not". To test the hypothesis used statistical tests. The similarity of the two averages aims to determine whether the results obtained by using treatment through ladder drills and shuttle runs to improve soccer dribbling agility. To test the hypothesis, the T test is used. using the T Test at the 95% confidence stage or  $\alpha = 0.05$ . With formulas.

### III. RESULTS AND DISCUSSION

#### A. Results of Expert Studies

##### 1. Expert Validity Test

Validity comes from the word validity which means the extent to which the accuracy and accuracy of the meter (test) in performing its measuring function, validity indicates the actual state and refers to the fit between constructs, or the way a researcher conceptualizes ideas in conceptual definitions and a measure. In addition, validity is a measure that shows that the variable being measured is really the variable that the researcher wants to research. Validity relates to a variable measuring what it is supposed to measure. Validity in research states the degree of accuracy of research measuring instruments to the actual content measured.

How to measure validity by operationally defining the concept to be measured until a measuring instrument is arranged in the form of questionnaires given to experts and experts in the field of football and evaluation of sports measurement tests. Then the results that have been obtained are presented in accordance with the norms of the feasibility category.

##### a). Football Expert

Football experts who are validators in this development research are:

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1) Antoni, S.IP He is one of the football coaches from Jambi City Once brought Jambi to Pre PON and league 3 until now' 2) Muhammad Nasir Senior Coach who brought PS. Bengkulu in the Premier Division competition in 2008.3) Rohul Irfan, S.Pd football coach once coached at the ASIOP academy in Jakarta and now coaches for Liga 3 in Rejang Lebong Regency. This validation is carried out by describing and explaining the established training model accompanied by an assessment instrument in the form of a questionnaire.

### 1) Assessment from First Football Expert Antoni, S.IP

Based on the assessment from Jaya Sanjaya, S.Pd using an assessment questionnaire, the assessment results can be represented in the table below.

**Table 1. Holistic Training Model Validation Questionnaire Scores by Football Experts**

No	Aspect	Score	F. Relatif
1	Conformity	18	33%
2	Ease	18	33%
3	Practicality	15	27%
	Value	51	93%
	Sum	55	100%

In the input box and advice that has been provided by football experts, Antoni, S.IP gave input "In holistic training methods in soccer or combined training methods, it is better to describe the types of training specifically in addition to the general type of training in the form of endurance training".

**Table 2. Persentase Hasil Penilaian Oleh Ahli Sepak Bola**

No	Expert	<i>f</i>	N	<i>P</i> (%)	Eligibility Categories
1	Football Expert	51	55	93%	Very good/ worth it

Based on the table above, football experts argue that the holistic form of training developed by this researcher will already be used properly but has some revisions in the training component, the results of the validity test of football experts obtained a percentage of 86% can be interpreted as having the category "Decent"

### 2) Assessment of the Second Football Expert Muhammad Nasir

Based on the assessment of Mr. Endang S.Pd using an assessment questionnaire, the assessment results can be displayed in the table below.

**Table 3. Skor Angket Validasi Oleh Ahli Sepak Bola Kedua**

No	Aspect	Score	F. Relatif
1	Conformity	18	33%
2	Ease	17	30%
3	Practicality	13	24%
	Value	48	87%
	Sum	55	100%

Pada kotak masukan dan saran yang sudah disediakan ahli Sepak Bola maka Bapak Muhammad Nasir memberikan masukan "buat latihan secara lebih diperinci satu persatu, seperti latihan daya tahan dan lain-lain"

**Table 4. Persentase Hasil Penilaian Alat Oleh Ahli Sepak bola Kedua**

No	Expert	<i>f</i>	N	<i>P</i> (%)	Eligibility Categories
1	Football Expert	48	55	87%	Very good/ worth it

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Based on the table above, Football experts argue that the holistic training model development product developed by this researcher will already be used properly but has several revisions in the training component, the results of the football expert validity test obtained a percentage of 86% can be interpreted as having a category of "Decent"

### 3) Assessment from the Third Football Expert Mr. Rohul Irfan, S.Pd

Based on the assessment of Mr. Rohul Irfan, S.Pd using the assessment questionnaire, the assessment results can be displayed in the table below.

**Table 5. Score Validation Questionnaire by Third Football Expert**

No	Aspect	Score	F. Relatif
1	Conformity	17	30%
2	Accuracy	17	30%
3	Practicality	15	29%
	Value	49	89%
	Sum	55	100%

In the input box and suggestions that have been provided by Football experts, Rohul Irfan, S.Pd gave input "It is even better if accompanied by modifications to the combined training components"

**Table 6. Percentage of tool assessment results by a third football expert**

No	Expert	f	N	P(%)	Eligibility Categories
1	Football Expert	49	55	89%	Very good/ worth it

Based on the table above, Football experts argue that the holistic training model development product developed by this researcher will already be used properly but has several revisions in the training component, the results of the football expert validity test obtained a percentage of 86% can be interpreted as having a category of "Decent"

Then the training model was applied using a small group where a sample of 20 men carried out endurance measurement tests with the test and retest method in small group tests where all samples were homogeneous because all samples were selected through a conditional sampling technique (Purposive Sampling), namely athletes whose data were taken must be aged 14-17 years. The sample used as a small group was SSB athlete Adyaksa Curup. The data obtained is then processed so that reliability is obtained by looking at the correlation between test and retest with the formula.

$$r = \frac{\sum XY}{\sqrt{[\sum X^2][\sum Y^2]}}$$

Ket :

$\sum XY$  = The result of the sum of the multiplication of variables X and Y

$\sum X^2$  = The result of the sum of variables X2

$\sum Y^2$  = The result of the sum of the variables Y2

## 2. Reliability

### a. Small Group Test Data

$$r = \frac{2233414}{\sqrt{[19444.34][25696.92]}}$$

$$r = \frac{2233414}{\sqrt{499659649}}$$

$$r = \frac{2233414}{2235306}$$

$$r = 0.999$$

From the results r 0.999, it can be said to be highly correlated and significant.

### b. Large Group Test Data

$$r = \frac{\sum XY}{\sqrt{[\sum X^2][\sum Y^2]}}$$

$$r = \frac{4380281}{\sqrt{[37970.41][50617.46]}}$$



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$$r = \frac{4380281}{\sqrt{1921965709}}$$

$$r = \frac{4380281}{4384022}$$

$$r = 0,99$$

From the results of r 0.99, it can be said to be highly correlated and significant.

The reliability test in this tool is used to see the level of reliability using the Small Group Test and Large Group Test methods and statistical calculations of the moment product then the following results are obtained:

**Table 7. group frequency distribution**

No	Interval Class	f.absolute	f. relative	category
1	<10.15	3	30%	Very Good
2	10.20-12.00	4	40%	Good
3	12.05-13.85	2	20%	Keep
4	13.90-15.70	1	10%	Less
5	>15.75	0	0%	Very less
		10	100%	

From these data, the mean of the test group was 12.98 s, while the standard deviation in the data was 1.84894. The data taken in the test group is said to be normal after conducting a data normality test, for more details can be seen in the following table:

**Table 8. SPSS Processed Table Data Normality Small Group Son**

Descriptive Statistics						
Endurance Football Athletes	N	Mean	Std. Deviation	Minimum	Maximum	
	10	12.98	1.84894	9.2	18.9	

### Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
VAR00001	.069	60	.200 <sup>*</sup>	.979	60	.398

a. Lilliefors Significance Correction

\*. This is a lower bound of the true significance.

The data is said to be normal because the sig is 0.200 > 0.05 then the data can be continued at a later stage.

**Table 9. Large Group Test Frequency Distribution**

No	Interval Class	f.absolute	f. relative	Category
1	<9.91	1	5%	Very Good
2	9.96-12.03	13	65%	Good
3	12.08-14.14	6	30%	Keep
4	14.19-16.26	0	0%	Less
5	>16.31	0	0%	Very less
		20	100%	

From this data, the mean of the Test group was 13.14s while the standard deviation in the data was 2.11655. The data taken in the test group is said to be normal after conducting a data normality test, for more details can be seen in the following table:

**Table 10. SPSS Processed Table Large Group Test Data Normality**

Descriptive Statistics						
Daya tahan Atlet sepakbola	N	Mean	Std. Deviation	Minimum	Maximum	
	20	13.14	2.11655	9.5	20.1	

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**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
VAR00001	.100	70	.077	.963	70	.034

a. Lilliefors Significance Correction

The data is said to be normal because the sig 0.77 > 0.05 then the data can be continued at the next stage.

$$r = \frac{\sum XY}{\sqrt{(\sum X^2)(\sum Y^2)}}$$

**Table 11. Reliability Level**

Interval Koefisien Korelasi	Realibilitas
0,00-0,19	Very weak
0,20-0,39	Weak
0,40-0,59	Keep
0,60-0,79	Strong
0,80-1,00	Very Powerful

Sumber. Ali (2012:116)

### B. Characteristics

After completing the validity test, empirical validity test results can be seen and the calculation of reliability in instrument development.

#### 1. Empirical Validity First Stage Expert Validity

**Table 11. Presentation and Eligibility Rate from Experts**

No	Expert	Presentase	Eligibility rate
1		93%	Very good/worth it
2	Football	87%	Very good/worth it
3		89%	Very good/worth it

From the results of validation by the eleven experts, if averaged, a percentage of 86% is obtained and it can be concluded that the results of development can be used in soccer training. As for some suggestions and criticisms on the results of the development of the exercise model is as material for advanced development when going to conduct further research.

#### 2. Reliability Test

**Table 12. Categories Correlation Coefficient Reliability of small and large groups**

N	Gender	Koofisien korelasi	Realibilitas
10	Son	0.999	Very Powerful
20	Son	0.999	Very Powerful

From the results of the table, the model developed as a form of soccer training is said to be reliable and consistent.

#### 3. Generated model

After a series of trials and revisions and improvements to the draft model, a football endurance training model for U-17 age players was compiled. The model that has been compiled includes physical, tactical, and mental in football. Such as speed, strength, accuracy and endurance as well as some form of combination play. The resulting model is a form of holistic exercise based on the analysis of theories as well as the need for soccer training that uses several exercise components combined into one training session. The form of exercise developed is physical exercise in the form of endurance Here is the model produced in endurance training in the game of football

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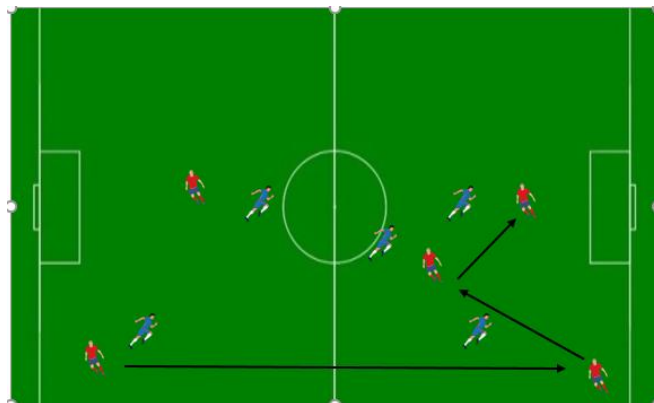


Figure 1. One-on-one moves mark free touches with goal points

### 4. Advantages of Training Models

The advantages of the holistic training model include: 1) This training model can integrate all elements of exercise into one form of exercise. 2) Athletes who train can understand all elements of training applied in one training session. 3) In its application, holistic training by modifying the form of training in one competition will make it easy for athletes to understand the elements of training.

### 5. Model Weaknesses

The disadvantages of this holistic training model include: 1) This model is still relatively new and rarely used so that knowledge about this model is still small. 2) The lack of modification of training elements in one competition that makes it difficult to prepare training models that cause athletes to have only a few forms of training that include all training elements in one session.

### 6. Research Limitations

This study produced a holistic training model, but in the implementation and results of the study there are several limitations, including: 1) validity testing is only limited to expert validity tests. 2) Reliability only uses an imphysical condition element in the form of durability.

## IV. CONCLUSION

Based on the results of data processing and analysis of research data that has been carried out, regarding the development of holistic exercise models, it is concluded that holistic exercise models have validity with an average expert validity level of 86% so that it can be said to be "feasible" with a level of reliability in small group trials of 0.997 and in large group trials of 0.998 with the category "High" so that it is said that the level of reliability of the model carried out on Large group and small group trials have a reliability category of "High" and the exercise model has several advantages especially in the effectiveness of the exercise model.

## REFERENCES

- 1) Akmal, I., & Lesmana, H. S. (2019). Kontribusi Kecepatan dan Kelincahan Terhadap Kemampuan Dribbling Pada Pemain SSB POSS. *Jurnal Patriot*, 1(3), 1197–1210. <https://doi.org/10.24036/patriot.v1i3.392>
- 2) Anuraga, G., Indrasetianingsih, A., & Athoillah, M. (2021). Pelatihan pengujian hipotesis statistika dasar dengan software r. *BUDIMAS: Jurnal Pengabdian Masyarakat*, 3(2), 327–334.
- 3) Basrizal, R., Sin, T. H., Irawan, R., & Soniawan, V. (2020). Latihan kelincahan terhadap peningkatan kemampuan dribbling pemain sepakbola. *Jurnal Patriot*, 2(3), 769–781. <https://doi.org/10.24036/patriot.v2i3.667>
- 4) Emral, E. (2016). *Sepakbola Dasar*.
- 5) Fatoni, M., Widodo, Z. D., Wijastuti, S., Darsono, D., Adiyani, R., Abdullah, S., & Puspitasari, D. A. K. (2021). SOSIALISASI EKONOMI KREATIF 4.0 DALAM PENINGKATAN PRODUKTIFITAS INDUSTRI OLAHRAGA DI ERA NEW NORMAL. *Jurnal Pendidikan Dan Pengabdian Masyarakat*.
- 6) Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to Design and Evaluate Research in Education* (8th Ed.). Mc Graw Hill.
- 7) Gantois, P., Caputo Ferreira, M. E., Lima-Junior, D. de, Nakamura, F. Y., Batista, G. R., Fonseca, F. S., & Fortes, L. de S. (2019). Effects of mental fatigue on passing decision-making performance in professional soccer athletes. *European Journal of Sport Science*, 0(0), 1–21. <https://doi.org/10.1080/17461391.2019.1656781>
- 8) Handoko, A. H. (2018). Analisis Kemampuan Teknik Dasar Pemain Sepak Bola SSB Deli Serdang United Kabupaten Deli Serdang. *Jorpres (Jurnal Olahraga Prestasi)*. <https://doi.org/10.21831/jorpres.v14i1.19982>
- 9) Hermawan, H. A., Nurcahyo, F., & Yudanto, Y. (2022). Pemantauan Profil Kondisi Fisik Kecabangan Sepakbola Pada Siswa Sekolah Menengah Pertama Kelas Khusus Olahraga Di Daerah Kabupaten Sleman Yogyakarta. *Jorpres (Jurnal Olahraga*

## Development of A Football Physical Training Model through A Holistic Approach

- Prestasi*, 18(3), 9–18. <https://doi.org/10.21831/jorpres.v18i3.53096>
- 10) Hughes, D. C., Ellefsen, S., & Baar, K. (2018). Adaptations to endurance and strength training. *Cold Spring Harbor Perspectives in Medicine*, 8(6), a029769. <https://doi.org/10.1101/cshperspect.a029769>
  - 11) Irfan, M., Yenes, R., Irawan, R., & Oktavianus, I. (2020). Kemampuan teknik dasar sepakbola. *Jurnal Patriot*, 2(3), 720–731. <https://doi.org/10.24036/patriot.v2i3.664>
  - 12) Jamalong, A. (2014). Peningkatan prestasi olahraga nasional secara dini melalui pusat pembinaan dan latihan pelajar (PPLP) dan pusat pembinaan dan latihan mahasiswa (PPLM). *Jurnal Pendidikan Olah Raga*, 3(2), 156–168. <https://doi.org/10.31571/jpo.v3i2.127>
  - 13) Kurniawan, R. (2018). Pengaruh Keseimbangan, Kecepatan, dan Percaya Diri Terhadap kemampuan Dribbling Dalam Permainan Sepakbola Pada Atlet Ssb Putra Wijaya Padang. *Unes Journal of Education Scienties*, 2(1), 62.
  - 14) Lamotte, G., Rafferty, M. R., Prodoehl, J., Kohrt, W. M., Comella, C. L., Simuni, T., & Corcos, D. M. (2015). Effects of endurance exercise training on the motor and non-motor features of Parkinson's disease: a review. *Journal of Parkinson's Disease*, 5(1), 21–41. <https://doi.org/10.3233/JPD-140425>
  - 15) Morgans, R., Orme, P., Anderson, L., & Drust, B. (2014). Principles and practices of training for soccer. In *Journal of Sport and Health Science*. <https://doi.org/10.1016/j.jshs.2014.07.002>
  - 16) Naspendra, E. (2020). *Pengaruh Keseimbangan, Kelincahan, dan Percaya Diri Terhadap Kemampuan Dribbling Pemain Sepakbola Ssb Balai Baru Kota Padang*.
  - 17) Nugroho, W. A. (2017). Pembinaan Prestasi Olahraga Sepakbola Di Pusat Pendidikan Dan Latihan Putra Batang. *Juara: Jurnal Olahraga*, 2(2), 162–173. <https://doi.org/10.33222/juara.v2i2.43>
  - 18) Putra, A., Yulifri, Y., Emral, E., & Lawanis, H. (2022). Tinjauan Kondisi Fisik Atlet Sepakbola SMA Negeri 3 Solok Selatan. *Jurnal JPDO*, 5(10), 7–13.
  - 19) Rahman, K. S., & Padli, P. (2020). Tinjauan Kemampuan Teknik Dasar Sepak Bola. *Jurnal Patriot*, 2(2), 369–379. <https://doi.org/10.24036/patriot.v2i1.562>
  - 20) Risdianto, R., Marthasari, G. I., & Suharso, W. (2020). Sistem Informasi Geografis Berbasis Web Untuk Pemetaan Lokasi Pelatihan Sepakbola Di Kota Malang Menggunakan ArcGIS. *Jurnal Repositor*. <https://doi.org/10.22219/repositor.v2i6.336>
  - 21) Subarjah, H. (2013). LATIHAN KONDISI FISIK. *Educacion*. <https://doi.org/10.1017/CBO9781107415324.004>
  - 22) Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.
  - 23) Susanto, N., & Lismadiana, L. (2016). Manajemen program latihan sekolah sepakbola (SSB) GAMA Yogyakarta. *Jurnal Keolahragaan*, 4(1), 98–110. <https://doi.org/10.21831/jk.v4i1.8133>
  - 24) Syahroni, M., Pradipta, G. D., & Kusumawardhana, B. (2019). Analisis Pembinaan Prestasi terhadap Manajemen Olahraga Sekolah Sepak Bola (SSB) Se-Kabupaten Pati Tahun 2019. *Jossae (Journal of Sport Science and Education)*, 4(2), 85–90. <https://doi.org/10.26740/jossae.v4n2.p85-90>
  - 25) Tanzila, R. A., & Febriani, R. (2019). Korelasi kapasitas vital paru dengan prestasi atlet di Sekolah Olahraga Nasional Sriwijaya Palembang. *Syifa'MEDIKA: Jurnal Kedokteran Dan Kesehatan*, 9(2), 79–85. <https://doi.org/10.32502/sm.v9i2.1661>
  - 26) UUKeolahragaan. (2022). Undang-Undang Republik Indonesia Nomor 11 Tahun 2022 Tentang Keolahragaan. *Pemerintah Republik Indonesia*, 1–89.
  - 27) Vargas González, A. N., Kapalo, K., Koh, S. L., & Laviola, J. J. (2017). Exploring the virtuality continuum for complex rule-set education in the context of soccer rule comprehension. *Multimodal Technologies and Interaction*. <https://doi.org/10.3390/mti1040030>
  - 28) WEDA, W. (2021). Peran Kondisi Fisik dalam Sepakbola. *Jurnal Pendidikan Kesehatan Rekreasi*, 7(1), 186–192. <https://doi.org/10.5281/zenodo.4452635>
  - 29) Widowati, A. (2015). Modal Sosial Budaya dan Kondisi Lingkungan Sehat Dalam Pembinaan Prestasi Olahraga Pelajar. *KEMAS: Jurnal Kesehatan Masyarakat*, 10(2), 218–226. <https://doi.org/10.15294/kemas.v10i2.3384>
  - 30) Wijaya, A. W. E. (2021). Manajemen Pembinaan Prestasi Di Sekolah Sepak Bola. *Jurnal Olahraga Dan Kesehatan Indonesia (JOKI)*, 2(1), 27–33. <https://doi.org/10.55081/joki.v2i1.542>
  - 31) Yulifri, Y. (2018). Pembinaan Prestasi Sekolah Sepakbola di Kabupaten Padang Pariaman. *Jurnal Stamina*, 1(1), 451–457.
  - 32) Zulfikar, M. I. (2019). Pengaruh Kecepatan, Kelincahan dan Keseimbangan Terhadap Kemampuan Dribbling Pemain Futsal di SMAN 2 Surabaya. *Jurnal Prestasi Olahraga*, 2(2).



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## Social and Physical Preparedness of Athletes in Secondary Schools



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**ABSTRACT:** Sports preparation is a critical aspect of athletes' performance improvement in their chosen field. It encompasses both physical and mental aspects of athletes during sports programs such as training, competition, and recovery. This study aimed to determine the level of social and physical preparedness of athletes in Secondary Schools in the 5<sup>th</sup> District of Iloilo, Western Visayas, Philippines. The study involved 72 athletes who were assessed based on their social and physical preparedness using computer-processed statistics through the Statistical Package for Social Science (SPSS) software.

Results showed that secondary school athletes have a higher level of social preparedness compared to their physical preparedness. However, there was no significant relationship between the two variables. It can be concluded that if athletes are socially prepared, they are not necessarily physically prepared as well. Social preparedness is innate and can be influenced by an individual's experiences and upbringing, including community norms and moral development.

Furthermore, the study revealed that physical training programs for student athletes were not adequately implemented, possibly due to other academic tasks in schools. In conclusion, developing athletes' physical and social preparedness is essential for their holistic sports development, and implementing rigorous physical training programs alongside academic tasks is vital. These findings can inform the development of sports programs and interventions aimed at improving the social and physical preparedness of adolescent athletes in secondary schools.

**KEYWORDS:** Athletes, Physical Education, Physical Preparedness, Secondary School, Sports, Social Preparedness

### INTRODUCTION

Sport has become a significant social phenomenon in contemporary society, driven by a human need for confrontation and competition (Coakley, 2018). Sport rules provide a framework for these confrontational tendencies, allowing athletes and teams to channel their energies towards achieving the best possible results (Bale, 2020).

To achieve high performance in sport, athletes and teams require appropriate and efficient sport preparation. This involves a complex process of improving all aspects of an athlete's physical and mental abilities, including skills, strength, endurance, and tactical awareness (Jukić et al., 2018). Monitoring and assessing an athlete's progress is an essential part of this process, as it provides valuable information on the athlete's status and areas for improvement (Laborde et al., 2018).

The attainment of high performance in sport also depends on other factors such as nutrition, sleep, recovery, and lifestyle (Saw et al., 2021). Coaches and sports scientists play a crucial role in designing effective training programs that take into account these factors and are tailored to the needs of individual athletes (McMahon et al., 2020).

### FRAMEWORK OF THE STUDY

Participation in sports is an important part of physical and mental development for students in secondary schools. However, it is essential that athletes are physically and socially prepared to participate in sports to prevent injuries and ensure their success.

One theoretical framework that can be applied to the social and physical preparedness of athletes in secondary schools is Bandura's Social Learning Theory. According to this theory, individuals learn by observing others and modeling their behavior. Therefore, athletes in secondary schools can learn about the appropriate social and physical behavior for sports participation by observing their coaches, teammates, and other athletes.

Another theoretical framework that can be applied is the Self-Determination Theory (SDT), which emphasizes the importance of intrinsic motivation for sustained behavior change. SDT suggests that athletes who are intrinsically motivated to participate in sports are more likely to engage in preparatory behaviors such as physical training, healthy eating, and restful sleep.

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Research suggests that social and physical preparedness are critical factors for athletic success in secondary schools. A study conducted by Enoksen et al. (2021) found that social support from coaches, teammates, and family members is essential for the social and emotional well-being of athletes. The study also found that athletes who received adequate social support were more likely to engage in preparatory behaviors such as physical training and healthy eating.

Another study conducted by Keeler et al. (2019) found that adequate physical preparation is essential for preventing injuries in athletes. The study recommended that athletes engage in strength training, flexibility training, and aerobic conditioning to reduce their risk of injury.

In addition to the studies mentioned above, other research has explored the social and physical preparedness of athletes in secondary schools.

A study conducted by Jowett and Poczwardowski (2018) found that the quality of coach-athlete relationships is a significant predictor of athlete motivation and well-being. Athletes who reported having positive relationships with their coaches were more likely to be intrinsically motivated to participate in sports and had higher levels of well-being.

Another study by Pons et al. (2019) examined the relationship between physical activity and academic achievement in adolescents. The study found that regular physical activity was positively associated with academic achievement and that the relationship was mediated by factors such as improved cognitive function and reduced stress.

Furthermore, a study by Visek et al. (2018) identified key social and emotional skills that are necessary for athletic success. These skills include teamwork, communication, goal setting, resilience, and emotional regulation. The study suggested that coaches and educators should prioritize the development of these skills in their training programs to improve the social and emotional preparedness of athletes.

Overall, these studies highlight the importance of social and physical preparedness for athletic success in secondary schools. Coaches, educators, and parents can play a critical role in supporting athletes' social and physical development through providing social support, fostering positive coach-athlete relationships, promoting regular physical activity, and emphasizing the development of social and emotional skills.

While the studies mentioned provide valuable insights into the social and physical preparedness of athletes in secondary schools, there are still some research gaps that need to be addressed.

One gap is the need for more research on the specific strategies that coaches, educators, and parents can use to promote social and physical preparedness among adolescent athletes. While the studies suggest that positive coach-athlete relationships, regular physical activity, and the development of social and emotional skills are important, more research is needed to identify effective approaches for promoting these factors.

Finally, there is a need for longitudinal studies that follow athletes over an extended period of time to examine how social and physical preparedness relates to long-term athletic success, as well as to broader outcomes such as academic achievement, mental health, and overall well-being. Such studies could provide important insights into the long-term benefits of promoting social and physical preparedness among adolescent athletes.

### Objectives of the Study

This study aimed to determine the level of social and physical preparedness of athletes in secondary schools in the school year 2022-2023.

Specifically, this study sought to answer the following:

- The level of physical preparedness among athletes in secondary schools,
- the level of social preparedness among athletes in secondary schools,
- significant difference in the level of physical and social preparedness among athletes in secondary schools, and
- the significant relationship between physical and social preparedness among athletes in secondary schools.

### METHODOLOGY

The study aimed to investigate the social and physical preparedness of athletes in selected secondary schools located in the 5th District of Iloilo, Western Visayas, Philippines. A descriptive-survey approach was used to collect data from the participants, who were purposively selected to fit the needs of the study.

A survey questionnaire was administered to the athletes to gather information on their social support, well-being, preparatory behaviors, and self-efficacy. The survey questionnaire was anchored from the Social Support, Well-being, and Preparatory Behaviour Among Adolescent Athletes in Norway study by Enoksen et al. (2021), as well as the Self-Efficacy Scale by Bandura (1977).

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To determine the level of social preparedness physical preparedness, a 10-item researcher made test using the Likert (5-point) scale. This was obtained through the following responses: 5 – Always, 4 – Often, 3 – Seldom, 2 – Sometimes, and 1 – Never. At the same time, to describe the level of social and physical preparedness of athletes, the following scale was used: 4.21 – 5.00 Highly Prepared, 3.41 – 4.00 Prepared, 2.61 – 3.40 Moderately Prepared, 1.81 – 2.60 Developing, and 1.00 – 1.80 Poorly Prepared.

The said questionnaire was a researcher-made questionnaire and presented it to the selected jurors of experts for content validation using the Carter V. Good and Douglas F. Scates set criteria for validation. The instrument used in this study was rated “very good” with mean score of 4.67 which meant that the instrument is valid. For reliability, the researcher administered the questionnaire to respondents. The questionnaire established alpha value of 0.893 which meant that the questionnaire was reliable.

Data collected from the survey questionnaire were analyzed using a combination of descriptive and inferential statistics. The findings of this study could inform the development of programs and interventions aimed at improving the social and physical preparedness of adolescent athletes in secondary schools in the 5th District of Iloilo, Western Visayas, Philippines.

**Table 1. Distribution of Participants**

Classification of Participants	No. of Participants
Male	38
Female	38
Total	76

### Data Gathering Procedure

The researcher followed ethical considerations in conducting the study. Prior to the data collection, the researcher obtained the necessary permission and informed consent from the appropriate authorities of the academic institution and concerned agencies. The participants were also informed about the purpose and nature of the study, and they were given the assurance that their participation was voluntary, confidential, and anonymous.

In collecting data, a self-administered questionnaire was used, and the participants were given ample time to complete it, which took around 5-10 minutes. Before answering the questionnaire, the participants were given detailed instructions and were encouraged to ask questions if there were any parts that they did not understand. The researcher made sure that the participants understood that their responses would be kept confidential and that the results would only be used for research purposes.

In the final analysis, only valid questionnaires were considered. The data collected from the questionnaires were analyzed using appropriate statistical.

### Statistical Data Analysis Procedure

To determine the data needed for the investigation, mean, standard deviation, Friedman Test, and Spearman correlation coefficient were used.

## RESULTS AND DISCUSSION

### Descriptive Data Analysis

#### Level of Social and Physical Preparedness of Athletes

The mean and standard deviation results show the level of social preparedness of athletes ( $4.4 \pm 0.35$ ) as “Highly Prepared” and level of physical preparedness ( $4.05 \pm 0.38$ ) as “Prepared”.

**Table 2. Level of Social and Physical Preparedness of Athletes**

	N	Mean	Std. Deviation	Description
Social Preparedness	72	4.4	0.35405	Highly Prepared
Physical Preparedness	72	4.05	0.37642	Prepared

Note: 4.21 – 5.00 Highly Prepared, 3.41 – 4.00 Prepared, 2.61 – 3.40 Moderately Prepared, 1.81 – 2.60 Developing, and 1.00 – 1.80 Poorly Prepared

The results indicate that the athletes are highly prepared in terms of social preparedness, with a mean score of 4.4 out of 5 and a standard deviation of 0.35, suggesting a relatively high level of consistency in the responses. In contrast, the athletes'

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physical preparedness was rated as "prepared," with a mean score of 4.05 and a standard deviation of 0.38, indicating a somewhat lower level of consistency in the responses.

The implications of these findings are that while the athletes are generally well-prepared in terms of their social skills, they may benefit from further training and development in the area of physical preparedness. This could include additional training on conditioning, strength, and agility, as well as mental preparation and sports psychology techniques.

Related research has found similar results in terms of the importance of both social and physical preparedness for athletes. For example, a study by Poczwardowski et al. (2019) found that social support and coping strategies were important predictors of athletic success, while physical fitness and technical skills were also crucial factors. Another study by Garcia-Mas et al. (2018) found that athletes who were well-prepared in terms of both physical and psychological factors were more likely to experience positive outcomes, such as increased confidence and satisfaction.

There is an importance of psychological characteristics such as motivation, self-regulation, and resilience in facilitating elite performance in sports. These mental skills can be developed and enhanced through deliberate practice and training (MacNamara et al., 2018). The need for mental health support for elite athletes, as they are often under significant pressure to perform and may face unique stressors related to their sport. Mental health concerns can impact athletic performance and overall well-being, and early detection and treatment is crucial (Reardon et al., 2019). Additionally, the importance of a multidisciplinary approach to injury rehabilitation in sports. This involves collaboration between medical professionals, coaches, and athletes to ensure a safe and effective return to play. In addition to physical rehabilitation, mental skills training can also be beneficial in the recovery process (Thornton et al., 2017).

Overall, these studies suggest that physical and mental preparedness are both important for sports performance and that a holistic approach to training and preparation can maximize an athlete's potential.

### *Inferential Analysis*

#### **Difference between the Levels of the Physical and Social Preparedness**

A non-parametric Friedman test of differences among levels of the physical and social preparedness among athletes in secondary schools was conducted and renders a Chi-square value of 23.529 which was significant ( $p < .05$ ) as shown in Table 3.

**Table 3. Difference between the Levels of the Physical and Social Preparedness**

Friedman Test	Mean Rank	N	Chi-Square	df	Asymp. Sig.
Social Preparedness	1.78	72	23.529	1	.000
Physical Preparedness	1.22				

The significant Chi-square value of 23.529 obtained from the non-parametric Friedman test indicates that there are differences among the levels of physical and social preparedness among athletes in secondary schools. This suggests that not all athletes are equally prepared in terms of their physical and social skills, which may have implications for their performance and overall success in sports.

Further analysis can be done to identify the specific areas where athletes differ in their levels of preparation. For instance, it could be determined whether athletes are more prepared physically or socially, and whether these differences vary based on the specific sport or gender of the athlete.

Related findings in this area of research have shown that physical and social preparedness are important factors for athletic success. For example, a study by Mäkelä et al. (2020) found that social support from coaches and teammates was positively associated with athletes' motivation and performance. Similarly, a study by Kovacs and colleagues (2018) showed that physical fitness was a key predictor of success in sports.

Physical fitness is an important predictor of success in sports. Several studies have shown that physical fitness is a key factor in athletic performance and success. For example, a study by Güllich and Emrich (2014) found that physical fitness was a significant predictor of success in youth soccer, while a study by Meyers et al. (2017) showed that physical fitness was positively associated with performance in high school basketball.

Social support is important for motivation and well-being. Social support from coaches, teammates, and family members has been shown to be important for athletes' motivation and well-being. A study by Liu and colleagues (2018) found that social support from coaches was positively associated with athletes' satisfaction with their sport participation, while a study by Kavussanu and colleagues (2018) showed that social support from teammates was associated with athletes' perceptions of their own competence.



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Mental skills training can improve performance. Mental skills such as goal-setting, visualization, and self-talk have been shown to be effective in improving athletic performance. A study by Weinberg and Gould (2018) found that mental skills training was associated with improved performance in high school swimmers, while a study by Gould and colleagues (2015) showed that mental skills training was effective in improving performance and reducing anxiety in youth soccer players.

Overall, these findings suggest that both physical and social factors are important for athletic success, and that training programs should address both areas in order to maximize athletes' potential.

### Relationship between Physical and Social Preparedness

Results in Table 5 using Spearman's rho Correlation Coefficient show the relationship of physical and social preparedness among athletes in secondary schools. This indicates that there was no significant relationship ( $\rho = -0.027$ ,  $p = .82$ ) in the level of social and physical preparedness among athletes in Secondary Schools which can be interpreted as "Negligible Relationship".

**Table 3. Relationship between Physical and Social Preparedness**

Spearman's rho	N	Correlation Coefficient	Sig. (2-tailed)
Social Preparedness	72	-0.027	.82
Physical Preparedness			

Note:  $\pm 0.81$  to  $\pm 1.0$  = Very Strong;  $\pm 0.61$  to  $\pm 0.80$  = Strong;  $\pm 0.41$  to  $\pm 0.60$  = Moderate;  $\pm 0.21$  to  $\pm 0.40$  = low;  $\pm 0.00$  to  $\pm 0.20$  = Negligible

This means that an athlete's level of physical preparedness does not have a significant impact on their level of social preparedness, and vice versa.

Implications of these findings could include that coaches and athletic departments may need to prioritize social preparedness and team-building activities in addition to physical training, as these may have a greater impact on team performance and success. Additionally, the lack of a significant relationship between physical and social preparedness may suggest that athletes who are physically prepared may not necessarily be socially prepared, and vice versa. This could have implications for team dynamics and cohesion.

Related findings may include studies on the impact of team-building and social activities on team performance and cohesion, as well as studies on the relationship between physical fitness and mental health. For example, research has shown that physical activity can have a positive impact on mental health and wellbeing, which may in turn have an indirect impact on social preparedness and team cohesion (Hassmen et al., 2000). Other studies have also suggested that social support can have a positive impact on physical fitness and performance (Sawamura et al., 2020).

Mental preparation has been shown to have a significant impact on athletic performance. Hays and Brownstein (2012) highlighted the importance of goal setting, visualization, and positive self-talk in helping athletes to achieve their performance goals. This suggests that coaches and trainers should consider incorporating mental preparation techniques into their training programs in addition to physical and social preparation.

Leadership has also been shown to be a key factor in team performance and cohesion. Eys and colleagues (2016) emphasized the importance of effective leadership in developing a team culture that prioritizes both physical and social preparedness. This includes promoting open communication and a sense of shared goals and values among team members. Coaches and trainers should therefore prioritize leadership development as part of their training programs.

The impact of social media on athlete development is an emerging area of research. Leaver and Gruzd (2020) explored the potential positive and negative effects of social media use on athlete development and performance. On the one hand, social media provides athletes with increased opportunities for social support and networking. On the other hand, it may also lead to distractions and negative social comparisons. Coaches and trainers should therefore consider the potential impact of social media use on athlete development and incorporate strategies to minimize negative effects while maximizing positive ones.

Athlete development is a complex and multifaceted process that requires attention to both physical and social preparedness, as well as mental and leadership preparation. Researchers and practitioners should continue to explore the relationship between these factors and their potential impact on athlete performance and well-being.

## CONCLUSIONS

Based on the mean and standard deviation results, the level of social preparedness of athletes is considered highly prepared, while the level of physical preparedness is considered prepared. The results of the non-parametric Friedman test indicate that there are significant differences among the levels of physical and social preparedness among athletes in secondary schools. The significant

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Chi-square value suggests that the null hypothesis, which assumes that there is no difference between the levels of physical and social preparedness among athletes in secondary schools, can be rejected.

Furthermore, the results of Spearman's rho correlation coefficient show that there is a negligible relationship between the levels of social and physical preparedness among athletes in secondary schools. This means that the level of social preparedness does not affect the level of physical preparedness among athletes in secondary schools, and vice versa.

It can be concluded that while athletes in secondary schools are highly prepared socially, their physical preparedness is only at a prepared level. Additionally, there are significant differences between the levels of physical and social preparedness among athletes in secondary schools, but there is a negligible relationship between these two factors.

The findings of this study have several implications for coaches, trainers, and educators working with athletes in secondary schools.

Firstly, coaches and trainers should focus on improving the physical preparedness of athletes in secondary schools, as the results suggest that athletes in this age group are less physically prepared than socially prepared. This could involve implementing more effective training programs that focus on developing the physical fitness and strength of athletes.

Secondly, the significant differences between the levels of physical and social preparedness among athletes in secondary schools indicate that coaches and trainers should develop training programs that address both factors separately. For example, social preparedness could be developed through team-building activities and communication exercises, while physical preparedness could be developed through more intense and focused training programs.

Lastly, the negligible relationship between social and physical preparedness suggests that coaches and trainers should not assume that improving one factor will automatically improve the other. Instead, they should focus on developing both factors separately to ensure that athletes in secondary schools are well-prepared both socially and physically.

Overall, the findings of this study highlight the importance of developing both social and physical preparedness in athletes in secondary schools and suggest that coaches and trainers should address these factors separately to achieve the best results.

### RECOMMENDATIONS

Based on the results of the study, the following recommendations can be made:

1. Coaches and trainers: should implement more effective training programs that focus on developing the physical fitness and strength of athletes in secondary schools; should develop training programs that address both physical and social preparedness factors separately to ensure that athletes in secondary schools are well-prepared both socially and physically; should include team-building activities and communication exercises to develop social preparedness in athletes in secondary schools; and should regularly assess the social and physical preparedness of athletes in secondary schools to identify areas for improvement and adjust their training programs accordingly.
2. Educators and school administrators should prioritize the development of both physical and social preparedness in athletes in secondary schools to ensure their overall well-being and success.
3. Future studies should investigate the factors that contribute to the differences in physical and social preparedness among athletes in secondary schools, to identify specific areas where coaches and trainers can focus their efforts.
4. Further research should be conducted to investigate the impact of social and physical preparedness on athletic performance in secondary school athletes.

By implementing these recommendations, coaches, trainers, educators, and school administrators can ensure that athletes in secondary schools are well-prepared both socially and physically, which can lead to improved athletic performance and overall well-being.

### REFERENCES

- 1) Bale, J. (2020). *Sport, space and the city*. Routledge. <https://www.routledge.com/Sport-Space-and-the-City-1st-Edition/Bale/p/book/9780367111059>
- 2) Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. doi: 10.1037/0033-295x.84.2.191
- 3) Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. doi: 10.1037/0033-295X.84.2.191
- 4) Coakley, J. (2018). *Sports in society: Issues and controversies*. McGraw-Hill Education. <https://www.mheducation.com/highered/product/sports-society-issues-controversies-coakley/9781259845009.html>
- 5) Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, 49(3), 182-185. doi: 10.1037/a0012801

## Social and Physical Preparedness of Athletes in Secondary Schools

- 6) Enoksen, E., Kristiansen, E., & Dybhavn, T. (2021). Social support, well-being and preparatory behaviour among adolescent athletes in Norway. *European Journal of Sport Science*, 21(1), 14-22. doi: 10.1080/17461391.2020.1747592
- 7) Enoksen, E., Kristiansen, E., & Dybhavn, T. (2021). Social support, well-being and preparatory behaviour among adolescent athletes in Norway. *European Journal of Sport Science*, 21(1), 14-22. doi: 10.1080/17461391.2019.1607748
- 8) *European Journal of Sport Science*. (2021). Taylor & Francis Online. Retrieved from <https://www.tandfonline.com/toc/tejs20/current>
- 9) Eys, M. A., Carron, A. V., Bray, S. R., & Beauchamp, M. R. (2016). Leadership and team building in sport. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology* (pp. 541-557). Wiley-Blackwell. doi: 10.1002/9781118270011.ch26
- 10) Garcia-Mas, A., Palou, P., & Gili, M. (2018). Mental toughness in sport: Motivational antecedents and associations with performance and psychological health. *Journal of Sport and Health Science*, 7(3), 272-280. doi: 10.1016/j.jshs.2017.07.002
- 11) Good, C. V., & Scates, D. F. (1957). Validity of judgment concerning a test. *Educational and Psychological Measurement*, 17(1), 7-24. doi: 10.1177/001316445701700102
- 12) Hassmen, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: a population study in Finland. *Preventive Medicine*, 30(1), 17-25. doi: 10.1006/pmed.1999.0597
- 13) Hays, K. F., & Brownstein, B. (2012). Mental preparation strategies of Olympic champions. *International Journal of Sport Psychology*, 43(2), 99-122. doi: 10.7352/IJSP.2012.43.099
- 14) Jowett, S., & Poczwardowski, A. (2018). Understanding the coach-athlete relationship. In *Routledge Handbook of Applied Sport Psychology* (pp. 235-244). Routledge. doi: 10.4324/9781315676766-17
- 15) Jowett, S., & Poczwardowski, A. (2018). Understanding the coach-athlete relationship. In *Routledge Handbook of Applied Sport Psychology* (pp. 235-244). Routledge. doi: 10.4324/9781315670304-20
- 16) Jukić, I., Milanović, Z., & Gregov, C. (2018). Training process design in team sports: From theory to practice. *Journal of Human Kinetics*, 65(1), 27-39. <https://doi.org/10.2478/hukin-2018-0004>
- 17) Keeler, L., Meierbachtol, A., & Noffal, G. (2019). Injury Prevention in Adolescent Athletes. *American Family Physician*, 99(9), 548-554. Retrieved from <https://www.aafp.org/afp/2019/0501/p548.html>
- 18) Kovacs, M. S., Roetert, E. P., & Ellenbecker, T. S. (2018). Efficient and effective methods for assessing physical performance in adolescent athletes. *Strength and Conditioning Journal*, 40(5), 89-97. doi: 10.1519/SSC.0000000000000385
- 19) Laborde, S., Mosley, E., & Ackermann, S. (2018). Monitoring and training athletes using biopsychosocial measures. *Frontiers in psychology*, 9, 2132. <https://doi.org/10.3389/fpsyg.2018.02132>
- 20) Leaver, T., & Gruzd, A. (2020). Social media and athlete development. In J. J. Hanrahan, J. Watson, & M. Li (Eds.), *The Routledge Handbook of Athlete Development* (pp. 316-328). Routledge. doi: 10.4324/9781315146276-20
- 21) MacNamara, A., Button, A., & Collins, D. (2018). The role of psychological characteristics in facilitating the pathway to elite performance part 1: identifying mental skills and behaviors. *The Sport Psychologist*, 32(1), 61-73. doi: 10.1123/tsp.2016-0130
- 22) Mäkelä, K., Aunola, K., Leskinen, E., & Kaprio, J. (2020). The role of social support in the motivational processes of young athletes. *Journal of Sports Sciences*, 38(3), 266-273. doi: 10.1080/02640414.2019.1675436
- 23) McMahon, J. J., Murphy, J. C., Reardon, C., & O'Brien, B. J. (2020). *Coaching science: the development of the athlete*. Routledge. <https://www.routledge.com/Coaching-Science-The-Development-of-the-Athlete-1st-Edition/McMahon-Murphy-Reardon-O'Brien/p/book/9780367191143>
- 24) Poczwardowski, A., Sherman, C. P., & Ravizza, K. (2019). The relationship between social support and athletic identity: A comparison between athletes from individual and team sports. *Journal of Applied Sport Psychology*, 31(1), 89-103. doi: 10.1080/10413200.2017.1380561
- 25) Pons, F., Lawson, C. T., & Harris, K. (2019). Physical activity and academic achievement in adolescents: A meta-analysis. *Journal of School Health*, 89(2), 96-105. doi: 10.1111/josh.12713
- 26) Pons, F., Lawson, C. T., & Harris, K. (2019). Physical activity and academic achievement in adolescents: A meta-analysis. *Journal of School Health*, 89(2), 96-105. doi: 10.1111/josh.12713
- 27) Reardon, C. L., Hainline, B., Aron, C. M., Baron, D., Baum, A. L., Bindra, A., ... & Currie, A. (2019). Mental health in elite athletes: International Olympic Committee consensus statement (2019). *British Journal of Sports Medicine*, 53(11), 667-699. doi: 10.1136/bjsports-2019-100715
- 28) Saw, A. E., Main, L. C., & Gustin, P. B. (2021). Monitoring Athlete Training Loads: Consensus Statement. *International Journal of Sports Physiology and Performance*, 16(2), 270-276. <https://doi.org/10.1123/ijsp.2020-0901>

## Social and Physical Preparedness of Athletes in Secondary Schools

- 29) Sawamura, S., Hagiwara, G., Okumiya, K., Wada, T., Sakamoto, R., Ishine, M., & Matsubayashi, K. (2020). Social support and physical activity among Japanese older adults. *International Journal of Environmental Research and Public Health*, 17(12), 4366. doi: 10.3390/ijerph17124366
- 30) Thornton, H. R., Delaney, J. A., Duthie, G. M., & Dascombe, B. J. (2017). Importance of a multidisciplinary approach for return-to-play decisions for players returning from hamstring injury. *Strength & Conditioning Journal*, 39(1), 47-56. doi: 10.1519/SSC.0000000000000274
- 31) Visek, A. J., Achrafi, S. M., Manning, H., McDonnell, K., Harris, B. S., & DiPietro, L. (2018). The fun integration theory: Towards sustaining children and adolescents sport participation. *Journal of Physical Activity and Health*, 15(2), 142-149. doi: 10.1123/jpah.2017-0053
- 32) Visek, A. J., Achrafi, S. M., Manning, H., McDonnell, K., Harris, B. S., & DiPietro, L. (2018). The fun integration theory: Towards sustaining children and adolescents sport participation. *Journal of Physical Activity and Health*, 15(2), 142-149. doi: 10.1123/jpah.2017-0054



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## Point Prevalence Survey on Antibiotic Use and Class-1 Integron Associated Antibiotic Resistance In No (1) DSGH, Yangon



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**ABSTRACT:** Antimicrobial resistance is becoming a global health emergency. Likewise, multidrug resistance of gram-negative bacteria also has a high impact on public health. This cross-sectional study aimed to study antibiotic prescription patterns and class-1 integron-associated antibiotic resistance among gram-negative bacteria in No (1) Defence Services General Hospital, Yangon. The research was conducted by modifying the WHO PPS methodology. All eligible patients who were prescribed antibiotics on the day of the survey were investigated. Among the participants whose culture samples were sent to the laboratory, gram-negative bacterial culture samples undergone the class 1 integron test. There were 441 patients from 12 eligible wards with a total of 781 prescriptions in the study in January and July of 2020. The leading indication was surgical prophylaxis 257 (32.91%). Cephalosporins and Penicillins were mostly prescribed antibiotic classes. Among bacterial culture, (52.31%) were multidrug-resistant, and (47.69%) were gram-negative. Class 1 integron positivity and rate of multidrug resistance among GNB were (54.84%) and (90.32%). Class 1 integron positivity among multidrug resistance was (60.71%). There was no statistically significant association between class 1 integron and multidrug resistance in this study. Three and more antibiotic prescriptions, surgical prophylaxis, and old age group were positively associated with multi-drug resistance with (AOR=8.9, 95% CI; 2.3-34.2), (AOR=21.1, 95% CI; 2.1-210.0), and (AOR=4.6, 95%CI; 1.2-17.2) respectively. Antibiotic policy and standard treatment guidelines for the tertiary military hospital should be developed while surveillance of antibiotic resistance must be performed simultaneously.

**KEYWORDS:** Antimicrobial resistance, class-1 integron, PPS methodology, gram-negative bacteria

### 1. INTRODUCTION

Sir Alexander Fleming discovered penicillin in 1928, and this discovery remodeled medical practice. It still stands as the most powerful life-saving intervention by saving millions of lives (Maugeri et al., 2019). People once believed that the discovery of antibiotics could prevent and control nearly all kinds of infections. Despite that, the main prime of death is still infections in the evolving world (Kapoor et al., 2017). World Health Organization (WHO) endorsed the antimicrobial stewardship (AMS) initiatives to monitor antimicrobial usage and address the burden of antimicrobial resistance (AMR) (WHO, 2015). Healthcare-associated infections (HAIs) and antimicrobial resistance (AMR) are notorious threats in healthcare.

There are various mechanisms involved in antimicrobial resistance among the bacterial isolate, the acquisition of resistance genes by horizontal transfer mediated by integron play a crucial role. There are many classes of integron has been described in bacteria isolates, class 1 integron has been found to be the most prevalence in gram negative bacterial isolates (Kaushik et al., 2018).

The prevalence of integron positivity among multidrug-resistant organisms was studied in some Myanmar studies which revealed that all multidrug-resistant *Klebsiella* species from Thu et al.2021, and 95% of multidrug-resistant *Pseudomonas* species from Win et al. 2021, were positive for class 1 integron. The association between the presence of class 1 integron and multidrug resistance was statistically significant in a study conducted by Win et al 2021.

Continuous data collection on antibiotic prescribing is not feasible because of the high workload and limited resources for typical monitoring. To overcome such an obstacle, an alternative way is to collect data at a specific point in time, by using the point prevalence survey (PPS) methodology. PPS on antibiotic use is already utilized in hospitals around the world (WHO, 2018). The present study aims to identify the prescription pattern of antibiotics in tertiary-level hospitals by using the WHO Point Prevalence Survey methodology.

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## 2. RESEARCH METHODOLOGY

It was a hospital and laboratory based descriptive study at selected tertiary hospitals. All wards, patients, and antibiotics that fulfilled the inclusion criteria of PPS were selected. According to limited resources, time, and the COVID-19 pandemic, all patients who fulfilled the inclusion criteria were included in the study. The study was carried out in two points of time, the first one from 1<sup>st</sup> to 21<sup>st</sup> January and the second period from 1<sup>st</sup> to 21<sup>st</sup> July of 2020.

The study was carried out in the following procedures. Firstly, a point prevalence survey on antibiotic use was conducted. After that, the participants whose clinical specimens were sent to the laboratory for culture and sensitivity testing were chosen. Then, the specimen with positive growth for gram-negative bacilli was proceeded to detect the presence of mobile genetic elements class 1 integron gene. For the fear of dropout, human error, and data collection and entry error, the addition of 10 percent to the minimum required sample size resulting in 410 participants were collected to study.

### 2.1 Gram Negative Bacteria Identification and Antimicrobial Susceptibility Testing

All gram-negative bacteria isolated from clinical samples involved in PPS were recruited in this study. Gram negative bacteria identification and antimicrobial susceptibility testing of isolated organisms were assessed by VITEK 2 Compact Automated Microbiology Analyzer.

### 2.2 Class 1 Integron Gene Detection by Polymerase Chain Reaction

Primers (Int1F 5'-3' AAGGATCGGGCCTTGATGTT and Int1R 5'-3' CAGCGCATCAAGCGGTGAGC) 471bp were used. The reaction mixture was prepared using 2.5 µl of 10X ThermoPol Reaction Buffer, 0.5 µl of 10mM dNTPs, 0.5 µl of 10 µM forward primer, 0.5 µl of 10 µM reverse primer, 0.125 µl (0.625 U) of Taq DNA Polymerase, Template DNA 2 µl and add 18.875 µl of Nuclease free water. The samples were amplified in Applied Biosystem 7500 Fast Thermocycler instrument (Thermofisher Scientific, USA). Cycling program was as follows: preincubation at 94°C for 5 min followed by 30 cycles of denaturation at 94°C for 30 sec, annealing at 56°C for 30 sec, extension at 72°C for 30 sec and final extension at 72°C for 7 min. Then, PCR products were separated by gel electrophoresis on 1.5 % agarose gels and were visualized under UV light.

### Ethical considerations

The research proposal was submitted to and approved by the Ethical Review Committee, Defence Services Medical Academy. Ethical clearance will be followed by the guidance of the Department of Preventive and Social Medicine and the Academic Board of Studies, Defence Services Medical Academy.

## 3. RESULTS

The study was carried out in No (1) DSGH in 2020 with two points of time, the first one from 1<sup>st</sup> to 21<sup>st</sup> of January and the second one from 1<sup>st</sup> to 21<sup>st</sup> of July. Among the eligible wards, 441 patients met the study inclusion criteria and underwent the point prevalence survey. Among the total 781 antibiotics prescription, 257 (32.91%) are indicated for surgical prophylaxis, community-acquired infection is 162 (21.13%), 98 (12.55%) are prescribed according to the indication of medical prophylaxis, and nine indications (1.15%) is prescribed for a hospital-associated infection. Other indications (indication for minor injuries, illness, and nonspecific indication reason) are 252 (32.27%) (Figure-1).

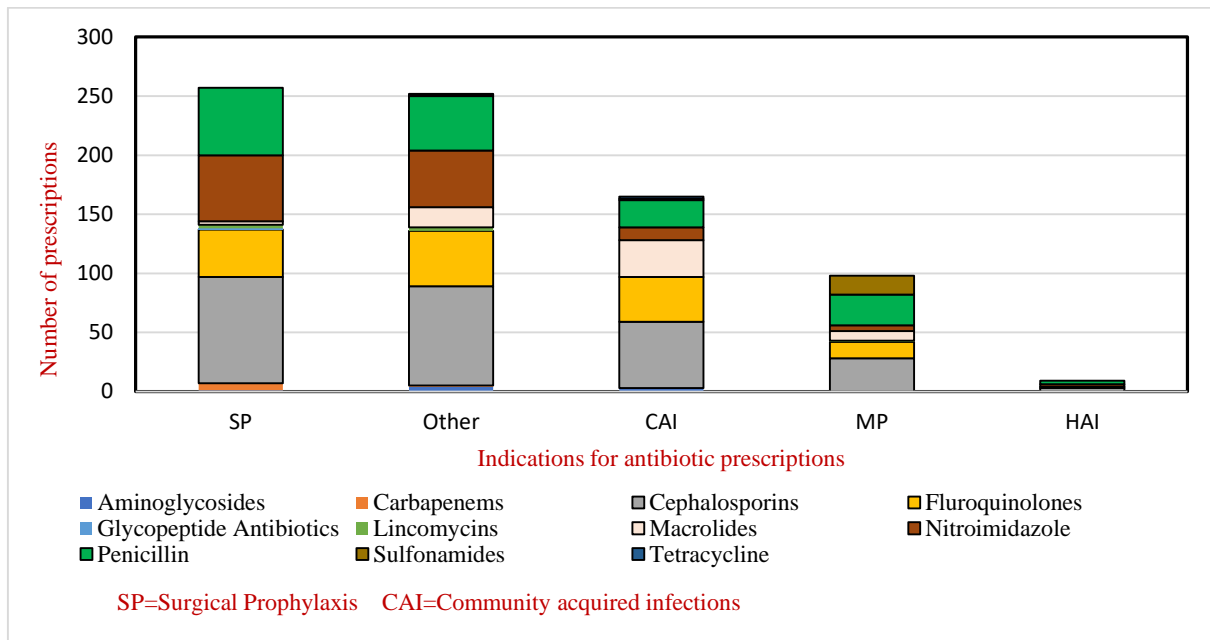
Among the overall prescriptions, Cephalosporins are the most prescribing antibiotic class 261 out of 781 (33.42%), followed by Penicillins (19.85%) and Fluoroquinolones (17.93%). Cephalosporins are the most prescribed antibiotic class in all prescribing indications with data of 35.02 % for surgical prophylaxis, 33.33 % for other indication, 33.94% for community-acquired infections, 28.57% for medical prophylaxis, and 33.33% of hospital-associated infections.

In the present study, culture samples from 65 study participants (14.74 %) are taken and sent for culture and sensitivity testing. Nearly half, 31 out of 65 (47.69 %) of the culture samples sent to the laboratory are gram-negative microorganisms and the rest of the culture samples reveal gram-positive bacteria and yeast.

Among the 65 positive growth culture samples, over half, 34 out of 65, (52.31 %) are multi-drug-resistant while the rest of the samples, 31 out of 65 (47.69 %) are non-multi-drug resistant. The table (1) provides the gram-negative bacterial pathogens isolated from the study participants. *Klebsiella pneumonia* is the most common microorganism, 14 out of 31 (45.16 %) and *Pseudomonas putida* is the less common one, one out of 31 (3.23%).

Among the 31 gram-negative bacteria, over ninety percent, 28 (90.32 %) reveal multi-drug resistance while a tiny minority 3 out of 31 (9.68 %) show non-MDR. Detection of class 1 integron gene in isolated gram-negative bacteria was proceeded by polymerase chain reaction (PCR). Class 1 integron was detected over half of gram-negative bacteria, 17 out of 31 (54.84 %) are positive for the class 1 integron gene while the remaining 14 (45.16 %) are negative for the class 1 integron gene.

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**Figure 1. Antibiotic classes among prescriptions**

**Table 1. Gram-negative bacterial pathogens isolated from the study participants.**

No.	Culture results	Number	Percentage
1	Klebsiella pneumoniae	14	45.16
2	Pseudomonas aeruginosa	7	22.58
3	Klebsiella oxytoca	4	12.90
4	Escherichia coli	3	9.68
5	Other gram-negative	2	6.45
6	Pseudomonas pudida	1	3.23
Total		31	100.00

**The association between antibiotic resistance and the presence of class 1 integron**

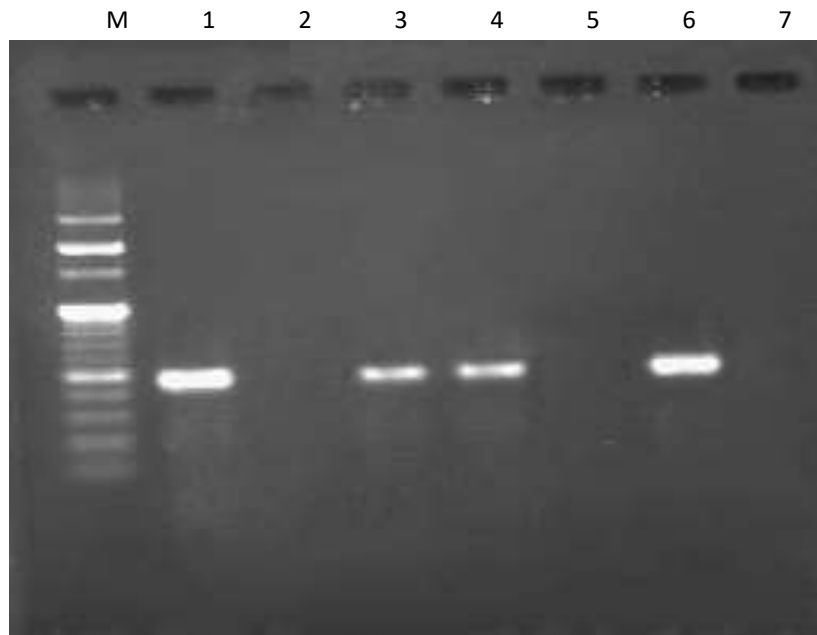
The proportion of class 1 integron positivity among MDR was 60.71%. The association between class 1 integron and multidrug resistance is calculated in the table (2). Fisher’s exact test showed that there is no statistically significant association between class 1 integron and multidrug resistance.

**Table 2. Association between multidrug-resistance and presence of class 1 integron among isolated gram-negative bacteria**

No.	Class 1 Integron and multi-drug resistance		Multi-drug-resistant		Total
			resistant	no resistant	
1	Class 1 Integron	Positive	17 (60.71%)	0 (0.00%)	17 (54.84%)
2		Negative	11 (39.29%)	3(100.00%)	14 (45.16%)
Total			28 (100.00%)	3(100.00%)	31(100.00%)

$X^2 (1, n=31) = 4.033, p = 0.081$

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**Plate (1) Detection of class 1 integron gene in bacteria species by PCR**  
 (Lane M - 100bp DNA ladder, Lane 1,3,4,6 - Sample positive for int1 gene at 471 bp,  
 Lane 2 and 5- Sample negative, Lane 7- No template control)

**Table 3. Odds ratio (OR) and 95% confidence interval (CI) for multidrug-resistant among the study participants who underwent culture and sensitivity testing (n=65)**

Variable	Odds ratio	95 % CI	p-value
Number of antibiotics less than 3 3 and above	1 4.69	1.53 – 14.32	0.007
Surgical prophylaxis No Yes	1 12.50	1.49 -104.61	0.020
Age group 50 years and below 51 years and above	1 3.37	1.19 – 9.54	0.022
Gender Male Female	1 2.58	0.84 - 7.97	0.100
Recent TB infection No Yes	1 6.43	0.73 – 56.80	0.094
Recent infections (Malaria/TB/HIV) No Yes	1 6.43	0.73 – 56.80	0.094

Bivariate analysis was done between MDR and six possible influencing factors on MDR and there are only three variables that showed statistically significant results. Prescription of antibiotics 3 and above is 4.69 times higher to be multidrug resistant than prescription of antibiotics less than or equal to 2 (OR=4.69, 95% CI; 1.53 – 14.32). Surgical prophylaxis indication is 12.50 times higher to be multidrug resistant than other prescribing indications (OR=12.50, 95% CI; 1.49-104.61). Fifty-one years and above age group is 3.37 times higher to be resistant than 50 years and below age group (OR=3.37, 95%CI; 1.19 – 9.54).



#### **4. DISCUSSION**

##### **Current Patterns of Antibiotic Prescriptions**

Among the total 781 antibiotic prescriptions, surgical prophylaxis, 257 out of 781, (32.91%) was the most frequent indication among study participants. Community-acquired infection was the third most prescribing indication with 21.13%. The second most frequent indication was other category with 32.27% which includes non-communicable diseases, minor injuries, and might be a result of inaccurate information from patient's medical records. These results slightly differ from another study, (Oo et al., 2022), which expressed that the highest prescribing indication was community-acquired infection (44.6%), and surgical prophylaxis was the second most frequent (34.3%). Surgical prophylaxis was the leading indication in this study which pointed out that the requirements of antibiotics for surgical prophylaxis should review in military healthcare settings. The study was carried out in a tertiary military hospital and there might be more trauma and warfare injuries than in a civil tertiary hospital.

Cephalosporins were the most prescribed antibiotic class (33.42% of the total prescription) followed by Penicillins (19.85%). The similarity was found in another study conducted in Myanmar, (Oo et al., 2022), which stated that the leading use of antibiotics was third-generation Cephalosporins. The findings from the India study also showed that third-generation Cephalosporins (18.48%) were the most prescribing antibiotic while Metronidazole stood at the fourth-most (14.65%) (Williams et al., 2011). The findings indicate a proper antibiotic stewardship program to review periodically the most prescribing antibiotics as hospital routine.

Only a tiny minority, 65 out of 441 study participants, (14.74%), underwent culture and sensitivity tests. The finding is lower in contrast to the findings from other studies, (43%) in Denmark (Sydenham et al., 2021), (48.8%) in Indonesia (Limato et al., 2021). However, the results are better than the culture sample taking data from other studies, no culture and sensitivity test for all prescriptions in Ethiopia (Demoz et al., 2020), (2.7%) in Ghana (Amponsah et al., 2021), and (14%) in Tanzania (Horumpende et al., 2020). Low culture and sensitivity tests might be the result of urgency of treatment, underutilized laboratory by prescribers, limited resources in the laboratory department, and time-consuming and delay results from the laboratory.

Among the culture test underwent participants, 34 out of 65 (52.31%) were multidrug-resistant. The finding of the MDR rate was higher than the multidrug-resistant data of other studies, 10% of *Pseudomonas aeruginosa*, 36% of *Klebsiella pneumoniae* among healthcare-associated infections in Thailand (Lim et al., 2016), 42.1% of Enterobacteriaceae in Ethiopia (Bitew & Tsige, 2020), However, the finding is lower than 67.1% MDR rate in Bangladesh (Alam et al., 2021). High MDR data might be a result of improper prescription (such as wrong antibiotic choice, wrong time of prescription, wrong dose, wrong duration and wrong route of administration, and wrong time to stop or review), high infections rate, and presence of counterfeit and substandard drugs.

##### **The Proportion of Multidrug-Resistant Gram-Negative Bacteria from Clinical Samples Obtained from the Study Population**

Among the culture test-underwent participants, nearly fifty percent expressed gram-negative microorganisms. The leading microorganism was *Klebsiella pneumoniae* (45.16%) followed by *pseudomonas aeruginosa* (22.58%). These findings were slightly different from the results from the study conducted in Ghana which revealed the most frequent gram-negative organism was *E.Coli* (24.5%) followed by *P. aeruginosa* (19.5%) and *K.pneumoniae* (19.0%) (Agyepong et al., 2018).

Among the gram-negative microorganisms, 28 out of 31 (90.32%) revealed MDR. This result was higher than MDR among gram-negative organisms in other studies, (26.16%), (32.98%) and (33.33%) in India (Nagvekara et al., 2020), (48.8%) in Thailand (Chaisathaphol & Chayakulkeeree, 2014), and (66.0%) in Bangladesh (Alam et al., 2021). The high MDR rate of gram-negative microorganisms pointed out the alarming signal of threats of gram-negative microorganisms and relevant prevention, control, and therapeutic measures should be encouraged.

##### **The Presence of Class 1 Integron Gene among Isolated Gram-Negative Bacteria**

Among the gram-negative bacteria, 17 out of 31 (54.84%) were class 1 integron positive. The finding was higher than the class 1 integron positive rate among gram-negative organisms in other studies, 26.5% for *E.coli* in China (Huang et al., 2020), 31.8% in the IRIS study (Barraud et al., 2022), 33.3% for *P.aeruginosa*, and 33.3% of *A.baumannii* in Iran (Moosavian et al., 2018), and 41% in Iran (Pormohammad et al., 2019). However, the finding was lower than the results of other studies, 59% in Russia (Kuzina et al., 2019). The high results of class 1 integron positivity among gram-negative organisms might be a result of inadequate gram-negative samples in the present study.

The proportion of class 1 integron in MDR was (60.71%) in this study. This finding was lower than the findings from other studies, (79%) in Iran (Pormohammad et al., 2019). The finding was similar to (67%) class 1 integron in MDR (Al-Hammadi et al., 2020). The result of the current study is higher than (Huang et al., 2020), in which (45.5%) of class 1 integron among MDR in China. Class 1 integron positivity among MDR in the current study might be lower than in the other studies as a result of limited culture tests leading to few gram-negative organisms in the study.

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## The Association Between Antibiotic Resistance and The Presence Of Class 1 Integron

The association between class 1 integron and multidrug-resistance showed a positive association between class 1 integron and multidrug-resistance but it was not statistically significant  $X^2(1, n=31) = 4.033, p = 0.081$ . This finding was different from the results of other studies, the negative predictive value of class 1 integron as a marker of antibiotic resistance was estimated at 92.8% in the IRIS study (Barraud et al., 2022), and the 95% of multidrug-resistant isolates were class 1 integron positive revealing statistically significant association between multidrug-resistance and the presence of class 1 integron (Win, 2021). The association between class 1 integron and drug resistance was expressed in numerous research and literature but there was no statistically significant association between class 1 integron and antibiotic resistance in the present study. The result might be a consequence of the limitation of the study where a few culture samples were sent to the laboratory leading to few numbers of gram-negative organisms in the study. The few gram-negative organisms in the present study cause failed to meet the adequate number to find out the association between class 1 integron and antibiotic resistance.

Three and more antibiotic prescriptions, surgical prophylaxis, and old age group were positively associated with multi-drug resistance with (AOR=8.9, 95% CI; 2.3-34.2), (AOR=21.1, 95% CI; 2.1-210.0), and (AOR=4.6, 95%CI; 1.2-17.2) respectively. A wide range of confidence interval of AOR might be a result of a few samples of culture testing from which the outcome variable for logistic regression, multidrug-resistance, was calculated. This finding accorded with the global contributors to antimicrobial resistance by (Chokshi et al., 2019) which stated that clinical misuse, ease of antibiotic availability, and poor hospital-level regulation were the main contributors to antibiotic resistance.

There are some limitations to the study. First, the coincidence of the study period with the COVID-19 pandemic and purposive sampling of one tertiary military hospital so that the findings from the study may not reflect all military hospitals. Second, we collected data at a certain point in time resulting in that duration of antibiotic prescription was not measured. Third, some health care professionals might probably miss writing down indications or reasons for antibiotic prescription in the chart which leads to misinterpretation in the study. Fourth, the culture taken among study participants was under-investigated which might lead to over or underestimating the actual prevalence of gram-negative microorganisms. Fifth, class 1 integron was tested among a few amounts of gram-negative microorganisms so that the association between multidrug resistance and class 1 integron might be underestimated.

## 5. CONCLUSION

Antibiotic consumption rate, the percentage of three or more antibiotic prescriptions was higher than WHO standard indicators and the findings from the other studies. Therefore, antibiotic policy and standard treatment guidelines for the tertiary military hospital should be developed while surveillance of antibiotic resistance must be performed simultaneously.

Only a tiny minority underwent the culture and sensitivity test. The antibiotic prescription should be the right choice for the infection so that culture and sensitivity tests of the high antibiotic consumption wards of the tertiary hospital should be promoted. Moreover, resources such as microbiologists, expert laboratory technicians, quick and simple technology, and machines, should supply to the laboratory department.

## 6. CONFLICT OF INTEREST

The authors declared that they have no conflict of interest.

## 7. ACKNOWLEDGEMENT

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## REFERENCES

- 1) Maugeri, G., Lychko, I., Sobral, R., & Roque, A. C. A. (2019). Identification and Antibiotic-Susceptibility Profiling of Infectious Bacterial Agents: A Review of Current and Future Trends. *Biotechnol J*, 14(1), e1700750. <https://doi.org/10.1002/biot.201700750>
- 2) Kapoor, G., Saigal, S., & Elongavan, A. (2017). Action and resistance mechanisms of antibiotics: A guide for clinicians. *J Anaesthesiol Clin Pharmacol*, 33(3), 300-305. [https://doi.org/10.4103/joacp.JOACP\\_349\\_15](https://doi.org/10.4103/joacp.JOACP_349_15)
- 3) WHO. (2015). Global Action Plan on Antimicrobial Resistance. WHO.
- 4) Kaushik, M., Kumar, S., Kapoor, R. K., Viridi, J. S., & Gulati, P. (2018). Integrons in enterobacteriaceae: diversity, distribution and epidemiology. *International Journal of antimicrobial agents*, 51(2), 167-176.

## Point Prevalence Survey on Antibiotic Use and Class-1 Integron Associated Antibiotic Resistance in No (1) DSGH, Yangon

- 5) Win, K. K. (2022). "Molecular Detection of Class 1 Integron Gene and Antibiotics Susceptibility Patterns of Pseudomonas Species Isolated from Clinical Specimens". AIJR Preprints, 413, Version 1, 2022.
- 6) Thu, M. K. (2022). "Detection of Class 1 Integron Among Klebsiella Species Isolated from Clinical Samples at No (1) Defence Services General Hospital (1000 Bedded)". AIJR Preprints, 414, Version 1, 2022.
- 7) WHO. (2018). Methodology for Point Prevalence Survey of antibiotic use in hospitals. WHO.
- 8) Oo, W. T., Carr, S. D., Marchello, C. S., San, M. M., Oo, A. T., Oo, K. M., . . . Crump, J. A. (2022). Point-prevalence surveys of antimicrobial consumption and resistance at a paediatric and an adult tertiary referral hospital in Yangon, Myanmar. *Infect Prev Pract*, 4(1), 100197. <https://doi.org/10.1016/j.infpip.2021.100197>
- 9) Williams, A., Mathai, A. S., & Phillips, A. S. (2011). Antibiotic prescription patterns at admission into a tertiary level intensive care unit in Northern India. *J Pharm Bioallied Sci*, 3(4), 531-536. <https://doi.org/10.4103/0975-7406.90108>
- 10) Sydenham, R. V., Justesen, U. S., Hansen, M. P., Pedersen, L. B., Aabenhus, R. M., Wehberg, S., & Jarbøl, D. E. (2021). Prescribing antibiotics: the use of diagnostic tests in general practice. A register-based study. *Scandinavian Journal of Primary Health Care*, 39(4), 466-475. <https://doi.org/10.1080/02813432.2021.2004721>
- 11) Limato, R., Nelwan, E. J., Mudia, M., de Brabander, J., Guterres, H., Enty, E., . . . Hamers, R. L. (2021). A multicentre point prevalence survey of patterns and quality of antibiotic prescribing in Indonesian hospitals. *JAC Antimicrob Resist*, 3(2), dlab047. <https://doi.org/10.1093/jacamr/dlab047>
- 12) Demoz, G. T., Kasahun, G. G., Hagazy, K., Woldu, G., Wahdey, S., Tadesse, D. B., & Niriayo, Y. L. (2020). Prescribing Pattern of Antibiotics Using WHO Prescribing Indicators Among Inpatients in Ethiopia: A Need for Antibiotic Stewardship Program. *Infect Drug Resist*, 13, 2783-2794. <https://doi.org/10.2147/IDR.S262104>
- 13) Amponsah, O. K. O., Buabeng, K. O., Owusu-Ofori, A., Ayisi-Boateng, N. K., Hameen-Anttila, K., & Enlund, H. (2021). Point prevalence survey of antibiotic consumption across three hospitals in Ghana. *JAC Antimicrob Resist*, 3(1), dlab008. <https://doi.org/10.1093/jacamr/dlab008>
- 14) Horumpende, P. G., Mshana, S. E., Mouw, E. F., Mmbaga, B. T., Chilogola, J. O., & de Mast, Q. (2020). Point prevalence survey of antimicrobial use in three hospitals in North-Eastern Tanzania. *Antimicrob Resist Infect Control*, 9(1), 149. <https://doi.org/10.1186/s13756-020-00809-3>
- 15) Lim, C., Takahashi, E., Hongsuwan, M., Wuthiekanun, V., Thamlikitkul, V., Hinjoy, S., . . . Limmathurotsakul, D. (2016). Epidemiology and burden of multidrug-resistant bacterial infection in a developing country. *Elife*, 5. <https://doi.org/10.7554/eLife.18082>
- 16) Bitew, A., & Tsige, E. (2020). High Prevalence of Multidrug-Resistant and Extended-Spectrum beta-Lactamase-Producing Enterobacteriaceae: A Cross-Sectional Study at Arsho Advanced Medical Laboratory, Addis Ababa, Ethiopia. *J Trop Med*, 2020, 6167234. <https://doi.org/10.1155/2020/6167234>
- 17) Alam, M. M., Islam, M. N., Hossain Hawlader, M. D., Ahmed, S., Wahab, A., Islam, M., . . . Hossain, A. (2021). Prevalence of multidrug resistance bacterial isolates from infected wound patients in Dhaka, Bangladesh: A cross-sectional study. *International Journal of Surgery Open*, 28, 56-62. <https://doi.org/10.1016/j.ijso.2020.12.010>
- 18) Agyepong, N., Govinden, U., Owusu-Ofori, A., & Essack, S. Y. (2018). Multidrug-resistant gram-negative bacterial infections in a teaching hospital in Ghana. *Antimicrob Resist Infect Control*, 7, 37. <https://doi.org/10.1186/s13756-018-0324-2>
- 19) Nagvekara, V., Sawantb, S., & Ameyc, S. (2020). Prevalence of multidrug-resistant Gram-negative bacteria cases at admission in a multispeciality hospital. *Journal of Global Antimicrobial Resistance*, 22, 457-461. <https://doi.org/10.1016/j.jgar.2020.02.030>
- 20) Chaisathaphol, T., & Chayakulkeeree, M. (2014). Epidemiology of infections caused by multidrug-resistant gram-negative bacteria in adult hospitalized patients at Siriraj Hospital. *Journal of the Medical Association of Thailand*, 97.
- 21) Huang, J., Lan, F., Lu, Y., & Li, B. (2020). Characterization of Integrons and Antimicrobial Resistance in Escherichia coli Sequence Type 131 Isolates. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2020, 3826186. <https://doi.org/10.1155/2020/3826186>
- 22) Barraud, O., Guichard, E., Chainier, D., Postil, D., Chimot, L., Mercier, E., . . . François, B. (2022). Integrons, a predictive biomarker for antibiotic resistance in acute sepsis: the IRIS study. *Journal of Antimicrobial Chemotherapy*, 77(1), 213-217.
- 23) Moosavian, M., Khoshkholgh Sima, M., Haddadzadeh Shoushtari, M., & Fazeli Naserabad, M. a. (2018). Detection of Class 1 Integrons among Gram-negative Bacilli Isolated from Sputum Cultures of Patients with Lower Respiratory Tract Infections in Ahvaz, Iran. *Journal of Medical Microbiology and Infectious Diseases*, 6(4), 103-107. <https://doi.org/10.29252/JoMMID.6.4.103>

## Point Prevalence Survey on Antibiotic Use and Class-1 Integron Associated Antibiotic Resistance in No (1) DSGH, Yangon

- 24) Pormohammad, A., Pouriran, R., Azimi, H., & Goudarzi, M. (2019). Prevalence of integron classes in Gram-negative clinical isolated bacteria in Iran: a systematic review and meta-analysis. *Iran J Basic Med Sci*, 22(2), 118-127. <https://doi.org/10.22038/ijbms.2018.32052.7697>
- 25) Al-Hammadi, M. A., Al-Shamahy, H. A., Ali, A. Q., Abdulghani, M. A. M., Pyar, H., & Al-Suboal, I. (2020). Class 1 Integrons in Clinical Multi Drug Resistance *E. coli*, Sana'a Hospitals, Yemen. *Pak J Biol Sci*, 23(3), 231-239. <https://doi.org/10.3923/pjbs.2020.231.239>
- 26) Huang, J., Lan, F., Lu, Y., & Li, B. (2020). Characterization of Integrons and Antimicrobial Resistance in *Escherichia coli* Sequence Type 131 Isolates. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2020, 3826186. <https://doi.org/10.1155/2020/3826186>
- 27) Chokshi, A., Sifri, Z., Cennimo, D., & Horng, H. (2019). Global Contributors to Antibiotic Resistance. *J Glob Infect Dis*, 11(1), 36-42. [https://doi.org/10.4103/jgid.jgid\\_110\\_18](https://doi.org/10.4103/jgid.jgid_110_18)



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## The Application of Blue Economy Principles to the Salt Sector in the Province of East Java, Indonesia



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**ABSTRACT:** Implementing the salt production process is often counterproductive with the reuse of "bittern" for production, which affects quality. But some throw away the "bittern", which can cause pollution of the ecosystem, thus contradicting the concept of the blue economy. This study aims to determine the implementation of the blue economy concept in the salt sector in East Java Province. The research approach uses qualitative methods. Data collection through interviews, observation, and audio and visual materials. Qualitative data analysis from Creswell includes processing and preparing data, reading data, coding, connecting themes/descriptions, describing themes, and interpreting data. The study results show that implementing the blue economy concept in the salt sector in East Java Province includes zero waste, social inclusion, innovation and adaptation, and multiplier economic effects.

**KEYWORDS:** Blue Economy, Sustainability, Salt Production, People's Salt, Atlas.ti

### I. INTRODUCTION

Indonesia is known as an archipelagic and maritime country because its territorial waters are wider than the mainland and are located in a very strategic position. In addition, Indonesia has around 17,504 islands with a coastline of 99,083 km (Ministry of Maritime Affairs and Fisheries of the Republic of Indonesia, 2019). A country with the longest coastline in the world does not guarantee that it is the biggest salt producer, either. This is like Indonesia, which has the second longest coastline in the world but is not the world's largest salt producer. Even today, salt production in Indonesia can still not meet domestic needs in quantity and quality.

In implementing the stages of salt production, salt farming communities often do counter-productive things. The salt production process, besides producing salt, also produces liquid waste called "Bittern". The content contained in "bittern" is in the form of minerals and salts which do not crystallize during the evaporation process on the salt table, so this liquid waste is in the form of a saturated solution which has a concentration level of 26-30° Be and is rich in minerals and minor elements in it (Nuzula et al., 2020). The mineral content in macro ions in "bittern" includes Magnesium ( $Mg^{2+}$ ), potassium ( $K^+$ ), sodium ( $Na^+$ ), chloride ( $Cl^-$ ), sulfate ( $SO_4^{2-}$ ), and other minor compounds (Pratiwi et al., 2021). According to Wibowo et al. (2014), high concentrations of Magnesium (Mg) in waters can affect the growth of aquatic organisms and cause environmental problems indirectly. The high or low hardness of Magnesium will have an impact on biota and aquatic ecosystems. However, based on the results of interviews, it is true that most salt farmers reuse it for the aging process of young water if it is still possible to reuse it, while the rest still have salt farmers who will throw the "bittern" back into the sea. This is, of course, contrary to the blue economy concept, which has become the direction of Indonesian Marine Policy as stipulated in the Law of the Republic of Indonesia Number 32 of 2014 concerning Maritime Article 12 Paragraph (1), which reads that the Government and Regional Governments following their authority carry out Marine Management for the greatest possible the great prosperity of the people through the utilization and exploitation of Marine Resources by using blue economy principles (Law of the Republic of Indonesia Number 32 of 2014 concerning Maritime Affairs, 2014). In addition, putting "bittern water" (above 30 oBe) back into the production process, which is done to speed up the cleaning process, can produce poor-quality salt (Widjaja et al., 2021).

Indonesia's abundance of biological and non-biological potential contained within its oceans, the country's blue economy strategy is a breakthrough seen as more efficient in utilizing its current marine resources. The Blue Economy, which focuses on economic growth and development while protecting marine resources, is becoming an increasingly popular strategy employed by many countries to support and safeguard their oceans and water resources in a manner that promotes both

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economic growth and environmental sustainability (Graziano et al., 2019; Lee et al., 2020). This definition of the blue economy varies depending on the entity issuing the identification and its purpose. In Indonesia, based on the Law of the Republic of Indonesia Number 32 of 2014 concerning Maritime Affairs, the "Blue Economy" is an approach to improve sustainable Marine Management and conservation of the Sea and coastal resources and their ecosystems to realize economic growth with principles including community involvement, resource efficiency, minimizing waste, and multiple added value (multiple revenues) (Undang-Undang Republik Indonesia Nomor 32 Tahun 2014 Tentang Kelautan, 2014). The Blue Economy aims to achieve sustainable economic development by empowering its elements while also protecting the sea, thereby enabling it to accomplish its objective of overall national economic growth (Fahrurrozi, 2020). The Blue Economy will boost the long-term benefits of sustainable marine resource use by finding profitable ocean sectors and activities. These benefits have a worldwide annual value of trillions of dollars, are responsible for the maintenance of hundreds of millions of jobs, and are beneficial to all nations located in coastal zones, which are home to approximately half of the world's population (Vega-Muñoz et al., 2021).

Thus, based on the description of the problems described above, it can be seen that a balance between economic, social, and environmental aspects, especially in the salt sector, requires an appropriate strategy to increase economic growth, prosper the community, and continue to preserve the marine ecosystem in East Java Province. Therefore this study aims to find out the forms of implementing the blue economy concept, especially in the salt sector in East Java Province.

## II. LITERATURE REVIEW

### A. Blue Economy Definition

The Blue Economy is the sustainable use of marine resources to reduce ecological scarcity and environmental risks, improve food security, human well-being, quality jobs, poverty reduction, and economic growth, and ensure sustainable production and consumption that includes all stakeholders in the maritime sector (Akhir et al., 2021). According to the World Bank (2017), the blue economy is the sustainable use of marine resources for economic growth and increased livelihoods and jobs by maintaining the health of marine ecosystems. Meanwhile, according to Tverdostup et al. (2022), the term "blue economy" refers to an economic model that promotes economic expansion, societal inclusion, and the maintenance or improvement of livelihoods while promoting environmental sustainability.

Indonesia already has a legal basis for developing a Blue Economy, including Law of the Republic of Indonesia Number 32 of 2014 concerning Maritime Article 14 Paragraph (1) (Undang-Undang Republik Indonesia Nomor 32 Tahun 2014 Tentang Kelautan, 2014), and Presidential Regulation of the Republic of Indonesia Number 16 of 2017 concerning Indonesian Maritime Policy (Peraturan Presiden Republik Indonesia Nomor 16 Tahun 2017 Tentang Kebijakan Kelautan Indonesia, 2017).

### B. Blue Economy Principles

Four principles of management and utilization of resources, according to Pauli (2010), namely:

- Zero waste, this concept focuses on the cyclical system in the production process to make clean production. There is always waste or residual production in every production process or resource extraction. This waste can be used as raw materials or energy sources for further production, which is expected to have economic value.
- Social inclusion, the objective of managing natural resources should be to promote social inclusion by ensuring social justice and equitable access to sustainable job opportunities for people experiencing poverty.
- Innovation and adaptation take into account the principles of the laws of physics and the adaptive nature of nature.
- Economic multiplier effect, every extraction of natural raw materials should provide a multiplier effect, which means that an economy can generate further economic activities that are in chains and have broad impacts. The multiplier economic effect has a market that is relatively safe and not vulnerable to market price fluctuations. The blue economy is more oriented toward multiple products, so it doesn't depend on a single product.

The application of the Blue Economy principle to the type of salt pond business, according to Zamroni et al. (2018), includes:

- Minimize waste, salt-making waste is in the form of old water or essential water with Be levels. The old water has been used to make a tofu mixture. Salt farmers get additional income from selling the old water, around IDR 15,000 – IDR 50,000 per jerry can (15 liters).
- Social inclusion, social inclusion in the BE principle, is an activity that everyone can carry out without being limited to certain groups. For example, they can use liquid waste in the form of old water in salt ponds to make tofu water. This does not require complicated technology and is not expensive.
- Adaptation and form innovation, carried out by salt farmers, is to arrange a system of water flow that goes to the salt table to be doubled. This is done to obtain the best salt yields in quality and quantity. Comparison of quality and comparison of quantity (production volume).

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- Multiple effects salt ponds have the opportunity to create multiple effects. This means that the business can generate alternative sources of income, which can positively impact the household economy.

### III. METHODOLOGY

This research was carried out in salt-producing areas in East Java Province, which are spread over 12 Regencies/Cities. East Java Province was chosen as the location of this research because East Java Province is a province that has the largest salt production contribution in Indonesia. A research approach with qualitative methods is used to achieve the objectives of this study. Qualitative research explores and understands the meanings that a number of individuals and groups of people ascribe to social or humanitarian issues (Creswell & Creswell, 2018).

Data collection in this study involved four strategies: observation, interviews, and audio and visual materials. Observations in this study were to obtain technical information on the production process of making salt. Semi-structured interviews were used to obtain information to determine the forms of blue economy principles implementation in the salt sector. Data collection by interview was obtained from the Head of the Utilization of Coastal and Small Islands Section of the Marine and Fisheries Office of East Java Province, the Salt Team Trainer of the Banyuwangi Fisheries Training and Extension, Marine Science Lecturer at Universitas Trunojoyo Madura, and Salt Farmers in East Java Province. At the same time, the form of data collection for audio and visual material is in the form of photos of the salt production process and YouTube videos from the Ministry of Maritime Affairs and Fisheries of the Republic of Indonesia, BPPP Banyuwangi, and LINGKAR JATIM related to salt.

Data analysis techniques from Creswell & Creswell (2018) include processing and preparing data for analysis; reading all data; analyzing in more detail by coding the data; applying the coding process to describe the settings of the people, categories, and themes to be analyzed; indicate how these descriptions and themes will be restated in the narrative/qualitative report; and interpret or make sense of the data (Creswell & Creswell, 2018). Data analysis in this study was assisted by Atlas.ti 9 software.

### IV. RESULT AND DISCUSSION

The blue economy is defined as sustainable production in the marine sector, especially in the salt sector. The implementation of blue economy principles in the salt sector in East Java Province can be described as follows:

#### A. Zero Waste

Dirt and waste generated from the people's salt production process in East Java Province include plankton, sludge, moss, calcium gypsum, and bittern. Based on the research data that has been done, the results of qualitative research data analysis with the help of Atlas.ti 9 software related to the principle of zero waste can be seen as follows:

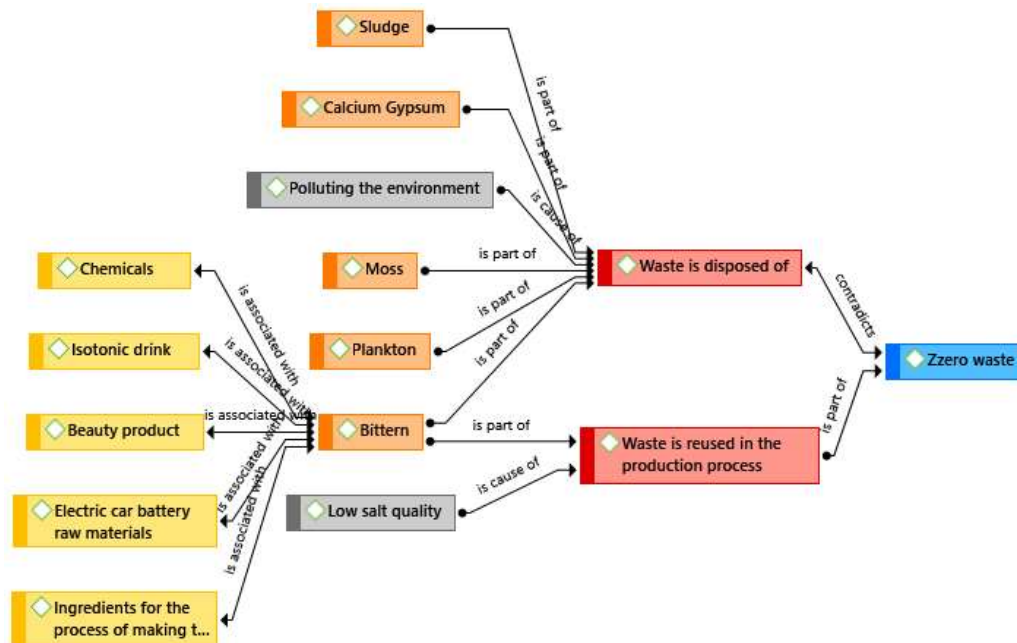


Figure 1. Results of Zero Waste Principle Analysis

Based on Figure 1 above, it can be explained that most of the dirt or waste resulting from the people's salt production process is thrown away without any further utilization. This is contrary to the blue economy principle without waste (zero waste). "bittern" is the most abundant among the various excrements and wastes generated. This "bittern" is the remains of old water on the

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crystallization table with a concentration level of  $> 29^{\circ}\text{Be}$ , where this "bittern" contains high minerals Mg, Ca, and  $\text{SO}_4$ . Most of the people's salt farmers in East Java Province reuse "bittern water" for the production process is mixed with young water. This is in line with the principle of zero waste but will impact the quality of the salt produced, which will become bitter, and the NaCl content cannot increase. Widjaja et al. (2021) also explained that putting "bittern water" back into the production process can speed up the cleaning process but can cause low-quality salt production. Meanwhile, salt farmers do not reuse it for the production process but throw it away without any further management, and if this is done continuously and in large quantities, it can also damage nature because this bittern has a high magnesium content. Waste that has the potential to affect the environment is old water left over from washing salt (Dewanti et al., 2021). According to Wang et al. (2015), improper treatment of concentrated salt discharge will inevitably cause severe environmental problems, and the most widely used approach is direct discharge into the sea, which causes a series of problems to the surrounding seawater bodies due to their effects on salinity, temperature, turbidity, dissolved oxygen and metal concentrations. The release of concentrated salts with high salt levels, usually twice that of seawater, will result in dramatic ecological degradation, such as substantial damage to seaweed, plankton, invertebrates, and fish.

Even though if it is directed at technology and basic scientific knowledge, "bittern water" waste can still be utilized and reprocessed into raw materials for other products, even the selling price of the waste generated from the production of this salt will also be far more expensive than the selling price of the salt. "Bittern" can be extracted into  $\text{MgSO}_4$ ,  $\text{MgCl}_2$ , and  $\text{CaCl}_2$  for chemicals, extracted into lithium for raw materials for electric car batteries, and further processed to be used as fertilizer, isotonic drinks, beauty products, ingredients for tofu production, and many more. If the "bittern" waste is used and processed further, the selling price will be far more expensive than the price of the salt. Meanwhile, if the "bittern" is reused for the production process, it must be returned to the initial selection to follow the process stages.

Using waste from the people's salt production process in East Java Province for raw materials for other products can increase the potential for salt production. It can be an alternative for additional income for salt farmers. Zero waste means that nothing is wasted, waste for one is food for another, and waste from one process is a source of energy for another (Tegar & Gurning, 2018). This zero waste principle emphasizes the cyclical system in the production process to create clean production where waste can be used as raw materials or energy sources for further production, which is expected to have economic value (Erviyanto, 2018). Apart from the blue economy concept, the utilization of "bittern" waste can also be used for reverse logistics, increasing the waste's productivity. According to Abidin & Leksono (2021), waste management by applying the reverse logistics concept is an alternative solution to minimize environmental pollution generated by the production process.

### B. Social Inclusion

The form of social inclusion in the salt sector in East Java Province can be seen in the management system working on people's salt ponds. Based on the research data that has been done, the results of qualitative research data analysis with the help of Atlas.ti 9 software related to the principle of social inclusion can be seen as follows:

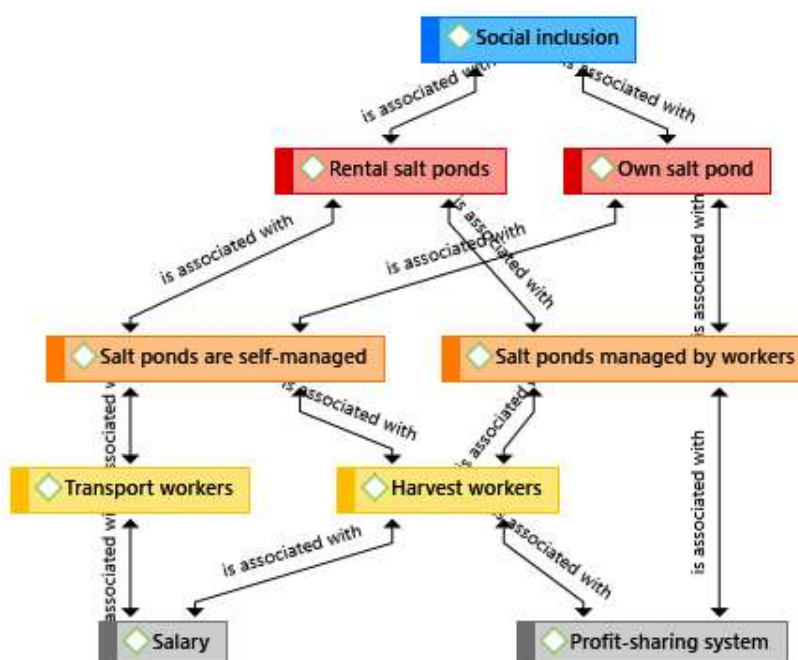


Figure 2. Results of Social Inclusion Principles Analysis



## The Application of Blue Economy Principles to the Salt Sector in the Province of East Java, Indonesia

Based on Figure 2 above, it can be explained that in East Java Province, there are two types of people working on salt fields, namely doing it yourself or doing it with others (mantongan). This type of management can occur either from owned land or leased land. Even though the ponds are owned by themselves or rented land, they still need the help of harvesting workers and transport workers from the surrounding community to help during the harvesting process. The compensation obtained by transport workers is in the form of wages, while for harvesting workers, it can be in the form of wages or a production sharing system with an agreement with the party made. The number of wages given to workers in each region will vary. The wages for workers transporting crops vary; some are IDR 150,000/ton, and some are IDR 3,000/sack. Meanwhile, the wage for harvesting workers is IDR 30,000/ton, and for the profit-sharing system, the wages can be in the form of money or salt. The number of workers needed is not certain according to the crops produced. The more salt yields obtained, the more workers are needed.

As for the work on salt ponds done by other people or the term mantongan can be found in salt-producing regencies/cities outside Madura. Most of these workers are Madurese from Sumenep and Pamekasan Regencies, but there may also be workers from surrounding areas. The number of workers (mantongan) is not limited, usually consisting of 1 family or a married couple. Workers' compensation (mantongan) is usually in the form of profit sharing. This profit-sharing consists of the results divided by two and the results divided by three, depending on the agreement between the two workers and the landowner. The result is divided in two if the land owner only provides land capital and for other costs, it is the workers who bear it. Meanwhile, the results are divided by three if the land owner only hands over his land to the workers without incurring any costs. It is the workers who bear all the costs, the workers (mantongan) will get 2 (two) shares while the pond land owners only get 1 (one), and vice versa if the land owner finances everything and the workers only do the work, the pond land owner will get 2 (two) shares, and the workers get 1 (one) share. Even though the land has been worked on by other people, during the harvesting/gathering process, it still requires additional workers from the surrounding community. The compensation can be in the form of wages or profit sharing.

The existence of various forms of management of salt pond land development in East Java Province provides opportunities for many people to get opportunities to work both for the local community and from outside the area. Thus, this is in line with the principle of social inclusion in implementing the blue economy concept, where Wiratma & Nurgiyanti (2019) explain that social inclusion means social equity and many job opportunities for the poor. Job provision, development, and welfare are necessary for the blue economy concept. Inclusion and participation are very important in a sustainable blue economy because they can promote fair and sustainable practices (Germond-Duret et al., 2022).

### C. Innovation and Adaptation

The form of innovation and adaptation in the salt sector in East Java Province can be seen from the technological methods used in the people's salt production process. Based on the research data that has been done, the results of qualitative research data analysis with the help of Atlas.ti 9 software related to the principles of innovation and adaptation can be seen as follows:

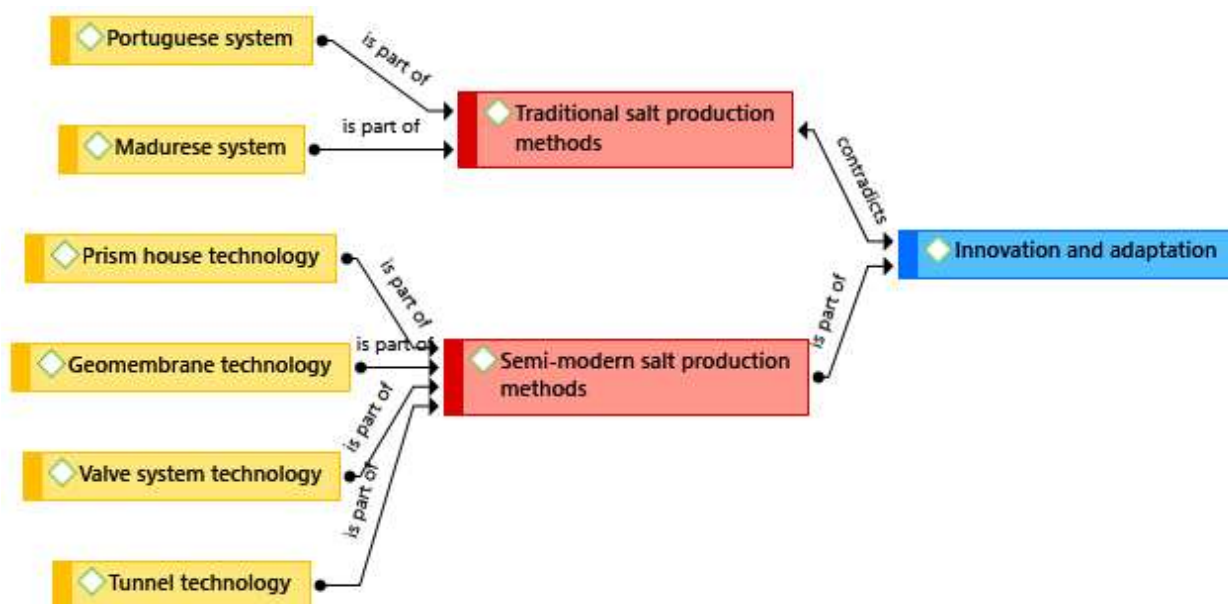


Figure 3. Results of Innovation and Adaptation Principles Analysis

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Based on Figure 3 above, it can be explained that the salt production process methods of the people in East Java Province consist of traditional and semi-modern methods. Traditional methods of salt production in East Java Province include the maduris system and the Portuguese system, where both systems use the crystal table from the ground. The difference is that in the Portuguese system, the salt collection is carried out on a salt floor made of salt crystals that were made before. The salt collection maduris system is carried out directly on the ground so that it will affect the quality of the salt harvested. The quality of salt produced traditionally based on the results of laboratory tests obtained NaCl levels between 65.3979% to 86.3091% and Mg levels between 0.052% to 0.084%. This traditional salt production method is contrary to the principles of innovation and adaptation because, according to Zamroni et al. (2018), innovation is formed from an adaptation when wanting to do efficiency. The people's salt production process with this traditional method will require longer. Apart from that, in terms of productivity, salt production is only around 40-60 tons/hectare/per season when the weather is normal.

Meanwhile, the semi-modern people's salt production methods applied in East Java Province include geomembrane technology, prism housings, valve systems, and tunnels. These production technologies have their advantages and disadvantages, and the quality produced is far better than traditional methods. Explanation of each method of semi-modern folk salt technology as follows:

### 1. Geomembrane Technology

This geomembrane technology is one of the technologies that salt farmers in East Java Province widely use because it is a program created by the government in 2011 through the People's Salt Business Development Program (PUGAR) to increase the quantity and quality of people's salt. The difference between the geomembrane method and the traditional method is in the crystallization table, where in this geomembrane method, the crystallization table is coated with geomembrane plastic. Using a geomembrane on a salt crystallization table can speed up production time, reduce work, and produce more white and white salt. Based on the results of laboratory tests related to the quality of salt produced with geomembrane technology, it was found that NaCl levels were between 77.3735% and 95.3152%, and Mg levels were between 0.081% and 0.102%. In terms of quantity, salt production using geomembranes can increase the amount of salt production by 2 times compared to traditional methods, namely as much as 80-120 tons/hectare/season. This is in line with what was disclosed by Muliana et al. (2022) that the geomembrane method has several advantages in operation, such as producing large quantities of salt, speeding up the salt crystallization process, and easing the work of salt farmers. Even so, this method still has drawbacks. Namely, the production process still relies on weather/sunlight, so production activities only occur during the dry season. Salt farmers are not uncommon to harvest prematurely, ultimately affecting the quality of the salt produced. In addition, additional costs must be incurred to purchase geomembrane plastic. The technology for producing salt using geomembrane on a crystal table which salt farmers widely use, can be seen in the following figure:

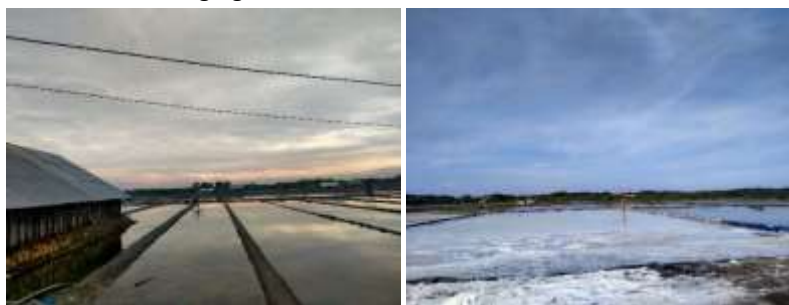


Figure 4. Salt Production with Geomembrane Technology

### 2. Prism House Technology

The people's salt production method using prism house technology can produce salt production that has the best quality among other production methods because the production process with the prism house is closed so that the production results are clean and very minimally contaminated from the surrounding environment. Based on the results of laboratory testing for the quality of salt produced using prism house technology, the NaCl level was 96.7788%, and the Mg level was 0.080%. Kurniawan et al. (2019) revealed that the quality of salt produced through the prism house method is included in the K1 quality category and can produce quality salt that meets the standards set by SNI. In addition, the production process using prism house technology does not depend on the weather so it can produce salt all year round because, in this prism house, it is in the form of a 2-story stack where the lower floor is a bunker which functions to store young water and the top floor is a production table that functions to the crystallization process. Meanwhile, in terms of the productivity of the prism house method, it can reach 240-260 tons. The prism house method's weakness is that it requires additional costs to make prisms, and the level of difficulty in prism

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construction is quite difficult, so special expertise is needed to make this prism house. The technology for salt production using a prism house can be seen as follows:



Figure 5. Salt Production with Prism House Technology

### 3. Valve System Technology

The valve system technology is a salt pond technological innovation created to overcome weather problems because there are infrastructure facilities that can provide shelter during the rainy season. If needed to be opened, then in the summer, it will be opened. This valve system technology method has a very high productivity, reaching more than 300 tons. However, in terms of quality, it is still inferior to the prism house method because the sides are still open in this valve system method. Based on the interview results, it was obtained information on the quality of salt produced with a valve system having a NaCl content of 96.4%. However, the drawback of this method is that there is an additional cost for the construction, and it can only be applied to salt production processes on a small scale. The technology for salt production using a valve system can be seen as follows:



Figure 6. Salt Production with Valve System Technology

### 4. Tunnels Technology

This tunnel technology is shaped like a semicircular tunnel. The production process with tunnel technology is weather resistant and can produce all year round. The resulting quality is also better than traditional salt fields or geomembranes. It is also higher in terms of production quantity because the salt production period with tunnel technology is faster than with a more closed prism. Making land construction is also easier, but the drawback of this tunnel technology is that it has a curved shape like a tunnel, which makes heat spread out of focus. It won't be as strong when applied to a large area with strong winds because the tunnel framework is made of split bamboo. Which is covered with plastic without clamps, so it will be damaged more quickly when exposed to strong winds.

With the application of several semi-modern technologies to the people's salt production methods in East Java Province, salt farmers can increase the quantity and quality of the people's salt produced by implementing the principles of innovation and adaptation. Encouraging and implementing technological innovations within communities can result in increased economic growth by serving as an economic catalyst, generating added value, achieving competitiveness and quality standards for produced goods through innovative methods (Prayuda & Sary, 2019). Thus, this follows the blue economy's innovation and adaptation concepts, which use physics-based technology to adapt to natural conditions and local resources (Fahrurrozi, 2020). The blue economy gives importance to applying fundamental physics principles, specifically the law of gravity, to ensure that energy is distributed efficiently and uniformly without any external energy extraction (Prasutiyon, 2018).

### D. Economic Multiplier Effect

The form of economic multiplier effect in the salt sector in East Java Province can be seen from the various kinds of salt produced apart from krosok salt, which is the main product. Based on the research data that has been done, the results of qualitative research data analysis with the help of Atlas.ti 9 software related to the principle of the economic multiplier effect can be seen as follows:

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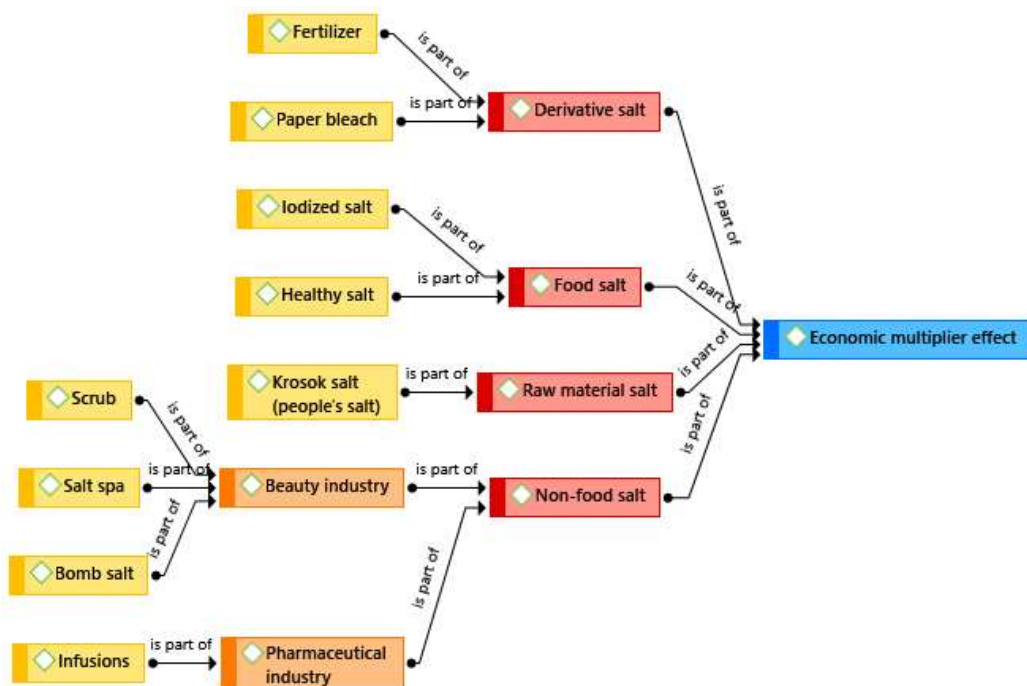


Figure 7. Results of Economic Multiplier Effect Principles Analysis

Based on Figure 7 above, it can be explained that the main product produced by salt farmers in East Java Province is krosok salt which can be referred to as raw material salt. Raw material salt is salt that salt farmers, in general, commonly produce. This raw material salt has the opportunity to carry out further processing to be able to produce food salt, non-food salt, and derived salt. Food salt is raw material salt as basic salt, which is processed into food salt. This food salt consists of iodized consumption salt and healthy salt (low NaCl salt). Non-food salt is used for industrial purposes in the pharmaceutical and beauty industries. In the pharmaceutical industry, this salt can be used as an ingredient in making infusions; in the beauty industry, this salt can be used as bomb salt, spa salt, and scrub products. Meanwhile, derived salt is a raw material that is further extracted or purified to become derived salt products which are usually used to manufacture fertilizers or paper-bleaching agents.

In East Java Province itself, the people's processed salt products produced by salt farmers are in the form of iodized consumption salt and spa salt. This is only limited to groups of salt farmers who have formed cooperatives and are advanced. However, academics, students, and lecturers from the Maritime Studies Program at Universitas Trunojoyo Madura are developing many innovations in processed salt products. The development of processed salt products is expected to empower the community and increase the selling price of the salt itself. The results of salt processing innovations produced by students of the Marine Science Study Program can be seen as follows:



Figure 8. Processed Products of People's Salt

Figure 8 shows the result of innovative salt products like Healthy Salt and Bath Spa. Healthy salt is healthy because it has a low NaCl level of only 60%, which is good for people with high blood pressure, while bath spa is salt that is used for bathing or bathing as well as scrubbing. The innovation of these salts is added with spices such as seaweed, moringa, cinnamon, oranges, etc. These innovations are expected to increase the selling price of people's salt.

The existence of further processing of krosok salt (raw material salt) produced by salt farmers in East Java Province into processed food salt, non-food salt, and derived salt is a form of implementation of the blue economy concept from the principle of the economic multiplier effect. According to Ervianto (2018), this economic multiplier effect means that every extraction of natural raw materials should have a multiplier effect which means that an economy can generate further economic activities

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that are in chains and have wide-reaching impacts. The multiplier economic effect has a market that is relatively safe and not vulnerable to market price fluctuations. The blue economy is more oriented toward multiple products, so it doesn't depend on a single product. As such, it can help stimulate local business opportunities and job creation, ultimately driving a long-term positive economic multiplier effect (Jones & Navarro, 2018).

Based on the explanation that has been presented, the author can provide points for each of the blue economy principles and their implementation in the salt sector in East Java Province to make them clearer and easier to understand. These points can be shown in Table 1 below:

**Table 1. Implementation Of Blue Economy Principles In The Salt Sector In East Java Province, Indonesia**

Blue Economy Principles	Explanation	Implementation	Information
Zero waste	The cyclical system is in the production process to create clean production where waste can be used as a material or energy source for continued production	Chemicals (MgSO <sub>4</sub> , MgCl <sub>2</sub> , and CaCl <sub>2</sub> ) Electric car battery raw materials (lithium extract) Fertilizer Isotonic drink Beauty product Ingredient for the process of making tofu	Salt farmers in East Java Province have not implemented waste treatment but are used for the production process again. Bittern waste treatment has been studied and developed by academics, both students and lecturers
Social inclusion	Social equity and lots of job opportunities for the poor	Salt pond management worker (mantongan) Harvest workers Transport worker	Salt farmers in East Java Province have implemented social inclusion
Innovation and adaptation	Innovation is formed from an adaptation when you want to do efficiency	Geomembrane technology Prism housing technology Valve system technology Tunnel technology	Salt farmers in East Java Province have applied technology in the production process
Multiplier economic effect	They are more oriented to multiple products, so they don't depend on one product	Salt raw material: krosok salt Food salt: consumption of iodized salt and healthy salt (low NaCl salt) Non-food salt: pharmaceutical industry (making infusions) and beauty industry (bomb salt, spa salt, and scrubs) Derivative salts: manufacture of fertilizers and paper-bleaching agents	Salt farmers in East Java Province only apply the processing of food salt (iodized consumption salt) and other processed non-food salt (spa salt) developed by academics, both students and lecturers

## V. CONCLUSIONS

Implementing blue economy principles in the salt sector in East Java Province includes four principles: zero waste, social inclusion, innovation and adaptation, and multiplier economic effects. The principle of no waste (zero waste) is shown in the reuse of "bittern" for production. However, it will affect the quality of the salt produced, and some farmers still throw it away without any further processing even though "bittern" can be used as raw material for other products such as raw materials chemicals (MgSO<sub>4</sub>, MgCl<sub>2</sub>, CaCl<sub>2</sub>), raw materials for electric car batteries (lithium), fertilizers, isotonic drinks, beauty products, and ingredients for tofu production. The principle of social inclusion is shown when working on salt pond land still involves salt pond management workers (mantongan), harvesting workers, and transport workers. The principle of innovation and adaptation is shown by applying semi-modern production technology methods to increase the quantity and quality of salt produced, including geomembrane technology, prism housings, valve systems, and tunnels. The principle of multiplier economy is shown in the main product produced in the form of raw material salt or krosok salt. The opportunity to be further processed for food salt includes iodized consumption salt and healthy salt (low NaCl salt), non-food salt includes the pharmaceutical industry for infusion and industrial beauty for bomb salt, spa salt, and scrub), as well as derived salt for the manufacture of fertilizers and paper bleaching agents.

The results of implementing the blue economy principles in the salt sector in East Java Province can be used by the government as a basis for making policies following the Law of the Republic of Indonesia Number 32 of 2014 concerning Maritime Article 14 Paragraph (1) and Presidential Regulation of the Republic of Indonesia Number 16 of 2017 concerning Indonesian Marine Policy Article 14.

## The Application of Blue Economy Principles to the Salt Sector in the Province of East Java, Indonesia

### REFERENCES

- 1) Abidin, A., & Leksono, E. B. (2021). Pemanfaatan Limbah Fly Ash Batubara Sebagai Koagulan dengan Konsep Reverse Logistics. *Jurnal INTECH Teknik Industri Universitas Serang Raya*, 7(1), 39–44. <https://doi.org/10.30656/intech.v7i1.2736>
- 2) Akhir, K., Farand, F. S. D., Araujo, B. D., & Nahumariri, M. G. G. (2021). Designing and Mapping the Blue Economy Company Index (BECdex) to the Sustainable Development Goals (SDGs) for Maritime Companies in the Coastal States. *International Journal of Innovative Science and Research Technology*, 6(9), 417–426. <https://ijisrt.com/designing-and-mapping-the-blue-economy-company-index-becdex-to-the-sustainable-development-goals-sdgs-for-maritime-companies-in-the-coastal-states>
- 3) Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Fifth Edit). SAGE Publications, Inc.
- 4) Dewanti, D. P., Arifudin, Adhi, R. P., Saraswati, A. A., Murti, S. D. S., Prayitno, J., & Santoso, A. D. (2021). Kajian Lingkungan Pengembangan Produksi Garam Industri Di Indonesia. *Jurnal Rekayasa Lingkungan*, 14(2), 146–155. <https://ejurnal.bppt.go.id/index.php/JRL/article/view/5217>
- 5) Ervianto, W. I. (2018). Studi Pendekatan Ekonomi Biru Untuk Insfrastruktur Di Indonesia. *Seminar Nasional Sains Dan Teknologi 2018*, 1–7. <https://jurnal.umj.ac.id/index.php/semnastek/article/view/3545>
- 6) Fahrurrozi, F. (2020). Analysis Concept of the Blue Economy Islamic Perspective (Case Studi Jumiang as Marine Tourism in Pamekasan). *Perisai : Islamic Banking and Finance Journal*, 4(1), 17–23. <https://doi.org/10.21070/perisai.v4i1.435>
- 7) Germond-Duret, C., Heidkamp, C. P., & Morrissey, J. (2022). (In)Justice and the Blue Economy. *Geographical Journal*, 1–9. <https://doi.org/10.1111/geoj.12483>
- 8) Graziano, M., Alexander, K. A., Liesch, M., Lemad, E., & Torrese, J. A. (2019). Understanding an Emerging Economic Discourse Through Regional Analysis: Blue Economy Clusters in the U.S. Great Lakes Basin. *Applied Geography*, 105, 111–123. <https://doi.org/10.1016/j.apgeog.2019.02.013>
- 9) Jones, A., & Navarro, C. (2018). Events and the Blue Economy: The Development of Sailing Events as Alternative Pathways for Tourism Futures - The Case of Malta. *International Journal of Event and Festival Management*, 9(2), 204–222. <https://doi.org/10.1108/IJEFM-09-2017-0055>
- 10) Kementerian Kelautan dan Perikanan Republik Indonesia. (2019). *Laut Masa Depan Bangsa, Mari Jaga Bersama*. Kkp.Go.Id. <https://kkp.go.id/artikel/12993-laut-masa-depan-bangsa-mari-jaga-bersama>
- 11) Kurniawan, A., Assafri, F., Munandar, M. A., Jaziri, A. A., Prihanto, A. A., & Guntur, G. (2019). Analisis Kualitas Garam Hasil Produksi Prisma Rumah Kaca di Desa Sedayu Lawas, Kabupaten Lamongan, Jawa Timur. *Jurnal Kelautan Nasional*, 14(2), 95–102. <https://doi.org/10.15578/jkn.v14i2.7073>
- 12) Lee, K., Noh, J., & Seong, J. (2020). The Blue Economy and the United Nations' Sustainable Development Goals: Challenges and Opportunities. *Environment International*, 137, 1–6. <https://doi.org/10.1016/j.envint.2020.105528>
- 13) Muliana, A., Nufus, H., Mursawal, A., Mulyana, A., & Gazali, M. (2022). Metode Geomembran Sebagai Alternatif Produksi Garam Tradisional Di Gampong Kuala Ba'u Kecamatan Kluet Utara Kabupaten Aceh Selatan. *Jurnal Laot Ilmu Kelautan*, 4(1), 40–49. <https://doi.org/10.35308/jlik.v4i1.4882>
- 14) Nuzula, N. I., Sri, W., Pratiwi, W., Indriyawati, N., & Efendy, M. (2020). Analisa Komposisi Kimia pada Bittern (Studi Kasus Tambak Garam Desa Pedelegan Pamekasan Madura). *Prosiding Seminar Nasional Kahuripan 1 Tahun 2020*, 173–175. <https://conference.kahuripan.ac.id/index.php/SNapan/article/view/45>
- 15) Pauli, G. A. (2010). *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*. Paradigm Publications.
- 16) Undang-Undang Republik Indonesia Nomor 32 Tahun 2014 Tentang Kelautan, (2014). <https://jdih.kkp.go.id/peraturan/1-uu-32-2014.pdf>
- 17) Peraturan Presiden Republik Indonesia Nomor 16 Tahun 2017 Tentang Kebijakan Kelautan Indonesia, Pub. L. No. Nomor 16 Tahun 2017 (2017). [https://jdih.dephub.go.id/assets/uudocs/perpres/2017/PERPRES\\_16\\_Tahun\\_2017.pdf](https://jdih.dephub.go.id/assets/uudocs/perpres/2017/PERPRES_16_Tahun_2017.pdf)
- 18) Prasutiyon, H. (2018). Paper Review Konsep Ekonomi Biru (Sebuah Potret: Indonesia Bukanlah Jakarta). *Jurnal Ekonomika*, 11(2), 87–92. [https://ildikti7.ristekdikti.go.id/uploadjurnal/4\\_EkonomikaV11No2Des2018.pdf](https://ildikti7.ristekdikti.go.id/uploadjurnal/4_EkonomikaV11No2Des2018.pdf)
- 19) Pratiwi, W. S. W., Nuzula, N. I., Suci, D. S., Kartika, A. G. D., & Effendy, M. (2021). Produksi MgCl<sub>2</sub> dari Bittern melalui Optimalisasi Pemisahan Ion Sulfat Menggunakan Reagen Kalsium Klorida Dihidrat. *Journal of Marine Research*, 10(2), 243–251. <https://doi.org/10.14710/jmr.v10i2.30687>
- 20) Prayuda, R., & Sary, D. V. (2019). Strategi Indonesia Dalam Implementasi Konsep Blue Economy Terhadap Pemberdayaan Masyarakat Pesisir di Era Masyarakat Ekonomi ASEAN. *Indonesian Journal of International Relations*, 3(2), 46–64. <https://doi.org/10.32787/ijir.v3i2.90>
- 21) Tegar, D., & Gurning, R. O. S. (2018). *Development of Marine and Coastal Tourism Based on Blue Economy*.

## The Application of Blue Economy Principles to the Salt Sector in the Province of East Java, Indonesia

- International Journal of Marine Engineering Innovation and Research, 2(2), 128–132. <https://doi.org/10.12962/j254>
- 22) Tverdostup, M., Paas, T., & Chebotareva, M. (2022). What Can Support Cross-Border Cooperation in the Blue Economy? Lessons from Blue Sector Performance Analysis in Estonia and Finland. *Sustainability*, 14(3), 1–18. <https://doi.org/10.3390/su14031817>
- 23) Vega-Muñoz, A., Salazar-Sepúlveda, G., & Contreras-Barraza, N. (2021). Identifying the Blue Economy Global Epistemic Community. *Water*, 13(22), 1–13. <https://doi.org/10.3390/w13223234>
- 24) Wang, H., Xu, X., & Zhu, G. (2015). Landscape Changes and a Salt Production Sustainable Approach in the State of Salt Pan Area Decreasing on the Coast of Tianjin, China. *Sustainability*, 7(8), 10078–10097. <https://doi.org/10.3390/su70810078>
- 25) Wibowo, B. H., Lumintu, I., & Anna, I. D. (2014). Peningkatan Nilai Tambah Limbah Bittern untuk Meningkatkan Produktivitas Industri Garam. *Journal Jurusan Ilmu Kelautan*. <https://pta.trunojoyo.ac.id/welcome/detail/090421100016>
- 26) Widjaja, S., Radiarta, I. N., Suhelmi, I. R., Bramawanto, R., Akhwady, R., Widodo, A. W., Triwibowo, H., Prabawa, F. Y., Mahabrur, D., Sagala, S. L., Kurniawan, T., Yanti, B. V. I., Apriliani, T., Deswati, R. H., & Dwiyoitno. (2021). *Telaah Akademik Potret Garam Nasional*. Amafrad Press.
- 27) Wiratma, H. D., & Nurgiyanti, T. (2019). Pembangunan Pariwisata Kulon Progo Melalui Konsep Green Economy dan Blue Economy. *Nation State: Journal of International Studies*, 2(2), 161–172. <https://doi.org/10.24076/NSJIS.2019v2i2.164>
- 28) World Bank. (2017). MENA Blue Program. *Worldbank.Org*. <https://www.worldbank.org/en/programs/mena-blue-program/overview>
- 29) Zamroni, A., Nurlaili, N., & Witomo, C. M. (2018). Peluang Penerapan Konsep Blue Economy Pada Usaha Perikanan di Kabupaten Lombok Timur. *Buletin Ilmiah Marina Sosial Ekonomi Kelautan Dan Perikanan*, 4(2), 39–44. <https://doi.org/10.15578/marina.v3i2.7388>



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## Lobular Breast Carcinoma Metastasis to the Myocardium: Case Report



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**ABSTRACT:** The invasive lobular carcinomas are the second type of cancer Invasive breast cancer after invasive ductal and account for over 20% of invasive breast cancer. Metastasis from primary cancer to the myocardium is uncommon in lobular breast cancer. Here we present a case of lobular breast carcinoma that metastasized to the myocardium.

**KEYWORDS:** Cardiac metastasis, Lobular Breast Carcinoma, Echocardiography, PET CT

### INTRODUCTION

Approximately 80% of invasive breast cancers are typically classified into invasive ductal carcinoma, the remaining 20% are invasive lobular carcinoma. The metastatic patterns of invasive lobular carcinoma and invasive ductal carcinoma are different [1]. In invasive lobular carcinoma, metastases are found more frequently in the bone and/or other sites such as the central nervous system, body cavities, and visceral organs [2], and the frequency of metastasis is higher in invasive lobular carcinoma than in invasive ductal carcinoma [2, 3].

Although the heart is a relatively uncommon site for metastatic disease. Myocardia metastases from breast cancer, particularly invasive lobular carcinoma, are rare. No case of invasive lobular carcinoma with metastasis in myocardium has been reported in the literature. The most case of cardiac metastasis are report with invasive ductal carcinoma.

Here we report a case of a metastatic lesion in the myocardium from invasive lobular carcinoma in a 54 years old woman along with a short review of the literature.

### CASE REPORT

A 54-year-old woman was admitted to Cheikh Khalifa Hospital for cardiac evaluation of invasive metastatic lobular carcinoma of the skin, lymph nodes, bone and eyes.

She had stage II NYHA dyspnea with fatigue, her cardiovascular clinical exam was normal. On the ECG, she had sinus tachycardia without any repolarization disorder.

On echocardiography, the cardiac cavities were at normal size with good systolic function of the ventricles. However, there was a mass in the wall of the right ventricle with moderate pericardial effusion (Figure 1).

PET revealed bilateral neoplastic mammary hypermetabolism with secondary ocular, skin, bone, lymph node, and left brain sites (Figure 2). There was no hypermetabolism in the cardiac air (Figure 3). Chest CT showed heart mass with moderate pericardial effusion with other metastatic sites.

The patient started chemotherapy. After the 4th session, there is a clinical improvement with disappearance of dyspnea. The control by ultrasound and CT scan showed a reduction in the size of the cardiac mass, which points towards a metastatic localization of his infiltrating lobular cancer (figure 4.5).



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### DISCUSSION

Cardiac metastases are rare. Bussani et al reported that the incidence of cardiac metastases ranges from 2.3% to 18.3% in autopsy studies, and is particularly high in malignant pulmonary mesotheliomas, malignant melanomas and pulmonary adenocarcinomas [4]. On breast cancer, the incidence is 15.5%, with no details on ductal or lobular carcinomas.

lobular carcinoma accounts for 20% of breast cancers, with secondary localizations mostly in the bones, lungs and lymphatics. the cardiac localization is exceptional [1].

Cardiac metastatic localizations are pericardial or epicardial, myocardial localizations, as in the present case, are less frequent [4,5].

Only 10% of patients with cardiac metastases will have symptoms. Clinical manifestations vary depending on the location and extent of myocardial involvement and may include rhythm disturbances, heart failure or embolic events [6]. Diagnosis of cardiac metastasis is done primarily with use of echocardiography and imaging techniques (scanner or magnetic resonance imaging), as in our patient [7, 8]: Echocardiography has the advantage of being easy to perform, easy to handle and reproducible, it is a test of choice for monitoring [8]. CT scanning has increased both speed and resolution, making it possible to visualize important cardiac anatomy, even in routine studies. The main strength of this modality is the excellent spatial resolution, which translates into high sensitivity to pericardial effusions. The main limitation of this modality is the poor tissue characterization [9]. Fluorine-18-FDG PET/CT is a useful modality for detecting sites of metastatic disease in cancer patients, but special considerations are required for accurate evaluation of cardiac metastasis [10,11]. In general, myocardial activity is indeterminate on whole-body FDG PET/CT given variable background myocardial uptake. However, when focal activity is present relative to background myocardium and biodistribution, further imaging should be considered.

Cardiac MRI is the best imaging modality for evaluating the extent of myocardial involvement by metastatic disease [12,13]. The tissue characterization capabilities of cardiac MRI can be used to differentiate infiltrating metastasis from myocardium and tumor from thrombus.

Lobular carcinoma is a rare disease associated with poor prognosis. It is important to control lesions using multimodal therapy that includes surgery, chemotherapy, and radiotherapy. Cardiac metastasis, which is difficult to treat, was already detected during the patient's initial examination. [14].

Systemic chemotherapy is usually the most beneficial in this situation. In cases where the metastasis results in tamponade, or obstruction of blood flow, palliative surgery is often used to relieve symptoms. Palliative radiotherapy to the heart is rarely helpful or indicated to relieve symptoms.

In our patient, the evolution was favorable after 4 sessions of chemotherapy, there is clinical improvement with reduction of the mass size at echocardiography (figure 4). After 6 session of chemotherapy, the mass has almost disappeared (figure 5), Long-term surveillance is needed clinically and with imaging.

### CONCLUSION

Myocardial Localization of lobular breast carcinoma metastasis is unusual site of Metastasis, Echocardiography is sensible to detect it, with imagery (CT, MRI), Pet scanner will be done with specific protocol to detect cardiac metastasis.

### CONFLICT OF INTEREST

The authors declare that they have no competing interests.

### REFERENCES

- 1) Fernandez B, Paish EC, Green AR, Lee AH, Macmillan RD, Ellis IO, et al. Lymph-node metastases in invasive lobular carcinoma are different from those in ductal carcinoma of the breast. *J Clin Pathol* 2011;64:995-1000.
- 2) Ferlicot S, Vincent-Salomon A, Médioni J, Genin P, Rosty C, Sigal-Zafrani B, et al. Wide metastatic spreading in infiltrating lobular carcinoma of the breast. *Eur J Cancer* 2004;40:336-41.
- 3) He et al. Distant Metastatic Disease Manifestations in Infiltrating Lobular Carcinoma of the Breast. *AJR*:202, May 2014 . 1140\_1148
- 4) Bussani R, De-Giorgio F, Abbate A, Silvestri F. Cardiac metastases. *J Clin Pathol*. 2007;60:27–34
- 5) Shapiro LM. Cardiac tumors: diagnosis and management. *Heart*. 2001;85:218–22
- 6) Morais VD, Dalbem F, Borges K, Restelli K: Right ventricular tumor in a patient with melanoma. *Arg Bras Cardiol* 2008, 91(3): e29-32, e21-24

## Lobular Breast Carcinoma Metastasis to the Myocardium: Case Report

- 7) Ekmektzoglou KA, Samelis GF, Xanthos T. Heart and tumors: location, metastasis, clinical manifestations, diagnostic approaches, and therapeutic considerations. *J Cardiovasc Med (Hagerstown)* 2008, 9(8):769-777
- 8) Butany J, Nair V, Naseemuddin A, Nair GM, Catton C, Yau T. Cardiac tumours: diagnosis and management. *Lancet Oncol* 2005, 6:219-228
- 9) Lichtenberger III JP et al: Metastasis to the Heart: A Radiologic Approach to Diagnosis With Pathologic Correlation. *AJR* 2016; 207:764–772
- 10) Rahbar K, Seifarth H, Schafers M, et al. Differentiation of malignant and benign cardiac tumors using 18F-FDG PET/CT. *J Nucl Med* 2012; 53:856 – 863.
- 11) Maurer AH, Burshteyn M, Adler LP, Steiner RM. How to differentiate benign versus malignant cardiac and paracardiac 18F FDG uptake at oncologic PET/CT. *RadioGraphics* 2011; 31:1287–1305
- 12) O’Donnell DH, Abbara S, Chaithiraphan V, et al. Cardiac tumors: optimal cardiac MR sequences and spectrum of imaging appearances. *AJR* 2009; 193:377–387
- 13) Buckley O, Madan R, Kwong R, Rybicki FJ, Hunsaker A. Cardiac masses. Part 2. Key imaging features for diagnosis and surgical planning. *AJR* 2011; 197:(web) W842–W851
- 14) Sato R, Ichiyasu H, Saeki S, Sakata S, Sasaki J, Fujii K, et al. FDG-PET and chemotherapy for successful diagnosis and treatment of cardiac metastasis from non-small cell lung cancer. *Intern Med.* 2012; 51:1909–12.].

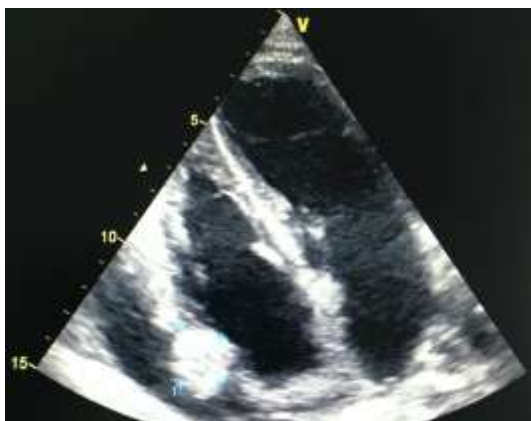


Figure 1: trans thoracic echocardiography (TTE) A 4 cavity view : The masse lateral Right ventricular with pericardial effusion

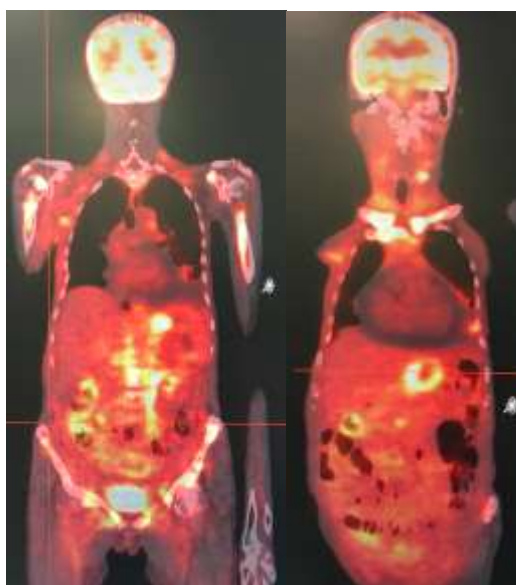


Figure2: PET scan

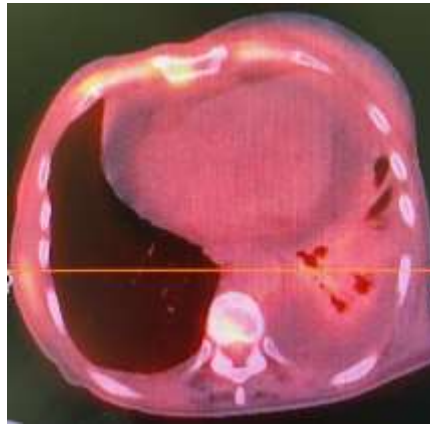


Figure 3: PET scan : no hypermetabolism in the cardiac air



Figure 4: trans thoracic echocardiography (4 cavity view) after 4 session of chemotherapy

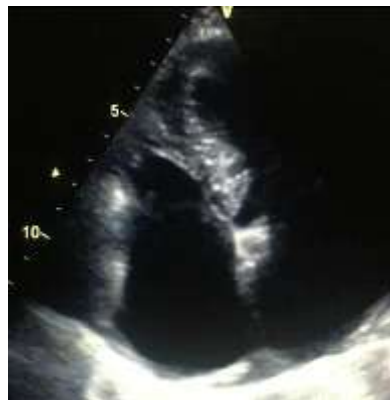


Figure 5: trans thoracic echocardiography (4 cavity view) after 6 session of chemotherapy



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## Development and Acceptability of Macaroons with Shoots from Different Species of Bamboo



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**ABSTRACT:** The study focused on the development and acceptability of macaroons made from different varieties of bamboo shoots with four flavorings. This product development research includes two major areas: preparation of bamboo shoots, and preparation of twelve type macaroons using the bamboo shoots in four different flavors. To further appreciate the developed macaroons, the researcher investigated the acceptability of the products in terms of appearance, aroma, taste, and texture, and in terms of the sensorial evaluation of bamboo shoot macaroons flavored with corn syrup, corn kernel, honey and latik along with the following age groups: children, teenagers, adults and experts. The evaluators were randomly chosen. The statistical tools utilized in this study were mean, standard deviation, and One-way between Groups Analysis of Variance (ANOVA) with Pos Hoc Analysis Using Tukey HSD when a significant difference was revealed based on the result of ANOVA. A five-point Likert scale was used in the determination of the evaluators' rating.

Results of this study revealed that all twelve developed macaroons from Bayog, Kawayan Killing, and Kawayan Tinik bamboo shoots each flavored with Corn Syrup, Corn Kernel, Honey and Latik were "highly acceptable". All different varieties of macaroons were highly acceptable in general in terms of appearance, aroma, taste, and texture.

The different varieties of macaroons were also "highly acceptable" in general according to the evaluators' age group with the highest total mean for macaroons from Kawayan Tinik flavored with Latik while the lowest for macaroons from Bayog with Honey. Meanwhile, significant difference was found in the general acceptability of the macaroons as perceived by the evaluators when grouped according to their age group. The significant differences exist between children and experts for macaroons from Bayog with Corn Syrup, Bayog with Corn Kernel, Bayog with Honey, Kawayan Killing with Corn Syrup, Kawayan Killing with Latik, and Kawayan Tinik with Corn Syrup, while between the children, teenagers, and experts for macaroons made from Kawayan Tinik flavored with Honey.

The nutritive content of the developed bamboo shoot macaroons has a greater amount of carbohydrates, a good source of energy giving food. It is also heart friendly and it helps to control bad cholesterol throughout the body because the developed bamboo shoot macaroons are low in fat content and contain considerable amount of protein the body needs.

Finally, the shelf-life of bamboo shoot macaroons when stored in normal temperature can last for six days and when stored in cold temperature, the bamboo shoot macaroons can last for ten days.

**KEYWORDS:** Bamboo shoot, Macaroons, Acceptability, Organic Food and Development

### I. INTRODUCTION

Development of nutritious food products provides everyone with specific health benefits. Everybody wants to live a healthier lifestyle. Development drives innovation and constant renovation of our food. Discovering or introducing new products to everyone is a challenging one, from its formula, ingredients, flavoring, shelf life and packaging. Developing new product involves assembling and analyzing a proto-type of the product to see how the ingredients interact, and to balance the technical realities of the product with its market goals. Developing nutritious food from products which are locally available in the market would combat or address issues on malnutrition. This is also to avoid temptation to eat unhealthy foods like junk foods.

Shifting to organic food is essential in maintaining healthy body. It is generally free of pesticides and chemical crops, and has minimal additives. According to the Organic Trade Association, organic foods are processed minimally and are free from artificial ingredients and preservatives "to maintain the integrity of the food". Preservatives are recent addition to the human diet, and organic food represents a shift back to older practices.

## Development and Acceptability of Macaroons with Shoots from Different Species of Bamboo

Bamboos belonging to family Poaceae are considered as one of the most versatile multi utility forest tree grasses with over 1,250 species, their presence are predominantly found in Southeast Asia. They are known to have more than 1500 uses and are considered as one of the most economically important plants in the world. The applicability of bamboos is highly diverse as they are employed immensely in paper, handicraft industry, house construction and making furniture, water pipes, storage vessels and other important household items.

People from different countries address bamboos in different names because of their highly multipurpose properties. The Chinese called bamboos as “Friends of the People”, Vietnamese as “My Brothers” and Indians as “Greek Gold”. Nongdam and Tikendra (2014). Bamboos in addition to their multiple applications have another important usage in utilizing their juvenile shoots as popular food items that can be consumed fresh, fermented or canned. The juvenile shoots are not only delicious but of high content of proteins, amino acids, minerals, fiber, carbohydrates and low in fats and sugar. The presence of photosynthesis in young shoots provides youthful feeling, athletic energy and longevity to regular consumers. The shoots are free from residual toxicity and grow without the application of fertilizers. Modern research has revealed that juvenile shoots of bamboo have a greater number of health benefits like healthy weight loss, control of bad cholesterol, strengthening the immune system, possible cancer fighting properties and anti-inflammatory properties. Furthermore, shoots have antioxidant capacity due to the presence of phenolic compounds. Moreover, bamboo shoots contain significant amount of dietary fiber that can be used as an ingredients for bakery products, meat products, snacks, pastas, desserts, cookies and many other food products.

The properties of bamboo shoots were documented in the book Compendium of Materia Medica, a pharmaceutical text written during the Ming dynasty (1368 to 1644), with following words “ Slightly called sweet, nontoxic, and it quenches thirst, benefits the liquid circulatory systems and can be served as a daily dish” (Yuming and Jiru,1999). Presently, bamboo shoots are consumed as vegetable by local people. It serves as a delicacy in up- scale markets. Most bamboo shoots produce edible shoots but only few are commonly grown on utilized for their shoots (Midmore, 1998).

It is for this reason that the researcher was motivated and interested to further explore and develop localized bamboo shoots products that can be popularly served and appreciated on the table by locals both children and adults because of its nutritive value.

## II. MATERIALS AND METHODS

The following tools, equipment and ingredients were used in the conduct of the study.

**Table 1. Tools and Equipment Used in the Conduct of the Study.**

DESCRIPTION					
Preparation tools	Measuring tools	Mixing tools	Cutting tools	Baking pans	Equipment
Flour Sifter	Measuring cups	Mixing bowls	Knife	Macaroon molder	Gas range
Grater	Glass measuring	Wooden spoon	Chopping board		Oven
Spatula	Measuring spoon				Gas stove
Utility tray					

## Ingredients

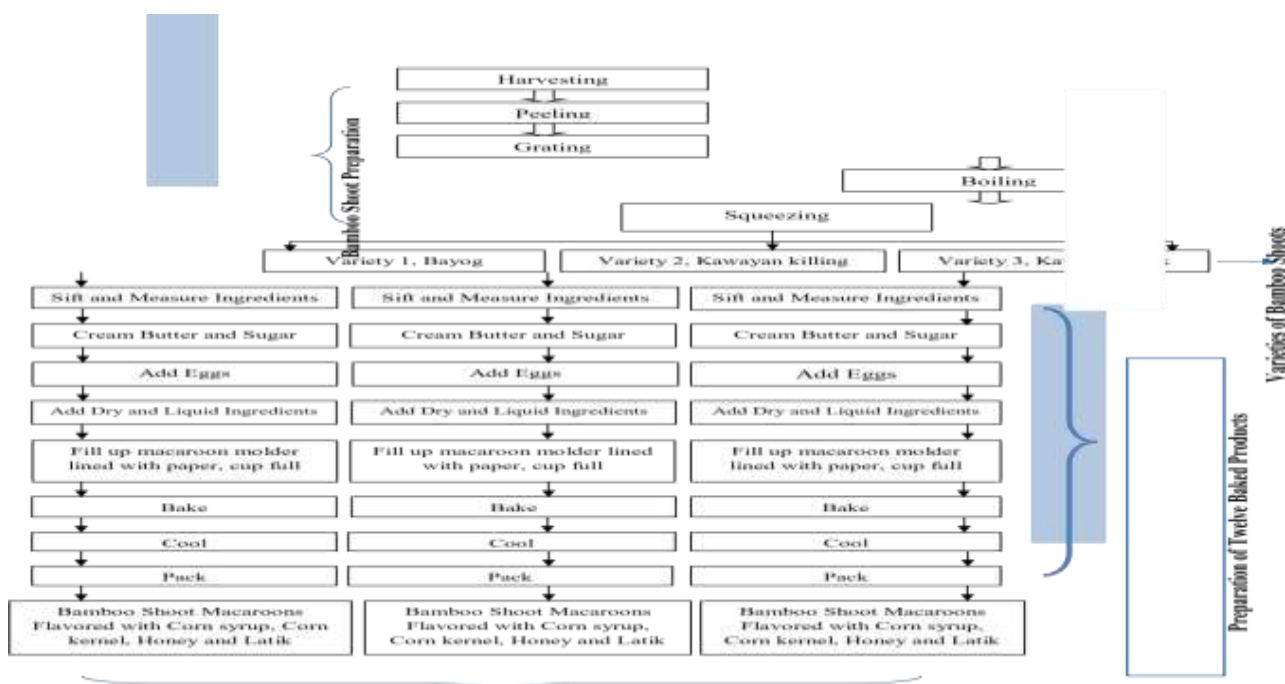
**Table 2. Proportion of Ingredients used in the Preparation of Four Flavored Macaroons from the Three Varieties of Bamboo Shoots.**

Flavoring Ingredients	Corn Syrup F1	Corn Kernel F2	Honey F3	Latik (Coconut curd) F4
Corn syrup, Corn kernel, Honey, Latik ©	¼	¼	¼	¼
Grated Bamboo shoot ©	2	2	2	2
Powdered Milk ©	1 ½	1 ½	1 ½	1 ½
Refined Sugar ©	1	1	1	1
Cake Flour ©	¾	¾	¾	¾
Egg yolk (pc)	1	1	1	1
Condensed Milk (ml.)	168	168	168	168
Butter (g)	100	100	100	100
Water ©	½	½	½	½

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### Developmental Procedure

In order to perform the research properly, the flowchart of the procedures in making flavored bamboo shoot macaroons out of Corn Syrup, Corn Kernel, Honey and Latik, were followed consistently. The needed materials and ingredients were prepared; followed by creaming and mixing the major ingredients then poured into prepared macaroon molder, then baked, cooled and packed.



### Sensory Evaluation

The finished products were subjected to sensory evaluation. One hundred twenty (120) varied age group of evaluators: 30 children, 30 teenagers, 30 adults and 30 food experts from selected bakery owners (e. g. Calamagui Bakery) of Ilagan City, Isabela, students and faculty and staff of the Isabela State University, Ilagan Campus, as well as selected food technology teachers of Isabela School of Arts and trades and Barangay Calamagui 2nd City of Ilagan, Isabela. They were randomly selected and properly oriented on what and how to evaluate the products using the score card depicting the sample code. The different flavors of bamboo shoot macaroons were served on the table. Each respondent was asked to taste the samples of each product. Data on the appearance/color, aroma, taste and texture of each product were collected and subjected to statistical analysis.

The instrument used for gathering was a score sheet using quantitative analysis method in determining the acceptability of the product.

The responses as to the level of acceptability of the flavored bamboo shoots macaroons in terms of appearance/color, aroma, taste, and texture were solicited using the five-point Likert's scale and given weight for computation.

Scale	Numeric Rating	Descriptive Rating
5	4.50-5.00	Highly Acceptable
4	3.50-4.49	Moderately Acceptable
3	2.50-3.49	Acceptable
2	1.50-2.49	Slightly Acceptable
1	0.50-1.49	Not Acceptable

### Statistical Tools Used

All data were gathered from the questionnaire/evaluation form given to the evaluators. The variables were analyzed and interpreted based on the output of the Statistic Package for Social Science Software.

1. Mean (M) was utilized to gauge the level of acceptability of the macaroons as to respondents' age groups and criteria used.
2. Standard Deviation (SD) was utilized to determine the homogeneity or average distance and the level of acceptability scores around the mean.
3. One Way Between Groups Analysis of Variance (ANOVA) was utilized to determine the differences of the level of general acceptability of the macaroons across the four age groups.

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4. Pos Hoc Analysis Using Tukey HSD. This was conducted only when the ANOVA revealed a significant difference between and among the level of general acceptability of the macaroons across the four age groups. This was utilized to determine which among the pairs of groups have significantly different level of general acceptability for the macaroons.

### Product Evaluation

**Table 3.1. Level of Acceptability of Macaroons from Bayog with Corn Syrup**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.85	.40	Highly Acceptable
Aroma	4.86	.36	Highly Acceptable
Taste	4.88	.32	Highly Acceptable
Texture	4.80	.47	Highly Acceptable

The table above shows the acceptability of macaroons from Bayog with corn syrup. It reflects a highly acceptable level of acceptability indicating their respective weighted means of 4.85, 4.86, 4.88 and 4.80. It implies that the product has a pleasing appearance and texture. Likewise, the taste of “Bayog” macaroon with corn syrup is palatable. Furthermore, the corn syrup contributed to increase the delightful aroma and sweetness of the developed product which makes it very much acceptable to children. This conforms to the study of Matibag on the acceptability of macaroons made of varying levels of bamboo shoot when it revealed that the general appearance, flavor, taste and texture were “very much liked” by the evaluators.

**Table 3.2 Level of Acceptability of Macaroons from “Bayog” with Corn Kernel**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.90	.32	Highly Acceptable
Aroma	4.89	.31	Highly Acceptable
Taste	4.90	.30	Highly Acceptable
Texture	4.85	.40	Highly Acceptable

Table 3.2. Exhibits the level of acceptability of macaroons made from “Bayog” with corn kernel as perceived by the evaluators. It is evident from the table that the appearance, aroma, taste, and texture were all assessed by the respondents as “highly acceptable” indicating their respective weighted means of 4.90, 4.89, 4.90, and 4.85. This means that the respondents accept very much the appearance, aroma, savory, and texture of the macaroons from “Bayog” with Corn Kernels.

**Table 3.3. Level of Acceptability of Macaroons from Bayog with Honey.**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.82	.44	Highly Acceptable
Aroma	4.85	.42	Highly Acceptable
Taste	4.86	.38	Highly Acceptable
Texture	4.81	.42	Highly Acceptable

The table exhibits the level of acceptability of macaroons made from “Bayog” with honey. It is evident from the table that the appearance, aroma, taste and texture of the developed product were all assessed by the respondents as “highly acceptable” indicating their weighted means of 4.82, 4.85, 4.86, and 4.81. This means that respondents accept very much the appearance, aroma, taste and texture of the macaroons from the “Bayog” with Honey.

**Table 3.4. Level of Acceptability of Macaroons from Bayog with Latik**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.87	.35	Highly Acceptable
Aroma	4.88	.32	Highly Acceptable
Taste	4.90	.32	Highly Acceptable
Texture	4.88	.34	Highly Acceptable

Table 3.4 shows the level of acceptability of macaroons with shoots from Bayog and “Latik” as ingredients and flavorings perceived by the evaluators. It reflects a “highly acceptable” level of acceptability from the respondents. It is evident that taste has the highest weighted mean of 4.90. It means that “Latik” as ingredient contributed much to make the finished product tasteful and aromatic.

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**Table 4.1. Level of Acceptability of Macaroons from Kawayan Killing with Corn Syrup**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.85	.39	Highly Acceptable
Aroma	4.84	.40	Highly Acceptable
Taste	4.91	.33	Highly Acceptable
Texture	4.88	.34	Highly Acceptable

Table 4.1 reflects the level of acceptability of macaroons from “Kawayan Killing” with corn syrup as perceived by the evaluators. It reveals that the appearance, aroma, taste, and texture were all assessed by the respondents as “highly acceptable” indicating their respective weighted means of 4.85, 4.84, 4.91 and 4.88 having taste as the highest. This means that the developed food product is very palatable to the respondent’s tongue.

**Table 4.2. Level of Acceptability of Macaroons from Kawayan Killing with Corn Kernel**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.87	.35	Highly Acceptable
Aroma	4.90	.31	Highly Acceptable
Taste	4.91	.30	Highly Acceptable
Texture	4.86	.36	Highly Acceptable

The table exhibits the level of acceptability of macaroons made from “Kawayan Killing” with Corn kernel. As presented in Table 4.2, the appearance, aroma, taste and texture of macaroon made from kawayan killing flavored with corn kernel were “highly” acceptable to the respondents as indicated by their respective mean values of 4.87, 4.90, 4.91, and 4.86. It clearly implies that the product is delicious.

**Table 4.3. Level of Acceptability of Macaroons from Kawayan Killing with Honey.**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.90	.31	Highly Acceptable
Aroma	4.88	.37	Highly Acceptable
Taste	4.88	.34	Highly Acceptable
Texture	4.85	.38	Highly Acceptable

The respondents gave a “highly acceptable” evaluation to the appearance, aroma, taste, and texture of macaroon made from kawayan killing flavored with honey as indicated by their mean values of 4.90, 4.88, 4.88, and 4.85. It is evident that the food product is pleasing to the eyes of the respondents.

**Table 4.4. Level of Acceptability of Macaroons from Kawayan Killing with Latik**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.87	.35	Highly Acceptable
Aroma	4.90	.31	Highly Acceptable
Taste	4.93	.25	Highly Acceptable
Texture	4.88	.34	Highly Acceptable

The table above shows the level of acceptability of macaroons from “Kawayan killing” with Latik. It reflects a “highly acceptable” level of acceptability from the respondents in terms of appearance, aroma, taste, and texture. It is evident that the taste of the macaroon has the highest weighted mean of 4.93. It means that “Latik” as ingredient contributed much to make the finished food product yummy.

**Table 5.1. Level of Acceptability of Macaroons from Kawayan Tinik with Corn Syrup**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.89	.36	Highly Acceptable
Aroma	4.89	.33	Highly Acceptable
Taste	4.87	.37	Highly Acceptable
Texture	4.84	.44	Highly Acceptable



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The table above shows the acceptability of macaroons from “Kawayan Tinik” with Corn syrup. The respondents gave a rating of “highly acceptable” in the appearance, aroma, taste and texture of macaroon from kawayan tinik with corn syrup as indicated by their respective weighted means of 4.89, 4.89, 4.87, and 4.84. It means that the developed food product is pleasant and agreeable to their sense of taste.

**Table 5.2. Level of Acceptability of Macaroons from Kawayan Tinik with Corn Kernel**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.88	.34	Highly Acceptable
Aroma	4.87	.33	Highly Acceptable
Taste	4.89	.33	Highly Acceptable
Texture	4.84	.42	Highly Acceptable

The table 5.2 exhibits the level of acceptability of macaroons from “Kawayan Tinik” with Corn kernel. It reflects a “highly acceptable” evaluation from the respondents with corresponding means of 4.88, 4.87, 4.89, and 4.84. It clearly implies that the developed macaroon is palatable.

**Table 5.3. Level of Acceptability of Macaroons from Kawayan Tinik with Honey**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.89	.33	Highly Acceptable
Aroma	4.90	.32	Highly Acceptable
Taste	4.90	.36	Highly Acceptable
Texture	4.90	.32	Highly Acceptable

The table above shows the acceptability of macaroons from “Kawayan Tinik” with honey. It reflects that the evaluators gave a “highly acceptable” rating as to the appearance, aroma, taste, and texture of the macaroons with corresponding means of 4.89, 4.90, 4.90, and 4.90. It means that developed product has good aroma, delicious and soft.

**Table 5.4. Level of Acceptability of Macaroons from Kawayan Tinik with Latik**

	Mean	Std. Deviation	Level of Acceptability
Appearance	4.91	.27	Highly Acceptable
Aroma	4.90	.35	Highly Acceptable
Taste	4.92	.32	Highly Acceptable
Texture	4.90	.32	Highly Acceptable

The table reveals the level of acceptability of macaroons from “kawayan Tinik” with Latik. The data revealed that the appearance, aroma, taste, and texture of macaroons from kawayan tinik with latik were highly acceptable by the respondents as indicated by the means of 4.91, 4.90, 4.92 and 4.90. It clearly implies that the developed macaroon is very nutritious and palatable.

**Table 6.1. Sensorial Evaluation of Macaroons from Bayog with Corn Syrup**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.95	.11	Highly Acceptable
Teenagers	4.88	.29	Highly Acceptable
Adults	4.88	.26	Highly Acceptable
Experts	4.68	.49	Highly Acceptable
Mean	4.85	.33	Highly Acceptable

The table above displays the respondents’ sensorial evaluation of the macaroons made from bayog with corn syrup in terms of their age groups. It shows that all age groups gave highly acceptable evaluation: children (M: 4.95, SD: .11), teenagers (M: 4.88, SD: .29), adults (M: 4.88, SD: .26), and experts (M: 4.68, SD: .49). The overall sensorial evaluation is highly acceptable with a grand mean of 4.85 and standard deviation of .33. It implies that the four groups of respondents gave the same rating to the developed macaroons. It means that the evaluators liked the macaroons very much.

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**Table 6.2. Sensorial Evaluation of Macaroons from Bayog with Corn Kernel**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.96	.12	Highly Acceptable
Teenagers	4.92	.24	Highly Acceptable
Adults	4.89	.27	Highly Acceptable
Experts	4.75	.42	Highly Acceptable
Mean	4.88	.29	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from bayog with corn kernel in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.96, SD: .12), teenagers (M: 4.92, SD: .24), adults (M: 4.89, SD: .27), and experts (M: 4.75, SD: .42). The overall sensorial evaluation is highly acceptable with a grand mean of 4.88 and standard deviation of .29.

**Table 6.3. Sensorial Evaluation of Macaroons from Bayog with Honey**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.94	.15	Highly Acceptable
Teenagers	4.91	.22	Highly Acceptable
Adults	4.88	.28	Highly Acceptable
Experts	4.61	.60	Highly Acceptable
Mean	4.83	.37	Highly Acceptable

The table displays the respondents' sensorial evaluation of the macaroons from bayog with honey in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.94, SD: .15), teenagers (M: 4.91, SD: .22), adults (M: 4.88, SD: .28), and experts (M: 4.61, SD: .60). The overall sensorial evaluation is highly acceptable with a grand mean of 4.83 and standard deviation of .37.

**Table 6.4. Sensorial Evaluation of Macaroons from Bayog with Latik**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.94	.19	Highly Acceptable
Teenagers	4.93	.17	Highly Acceptable
Adults	4.30	.25	Highly Acceptable
Experts	4.76	.42	Highly Acceptable
Mean	4.88	.28	Highly Acceptable

Table 6.4 reveals the respondents' sensorial evaluation of the macaroons from bayog with latik in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.94, SD: .19), teenagers (M: 4.93, SD: .17), adults (M: 4.30, SD: .25), and experts (M: 4.76, SD: .42). The overall sensorial evaluation is highly acceptable with a grand mean of 4.88 and standard deviation of .28.

**Table 7.1. Sensorial Evaluation of macaroons from Kawayan Killing with Corn Syrup**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.95	.13	Highly Acceptable
Teenagers	4.90	.23	Highly Acceptable
Adults	4.91	.21	Highly Acceptable
Experts	4.71	.52	Highly Acceptable
Mean	4.87	.32	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from kawayan killing with corn syrup in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.95, SD: .13), teenagers (M: 4.90,

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SD: .23), adults (M: 4.91, SD: .21), and experts (M: 4.71, SD: .52). The overall sensorial evaluation is highly acceptable with a grand mean of 4.87 and standard deviation of .32.

**Table 7.2. Sensorial Evaluation of macaroons from Kawayan Killing with Corn Kernel**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.94	.14	Highly Acceptable
Teenagers	4.95	.20	Highly Acceptable
Adults	4.87	.27	Highly Acceptable
Experts	4.80	.41	Highly Acceptable
Mean	4.89	.28	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from kawayan killing with corn kernel in terms of their age groups. The result revealed that all age groups have highly acceptable evaluation: children (M: 4.94, SD: .14), teenagers (M: 4.95, SD: .20), adults (M: 4.87, SD: .27), and experts (M: 4.80, SD: .41). The overall sensorial evaluation is highly acceptable with a grand mean of 4.89 and standard deviation of .28.

**Table 7.3. Sensorial Evaluation of Macaroons from Kawayan Killing with Honey**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.92	.19	Highly Acceptable
Teenagers	4.94	.20	Highly Acceptable
Adults	4.90	.25	Highly Acceptable
Experts	4.75	.47	Highly Acceptable
Mean	4.88	.31	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from kawayan killing with honey in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.92, SD: .19), teenagers (M: 4.94, SD: .20), adults (M: 4.90, SD: .25), and experts (M: 4.75, SD: .47). The overall sensorial evaluation is highly acceptable with a grand mean of 4.88 and standard deviation of .31.

**Table 7.4. Sensorial Evaluation of Macaroons from Kawayan Killing with Latik.**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.98	.09	Highly Acceptable
Teenagers	4.93	.28	Highly Acceptable
Adults	4.90	.23	Highly Acceptable
Experts	4.77	.37	Highly Acceptable
Mean	4.90	.27	Highly Acceptable

Table 7.4 displays the respondents' sensorial evaluation of the macaroons from kawayan killing with latik in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.98, SD: .09), teenagers (M: 4.93, SD: .28), adults (M: 4.90, SD: .23), and experts (M: 4.77, SD: .37). The overall sensorial evaluation is highly acceptable with a grand mean of 4.90 and standard deviation of .27.

**Table 8.1. Sensorial Evaluation of Macaroons from Kawayan Tinik with Corn Syrup**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.95	.13	Highly Acceptable
Teenagers	4.93	.20	Highly Acceptable
Adults	4.93	.19	Highly Acceptable
Experts	4.67	.55	Highly Acceptable
Mean	4.87	.33	Highly Acceptable

Table 8.1 shows the respondents' sensorial evaluation of the macaroons from kawayan tinik with corn syrup in terms of their age groups. As shown, all age groups have highly acceptable evaluation: children (M: 4.95, SD: .13), teenagers (M: 4.93, SD: .20), adults

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(M: 4.93, SD: .19), and experts (M: 4.67, SD: .55). The overall sensorial evaluation is highly acceptable with a grand mean of 4.87 and standard deviation of .33.

**Table 8.2. Sensorial Evaluation of macaroons from Kawayan Tinik with Corn Kernel**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.92	.22	Highly Acceptable
Teenagers	4.94	.20	Highly Acceptable
Adults	4.85	.28	Highly Acceptable
Experts	4.76	.46	Highly Acceptable
Mean	4.87	.31	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from kawayan tinik with corn kernel in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.92, SD: .22), teenagers (M: 4.94, SD: .20), adults (M: 4.85, SD: .28), and experts (M: 4.76, SD: .46). The overall sensorial evaluation is highly acceptable with a grand mean of 4.87 and standard deviation of .31.

**Table 8.3. Sensorial Evaluation of macaroons from Kawayan Tinik with Honey**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.96	.14	Highly Acceptable
Teenagers	4.97	.13	Highly Acceptable
Adults	4.90	.25	Highly Acceptable
Experts	4.80	.46	Highly Acceptable
Mean	4.91	.28	Highly Acceptable

The table above displays the respondents' sensorial evaluation of the macaroons from kawayan tinik with honey in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.96, SD: .10), teenagers (M: 4.96, SD: .18), adults (M: 4.90, SD: .23), and experts (M: 4.75, SD: .52). The overall sensorial evaluation is highly acceptable with a grand mean of 4.90 and standard deviation of .31.

**Table 8.4. Sensorial Evaluation of Macaroons from Kawayan Tinik with Latik**

Age Group	Mean	Std. Deviation	Descriptive Rating
Children	4.96	.10	Highly Acceptable
Teenagers	4.96	.18	Highly Acceptable
Adults	4.90	.23	Highly Acceptable
Experts	4.75	.52	Highly Acceptable
Mean	4.90	.31	Highly Acceptable

The table displays the respondents' sensorial evaluation of the macaroons from kawayan tinik with latik in terms of their age groups. It shows that all age groups have highly acceptable evaluation: children (M: 4.96, SD: .14), teenagers (M: 4.97, SD: .13), adults (M: 4.90, SD: .25), and experts (M: 4.80, SD: .46). The overall sensorial evaluation is highly acceptable with a grand mean of 4.91 and standard deviation of .28.

### Difference in the Level of General Acceptability of the Macaroons Across Age Groups

**Table 9.1. ANOVA of Bayog with Corn Syrup**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.252	3	.417	4.098	.008
Within Groups	11.810	116	.102		
Total	13.062	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from bayog with corn syrup across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different

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level of acceptability towards the macaroons. As shown in the table 9.1.1 the significant difference exists between the children and experts. This implies that possible reasons why macaroon is more acceptable to the children than to the experts.

**Table 9.1.1. Multiple Comparisons (Using Tukey HSD) of Bayog with Corn Syrup**

(I) Age Group	(J) Age Group	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.07500	.799	NS
	Adults	.07500	.799	NS
	Experts	.27500*	.006	*
Teenagers	Children	-.07500	.799	NS
	Adults	.00000	1.000	NS
	Experts	.20000	.078	NS
Adults	Children	-.07500	.799	NS
	Teenagers	.00000	1.000	NS
	Experts	.20000	.078	NS
Experts	Children	-.27500*	.006	*
	Teenagers	-.20000	.078	NS
	Adults	-.20000	.078	NS
*. The mean difference is significant at the 0.05 level.				

**Table 9.2. ANOVA of Bayog with Corn Kernel**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.731	3	.244	2.934	.036
Within Groups	9.631	116	.083		
Total	10.362	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from bayog with corn kernel across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different level of acceptability towards the macaroons. As shown in the table 9.2.1 the significant difference exists between the children and experts. This means that this type of macaroon is more acceptable to the children than to the experts

**Table 9.2.1. Multiple Comparisons (Using Tukey HSD) of Bayog with Corn Kernel**

(I) Age Group	(J) Age Group	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.04167	.944	NS
	Adults	.07500	.745	NS
	Experts	.20833*	.030	*
Teenagers	Children	-.04167	.944	NS
	Adults	.03333	.970	NS
	Experts	.16667	.119	NS
Adults	Children	-.07500	.745	NS
	Teenagers	-.03333	.970	NS
	Experts	.13333	.282	NS
Experts	Children	-.20833*	.030	*
	Teenagers	-.16667	.119	NS
	Adults	-.13333	.282	NS
*. The mean difference is significant at the 0.05 level	*. The mean difference is significant at the 0.05 level.			

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**Table 9.3. ANOVA of Bayog with Honey**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.039	3	.680	5.279	.002
Within Groups	14.935	116	.129		
Total	16.974	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from bayog with corn kernel across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different level of acceptability towards the macaroons. As shown in the table 9.3.1 the significant difference exists between the (1) children and experts, (2) teenagers and experts, and (3) adults and experts. This means that this type of macaroon is more acceptable to the children, teenagers, and adults than to the experts.

**Table 9.3.1. Multiple Comparisons (Using Tukey HSD) of Bayog with Honey**

(I) Age Group	(J) Age Group	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.02500	.993	NS
	Adults	.05833	.922	NS
	Experts	.32500*	.004	*
Teenagers	Children	-.02500	.993	NS
	Adults	.03333	.984	NS
	Experts	.30000*	.008	*
Adults	Children	-.05833	.922	NS
	Teenagers	-.03333	.984	NS
	Experts	.26667*	.024	*
Experts	Children	-.32500*	.004	*
	Teenagers	-.30000*	.008	*
	Adults	-.26667*	.024	*
*, The mean difference is significant at the 0.05 level.				

**Table 9.4. ANOVA of Bayog with Latik**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.593	3	.198	2.509	.062
Within Groups	9.144	116	.079		
Total	9.737	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from bayog with honey across the four age groups. There is no significant difference between their level of acceptability at .05 level of significance. This means that this type of macaroon has a similar acceptability across the respondents' age groups.

**Table 10.1. ANOVA of Kawayan Killing with Corn Syrup**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.046	3	.349	3.530	.017
Within Groups	11.454	116	.099		
Total	12.500	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from kawayan killing with corn syrup across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have

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different level of acceptability towards the macaroons. As shown in the table 10.1.1 the significant difference exists between the children and experts. This means that this type of macaroon is more acceptable to the children than to the experts.

**Table 10.1.1. Multiple Comparisons (Using Tukey HSD) of *Kawayan Killing* with Corn Syrup**

(I) AgeGroup	(J) AgeGroup	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.05000	.886	NS
	Adults	.04167	.956	NS
	Experts	.24167*	.018	*
Teenagers	Children	-.05000	.927	NS
	Adults	-.00833	1.000	NS
	Experts	.19167	.090	NS
Adults	Children	-.04167	.956	NS
	Teenagers	.00833	1.000	NS
	Experts	.20000	.071	NS
Experts	Children	-.24167*	.018	*
	Teenagers	-.19167	.090	NS
	Adults	-.20000	.071	NS
	*. The mean difference is significant at the 0.05 level.			

**Table 10.2. ANOVA of *Kawayan Killing* with Corn Kernel**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.438	3	.146	1.900	.133
Within Groups	8.904	116	.077		
Total	9.342	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from *kawayan killing* with corn kernel across the four age groups. There is no significant difference between their level of acceptability at .05 level of significance. This means that this type of macaroon has a similar acceptability across the respondents' age groups.

**Table 10.3. ANOVA of *Kawayan Killing* with Honey**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.631	3	.210	2.245	.087
Within Groups	10.865	116	.094		
Total	11.495	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from *kawayan killing* with honey across the four age groups. There is no significant difference between their level of acceptability at .05 level of significance. This means that this type of macaroon has a similar acceptability across the respondents' age groups.

**Table 10.4. ANOVA of *Kawayan Killing* with Latik**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.712	3	.237	3.355	.021
Within Groups	8.213	116	.071		
Total	8.925	119			

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A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from kawayan killing with latik across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different level of acceptability towards the macaroons. As shown in the table 10.4.1 the significant difference exists between the children and experts. This means that this type of macaroon is more acceptable to the children than to the experts.

**Table 10.1.1. Multiple Comparisons (Using Tukey HSD) of *Kawayan Killing with Latik***

(I) AgeGroup	(J) AgeGroup	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.05000	.886	NS
	Adults	.07500	.695	NS
	Experts	.20833*	.016	*
Teenagers	Children	-.05000	.886	NS
	Adults	.02500	.983	NS
	Experts	.15833	.103	NS
Adults	Children	-.07500	.695	NS
	Teenagers	-.02500	.983	NS
	Experts	.13333	.217	NS
Experts	Children	-.20833*	.016	*
	Teenagers	-.15833	.103	NS
	Adults	-.13333	.217	NS
*. The mean difference is significant at the 0.05 level.				

**Table 11.1. ANOVA of *Kawayan Tinik with Corn Syrup***

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.613	3	.538	5.245	.002
Within Groups	11.888	116	.102		
Total	13.500	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from kawayan tinik with corn syrup across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different level of acceptability towards the macaroons. As shown in the table 11.1.1 on the next page, the significant difference exists between the children and experts. This means that this type of macaroon is more acceptable to the children than to the experts.

**Table 11.1.1. Multiple Comparisons (Using Tukey HSD) of *Kawayan Tinik with Corn Syrup***

(I) AgeGroup	(J) AgeGroup	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.02500	.990	NS
	Adults	.02500	.990	NS
	Experts	.28333*	.005	*
Teenagers	Children	-.02500	.990	NS
	Adults	.00000	1.000	NS
	Experts	.25833*	.012	*
Adults	Children	-.02500	.990	NS
	Teenagers	.00000	1.000	NS
	Experts	.25833*	.012	*
Experts	Children	-.28333*	.005	*
	Teenagers	-.25833*	.012	*
	Adults			



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	*. The mean difference is significant at the 0.05 level.	-.25833*	.012	*

**Table 11.2. ANOVA of *Kawayan Tinik* with Corn Kernel**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.568	3	.189	1.943	.126
Within Groups	11.306	116	.097		
Total	11.874	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from *kawayan tinik* with corn kernel across the four age groups. There is no significant difference between their level of acceptability at .05 level of significance. This means that this type of macaroon has a similar acceptability across the respondents' age groups.

**Table 11.3. ANOVA of *Kawayan Tinik* with Honey**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.871	3	.290	3.117	.029
Within Groups	10.804	116	.093		
Total	11.675	119			

A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from *kawayan tinik* with honey across the four age groups. It was revealed that a significant difference exists at .05 level of significance. Hence, a post hoc analysis using tukey HSD was conducted to determine which age groups have different level of acceptability towards the macaroons. As shown in the table below, the significant difference exists between the (1) children and experts, and (2) teenagers and experts. This means that this type of macaroon is more acceptable to the children and teenagers than to the experts.

**Table 11.3.1. Multiple Comparisons (Using Tukey HSD) of *Kawayan Tinik* with Honey**

(I) AgeGroup	(J) AgeGroup	Mean Difference (I-J)	Sig.	Descriptive Rating
Children	Teenagers	.00000	1.000	NS
	Adults	.05833	.881	NS
	Experts	.20833*	.045	*
Teenagers	Children	.00000	1.000	NS
	Adults	.05833	.881	NS
	Experts	.20833*	.045	*
Adults	Children	-.05833	.881	NS
	Teenagers	-.05833	.881	NS
	Experts	.15000	.232	NS
Experts	Children	-.20833*	.045	*
	Teenagers	-.20833*	.045	*
	Adults	-.15000	.232	NS
*. The mean difference is significant at the 0.05 level.				

**Table 11.4. ANOVA of *Kawayan Tinik* with Latik**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.589	3	.196	2.427	.069
Within Groups	9.385	116	.081		
Total	9.974	119			

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A One-way Between Groups Analysis of Variance was conducted to investigate the differences in the level of general acceptability of the macaroons from kawayan tinik with latik across the four age groups. There is no significant difference between their level of acceptability at .05 level of significance. This means that this type of macaroon has a similar acceptability across the respondents' age groups.

### C. Nutritive Content of Bamboo Shoot Macaroons

Report analysis of DOST on Nutritive Content of Bamboo Shoot Macaroons

Number	Sample Description	Parameter	Result	Method Used	Date of Analysis	Analyst
CHM-S-479	Bamboo Shoots (Bayog Macaroons) Honey	Moisture (g/100g)	24.41	Gravimetric	July 27, 2016	CTM
		Ash (g/100g)	1.64	Gravimetric	August 3, 2016	CTM
		Crude Protein (g/100g)	5.90	Block Digest/Steam Distillation	August 15, 2016	EMML
		Total Fat (g/100g)	9.23	Soxhlet Extraction	August 10, 2016	CTM
		Carbohydrates (g/100g)	58.82	by Computation	-	CTM
CHM-S-480	Bamboo Shoots (Bayog Macaroons) Latik	Moisture (g/100g)	25.18	Gravimetric	July 27, 2016	CTM
		Ash (g/100g)	1.92	Gravimetric	August 3, 2016	CTM
		Crude Protein (g/100g)	5.91	Block Digest/Steam Distillation	August 15, 2016	EMML
		Total Fat (g/100g)	11.42	Soxhlet Extraction	August 10, 2016	CTM
		Carbohydrates (g/100g)	55.57	by Computation	-	CTM

Table showing the Nutritive Content of developed Bamboo Shoot Macaroons compared to available macaroons in the Market.

	Calories	Moisture	Ash	Crude Protein	Total Percent Fat	Total Percent Carbohydrates
Bamboo Shoots Macaroons Flavored with Honey	N/A	24.41g/100g	1.64 g/100g	5.90g/100g	9.23g/100g	58.82g/100g
*Macaroon A	46.66g/100g	N/A	N/A	1g	150g/100g	33.33g/100g
*Macaroon B	52.63g/100g	N/A	N/A	1g	154.54g/100g	31.57g/100g
Bamboo Shoots Macaroons Flavored with Latik	N/A	25.18g/100g	1.92g/100g	5.91g/100g	11.42g/100g	55.57g/100g

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*Macaroon A	46.66g/100g	N/A	N/A	1g	150g/100g	33.33g/100g
*Macaroon B	52.63g/100g	N/A	N/A	1g	154.54g/100g	31.57g/100g
*Macaroons Sold in the Market						

Table shows Report of Analysis of Department of Science and Technology (DOST) on Bamboo shoot macaroons flavored with Honey, and Bamboo shoot macaroons flavored with Latik regarding its nutritional value. The data revealed that the protein content of the bamboo shoot macaroons flavored with Honey and Latik has a high protein value of 5.90 and 5.91 as compared to macaroon A and macaroon B available in the market with 1g of protein content. The total percent fat of Bamboo shoot macaroons flavored with honey and Latik of 9.23 and 11.42 respectively is very low as compared to macaroon A and macaroon B of 150g and 154.54g there is a significant difference on its total percent fat content. As to its total percent of carbohydrates of bamboo shoot macaroons flavored with Honey and bamboo shoot macaroons flavored with Latik of 58.82 and 55.57 is greater than 33.33 and 31.57. Thus, the obtain difference is significant.

The proximate analysis of the nutritive content of the developed Bamboo Shoot Macaroons in terms of moisture content, ash content, protein content, fat content and carbohydrate content is highly recommended for the developed products as compared with the other macaroon product available in the market. Hence, bamboo shoots have high nutritive value. It is healthy and friendly food which helps control bad cholesterol throughout the body. Moreover, it is a good source of energy giving and body building food which plays an important role in maintaining normal blood pressure and heart rate.

### CONCLUSIONS

Based on the findings of this study, it can be concluded that all twelve types of macaroons using three varieties of bamboo shoots and four different flavorings were highly accepted in terms of appearance, aroma, taste, and texture. The general acceptability of all twelve types of macaroons is high in terms of the respondents' age group where the best product is macaroon from Kawayan Tinik with Latik. This said general acceptability differs significantly exists between children and experts for macaroons from Bayog with Corn Syrup, Bayog with Corn Kernel, Bayog with Honey, Kawayan Killing with Corn Syrup, Kawayan Killing with Latik, and Kawayan Tinik with Corn Syrup, while between the children, teenagers, and experts for Kawayan Tinik flavored with Honey Macaroons.

The Proximate Analysis of the Nutritive Content of the developed Bamboo shoot macaroons in terms of moisture content, ash content, protein content, fat content, and carbohydrate content is highly recommended for the developed product as compared with the other macaroon product available and sold in the market.

Finally, the shelf-life of bamboo shoot macaroons stored at room temperature can last for six days and bamboo shoot macaroons stored at cold temperature can last for ten days.

### RECOMMENDATIONS

In the light of the foregoing findings and conclusions, the research recommends the following:

1. Homemakers, professionals, students, or anyone interested is encouraged to make flavored macaroons using bamboo shoot as main ingredient as the ones used in this study
2. Care and accuracy are to be observed when making flavored macaroons to ensure high quality products.
3. Food technology teachers, students, homemakers are encouraged to do more research and innovations in the making of quality food products particularly considering nutritional value and availability of local materials.
4. More baked products should be made to determine the acceptability of bamboo shoots as main ingredient.
5. Findings of the study may be made known to the school administrator particularly the office of the Research and Extension. Furthermore, these findings would in some ways help Technical Teacher Educators to extend income generating enterprise in the campus as well as in the University.
6. Farmers may consider growing different varieties of bamboo not just for their personal consumption but also for additional income of the family.
7. Research of this kind should be conducted to enrich the findings of this study.

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### REFERENCES

#### A. Books

- 1) De Guzman, Ines A. (2004). Technology and livelihood education I. Innovative Educational Materials, Inc.
- 2) Manantan, Victoria T. (1995). Food Management and Service. Quezon City: Phoenix Publishing House Inc.
- 3) Claudio, V.S, and Ruiz, A.J. (2007) International Cuisine. Philippine Copyright, 2007 by National Book Store, Inc.

#### B. Internet Materials

- 1) XU Sheng-You 1, 2, CAO WAN-YOU1, SONG Yue-qin1, FANG Le-jin1 (2005),
- 2) "Analysis and Evaluation of Protein and Amino Acid Nutritional Components of Different Species of Bamboo Shoots". (1. Department of resource and environment, Huang Shan College, Huang Shan 245000, China. 2. Department of Environment and Engineering. Zhejiang University, Hang Zhou 310029, China) <http://www.spkx.net.cn/EN/>
- 3) Nirmala C; Sharma, M,L,j E, David(2008) A Comparative Study of Nutrient and Canned Bamboo Shoots of Denehocalamaus Gigantes Munro (Bamboo Science and Culture. 2008 vol. 21 issue 1. P.41-47 p)
- 4) Maroma, Dolly P. (2015) Utilization of Bamboo Shoots (Bambusa Vulgaris) in Chips Production
- 5) Michael Tong Shun Lee Palace, New York, NY, Epicurious/January 2001. Spinach with Bamboo Shoots. <http://www.epicurious.com/recipes/Foodviews/Spinach-with-Bamboo-shoots104616>
- 6) AG, 2013 Asian Bamboo. The Nutritional Benefits of Eating Bamboo Shoots. [http://www.Asianbamboo.com/Bambooculture/bamboo-the-species/the\\_nutritional\\_benefits-of-eating\\_bamboo-shoots/](http://www.Asianbamboo.com/Bambooculture/bamboo-the-species/the_nutritional_benefits-of-eating_bamboo-shoots/)

#### C. Published and Unpublished Materials

- 1) Matibag, Ilona A. (2014) Acceptability of macaroons made of varying levels of Bamboo Shoots, unpublished masteral thesis, Isabela State University, Echague Campus Isabela.
- 2) Domingo, Jane M. (2010) Potential and Profitability of Banana Blossom in different proportions are Extender to Fried Lumpia, unpublished masteral thesis, Isabela State University, City of Ilagan.
- 3) Bautista, Ivy D. (2015) Acceptability of Dried Mango, Pineapple, Banana, and Sour soup as flavouring ingredients to dessert cookies (polvoron).
- 4) Somera, Mariel L. (2016) Development and Acceptability of Corn Flour as main ingredient in baked products, unpublished masteral thesis, Isabela State University, City of Ilagan.
- 5) Alejandro, Glorilyn B. (2015). Development and acceptability of rice fields eel (monopterus Albus) Food products unpublished material thesis, Isabela State University, City of Ilagan.
- 6) Somera, Mariel L. (2016).Development and acceptability of corn flour as main Ingredient
- 7) in baked products, unpublished masteral thesis, Isabela State University, City of Ilagan.



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## Literature Study of Arm Muscle Strength on Shooting Ability in Basketball Games



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**ABSTRACT:** This study was library research. It was conducted by looking at and linking the strength of the arm muscles to the shooting in the basketball game. The ICO method was used to collect the data. The data analysis included the identification of journal article selection and inclusion criteria. From the literature study results, there was a significant relationship between arm muscle strength and the ability to shoot. There is a contribution of arm muscle strength to the shooting ability of basketball players. Less dominant factors in supporting shooting skills in basketball games need to be considered and resolved so that these factors are more helpful in improving shooting skills.

**KEYWORDS:** Arm muscle strength, shooting ability, basketball game.

### INTRODUCTION

Most Indonesians know how vital health care is if people are to continue living physically and mentally healthy lives. The fact that Indonesians compete in sports by hosting regional, national, and international tournaments and on holidays in the fields and locations where sports activities are possible serves as evidence for this. Sport has evolved into a necessity for the community to maintain and enhance physical fitness so that members may perform well in daily activities and retain their enthusiasm for them. This is consistent with the specific goals for sports activities outlined by Iman Sodikun (1992), who stated that "sports in Indonesia are not just for physical fitness or recreation, but the focus must be put in increasing achievement to make the country proud in the international arena."

Sports are socialized in Indonesia for the benefits of education, entertainment, and physical fitness, as well as a way of success. The Republic of Indonesia Law Number 3 of 2005 regarding the National Sports System explains this. It is described in detail in CHAPTER II, Article 4: National sports aim to preserve and enhance physical and mental well-being, achievement, and human quality, instill moral principles and a noble character, foster sportsmanship and discipline, and strengthen the resilience of the country as a whole. They also aim to elevate the country's dignity, prestige, and honor. Achievement is not just based on the ability to master procedures; it is also influenced by preparation through systematic and ongoing maximal training. The lack of several characteristics that assist this goal has contributed to Indonesians' poor sporting performance, particularly in basketball. This has left them with weak physical, technical, and tactical skills, which will affect the players' psyche. According to the author's observations, existing extracurricular activities, particularly basketball, are attractive to students. Basketball is one of the extracurricular activities that students greatly enjoy because it helps the school's reputation. Although this extracurricular activity has been successful so far, there are still a lot of challenges that players face during games, such as frequently losing the ball when attacking the opponent's area, having poor passing, shooting, and dribbling skills, and having poor body posture in comparison to the opponent.

Basketball is currently undergoing tremendous development, as shown by the emergence of national competitive clubs and student-athletes playing basketball at both the high school and collegiate levels. In addition, the diversity of basketball games available today, such as streetball, three-on-three, and crush bone, make the sport respectable and popular among young people. The game's object in basketball, which is played with hands and a large ball, is to score as many points as possible by placing the ball in the opponent's basket. The ball can be tossed to a teammate or bounced on the ground while walking or standing still.

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However, to excel at this game, the players must first become proficient in basic basketball techniques like passing, dribbling, and shooting. (Siti Nurrochmahdkk, 2009).

Five players per team, male and female, compete in basketball. In essence, the goal of the game of basketball is to make as many baskets as possible while preventing your opponent from doing the same. Basketball requires the fundamental skills of passing, shooting, and dribbling because those are crucial components for attaining the best results in basketball. Since the object of the basketball game is to send as many balls into the opponent's hoop as possible while preventing the visitors from scoring, shooting is a fundamental talent that every basketball player must possess. The fundamentals of shooting are crucial since the total goals scored by a team determine its win in a game.

Arm strength is necessary for shooting. In order to improve arm muscle strength and generate a successful shot, adequate muscle quality is also required. Arm muscle strength is one of the components that makes up the explosive power of the arm muscles. Exercises that result in shooting can help build and enhance arm muscle strength. Basketball is a game where shooting is one of the fundamental skills. While using other essential skills, like passing, dribbling, guarding, and rebounding, can lead to fantastic scoring opportunities, shooting is still a requirement. Shooting itself can compensate for the shortcomings of other fundamental methods. To be able to put the ball into the ring with each shot taken, a shot must be accurate. Both physical and mental factors affect one's capacity to throw the ball into the ring. Muscle strength is a mental factor affecting shooting, forcing players to concentrate on possessing the necessary strength. According to Safarul Anam (2015), the ability to shoot in basketball significantly correlates with arm muscle strength and length.

Strength is the capacity of the muscles to withstand loads or resistance while performing activities (Suharno, 1986). One physical characteristic that significantly affects the outcome of free throws is strength, as it allows the shot to travel farther and has a more favorable effect. The accuracy of making free throws in basketball mostly depends on wrist flexibility and arm muscle strength; two things rarely practiced on the court.

Shooting is the most well-known and favored fundamental basketball talent, according to Kosasih (2008). According to Wissel (2000), all players must master shooting skills. This aligns with the basketball goal, which calls for each team to shoot as many balls into the opponent's hoop or basket while preventing the other team from doing the same. According to M. Sajoto (1988), strength is a physical quality that involves a person's capacity to use his muscles and take the load at a specific time of work. The success of a free throw depends on the power of the arm muscles, which aid in pushing the ball into the basketball hoop. The force required to push the ball into the basketball hoop depends on the shot's distance. The arms, wrists, and fingers greatly enhance successful shooting at close range (Wissel Hal, 2000).

Some fundamental moves in basketball include dribbling, passing, pivoting, and shooting. In the game of basketball, shooting technique is essential. The steps involved in shooting a basketball are as follows: 1) The position of the contact of the palms of the hands on the ball forms the letter "w"; 2) Position your feet shoulder-width apart; 3) Body slightly leaning forward; 4) The position of the hands form a 90-degree angle accompanied by an upright body position; 5) Both hands straight up then accompanied by a whip. The outcomes of a game will depend on a team's ability to shoot. Strength is the capacity of the muscles to withstand loads or resistance while performing activities (Suharno HP, 1986). Strength is a physical characteristic that significantly affects free throw outcomes since it increases shooting range and positively impacts shot quality (Brittenham Greg, 1996).

According to M. Sajoto (1988), strength is a component of physical condition that involves the problem of a person's ability to use his muscles to receive loads at certain times of work. The arm is the upper limb consisting of the humeral head (joint head), humeral column (indentation of the bone), major and minor tubercles, olecranon fossa (back indentation), coronoid fossa (front indentation), capitulum, lateral epicondyle (Syaifuddin, 1997). As arm muscle strength contributes to good shooting skill, the authors were interested in researching the Literature Study of the Relationship between Arm Muscle Strength and Arm Length to Shooting Ability in Basketball Games.

### METHOD

This study was library research. This type of research attempts to gather information from the literature, and the methodology employed is a synchronous research paradigm. In order to conduct the study, basketball shooting performances in games were compared to arm muscle strength. Since this research is based on library materials, documentation—that is, tracking down textual sources that contain numerous themes and issues discussed—was employed to obtain the data. The information gathered and examined using a descriptive methodology describes the subject under study.

The research started by collecting and studying research data from previous researchers. Furthermore, data was added to support this research through journals, books and the internet. After being collected and studied, data processing was performed.

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Then, the analysis was done descriptively. This research is expected to determine the relationship between arm muscle strength and shooting results in basketball games. The journal articles were gathered using the ICO method described as follows:

1. I stands for intervention, Prognostic Factor, or Exposure. The intervention or prognostic factor in this literature review was shooting performance.
2. C stands for comparison, which also includes intervention (if necessary). It means comparisons between the intervention and exposure to the studied topic. In our case, arm muscle strength was compared.
3. O stands for an outcome to be measured or attained. The outcome investigated in our research was the strength of the arm muscles on the results of shooting a basketball game. To facilitate the search for journals, keywords are needed, namely arm muscle strength on the results of shooting basketball games.

### Data/Journal articles collection techniques

In collecting data/journal articles, the authors set the inclusion and exclusion criteria. Inclusion criteria are criteria/requirements that must be in the journal articles to be reviewed, while exclusion criteria are those that cannot be in the articles to be reviewed. The following are the journal inclusion criteria in this research:

1. Articles with relevant titles and contents to our study's objective
2. The research design should be quasi-experiment, research, and development.
3. Respondents should be students joining basketball extracurriculars.
4. The articles were published in 2020 or prior.
5. The Independent variable is arm muscle strength, and the dependent variable is shooting results.

Meanwhile, the exclusion criteria include the following:

1. Cross-sectional and case study research design
2. Society as respondents
3. Articles published before 2020.
4. Articles with irrelevant titles and content to our study's objective

### Analysis/Review technique

The selection of the journals to be included in this study and the criteria for inclusion were the first steps in the data analysis process. The information about the effects of arm muscle strength on the outcomes of shooting basketball games was found in an electronic database, Google Scholar, between 2020 and above. Hundreds of articles were retrieved from the database's keywords. The authors independently selected the 134 articles used as references based on their titles, contents, and purposes. After carefully reading the text, many were later excluded because they did not address the original query, leaving only eight articles that did. To learn more about the connection between arm muscle strength and the outcomes of shooting a basketball game, the researcher carefully reviewed each of the chosen publications, paying close attention to the abstract, objectives, and data analysis.

**Table 1. literature review**

No	Author, Year, Title	Sumber Jurnal dan DOI
1	Jeanne R. Malonda (2020), The Relationship between Arm Muscle Strength and Hand-Eye Coordination with Shooting Accuracy in Basketball Games in Male Students of SMA Negeri 1 Dimembe	Jurnal Sporta: Vol. 1, No. 1, June 2020 <a href="https://smallpdf.com/id/result">https://smallpdf.com/id/result</a>
2	Callixtus Fedy Purnawan, Margono, and Moch. Senoadji K. (2022), Correlation between Arm Muscle Strength and Wrist Flexibility with Basketball Free Shot Results	Journal of Physical Education, Sport, Health and Recreation 1 <a href="http://journal.unnes.ac.id/sju/index.php/ujss">http://journal.unnes.ac.id/sju/index.php/ujss</a>
3	Sukirno, and M. Rizky Kurniawan (2017), The Relationship between Arm Length and Arm Muscle Strength with Free Throw Shooting Results in Men's Athletes of Bangau Palembang Basketball Club	Jurnal Multilateral, Volume 16, No. 1 June 2017 <a href="https://ppjp.ulm.ac.id/journal/index.php">https://ppjp.ulm.ac.id/journal/index.php</a>

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4	Dahlia Asti Permatasari and Dwi Cahyo Kartiko, Contribution of Arm Muscle Strength, Leg Muscle Strength, and Balance to the Accuracy of Men's Basketball Shooting in the Student Activity Unit of Surabaya State University	Jurnal Kesehatan Olahraga, Vol. 08 No. 02, Edisi Juli 2020 <a href="https://jurnalmahasiswa.unesa.ac.id/index.php">https://jurnalmahasiswa.unesa.ac.id/index.php</a>
5	Tery Wanena (2018), The Contribution of Leg Muscle Power, Arm Muscle Strength, and Hand-Eye Coordination with the Ability to Jump Shot Basketball in sport science Students in Cendrawasih University in 2017	JPOS (Journal Power Of Sports), 1 (2) 2018 <a href="http://ejournal.unipma.ac.id/index.php/JPOS">http://ejournal.unipma.ac.id/index.php/JPOS</a>
6	Aulia Lita Pradina and Heri Wahyudi (2020), Contribution of Arm Muscle Strength, Leg Muscle Strength, and Balance to the Shooting Accuracy of Men's Basketball Student Activity Unit, Surabaya State University	Jurnal Kesehatan Olahraga, Vol. 08 No. 02, Edisi Juli 2020 <a href="https://core.ac.uk/download/pdf/230790221.pdf">https://core.ac.uk/download/pdf/230790221.pdf</a>
7	Muhammad Zahrony and Himawan Wismanadi (2017), The Contribution of Arm Muscle Strength to 3-Point Shot Accuracy in the Men's Basketball Team of Santa Agnes Catholic High School Surabaya	Jurnal Kesehatan Olahraga Vol. 05 No. 02 Tahun 2017 <a href="https://core.ac.uk/download/pdf/230790221.pdf">https://core.ac.uk/download/pdf/230790221.pdf</a>
8	Recky Dwi Putra, Titis Nurina, and Bachtiar (2020), Relationship of Arm Muscle Strength and Leg Strength to Jump Shoot	JPOS (Journal Power Of Sports), 3 (1) 2020 <a href="http://ejournal.unipma.ac.id/index.php/JPOS">http://ejournal.unipma.ac.id/index.php/JPOS</a>

## RESULT AND DISCUSSION

- Jeanne R. Malonda (2020) wrote The Relationship between Arm Muscle Strength and Hand-Eye Coordination with Shooting Accuracy in Basketball Games in Male Students of SMA Negeri 1 Dimembe, published in Jurnal Sporta: Vol. 1, No. 1, June 2020 Faculty of Sports Science, Manado State University, Indonesia retrieved from <https://smallpdf.com/id/result#r=27dc75957089dc37d39960b943d6aa8d&t=merge>. Research goals are as follows: 1. How significant is the correlation between shooting accuracy and arm strength in basketball games played by male students at SMA N 1 Dimembe? 2). How significant is the correlation between basketball shooting accuracy and hand-eye coordination among male SMA N 1 Dimembe students? A descriptive methodology was employed. Up to 67 male students made up the population, and 30 randomly chosen individuals made up the sample. Tests of arm muscle strength, hand-eye coordination, and shooting tests were employed to collect data. This study adopted a "product moment and multiple correlation" research design. Statistical methods were used in hypothesis testing with the r-test. The calculation results for t observations showed that tcount (9.241) was greater than the t table both at  $\alpha$  5% ttable (1.671) and 1% ttable (2.390). Because the tcount was bigger, it can be concluded that the multiple correlation coefficient was very significant. This study concluded 1) a relationship between arm muscle strength and shooting accuracy in basketball games for male students at SMA N 1 Dimembe, 2) a relationship between hand-eye coordination and shooting accuracy in basketball games for male students at SMA N 1 Dimembe, 3) a relationship between arm muscle strength and hand-eye coordination together with Shooting Accuracy in Basketball Games in Male Students of SMA N 1 Dimembe. For the variable arm muscle strength (X1), based on the analysis results of the SPSS series 20 program, with the One-Sample Kolmogorov Smirnov Test for normality on the arm muscle strength score data, the value Asymp, Sig (2-tailed) = 0.773 was obtained. This indicated that the Asymp. Sig (2-tailed) was greater than the ( $\alpha$ ) value (0.05). Thus, Ho was accepted, stating that the data came from a normally distributed population (the distribution of data on arm muscle strength scores was normal). For the hand-eye coordination variable (X2), based on the analysis results of the SPSS series 20 program, using the One-Sample Kolmogrov-Smirnov Test for normality on the hand-eye coordination score data, the Asymp value was obtained. Sig(2-tailed) = 0.184. This indicated that the Asymp. Sig (2-tailed) was greater than the ( $\alpha$ ) value (0.05). Thus, Ho was accepted, meaning that the data came from a normally distributed population (the eye-hand coordination score data distribution was normal). For the variable Shooting Accuracy of students (Y), based on the analysis results of the SPSS series 20 program, with the normality test of the One-Sample Kolmogrov-Smirnov Test on the shooting accuracy score data, the Asymp value was obtained. Sig(2-tailed) = 0.547. This indicated that the Asymp.



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Sig (2-tailed) was greater than the ( $\alpha$ ) value (0.05). Thus,  $H_0$  was accepted, which means that the population was normally distributed (the distribution of the student's shooting Accuracy score data was normal). In descriptive hypothesis testing, arm muscle strength in basketball games for male students at SMA N 1 Dimembe shows values and scores with an average ( $X_1$ ) = 28.73 and a standard deviation ( $SD_{X1}$ ) = 5.58. Based on the ANOVA SPSS Coefficients test results, the linear regression equation between arm muscle strength ( $X_1$ ) and student shooting ability ( $Y$ ) was  $\hat{Y} = -0.437 + 0.333 X_1$ . This means that if there is an increase in the arm muscle strength variable, the shooting accuracy in basketball games for male students at SMA N 1 Dimembe will also increase by 0.333 units. This indicates the significant and positive relationship between the variable level of arm muscle strength ( $X_1$ ) and student shooting accuracy ( $Y$ ). Therefore, any changes in the increase in the arm muscle strength variable ( $X_1$ ) will also be followed by an increase in the shooting accuracy variable ( $Y$ ) in a basketball game for male students at SMA N 1 Dimembe.

2. The second article was by Callixtus Fedy Purnawan, Margono, and Moch. Senoadji K entitled Correlation between Arm Muscle Strength and Wrist Flexibility with Basketball Free Shot Results published by Journal of Physical Education, Sport, Health and Recreation retrieved from <http://journal.unnes.ac.id/sju/index.php/ujss> Universitas Negeri Semarang. This study aimed to determine the relationship between arm muscle strength and wrist flexibility with the results of basketball free throws. The data collection method used in this study was a survey. The population in this study were male members of the Tri Tunggal Christian High School basketball club in the 2011/2012 academic year, which consisted of 23 students. The sample in this study was 23 male members of the Tri Tunggal Christian High School basketball club in the 2011/2012 academic year. The total sampling technique was employed; thus, the entire population was used as a sample, in this case, 23 participants. This research used a correlation design and collected data through a survey. The independent variable was arm muscle strength and wrist flexibility, while the dependent variable was the free throw result. The pull and push dynamometer was used to measure the strength of the arm muscles, while to measure wrist flexibility, the goniometer and the free throw test were employed ten times. Data were analyzed using multiple regression. The results of the regression analysis showed that arm muscle strength and wrist flexibility, either partially or simultaneously, did not make a significant contribution to the results of free throws in the male participants of the Tri Tunggal Christian High School basketball club in the 2011/2012 academic year. This is shown from the partial test results with a significance value of each independent variable of 0.854 and 0.353, which exceeds the 5% error level. The results of the partial test showed that the arm muscle strength of the male participants of the Tri Tunggal Christian High School basketball club in the 2011/2012 academic year did not affect the accuracy of the free throw results. Based on the results of the research and discussion, it can be concluded that there is no relationship between arm muscle strength and the results of one-handed free throws. There is no relationship between wrist flexibility and the results of one-handed free throws. There is no relationship between arm muscle strength and wrist flexibility with the results of one-handed free throws in male Tri Tunggal Christian High School basketball club participants in the 2011/2012 academic year.
3. The third article was by Karya Sukirno and M. Rizky Kurniawan (2017), entitled The Relationship between Arm Length and Arm Muscle Strength with Free Throw Shooting Results in Men's Athletes of Bangau Palembang Basketball Club, published by Jurnal Multilateral, Volume 16, No. 1 Juni 2017 retrieved from <https://ppjp.ulm.ac.id/journal/index.php/multilateralpjk/article/view/3663>. The correlational method was used in this study to describe the relationship between the independent variables, namely arm length and arm muscle strength, and the dependent variable, namely shooting free throws in games. In connection with the theme/title of our study, we only examined the variables of arm muscle strength and free throw shooting variables. To measure arm muscle strength, Sukirno and M. Rizky Kurniawan (2017) used the expanding dynamometer method to compare the relationship between arm muscle strength and the results of shooting free throws. Based on the research, the average athlete could do an expanding dynamometer of 49.067 kg. The highest data was 71 kg, and the lowest was 29 kg. These results indicate that arm muscle strength is a very influential component in the results of shooting free throws. The highest frequency of arm muscle strength in athletes was 9, with a distance range of 50.3-57.3 kg, and the smallest frequency was 1, with a distance range of 43.2-50.2 kg. Subjects were asked to do a free throw shooting test to compare the relationship between arm length and arm muscle strength with free throw shooting. Based on research, the average athlete could score 5.917. The highest data was 9, and the lowest was 2. These results show that arm length and muscle strength are crucial in shooting free throws. The highest frequency of free throw shooting results owned by athletes was 9 with a distance range of 8-9.1, and the smallest frequency was 4 with a distance range of 4.4 - 5.5. Sukirno and M. Rizky Kurniawan's research indicates that arm muscle strength positively impacts the outcomes of free throw shooting. This is demonstrated by the arm muscular strength's 95.33% effective contribution, which falls under the category of very strong relationship levels (Sugiyono, 2012: 184). Based on these

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findings, it is vital to pay attention to the components of arm muscle strength to be able to generate optimal free throw shooting and shoot free throws with good outcomes.

4. The fourth article was written by Dahlia Asti Permatasari and Dwi Cahyo Kartiko, entitled Contribution of Arm Muscle Strength, Leg Muscle Strength, and Balance to the Accuracy of Men's Basketball Shooting in the Student Activity Unit of Surabaya State University, published by Jurnal Kesehatan Olahraga, Vol. 08 No. 02, Edisi Juli 2020 retrieved from [https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-pendidikan\\_jasmani/article/view/19694/18008](https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-pendidikan_jasmani/article/view/19694/18008). This study aimed to determine the contribution of arm muscle strength, leg muscle strength, and balance to basketball shooting accuracy involving 14 male basketball athletes at Surabaya State University. The descriptive correlation analysis was used by collecting data on arm muscle strength, leg muscle strength, balance, and 7-meter shooting accuracy. The results of the normality test showed a normal distribution for all variables. The results of this study indicated no contribution between the variables of arm muscle strength (X1), leg muscle strength (X2), and balance (X3) together on the accuracy of shooting a basketball (Y) with a value of  $F_{count} (2.339) < F_{table} (3,34)$ . Individually, the study's results showed that the greatest contribution was obtained from arm muscle strength, with a percentage of 38.44%. In comparison, other variables (leg muscle strength and balance) did not contribute to the accuracy of basketball shooting, with a contribution obtained from leg muscle strength of 1.34% and a balance of 8.35%. This finding is in accordance with the results of other research, which explain that arm muscle strength significantly contributes to the accuracy of shooting the basketball. This is because the work of the muscles in carrying out certain movements is dominated by some of the arm muscles, such as the pectoralis major, which is very good for use in pushing and throwing. Playing basketball relies on the arm muscles because almost 50% of the arm muscles are used in shooting techniques. Arm muscles are used to throw and direct the ball right toward the goal to create points, with a role of 38.4%. Arm muscle strength (X1) has a significant role in the accuracy of shooting the basketball (Y).
5. The fifth article was by Tery Wanena (2018), entitled The Contribution of Leg Muscle Power, Arm Muscle Strength, and Hand-Eye Coordination with the Ability to Jump Shot Basketball in sport science Students at Cendrawasih University in 2017. This article was published by JPOS (Journal Power Of Sports), 1 (2) 2018, which can be retrieved from <http://ejournal.unipma.ac.id/index.php/JPOS>. This study aimed to determine the contribution of several variables to the jump shot ability of students of sports science at Cendrawasih University in 2017. These variables include a) the contribution between leg muscle power and their jump shot ability, b) the contribution between arm muscle strength and their jump shot ability, c) the contribution between hand-eye coordination with their jump shot ability, and d) the contribution between leg muscle power, arm muscle strength, and hand-eye coordination with their jump shot ability. This research used the descriptive correlational method. This method describes the data obtained from measurement results and literature studies. The subjects in this study were 30 students. The analysis used in this study was correlational. Based on calculations using the SPSS computer program, it was found that the correlation coefficient for the relationship between arm muscle strength and jump shot ability was 0.754. The significance of the correlation coefficient can be tested using the r test at  $\alpha = 5\%$  with  $n = 30$  and  $r_{table} = 0.361$ . Because  $r_{count} (0.754) > r_{table} (0.361)$ , it can be concluded that there was a relationship between arm muscle strength and student basketball jump shoots. There was a significant contribution between arm muscle strength and jump shoot results of 30.5%.
6. Aulia Lita Pradina and Heri Wahyudi's (2020) article was entitled Contribution of Arm Muscle Strength, Leg Muscle Strength, and Balance to the Shooting Accuracy of Men's Basketball Student Activity Unit, Surabaya State University, published by Jurnal Kesehatan Olahraga, Vol. 08 No. 02, Edisi Juli 2020 retrieved from <https://core.ac.uk/download/pdf/230790221.pdf>. This study aimed to determine the contribution of arm muscle strength, leg muscle strength, and balance to the accuracy of shooting a basketball. This study used a descriptive research type of correlational analysis. The descriptive approach has the meaning of explaining the data obtained from measurement results and literature studies. The results of the individual correlation analysis found a significant role between arm muscle strength (X1) on shooting accuracy (Y). This is per the research results, which explain that arm muscle strength has a major contribution to the accuracy of shooting basketball. This is because the work of the muscles in carrying out certain movements is dominated by some of the arm muscles, such as the pectoralis major, which is very well used in pushing and throwing. The technique of playing basketball does rely on arm muscles because almost 50% of arm muscles are used in shooting techniques because they are essential for throwing and directing the ball right at the basket to create points, with a role of 38.4%. Arm muscle strength (X1) has a significant role in the accuracy of shooting the basketball (Y) for men's student activity units at Surabaya State University by 38.4%.
7. Muhammad Zahrony and Himawan Wismanadi wrote the next article (2017), entitled The Contribution of Arm Muscle Strength to 3-Point Shot Accuracy in the Men's Basketball Team of Santa Agnes Catholic High School Surabaya published by Jurnal Kesehatan Olahraga Vol. 05 No. 02 Tahun 2017 retrieved from <https://core.ac.uk/download/pdf/230790221.pdf>. This

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study aimed to determine the contribution of arm muscle strength to the accuracy of a 3-point shot on the men's basketball team at Santa Agnes Catholic High School Surabaya, with a sample size of 12 students. This study used a descriptive quantitative statistical method of correlation. Two variables were observed: the independent variable, arm muscle strength, and the dependent variable, the accuracy of shooting three-point shots. The method used in this research was a quantitative research method. Because the quantitative research method can be interpreted as a research method based on the philosophy of positivism, the sampling technique is generally carried out randomly, and the data is collected using research instruments and analyzed quantitatively/statistically to test the hypotheses that have been set. This study used a correlational design to determine the correlation between the independent variable, arm muscle strength, and the dependent variable, the accuracy of 3-point basketball shots. These calculations showed a significant contribution between arm muscle strength and 3-point shooting accuracy because  $\alpha = 0.05$ ; the critical t for 10 degrees of freedom was 2.228. The formula for the coefficient of determination was tested to give an overview of the contribution of another variable in the linear relationship between variables, with a coefficient of determination value with a percentage. From the calculation of the coefficient of determination, a value of 37.5% was obtained, so the contribution of arm muscle strength with a 3-point shot on the Surabaya Catholic High School men's basketball team was 37.5%. In accordance with the formulation of the problem, research objectives, and research results on the contribution of arm muscle strength to 3-point shooting accuracy in the men's basketball team at Santa Agnes Catholic High School Surabaya, it can be seen that the results of the product-moment correlation test stated that there was a fairly strong contribution between arm muscle strength and 3-point shot accuracy for the men's basketball team at Santa Agnes Catholic High School Surabaya.

8. The last article reviewed in this study was by Recky Dwi Putra, Titis Nurina, and Bachtiar, entitled Relationship of Arm Muscle Strength and Leg Strength to Jump Shoot, published by JPOS (Journal Power Of Sports), 3 (1) 2020, which can be retrieved from <http://e-journal.unipma.ac.id/index.php/JPOS>. This study aims to prove the relationship between arm and leg muscle strength in the jump shoot at SMA Negeri 4 Sukabumi City. This study used a survey method with test and measurement techniques. The population in this study was 18 students of SMA Negeri 4 Kota Sukabumi. However, using a purposive sampling technique, only ten people were selected for this study. The instruments used in this study included arm muscle strength tests, leg muscle strength tests, and jump shoot tests. A double correlation statistical data collection technique was carried out to find the relationship and contribution of two independent variables (X) or more simultaneously (together) with the dependent variable (Y) using the multiple correlation formula, and significance was tested with Fcount. The study showed that there was a significant relationship between  $r_{x1y}$  (0.546) >  $r_{table}$  (0.631), indicating a relationship between arm muscle strength and jump shoot. The highest score on this test was 33, and the lowest was 28. Leg muscle strength contributed 29.81%, and the remaining 70.19%. Thus, the jump shoot requires good arm muscle strength to produce accurate and directed shooting. In addition, the better the leg muscle strength, the better the jump shot because basic basketball techniques mostly involve jumping. Hence, it can be concluded that there is a significant relationship between arm muscle strength (X1) and jump shooting (Y).

### CONCLUSION

Based on the data analysis, description, testing of research results, and discussion, it can be concluded that:

1. A significant relationship exists between arm muscle strength and the ability to shoot.
2. There is a contribution of arm muscle strength with a shooting ability.
3. Factors that are less dominant in supporting shooting skills in basketball games need to be considered so that these factors are more helpful in improving shooting abilities.

### RECOMMENDATIONS

Based on the research conclusions above, several suggestions can be made:

1. Teachers should consider their students' arm strength because it impacts their shooting ability in a basketball game.
2. Students could include additional activities that aid in honing their basketball shooting techniques.
3. This study has numerous shortcomings; thus, further researchers should advance and improve it.

### REFERENCES

- 1) Asri Trisnawati (2015). Hubungan Antara Tinggi Badan, Panjang Lengan, Kekuatan Otot Lengan Dan Power Tungkai Dengan Kemampuan Tembakan Free Throw Pada Pemain Bola Basket Di SMA Negeri 1 Kalasan. Skripsi. Universitas Negeri Yogyakarta.

## Literature Study of Arm Muscle Strength on Shooting Ability in Basketball Games

- 2) Aulia Lita Pradina dan Heri Wahyudi (2020). Kontribusi Kekuatan Otot Lengan, Kekuatan Otot Tungkai, Dan Keseimbangan Terhadap Ketepatan Shooting Bola Tangan Putra Unit Kegiatan Mahasiswa Universitas Negeri Surabaya. *Jurnal Kesehatan Olahraga*, Vol. 08 No. 02, Edisi Juli 2020, Hal 67 – 72.
- 3) Brittenham, Greg (1996). *Panduan Lengkap Latihan Khusus Pemantapan Bola Basket*. Jakarta: PT. Rajagrafindo Persada.
- 4) Damar Budi M. (2016). Pengaruh Permainan Target Terhadap Kemampuan Shooting Under Ring Bolabasket Pada Siswa Kelas VIII Di SMP N 1 Sedayu Kabupaten Bantul Tahun 2016. Skripsi. Universitas Negeri Yogyakarta
- 5) Imam Sodikun (1992). *Olahraga Pilihan Bola Basket*. Jakarta: Depdikbud Dirjen Dikti Proyek Pembinaan Tenaga Kependidikan.
- 6) Kosasih, Engkos (1983). *Teknik dan Program Latihan*. Jakarta: CV. Akademika Pressindo.
- 7) M. Nazir (2003). *Metode Penelitian*. Jakarta: Ghalia Indonesia.
- 8) Muklis Purwanto (2015). Hubungan Antara Kekuatan Otot Lengan Dan Panjang Lengan Dengan Kemampuan Shooting Dalam Permainan Bola Basket Pada Siswa Putra Kelas VIII Semester Genap SMP Negeri 2 Karanganyar Kabupaten Trenggalek Tahun Pelajaran 2014/2015. Artikel Skripsi Universitas Nusantara PGRI Kediri.
- 9) Mestika Zeid (2004). *Metode Penelitian Kepustakaan*. Jakarta. Yayasan Obor Indonesia.
- 10) Muhamad Herman Juliyanto Noriman Hadi Saputro (2007). Hubungan Kekuatan Otot Lengan dan Daya Ledak Otot Tungkai terhadap Hasil Tembakan Bebas pada Pemain Putra UKM Bola Basket UNNES Tahun 2007. Skripsi. Jurusan PJKR. Fakultas Ilmu Keolahragaan. Universitas Negeri Semarang.
- 11) Neumann, Hannes (1988). *Bola Basket Pendidikan Dasar dan Latihan*. PT Gramedia . Jakarta.
- 12) Sarumpaet (1992). *Permainan Bola Besar*. Jakarta: Depdikbud.
- 13) Syaiffudin.H. B. AC. (1994). *Anatomi Fisiologi Untuk Siswa Perawat*. Jakarta: Penerbit Buku Kedokteran, EGC.
- 14) Sugiyono (2010). *Statistika Untuk Penelitian*. Bandung: Alfabeta.
- 15) Suharno, HP. 1986. *Ilmu Kepeleatihan Olahraga*. Yogyakarta: IKIP Yogyakarta.
- 16) Sukadiyanto (2005). *Pengantar Teori dan Metodologi Melatih Fisik*. FIK UNY. Yogyakarta.
- 17) Sajoto (1988). *Peningkatan dan Pembinaan Kekuatan Kondis Fisik Dalam Olahraga, Dahara Prize*. Semarang.
- 18) Sajoto (1981). *Permainan Bola Basket dan Peraturan Praktis*. Semarang: IKIP Semarang.
- 19) Sajoto (1988). *Pembinaan Kondisi Fisik Dalam Olah Raga*. Jakarta: Depdikbud Dirjen Proyek Pengembangan Lembaga Pendidikan Tenaga Kepeleatihan.
- 20) Sukirno, dan M. Rizky Kurniawan (2017). Hubungan Panjang Lengan dan Kekuatan Otot Lengan Dengan Hasil Shooting Free Throw Pada Atlet Putra Klub Basket “Bangau” Palembang. *Jurnal Multilateral*, Volume 16, No. 1 Juni 2017 hlm. 50-57.
- 21) Undang-Undang Sistem Keolahragaan Nasional No 3 tahun 2005. *Pembinaan dan Pengembangan Olahraga Prestasi Pasa* 27 Ayat: 4. PT. Sinar Grafika. Wilkens, Lenny, *NBA Power Conditioning*, (USA: Human Kinetics,1998).
- 22) Wissel Hall (2000). *Bola Basket Dilengkapi Dengan Program Pemahiran Teknik dan Taktik*. Jakarta: PT. Rajagrafindo Persada

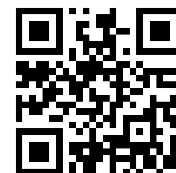


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## Indonesian Aviation Law Reform

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**ABSTRACT:** Significant role of air transportation in Indonesia, especially from a political and economic perspective, it has led to rapid developments in the world of national aviation. This remarkable development of air transportation is not supported by adequate laws and regulations, especially those relating to the requirement to obtain compensation in the event of a loss suffered by the passenger due to an error made by the air carrier. Law Number 1 of 2009 Concerning Aviation which is expected to bring about reforms within Aviation Law in Indonesia, especially regarding the terms of liability of the air carrier for losses suffered by air transport service users, there are not many fundamental changes when compared to the provisions contained in the Air Freight Ordinance (Luchvervoer Ordonantie). It is necessary to review the status of Law Number 1 of 2009 as a form of renewal of aviation law in Indonesia. Conditions for accidents need to be expanded, not only accidents experienced by air transportation modes, but accidents experienced by users of air transportation services since paying the transportation costs are the liability of the air carrier. The terms of embarkation so far need to be expanded in terms of meaning, starting from the time the transportation agreement is agreed upon by the payment of transportation costs by the transportation service user and the meaning of disembarkation ending when the transportation service user leaves the destination airport building.

**KEYWORDS:** Aviation; Air Transportation; Law Reform

### INTRODUCTION

Based on the area and population distribution in Indonesia,<sup>1</sup> the role and function of air transportation<sup>2</sup> in Indonesia has important and strategic position, both in terms of national unity, socio-cultural life, economy, government, defense and security. Refers to the significant role of air transportation in Indonesia, especially from a political and economic perspective, it has led to rapid developments in the world of national aviation.

This development is not only in the number of aircraft, but also in the number of airlines operating in Indonesia. Data obtained in the Ministry of Transportation of the Republic of Indonesia, until 1998 the number of airlines operating in Indonesia were Garuda Indonesia, Merpati Nusantara Airlines, Bouraq Indonesia Airlines, Pelita Air Service, Sempati Air Transport. Meanwhile, the number of airlines until 2020 there are 40 airlines registered, both large and small. The number of aircraft in Indonesia until 2020 for the top five airlines is the Lion Group with 268 fleets of various types; Garuda Indonesia as many as 144 fleets of various types; Citilink as many as 58 aircraft; Sriwijaya airlines and Air Asia Indonesia each have 24 aircraft.

However, the significant development of air transportation is not supported by adequate laws and regulations, especially those relating to the requirement to obtain compensation in the event of a loss suffered by the passenger due to an error made by the air carrier. The regulations that underlie the operation of air transportation in Indonesia refer to:

1. Air Freight Ordinance (Luchvervoer Ordonantie) Stb. 1939 Number 100 (hereinafter referred to as OPU) as a follow-up after the ratification of the 1929 Warsaw Convention.
2. Law Number 15 of 1992 Concerning Aviation (State Gazette of the Republic of Indonesia 1992 Number 53, Supplement to the State Gazette of the Republic of Indonesia 1992 Number 3481).
3. Law Number 1 of 2009 Concerning Aviation (State Gazette of the Republic of Indonesia of 2009 Number 1 and Supplement to the State Gazette of the Republic of Indonesia Number 4956).

<sup>1</sup> The total area of Indonesia is approximately 1,919,440 km<sup>2</sup>, with a total of 17,508 islands and a population according to the BPS in 2020 as many as 270.2 million people.

<sup>2</sup> Air Transportation according to Article 1 Number 13 of Law Number 1 of 2009 Concerning Aviation is any activity using aircraft to transport passengers, cargo, and/or post for one or more trips from one airport to another or several airports. air.

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Law Number 1 of 2009 Concerning Aviation which is expected to bring about reforms within Aviation Law in Indonesia, especially regarding the terms of liability of the air carrier for losses suffered by air transport service users, there are not many fundamental changes when compared to the provisions contained in the OPU. Even the provisions contained in the OPU are still enforced in the air transport agreement in Indonesia, especially for domestic transportation. This provision can be seen in the terms of the domestic regulatory agreement for each domestic passenger ticket and baggage.<sup>3</sup>

The conditions for providing compensation by air carriers contained in the OPU are as follows:

1. There is an accident;
2. There is a relationship with the aircraft;
3. In an aircraft;
4. Embarkation and disembarkation.

The conditions for providing compensation "on board the aircraft" contained in the OPU were solely intended to protect the interests of the air carriers, because at that time the air transport industry was a capital-intensive industry with enormous risks. Thus, the "in-aircraft" requirement contained in the OPU is a must to stimulate the air transportation industry in Indonesia.

Meanwhile, in Law Number 1 of 2009, the liability of the carrier to the passengers as stated in Article 141 Paragraph (1) that the carrier is liability for the loss of passengers who die, permanent disability, or injuries caused by the incident of air transportation in the aircraft. and/or boarding the aircraft. In the Elucidation of Article 141 Paragraph (1), what is meant by "air transportation incident" is an incident that is solely related to air transportation.

The conditions on the aircraft contained in Article 141 Paragraph 1 of Law Number 1 of 2009 Concerning Aviation are no longer relevant considering the risk of compensation by the air carrier which is their liability has been transferred to the insurance party, because in Article 179 of Law Number 1 In 2009 it was mandatory for air carriers to insure their liabilities for the passengers and cargo they carry. Therefore, based on this explanation, it is necessary to review the status of Law Number 1 of 2009 as a form of renewal of aviation law in Indonesia.

## RESEARCH RESULTS & DISCUSSION

### Carriage Agreement

Talking about the liability of air carriers, it cannot be separated from talking about the agreement;<sup>4</sup> as an agreement, the air carriage agreement cannot be separated from the formulation of the agreement itself. Law Number 1 Year 2009 formulates an air carriage agreement as an agreement between the carrier and the passenger and/or cargo shipper to transport passengers and/or cargo by aircraft, in exchange for payment or in the form of other service fees.<sup>5</sup> Abdul Kadir Muhammad formulated the meaning of an agreement as an agreement in which two or more people bind themselves to carry out a thing in the field of wealth.<sup>6</sup> In this formulation, it can be drawn a common thread that clearly shows the consensus between the parties; one party agrees and the other party also agrees to do something.

The consensual principle in the carriage agreement does not require a written carriage agreement, the carriage agreement is considered sufficient if there is an agreement of will between the parties. In the law of transportation there is a document called a letter of charge or vrachtbrief and also a ticket for passengers. These documents are not an absolute requirement for the existence of a carriage agreement. Without these documents a carriage agreement also exists, meaning that the absence of these documents does not invalidate the existing carriage agreement. Thus, these documents are not an element of the carriage agreement but are only evidence of the existence of a carriage agreement. It can be concluded that the carriage agreement is consensual.

Air freight documents can be in the form of tickets or air cargo letters. Basically, ticket is a "document in printed form, through an electronic process, or in other forms, which is one of evidence of the existence of an air transportation agreement between the passenger and the carrier, and the passenger's right to use the aircraft<sup>7</sup> or be transported by aircraft. While airway

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<sup>3</sup> Furthermore, it can be seen in the terms of the domestic regulatory agreement for each passenger ticket and domestic baggage on each ticket, the point which states that: "This carriage agreement is subject to the provisions of the Indonesian Air Transport Ordinance (Stbls 1939/100) as well as to the terms -conditions of carriage, tariffs, service regulations (except the departure times and arrival times mentioned therein) and other regulations of the carrier which are an inseparable part of this agreement and which can be checked at carrier's offices.

<sup>4</sup> A carriage agreement is a reciprocal agreement between two parties, where the first party called the carrier binds himself to transport from and to the destination, both goods and passengers safely, and the second party, called the user of transportation services, has an obligation to pay transportation costs.

<sup>5</sup> Article 1 Number 29 of Law Number 1 of 2009 Concerning Aviation.

<sup>6</sup> Abdul Kadir Muhammad, *Hukum Perikatan*, Alumni, Bandung, 1982 (hereinafter referred to as Abdul Kadir Muhammad I), page 78.

<sup>7</sup> Article 1 Number 27 of Law Number 1 of 2009 Concerning Aviation.

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bill is a "document in printed form, through an electronic process, or in other forms, which is one of evidence of the existence of an air carriage agreement between the cargo shipper and the carrier, and the cargo receiver's right to pick up the cargo."

In the air transportation agreement there are parties, the parties in the air transportation agreement are the carriers and the users of air transportation services can be in the form of shippers of goods or passengers. The air carriage agreement is reciprocal, meaning that both parties each have obligations and rights. The carrier's obligation to carry out transportation from one place to the destination is safe and secure.<sup>8</sup> The "unsafe" condition for passenger transportation means that the passenger dies or suffers temporary or permanent injury/disability, due to an event or incident. If the passenger is in an unsafe condition, it will be the liability of the carrier. In the air transportation law in Indonesia, until now, the carrier's liability adheres to the Presumption of Liability Principle as well as the Fault Liability Principle.

According to this principle, the carrier could free himself from his obligation to provide compensation to the user of the transportation service if he and his employees can prove that the accident was not due to his fault. This means that the carrier's guilt or innocence must go through a court judge's decision, because only a judge authorized to declare a person is culpable for a specified wrongdoing. Regarding to the settlement of aircraft accident cases in Indonesia, it was only resolved once through the district court, namely when the case of the Garuda Indonesia airplane crash on Mount Burangrang, West Java, known as the Mrs. Oswald Vermaak Case. After a long case at the Jakarta District Court between Mrs. Oswald Vermaak and PT Garuda Indonesia,<sup>9</sup> the settlement of an aircraft accident in Indonesia has never been resolved in court as required by law.<sup>10</sup>

This is because the users of air transportation services who are victims of accidents realize that resolving claims for compensation through the courts takes a long time and there is no guarantee that their demands will be granted by the judge. Meanwhile, on the air carrier side, they no longer use courts to settle compensation cases, because using a district court will destroy the trust of air transport service users<sup>11</sup> towards the carrier, especially with regard to liability.<sup>12</sup> Therefore, every time an airplane crash occurs in Indonesia, the carrier always pays the victim or his heirs for the accident. The compensation is given by the carrier after obtaining the results of an investigation conducted by the KNKT (National Transportation Safety Committee).<sup>13</sup>

The amount of compensation for victims who die or become permanently disabled according to government regulation Number 40 of 1995 is IDR 40,000,000. This regulation has been abandoned by the air carriers.<sup>14</sup> The last regulation that regulates

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<sup>8</sup> The term safely means that if the air transportation is not safe, it will be the liability of the carrier, quoted from Abdul Kadir Muhammad, *Hukum Pengangkutan Darat, Laut, dan Udara*, Citra Aditya, Bakti, Bandung, 1994 (hereinafter referred to as Abdul Kadir Muhammad II ), page 21).

<sup>9</sup> In the history of aviation in Indonesia, on January 24, 1961 a Garuda Indonesia aircraft with Flight Number PK GDI had an accident at Mount Burangrang, near Bandung, which resulted in the death of its passengers, one of the passengers was Ferdinand Josef Leo Oswald, a citizen of South Africa. The carrier – Garuda Indonesia – relieved itself of its obligations because the accident was not caused by his fault. The carrier's reason is because he can prove that he has taken all steps to avoid the accident, or that he is in such a state that he cannot take any steps to avoid the accident. The heir of the victim, Mrs. Oswald Vermaak sued Garuda Indonesia at the Jakarta District Court and the Jakarta District Court defeated Mrs. Oswald Vermaak for the reasons mentioned above, but Mrs. Oswald Vermaak's reason stated that the carrier did not take any action to avoid the accident, namely when passing Purwakarta and seeing the very bad weather he should have flown higher, higher than the highest mountain peak around the flight route or decided to return to Jakarta before entering the dangerous corridor. The reason for Mrs. Oswald Vermaak's lawsuit was accepted by the judge at the appeal level and Mrs. Oswald Vermaak was won. At the cassation level, Mrs. Oswald Vermaak won. The duration of the case was from 1961 and ended in 1968. This is one of the weaknesses of the application of the Presumption of Liability Principle. Chaidir Ali, *Yurisprudensi Hukum Dagang*, Alumni, Bandung, 1982, page 3.

<sup>10</sup> Article 29 OPU, Article 43 Law Number 15 of 1992, Article 141 Paragraph (2) of Law Number 1 of 2009.

<sup>11</sup> Sudiarto, *Penyelesaian Ekstra Yudisial Kecelakaan Pesawat Udara di Indonesia*, Thesis, Universitas Diponegoro Semarang, 1998.

<sup>12</sup> From the several aircraft accidents that occurred in Indonesia, including the Merpati plane crash on October 10, 1971 in Ujung Pandang, March 29, 1977 in Tinombala, the Garuda plane on July 11 1979 in Polonia Medan, the Merpati plane in 1985 in Banjarmasin, the Garuda plane on April 4 1987 at Polonia Medan, Merpati aircraft on 23 May 1987 at Ruteng NTT, Garuda aircraft on 26 September 1997 in Sibolangit, North Sumatra, Silk Air aircraft on 19 December 1997 in Palembang, Garuda aircraft on 16 January 2002 in Bengawan Solo, Lion Air aircraft on November 30, 2004 at Adi Sumarmo Airport in Solo, Mandala aircraft on September 5, 2005 at Polonia Medan, Adam Air aircraft on January 1, 2007 in West Sulawesi and Garuda aircraft on March 7, 2007 at Adi Sucipto Airport in Yogyakarta. Of all the airplane accidents that claimed the lives of the above, the air carrier provides compensation to the victims or their heirs without waiting for a lawsuit in the district court. This means that the Presumption of Liability Principle as adopted in Indonesia has so far been no longer applied but has used the Strict Liability Principle.

<sup>13</sup> The National Transportation Safety Committee or KNKT is an independent institution established under Presidential Decree Number 105 of 1999. This commission is liable for investigating accidents on land, sea and air transportation and then making suggestions for improvement so that the same accidents do not happen again in the future. This commission is under the Ministry of Transportation. This commission consists of five people who are appointed by the President for a term of five years.

<sup>14</sup> The Garuda plane crash at Adi Sutjipto Airport Yogyakarta for victims of death and permanent disability is given Rp. 300,000,000,- and the Lion Air accident at Adi Sumarmo Airport, Solo, the amount of compensation is Rp. 400,000,000.

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the amount of compensation given to air transportation service users who die, permanent total disability due to aircraft accidents in Indonesia is the Minister of Transportation Regulation Number 77 of 2011 concerning the Liability of Air Transport Carriers, which is Rp. 1,250,000,000,- (one billion two hundred and fifty million rupiah) which came into force on November 1, 2011, however, the implementation of this Regulation of the Minister of Transportation of the Republic of Indonesia was postponed from its entry into force with the issuance of the Regulation of the Minister of Transportation Number PM 92 of 2011 which stated that the provisions contained in the Regulation of the Minister of Transportation PM Number 77 of 2011 is implemented effectively starting January 1, 2012 with the consideration that there is no insurance consortium to guarantee liability for air transportation claims to service users; and also there are still some air transportation business entities that are not ready with these rules, especially regarding the direct application of compensation for delays.<sup>15</sup> The determination of the amount of compensation contained in the Regulation of the Minister of Transportation Number 77 of 2011 does not refer to the amount of compensation contained in international conventions, but is based on the criteria specified in the laws and regulations in Indonesia.

Seeing the fact that aircraft operations in Indonesia are very difficult to separate from international flights, the form of liability of air carriers to users of air transportation services and how to resolve cases of aircraft accidents in Indonesia need to be re-examined. Discussing liability, according to Martono<sup>16</sup>, general responsibility can mean three kinds, namely accountability, responsibility and liability.

Responsibility in the sense of liability according to Martono is legal responsibility according to civil law. The obligation to pay compensation for the loss or suffering suffered by the victim as a result of the perpetrator's actions. The victim can sue before a civil court to pay the loss to the perpetrator, either the person or legal entity that caused the loss.<sup>17</sup>

Peter Mahmud Marzuki interprets liability as a translation of liability/aansprakelijkheid which is a specific form of responsibility. According to him, the notion of liability refers to the position of a person or legal entity that is deemed to have to pay a form of compensation or compensation after a legal event or legal action. He, for example, must pay compensation to another person or legal entity because he has committed an unlawful act (onrechtmatige daad) so as to cause harm to the other person or legal entity. The term liability is within the scope of private law.<sup>18</sup>

J.H. Nieuwenhuis,<sup>19</sup> stated that this liability rests on two pillars, namely violations of the law and mistakes. The person who causes harm to another person is liable, as long as the loss is the result of a violation of a norm (a violation of the law) and the perpetrator can be regretted for having violated that norm (a mistake). Apart from this, the perpetrator in question is declared free; this is called fault liability (schuld aansprakelijkheid); here guilt is given a broad meaning which also includes the unlawful nature of the act.

Refers to Nieuwenhuis's opinion, an understanding can be drawn that liability can occur because:

- a. The error that occurs is due to an agreement between the parties that harms one of the parties as stipulated in Article 1365 of the Civil Code (lawful acts). This kind of liability is known as liability based on the element of guilt and in its development also – because of the evidence – becomes the liability on the basis of the presumption of guilt.
- b. Constitution; it means that a certain person/party is declared liable not because of the wrong he did, but he is liable because of the provisions of the law.

### Recent Implementation of Air Carrier Liability

The provisions governing the conditions for air carriers to be liable are not clearly described in Law Number 1 of 2009 Concerning Aviation. In order to obtain clarity on the conditions under which air carriers are liable, it is found in the Warsaw Convention 1929 which is contained in Article 17 which states that the carrier is liable for losses that arise, the conditions that the loss must be caused by an accident; the accident must occur in the aircraft; the accident must occur at the time of embarkation or disembarkation (in the course of any of the operations of embarking or disembarking).

In tracing cases of international aircraft accidents, it is concluded that in order for an incident to be qualified as an "accident" within the meaning of Article 17 of the Warsaw Convention, the incident on board the aircraft causing the loss must be an extraordinary event (unusual) or could not be foreseen (unexpected).<sup>20</sup> Furthermore, if the incident or accident is the result of a

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<sup>15</sup> Legal and Public Relations Division of the Directorate General of Civil Aviation at the Ministry of Transportation, Israfuhluya as published in the Jawa Post, Wednesday, November 9, 2011 page 7.

<sup>16</sup> K. Martono, *Kamus Hukum dan Regulasi Penerbangan*, First Edition, RajaGrafindo Persada, Jakarta, 2007 (hereinafter shortened to Martono I), page 306-307.

<sup>17</sup> *Ibid*, page 308.

<sup>18</sup> Peter Mahmud Marzuki, *Pengantar Ilmu Hukum*, Kencana Prenada Media, Jakarta, 2008, page 258.

<sup>19</sup> J.H. Nieuwenhuis, *Hoofdstukken Verbintenissenrecht*, Translate Version, Universitas Airlangga, Surabaya, 1985, page 135.

<sup>20</sup> Kahn-Freund, as stated by Saefullah Wiradipradja I, *Ibid*. page 58.



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physical condition of the passenger or the defect of the goods or a condition that has nothing to do with air transport, it is not an accident as referred to in Article 17 of the Warsaw Convention. It is logical that the carrier cannot be held liable for a loss or accident caused by the physical condition or health of the passenger or the defect of the goods themselves, because it has nothing to do with air transportation.

In the Dictionary of Aviation Law and Regulations,<sup>21</sup> an accident is an event that occurs unexpectedly by humans related to the operation of an aircraft that takes place from the moment the passenger gets on the plane (boarding) with the intention of flying to the destination until all passengers get off (disembarkation). from the aircraft at the destination airport. The incident causes people to die or be seriously injured, minor injuries, permanent or temporary injuries resulting in (a) collision with an aircraft or (b) direct contact with aircraft parts or (c) being hit by a direct blow to an aircraft jet engine or (d) the aircraft requires major repair or (e) requires replacement of components of the aircraft or (f) the aircraft is completely lost.

So far, in Indonesia, the interpretation of the definition of accident contained in Article 17 of the Warsaw Convention or Article 24 of the Air Transport Ordinance (OPU) 1939 has never been questioned, because every time an aircraft crash occurs, the settlement of compensation is determined based on government policy which is always accepted by the government. both sides

### 1. Definition of "There is a Relationship with Air Freight"

As the second condition stipulated in Article 24 of OPU, to determine the scope of liability of the carrier, if the accident is related to air transportation. If the accident that causes harm to passengers has nothing to do with air transportation, the air carrier cannot be held liable for the lawsuit.

Thus, the scope of liability of domestic air carriers which refers to the provisions of the Air Carriage Ordinance as well as laws and regulations concerning aviation in Indonesia is narrower than the scope of liability of international air carriers who use the 1929 Warsaw Convention. suffered by the passenger has nothing to do with air transportation, as long as it is caused by an accident and occurs on an aircraft or during embarkation and disembarkation, the carrier must be held liable.<sup>22</sup>

For example, a passenger suffers an injury due to being stabbed by another passenger beside him without the knowledge of the carrier or his crew, then according to the Warsaw Convention the carrier remains liable, while according to the regulations in force in Indonesia the carrier is not liable. Another example, a passenger dies on an airplane without an accident, then according to the 1929 Warsaw Convention the carrier must be held liable, the case of Munir's death on a Garuda Indonesia airplane with a flight route from Jakarta to Amsterdam with a transit at Changi Singapore, can be used as an example case. Meanwhile, according to the regulations in Indonesia, the carrier is not liable; take for example the case of the death of Dr. Ridawan, a lecturer at the Faculty of Animal Husbandry, University of Mataram, on a Garuda Indonesia flight from the Mataram-Jakarta route.

### 2. Definition "On Board of The Aircraft"

Understanding in aircraft; as in the case of accident, there is no understanding of what is meant by an airplane by the 1929 Warsaw Convention. At first glance it seems that the expression 'in an airplane' provides a clear limitation on when the carrier is liable; but in practice this is not the case. If a plane has an emergency landing, the passengers are asked to get off and wait around the plane and then have an accident, can the accident be interpreted as occurring on an aircraft as referred to by the Warsaw Convention?

According to Saefullah Wiradipraja,<sup>23</sup> saying that from a juridical point of view, the notion of 'on board the aircraft' does not mean only when the passenger is physically on the plane, but also includes when the passenger is (physically) outside the aircraft caused by abnormal circumstances; means that the presence of passengers outside the aircraft is not due to the end of the journey as stated in the air carriage agreement. So that if the passenger suffers a loss or accident while outside the plane due to abnormal conditions, the carrier must still be liable. Of course, the carrier can be released from his liability if the loss or accident is caused by the passenger's own fault or because of his health condition.

### 3. Definition of "Embarkation and Disembarkation"

Definition of embarkation and disembarkation; The Warsaw Convention does not specify what is meant by boarding or leaving the aircraft (in the course of the operations of embarking or disembarking). As a result, there are differences in interpretation, especially regarding when the embarkation process begins and when the disembarkation process ends.

It is clear and no longer a problem that an accident suffered by a passenger while he or she is boarding or disembarking an aircraft will be deemed to have occurred at the time of embarkation or disembarkation. However, in practice problems arise in the event of an accident or loss when the passenger is in the airport waiting room before boarding the plane or while waiting for

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<sup>21</sup> Martono I, *Op. Cit*, page 111.

<sup>22</sup> Saefullah Wiradipradja, *Tanggungjawab Pengangkut dalam Hukum Pengangkutan Udara Internasional dan Nasional*, Liberty, Yogyakarta, (hereinafter mentioned as Saefullah I), page 166.

<sup>23</sup> *Ibid*, page 64.

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baggage after getting off the plane. The question is, does such a situation fall within the scope of Article 17 of the Warsaw Convention?

There are several opinions regarding what is meant by embarkation (going to the aircraft) and disembarkation (leaving the aircraft):

1. The first opinion, driven by D. Lureau, stated that embarkation begins when the passenger leaves the airport building in order to get to the runway (run way), and disembarkation ends when the passenger enters the airport building at the destination.<sup>24</sup>
2. The second opinion, which was initiated by Matte and Kahn-Freund, states that the period of embarkation begins when the passengers are under the supervision of an employee of the airline company (the carrier) in order to get to the aircraft, and ends when the employee leaves the passengers after dropping off. they enter the airport building at their destination.<sup>25</sup>
3. The third opinion, from a court in the United States, states that the embarkation process begins at 'check in' and the disembarkation process ends after the passenger collects his or her registered luggage. This opinion is supported by a decision in the United States court which states that the carrier is liable for passengers who have an accident on the escalator while heading to the baggage claim. The Court of Appeal in Berlin in a case stated that the carrier is liable for the accidents experienced by passengers in the airport building after 'checking in' to the plane, because the carrier's obligation to supervise passengers and their belongings starts from the time the passengers check in.<sup>26</sup>

### Implementation of Air Carrier Liability in the Future

The liability of the air carrier begins with a transportation agreement, namely an agreement between the carrier and the user of the transportation service, where the carrier is obliged to transport the user of the transportation service from one place to the destination safely and safely, while the user of the transportation service is obliged to pay for the transportation.

Departing from the definition of air transportation above, it is known that the carriage agreement is an agreement (consensus) between the carrier and the users of transportation services that must be adhered to by both parties. The obligation of the carrier is to transport users of transportation services from one place to the destination safely; while the obligation of users of transportation services is to pay transportation costs. If the user of the transportation service has arrived at his destination safely, then the carriage agreement is complete, but on the other hand, if the user of the transportation service does not arrive at his destination safely, it will be the liability of the carrier to provide compensation to the user of the transportation service, because the carrier does not fulfill its obligations. The question is, when did the contract of carriage start and when did it end?

As with the agreement in general, the agreement begins when there is an agreement (consensus) between the carrier and the user of the transportation service. The agreement occurs since the user of the transportation service agrees and pays the transportation fee offered by the carrier. With the agreement between the carrier and the user of the transportation service, the rights and obligations of each party come into effect. While the carriage agreement ends, when the user of the transportation service has arrived at his destination safely. With the payment of the transportation fee by the user of the transportation service, since then the carrier is liable for the user of the transportation service. Here, I broaden the meaning of embarkation, namely by proposing one opinion, that embarkation begins from the time the carriage agreement is agreed upon by the carrier with the air transport service user and disembarkation ends when the transport service user leaves the destination airport building.

Conditions that are closely related to the occurrence of the accident on an airplane, in my opinion, need to be corrected again, because these requirements were contained in the OPU because at that time the air transportation industry was still new and there was no insurance that accepted the transfer of liability risks that should have been charged to the carrier. Protection against the carrier at that time should have been given by complicating the terms of liability of the air carrier against the user of the transportation service in the event of a loss experienced by the user of the air transportation service.

The condition of air transportation today is not the same as the condition of air transportation 82 years ago with the implementation of the OPU. Since the insurance business in Indonesia has grown so rapidly, including liability insurance as mandated by Law Number 1 of 2009 Concerning Aviation. The air carrier's liability insurance premium has been paid in full by the air transport service user when paying the freight, because one item in the air ticket price includes the air carrier's liability insurance.

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<sup>24</sup> *Ibid*, page 66.

<sup>25</sup> *Ibid*.

<sup>26</sup> *Ibid* page 172.

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### CONCLUSION

Based on the description above, in this paper I conclude that:

1. Conditions for accidents need to be expanded, not only accidents experienced by air transportation modes, but accidents experienced by users of air transportation services since paying the transportation costs are the liability of the air carrier;
2. The terms of embarkation so far need to be expanded in terms of meaning, starting from the time the transportation agreement is agreed upon by the payment of transportation costs by the transportation service user and the meaning of disembarkation ending when the transportation service user leaves the destination airport building.

### RECOMMENDATION

It is hoped that the Government of the Republic of Indonesia will revise Law Number 1 of 2009 concerning Aviation, in particular Article 141 Paragraph (1) along with its explanation by expanding the meaning in aircraft and embarkation and disembarkation by considering the progress of the air transport industry in Indonesia.

### REFERENCES

#### Book

- 1) Ali, Chaidir, 1982, *Yurisprudensi Hukum Dagang*, Alumni, Bandung
- 2) Djatmika, Tatiek Sri, 2010, *Laladministrasi dalam Konteks Kesalahan Pribadi dan Kesalahan Jabatan, Tanggung Jawab Pribadi dan Tanggung Jawab Jabatan*, Universitas Trisakti, Jakarta. Departemen Pendidikan dan Kebudayaan Republik Indonesia, *Kamus Besar Bahasa Indonesia*. Jakarta. Gautama, Sudargo, *Pengertian Tentang Negara Hukum*, Alumni, Bandung
- 3) Harahap, Yahya, 2006, *Hukum Acara Perdata, Tentang Gugatan, Persidangan, Penyitaan, Pembuktian dan Putusan*, Sinar Grafika, Jakarta.
- 4) Martono, K, 2007, *Kamus Hukum dan Regulasi Penerbangan*, Edisi Pertama, Rajagrafindo Persada, Jakarta.
- 5) Martono dan Amad Sudiro, 2010, *Hukum Angkutan Udara Berdasarkan Undang*
- 6) *Undang Nomor 1 Tahun 2009*, Rajawali Pers, Jakarta.
- 7) Marzuki, Peter Mahmud, 2008, *Pengantar Ilmu Hukum*, Prenada Media, Jakarta.
- 8) Muhammad, Abdul Kadir, 1982, *Hukum Perikatan*, Alumni, Bandung. 1994, *Hukum Pengangkutan Darat, Laut dan Udara*, Citra Aditya Bakti, Bandung.
- 9) Nieuwenhuis, JH, 1985, *Houfstrukken Verbentnissenrecht*, Universitas Airlangga, Surabaya.
- 10) Prodjodikoro, Wirjono, 2000, *Perbuatan Melanggar Hukum Dipandang dari Sudut Hukum Perdata*, Mandar Maju, Bandung.
- 11) Soesilo, 1985, *RBG/HIR dengan Penjelasannya*, Poletea, Bandung
- 12) Sudiarto, 1998, *Penyelesaian Ekstra Yudisial Kecelakaan Pesawat Udara di Indonesia*, Universitas Diponegoro, Semarang.
- 13) Wijaya, Gunawan & Kartini Muljadi, 2003, *Prikatan yang Lahir Dari Undang Undang*, Rajawali Grafindo Persada, Jakarta
- 14) Wiradipradja, Saefullah, 1989, *Tanggung Jawab Pengangkut dalam Hukum Pengangkutan Udara Internasional dan Nasional*, Liberty, Yogyakarta.

#### Law

- 1) *Undang Undang Nomor 1 Tahun 2009, Tentang Penerbangan*, Lembaran Negara
- 2) *Tahun 2009 Nomor 1, Tambahan Lembaran Negara Republik Indonesia Nomor 4956*.
- 3) *Ordonantie Pengangkutan Udara, Stb 1939 : 100*



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## Can Grammarly be Implemented as an English Writing Tool?



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**ABSTRACT:** The need for application-based writing is all-time high due to the inevitable implementation of technology in education. Several proofreaders are available in the market and used by EFL learners to develop error-free content; one such popular tool is Grammarly, which has gained popularity in the last few years. Significantly, before implementing any such tool for teaching-learning activities, we must determine users' perceptions of using it. However, such applications are more common in developed nations than in the Arab world. Therefore, this study determines EFL learners' perceptions of using Grammarly in their writing skills improvements. A web-based questionnaire was randomly distributed among 50 Arab EFL learners. The valid responses received against each item were quantitatively analyzed using SPSS. The results clearly show that EFL learners are positive and agree that Grammarly positively impacts writing skills.

**KEYWORDS:** Grammarly, Online writing tool, EFL writing, Learner's perceptions.

### 1. INTRODUCTION

The growing demand for technology has stimulated developers to design numerous applications for teaching-learning activities. As a result, several apps have been designed that significantly improve writing skills; one among them is Grammarly, which has gained overwhelming popularity among EFL learners globally. However, using technology for academic purposes is not new, but in a country like Saudi still, it is in the infancy stage (Rahman, 2020). Therefore, it is imperative to understand its users' perception of using such tools in achieving their writing goals. Grammarly is a tool that supports features like spelling checking, grammar checking, punctuation checking, etc., and enables users to write error-free writing. As a result, one can write reliable content in English with Grammarly's help and enable learner's co-dependence.

Notably, Meyers (2005) notes that writing is a complex language learning action; hence, writing a complex grammatical construction requires more attention. In this study, the author mentions that second language teaching is the most crucial and challenging task, mainly writing skills, as several learners rated writing as the most tedious task to accomplish. This gives rise to the feeling that teachers need to make class creative and exciting to push EFL learners towards the writing activity. Here comes the scope of an online tool that can easily benefit our goal both as a teacher and students, on which most scholars agreed that this might spark new energy to fulfil our writing goal. Further, the potential of the online tool has primarily been recognized and said to be a game-changer and motivates learners towards writing. A large number of learners report that their writing was poor but using an online tool, they have significantly improved their English writing. The primary observations reveal that EFL students had problems placing the right choice of proverbs, vocabulary, spelling, and collocation based on the context. However, they significantly improved their writing skills after using the online tool.

Further, on the one hand, the learners also claim that developing good writing skills requires practice and demands a handsome amount of time. On the other hand, they say that teachers hardly realize to focus on the student's creativity rather than consistently teaching complicated methods and traditional methods to improve writing. If the teacher focuses on the student's creativity, the results would be more satisfying and surprising (Sokoholic, 2003). Recent research has even claimed that EFL learners can improve their writing by monitoring their mistakes using online tools (Hui and Yinjuan, 2011). Based on the above discussion, it can be surmised that online tools have such potential which can be implemented as a new writing tool to improve English writing skills.

### 2. LITERATURE REVIEW

Numerous studies have been conducted to determine the efficacy of web-based learning (WBL) and application-based learning (ABL), including language writing. This shift from the traditional method to the technology-aided language learning approach is

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seen in relation to the growing demand for technology, which has significantly impacted human life (Rahman, 2020). Therefore, a rapid influx in the area of ICT has been noticed in the last several decades. The literature provides complete coverage of the journey of technological penetration in teaching methods like WBL to Computer Assisted Language Learning (CALL), Mobile Aided Language Learning (MALL) to online tool-supported writing and even shifting more towards the WBL, which several researchers have noted that the use of technology in teaching has a significant impact on learners' attitude and learning ability, especially in improving learners' writing skills. In this regard, Setiyadi (2000, p.22) note that the outcome of language learning greatly depends on the appropriateness of the employed method, which is derived based on the characteristics, needs, and context of both learning and learners. Therefore, this becomes pertinent to choose the appropriate method. In this line, teachers also require in-depth training, such as designing learning materials, resources, and tools, as they are integral to teaching activities. Further, language teaching is not merely seen as a process of class activity which requires formal training for this purpose, but this translates into language learning; as a result, language teaching or instructors is always in a combination of language learning.

McNamara et al. (2010) claimed that writing a quality requires superior linguistic competence belonging to syntactic complexity, textual complexity, and other linguistic devices. In addition, they stressed that focusing on these aspects could significantly improve writing skills. Also, students need to be taught about different writing strategies, their steps, process, and organizations which will help them develop sophisticated writing skills. In this line, Fowler et al. (2007) proposed several theories concerning writing steps which focus on how different writers discovered, explored, and defined themselves through quality and creative writing.

Moreover, VanderPyl (2018) explained different crucial stages for writing, such as organizing, drafting, reviewing, and editing. Where organizing and planning chiefly involve brainstorming (critical thinking skills, exchanging thoughts with others, highlighting, browsing materials and sources) as well as goal setting. According to Bello (2008), there are two ways to do brainstorming, i.e., either oral (through discussion) or written, both individually or group-wise (in class). Planning helps students visualize and craft what they have in their minds amidst the planning process, leading to their learning goal fulfilment (First and MacMilan, 1995). Here, the visuals may appear in different forms ranging from websites, figures, charts, animation, and note-taking on paper using a pen (Saddler and Andrade, 2004). Therefore, an effective writing strategy gives thoughtful consideration to all such problems that might hinder students' writing during the writing process, which requires timely review and planning to make the writing task interesting and creative (Karyuatry, Rizqan, and Darayani, 2018).

Karyuatry et al. (2018) note that besides MALL's overwhelming acceptance among EFL learners, CALL is more reliable and essential for writing activities. Also known as WBL, illustrated in the following words, "a hypermedia-based educational program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (Karyuatry et al., 2018); "individualized instruction delivered over a public or private computer network and displayed by a Web browser" (Clark and Healy, 1996) (cited in Henke, 1997: 1). Previous studies revealed that WBL has significantly improved students' writing skills in contrast with the traditional approach (pen-paper) used for writing skills. Taking this observation, Lin (2008) further argues for the inclusion of WBL for writing skill improvement over the use of the traditional approach. The WBL provides tremendous opportunities for the learner to collaborate with classmates, share feedback about each other work, publish their work, and so on. Overall, these advantages cultivate the development of strong writing skills. The WBL offers a significantly fair chance for learners to learn and improve second language writing skills. A similar thought has been expressed by Grejda and Hannafin (1992), where they say that online writing tool significantly minimizes writing errors as compared to the pen-paper approach. As a result, this enables learners to write sophisticated content in English. With added points, McCarthy and Grabowski (1999) say that language tools could be the future of teaching-learning activities, as this provides enormous opportunities for students to learn more than required. They also claimed that by using such language tools, a teacher could also make the session more interesting and exciting for the students, ultimately developing the motivation among the learners towards writing skills. In this context, one such tool is Grammarly, which has gained immense acknowledgement from EFL learners nowadays. Grammarly supports the features like grammar checking, spell checking, clarity of the content, writing styles, etc. (Krasnikov et al., 2018). Notably, Grammarly supports both the CALL and MALL platforms; hence, separate versions are available for each platform.

### 3. METHODS

The current paper offers a descriptive statical analysis of EFL learners' perceptions about the use of Grammarly as a writing tool for English writing skills. The results obtained from the valid responses against each item helped the author figure out the learners' actual perception, and the results' findings can facilitate the teachers and developers to design a framework that can fulfil the learners' requirements. To conduct this study, both male and female respondents have been chosen to determine the specific challenges and issues that can be used to prepare customized teaching-learning materials based on individual strengths,

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weaknesses, and personalized preferences. Further, questions focus on the frequency of use, prior experience, and the purpose of using Grammarly to understand the level of readiness among learners for such tools for their writing skills. The data was collected from undergraduate EFL learners at Qassim University in Saudi Arabia.

### 3.1. Audience

This study's sample size is 50 EFL learners, which are further subdivided into two groups based on gender: male (25), and female (25) students. All the respondents are currently enrolled at Qassim University, Saudi Arabia.

### Instrument

The nature of the questionnaire was close-ended; it includes a total number of 10 items of close-ended nature to determine EFL learners' perception towards the use of Grammarly as a new writing tool for English content. Only one set of questionnaires is prepared as this study only aims to understand students' perception of being the ultimate user. The questionnaire is divided into two parts; the first section deals with general questions like the student's demography, use of Grammarly, frequency of use, etc. On the contrary, the second deals with the real questions asked to understand the perception related to Grammarly and its use in EFL learning, especially in the improvement of writing skills. A five (5) point Likert-scaling system has been used, starting from strongly agree (SA), agree (A), neutral (N), disagree (D), and strongly disagree (SD).

### 3.2. Procedure

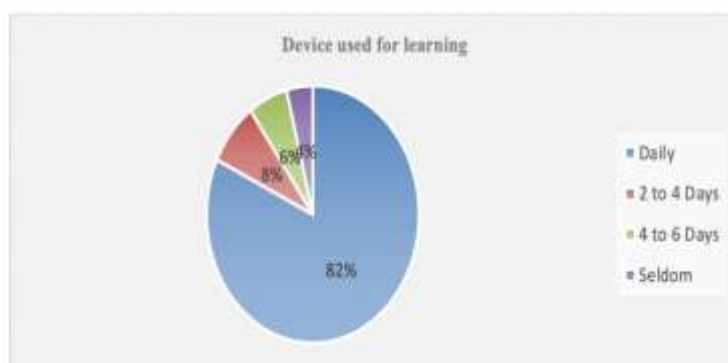
The current study is quantitative, and the analysis has been made against the valid responses received from the students for each item asked in the questionnaire. The total number of fifty (50) students have randomly been selected from Qassim university undergraduate level learners and include both male and female respondents. The questionnaire was circulated using electronic media like email, Facebook, and other social media platforms. After receiving the total valid responses, a quantitative analysis was performed using SPSS, and the results have been enumerated in table 1.2 below.

## 4. RESULTS

In this sub-section, the results have been presented based on the EFL learner's perception that is analyzed through their valid responses. This section includes two tables; table 1 offers the respondents' demographic details, and table 2 presents the total number of responses and their percentage for each Likert scale. Further, two figures have also been presented; figure 1 displays the frequency of using Grammarly, while figure 2 shows the purpose of using Grammarly, respectively.

**Table 1. Demographic details of the learners**

Groups	Number		Frequency		Education/Undergraduate	
	N	F	N	M	N	M
Male	25	50			25	50
Female	25	50			25	50
Total	50	100	50	100		



**Figure 1. Frequency of using Grammarly**

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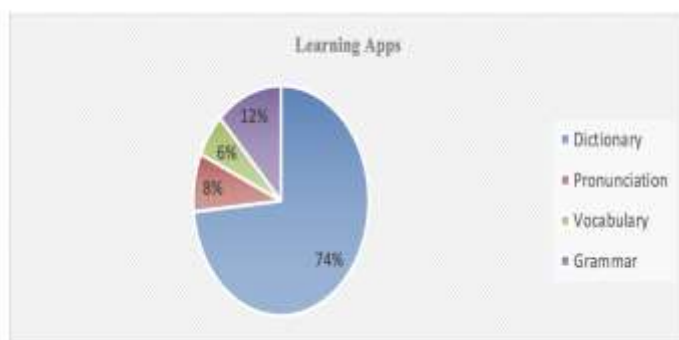


Figure 2. Purpose of using Grammarly

Table 2. Perceptions of EFL learners' towards Grammarly for writing skills

Items/Questions	Str. Agree		Agree		Neutral		Disagree		Str. Disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
1. Do you agree that Grammarly enables the learner to write error free English?	16	32.0	24	48.0	6	12.0	3	6.0	1	2.0
2. Do you agree that Grammarly enables the learner to achieve desired writing skills?	13	26.0	22	44.0	10	20.0	3	6.0	2	4.0
3. After continuous use of Grammarly one day I will write polished English.	9	18.0	32	64.0	8	16.0	1	2.0	-	-
4. Do you agree that Grammarly provides immediate solutions to EFL learners during writing?	10	20.0	23	46.0	14	28.0	-	-	3	6.0
5. Do you agree that Grammarly has a positive impact on your English writing?	7	14.0	21	42.0	13	26.0	4	8.0	5	10.0
6. Do you agree that English writing with Grammarly is a great idea?	14	28.0	25	50.0	9	18.0	1	2.0	1	2.0
7. I welcome Grammarly as a new writing tool if implemented.	9	18.0	27	54.0	9	18.0	2	4.0	3	6.0
8. Do you agree that Grammarly is a good online proofreader?	16	32.0	19	38.0	11	22.0	-	-	4	8.0
9. Write up scanned using Grammarly gets lesser grammatical error comments by instructors?	11	22.0	21	42.0	5	10.0	7	14.0	6	12.0
10. Do you agree that Grammarly will increase dependency on English writing?	9	18.0	12	24.0	21	42.0	5	10.0	3	6.0

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### 5. DISCUSSION AND IMPLEMENTATION

Using digital tools is not a new practice for writing purposes in developed nations. On the other hand, literature shows a dearth in developing nations' perspectives. Previous studies have reported its crucial role in improving learners' English writing skills. The literature concerning the use of technology for academic purposes strongly recommends that technology has significantly improved the results and enables learners to write sophisticated content in English over the traditional method (Grejda and Hannafin, 1992). In a recent study, Haque (2022) reports that the continuous use of Grammarly significantly reduced Arab EFL learners' writing errors. Further, he notes that Grammarly did not only help students minimize errors but also enabled them to choose contextually appropriate grammatical items such as correct placement of article, the right choice of verb, and plurals. The existing study's findings also align with Haque's (2022) findings, revealing that 82% of the EFL learners use Grammarly daily for English writing (see figure 1 above). These tools are gaining popularity based on the fact that learners can use them anywhere-anytime. This infers that such tools are not limited to classrooms only but also provide learner with fair opportunities to use and practice as much as they can, based on their writing needs. The findings of Q3 further indicate that 82% of learners believed that "After continuous use of Grammarly, one day I will write polished English?" students were satisfied because Grammarly has highlighted the inaccuracy they resolved and fixed quickly, leading to the improvement in their writing. This entails that Grammarly helped them choose appropriate syntactic elements that fit well in the context that learners would not have known independently. This can be supported by the findings recorded by previous researchers that such tools like Grammarly facilitates students in several ways: collaborate with classmates and other peers and exchange feedback on each other's writing, ultimately leading to meaningful and interactive writing sessions (Krasnikov et al., 2018).

Notably, the vast majority of respondents have voiced that writeup produced by learners using Grammarly was more reliable and consistent and received lesser instructors' comments and rectification (see Q9). In addition, they also agreed that using such tools provides confidence and plays a key role in learners' writing improvements. As a result, they also indicated that they welcomed the institution's idea of implementing such tools for their academic writing.

Therefore, based on the overwhelming popularity of using the online tool for writing skills improvement, it may best be used to implement in the primary course teaching-learning curriculum. The results also reveal that the students show a strong desire to use Grammarly as it enables them to gain confidence, which results in developing good writing skills.

Moreover, most learners believe that using Grammarly can get immediate assistance with the content and immediate amelioration of errors based on the suggestions highlighted by Grammarly. The learners also opine that Grammarly is an intelligent language tool that is also used to place the right choice of lexicons, prepositions, articles, and subject-verb agreement. Furthermore, in response to Q.1, 'Do you agree that Grammarly enables the learner to write error-free English?', it is evident that Grammarly helps learners to write error-free content. Lastly, based on this study's overall results, it can be said firmly that Grammarly can be implemented in the EFL learning curriculum.

This work makes a significant contribution to the literature that it indicates the utility of Grammarly as a grammar proofreader in developing English writing skills in the Saudi Arabia context. Specifically, the results of items 1, 2, 3, and 6 (see table 2) revealed that students bear a positive bend of mind towards the use of Grammarly as a new writing tool due to its numerous feedback features like highlighting wrong spelling, punctuation, grammar and so on. This infers that students were satisfied with the features and services provided by Grammarly. The implications concluded from the findings of this work in the Saudi Arab context are listed below:

It is advised that university administrators and teachers pay careful attention to the items asked from students concerning Grammarly for better implementation in the main curriculum. Writing tool like Grammarly promotes collaborative learning between the students and teachers that significantly contribute to developing English writing skills.

Several students argued the vitality of Grammarly, specifically towards its 'ease of use' feature. Ease of use mainly refers to the 'anywhere-anytime' support feature, which especially enables students to practice more and more in English and complete the assignment even outside the formal classroom. The 'anywhere-anytime' feature will provide students with more opportunities to write and enhance their writing skills than in formal classroom situations. In this context, more practice will contribute to higher and enhanced learning. In order to avail of seamless and uninterrupted services of Grammarly, it is recommended that both instructors and learners must ensure compatible devices and high-speed internet connection to enjoy the services of Grammarly to the fullest. Notably, the topic we explored in this research is mainly considered from the perspectives of its utility, fitability, accessibility, and easy-to-use factors. Therefore, teachers and educational administrations in Saudi Arabia must pay careful attention to the items highlighted in this study for the optimal effectiveness of Grammarly in EFL classrooms. More specifically, encouraging students to use Grammarly will overall enhance students' writing skills.



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### 6. CONCLUSION

Before proposing or implementing technology for learning purposes, it is of high importance to determine the ultimate user (i.e., learner) perception towards it. Therefore, in this study, we have investigated EFL learners' perceptions of the role of Grammarly in writing English content. The results revealed that the learners are overall fully ready to use Grammarly for their writing tasks. The responses received against Q1 show significant results that learners are more excited due to its function of an anytime-anywhere writing facility helping students gain confidence. Consequently, EFL learners' English writing skills have noticeably improved, and the errors have also decreased. Further, learners also claimed that someday they would be able to write sophisticated English. In conclusion, based on the findings of the results, it can be noted that Grammarly plays a vital role in the development of writing skills.

### REFERENCES

- 1) Andersen, I. (2013). Mobile Apps for Learning English. A Review of 7 Complete English Course Apps: Characteristics, Similarities and Differences (Doctoral dissertation).
- 2) Breese, C., Jackson, A., & Prince, T. (1996). Promise in Impermanence: Children Writing with Unlimited Access to Word Processors. *International Journal of Adolescence and Youth*, 6(2), 129-160.
- 3) Clark, I. L., & Healy, D. (1996). Are Writing Centers Ethical? *WPA-LOGAN-*, 20(1/2), 32-48.
- 4) Darayani, N. A., Karyuatry, L. L., & Rizqan, M. D. A. (2018). Grammarly as a Tool to Improve Students' Writing Quality: Free Online Proofreader across the Boundaries. *Jurnal Sains Sosial dan Humaniora*, 2(1), 83-89.
- 5) Grabowski, B., McCarthy, M., & Koszalka, T. (1998). Web-based Instruction and Learning: Analysis and Needs Assessment. NASA Technical Publication 1998-206547. NASA Center for Aerospace Information, Hanover, MD.
- 6) Graham, S., & Harris, K. R. (2009). Almost 30 Years of Writing Research: Making Sense of It All with the Wrath of Khan. *Learning Disabilities Research & Practice*, 24(2), 58-68.
- 7) Henke, R. (1997). *Pastoral Transformations: Italian Tragicomedy and Shakespeare's Late Plays*. University of Delaware Press.
- 8) Hui, D., & Yinjuan, S. (2011). Self-directed English Vocabulary Learning with a Mobile Application in Everyday Context.
- 9) Isaac, S., & Michael, W. B. (1997). *Handbook in Research and Evaluation: A Collection of Principles, Methods, and Strategies Useful in the Planning, Design, and Evaluation of Studies in Education and the Behavioral Sciences* (3rd Ed.). San Diego: Educational and Industrial Testing Services.
- 10) Karyuatry, L., Rizqan, M. D. A., & Darayani, N. A. (2018). Grammarly As A Tool To Improve Students' Writing Quality: Free Online-Proofreader Across The Boundaries. *Jurnal Sains Sosial dan Humaniora*, 2(1), 83-89. 10.30595/jssh.v2i1.2297
- 11) Krasnikov, D., "Grammarly Opens New Kyiv Office as Demand Rises for Help with English," July 6, 2018 <<https://www.kyivpost.com/technology/grammarly-opens-new-kyiv-office-as-demand-rises-for-english-help.html?cn-reloaded=1>> retrieved on 20 September 2020.
- 12) Lam, F. S., & Pennington, M. C. (1995). The Computer vs. the Pen: A Comparative Study of Word Processing in a Hong Kong Secondary Classroom. *Computer Assisted Language Learning*, 8(1), 75-92.
- 13) McCarthy, M., & Grabowski, B. (1998). Web-based Instruction and Learning: Analysis and Needs Assessment Summary. Retrieved September 20, 2020 from the World Wide Web: [http://www.isoc.org/inet98/proceedings/4c/4c\\_1.html](http://www.isoc.org/inet98/proceedings/4c/4c_1.html)
- 14) Rahman, M. M. (2020). Undergraduate students' attitudes towards learning English: A case study at the college of Arabic language and social studies, Qassim University. *Asian EFL Journal*, 27(4.4). <https://repository.psau.edu.sa/jspui/retrieve/6c32b699-5c06-4e2f-8286-b2466f868127/EFL%204.pdf>. Retrieved on 21 February 2021.
- 15) Meyer, A. (2005). *Gateways to Academic Writing: Effective Sentences, Paragraphs, and Essays*.
- 16) Sokoholic, M. (2003). *Writing*. In D. Nunan (Ed.), *Practical English Language Teaching*. New York: McGraw-Hill.
- 17) Haque, S. I. (2022). Comparing Arab 'EFL Learners And Instructors' Perceptions Of Using Online Writing Tools During COVID-19. *Journal of Positive School Psychology*, 3228-3245.



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## The Effectiveness of the Joint Training Program of the Marine Corps of the Indonesian National Army Navy (TNI AL) with the United States Marine Corps (USMC)



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**ABSTRACT:** The objective of the Indonesian National Army Marine Corps (TNI AL) Marine Corps Joint Training Program with the United States Marine Corps (USMC) is to increase the professionalism of the soldiers involved in the training, strengthen the cooperative relations between the two countries in the field of defense and security as well as internally as a form of carrying out the duties of the Indonesian Navy in enhancing the diplomatic role of the Navy in order to support the foreign policy policies set by the government. In this study the authors formulate the problem regarding: how effective is the joint training program carried out by the Marine Corps of the Indonesian Navy and the USMC?; and what are the things that support and hinder the effectiveness of the joint training cooperation program carried out by the Marine Corps of the Indonesian Navy and USMC. By using qualitative research methods, the Joint Training Program of the Marine Corps of the Indonesian National Army Navy (TNI AL) of the Indonesian Navy and the United States Marine Corps (USMC) was photographed with the concept of program effectiveness according to S.P Siagian (2008), namely clarity of objectives to be achieved; Clarity of strategy for achieving goals; The process of analysis and formulation of policies; Careful planning; Preparation of the right program; Availability of facilities and infrastructure; Effective and efficient program implementation; Monitoring and control system. The findings in the field are in accordance with the concept of effectiveness according to S.P Siagian (2008) which describes 8 aspects of program effectiveness namely; Clarity of goals to be achieved; Clarity of strategy for achieving goals; The process of analysis and formulation of policies; Careful planning; Preparation of the right program; Availability of facilities and infrastructure; Effective and efficient program implementation; Monitoring and control system. Factors supporting the effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC are the support from the central management (Mabes TNI AL); there is a clear relationship between the objectives and the training plan; Adequate funding; there is a training needs assessment (TNA); support for applying skills and knowledge learned in on-the-job training; and the assessment of the impact of training on personnel performance. Meanwhile, the inhibiting factor for the effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC is the lack of English skills for members of the Marine Corps of the Indonesian Navy who carry out Joint Training tasks.

**KEYWORDS:** Program Effectiveness, Joint Training, Marine Corps, USMC

### INTRODUCTION

The quality of human resources is a very strategic issue because human quality will support success in carrying out work (Rustiana, 2010). Therefore, increasing the ability of human resources both from the aspect of knowledge and skills aspects needs to be carried out continuously, including the organization of the Indonesian National Armed Forces (TNI). The development of the Marine Corps Organization, which is part of the Indonesian Navy, has implications for the duties and responsibilities of the Marine Corps which are also getting bigger (Safi'i and Permana 2021). Efforts to realize the implementation of tasks so that they are efficient and effective certainly require capacity building that is planned, gradual, multilevel in a sustainable and integrated manner. This was also conveyed by Widodo (2014) who said one of the efforts to improve the quality of professionalism of TNI AL soldiers was through the implementation of training which was carried out in a programmed, gradual and sustainable manner. Supriyono (2020) also explains that training will provide an opportunity for TNI soldiers to develop new skills and abilities at work so that what is known and mastered now and in the future can help soldiers understand what should be done and why it should be done, providing opportunities to increase knowledge, expertise, while motivation will provide an opportunity for soldiers to

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channel their individual ego and strengthen the soldier's commitment to the company. In order to achieve reliable and respected Marine Defense Forces, it is necessary to be supported by the capabilities of TNI AL soldiers who are professionals in their fields. One of the efforts to improve the quality of the professionalism of TNI AL soldiers is through the implementation of training which is carried out in a programmed, gradual and sustainable manner

The Indonesian Navy is the main component of the National Defense System in maritime media. Based on Presidential Regulation Number 66 article 6 of 2019 concerning the Organizational Structure of the TNI and Law Number 34 article 9 of 2004 concerning the Indonesian National Armed Forces, the main duties of the Indonesian Navy are as follows; (1) Carry out the duties of the TNI in the field of defense; (2) Uphold the law and maintain security in the sea area under national jurisdiction in accordance with the provisions of national law and ratified international law; (3) Carry out naval diplomacy tasks in order to support the foreign policy policies set by the government; (4) Carry out the tasks of the TNI in the construction and expansion of maritime forces; and, (5) Carry out the empowerment of marine defense areas. In carrying out the tasks set out in point 2 above, namely enforcing the law and maintaining security in the maritime area of national jurisdiction in accordance with the provisions of national law and ratified international law, the TNI AL carries out the function of deterrence and the function of taking action against every form of threat in, from and by sea, both from abroad and from within the country which threatens the sovereignty, territorial integrity and safety of the nation. These two functions are implemented including in the form of deploying forces carrying out sea operations with a fleet of warships and maritime patrol aircraft (KASAL Decree Number KEP/1111/V/2018, TNI AL JALESVEVA JAYAMAHE Doctrine, 26).

In order to maintain and maintain the professionalism of marine matra soldiers, the Indonesian Navy carries out a systematic and regular training program. TNI AL training is carried out in the form of internal TNI AL training, joint training with other dimensions, as well as joint training with other countries. Joint exercises with other countries include joint exercises between the Indonesian Navy Marine Corps and the United States Marines Corps (USMC). The joint exercise has quantitative and qualitative training targets (Decree of the TNI Commander Number KEP/986/XII/2014, Handbook for the Implementation of the TNI Joint Exercise). In the quantitative target, there are three main objectives, namely first, the achievement of all planned joint training programs and joint training. The aim of the program is to create dynamic relations between countries that reflect friendship, harmony, equality and mutual benefit. Second, the implementation of all training material in each training activity in accordance with the training plan. The training material is the main thing that contains various content of expertise to be taught to participants in the joint training program for both the Indonesian Navy and USMC. Third, meeting the needs of personnel, material, and logistical support for each training activity. This last point certainly needs to be of concern to the leadership as long as soldiers from the two countries are carrying out joint exercises. Therefore, the Indonesian Navy pays close attention to certain standards and qualifications as a form of seriousness towards the work program in joint training between the two countries.

In addition, this joint training program has a qualitative objective. This goal focuses on realizing the understanding and ability of the trainees in testing the training material. Then the next goal is to realize the ability of the trainees to apply the material to the dynamics of the exercise. At this stage the application process is not always smooth, in general the language barrier is a determining factor in the absorption of the material, so that understanding of the material will determine the implementation of the material at the training stage. Finally, to realize the spirit of integration among the training participants through the alignment of vision, perception and interpretation of training material in the implementation of the training. Based on the data the researchers obtained from the Operations Staff of the Marine Corps, the training material which became a joint training program for the Indonesian Navy and USMC Marine Corps, joint exercises carried out by the Indonesian Navy and USMC Marine Corps have been established for a long time since the last twenty years (Staff Marine Corps Operations, Marine Corps joint training material data with USMC until 2019).

Every year, both parties, namely the Marine Corps of the Indonesian Navy and the USMC have sent a number of envoys with different numbers of personnel, but one can see in them the development of the type of training that adapts to the needs of the times . At least 14 types of exercises have been carried out in the period up to 2019. Some of them are the Rim of Pacific Multilateral Exercise (RIMPAC); Cooperation Afloat Readiness and Training (CARAT); Marine Exercise (MAREX); Platoon Exchange (PLATEX); Intelligence Preparation of the Battlefield (IPB), Landing Support Element (LSE); Fire Support Coordination Center (FSCC); Embarkation (EMB); Non-Combatant Evacuation Operation (NEO); Rapid Response Planning Process (R2P2); Fire Support Coordination Center (FSCC); Marine Tactical Warfare Simulation System (MTWS), and; Military Decision-Making Process (MDMP). To support the quality of the joint training program, the Indonesian Navy and USMC hold regular meetings as an effort to strengthen communication between the two countries in the military field, especially marines, some of which include the Marine Engagement Meeting (MEM), Subject Matter Expert Exchange (SMEE), Pacific Amphibious Leader Symposium (PALS).

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In the joint exercise between the Marine Corps of the Indonesian Navy and the USMC, the objectives to be achieved by the two countries are to increase the professionalism of the soldiers involved in the training, to strengthen the cooperative relations between the two countries in the field of defense and security as well as internally as a form of carrying out the duties of the Indonesian Navy in increasing the role of diplomacy. TNI AL to support foreign policy policies set by the government. The implementation of joint exercises between the Marine Corps of the Indonesian Navy and the USMC involves personnel and materials belonging to the Marine Corps. In the field of personnel, Marine Corps soldiers who take part in the training are carried out alternately from various units in the Marine Corps with backgrounds of different specifications according to the training material being carried out. The entire training material carried out in the field with the concept of integrating Marine Corps soldiers of the Indonesian Navy and USMC soldiers. This integration activity is one of the appropriate diplomatic ways so that each soldier can exchange knowledge and experience. Among national powers (diplomacy, information, military, economy, and various industrial sectors), the military is often seen as a last resort (when all resources are no longer viable). However, military power actually becomes a key player in building strength between countries through military-to-military relations (including bilateral exercises). The Indonesian Navy is an integral part of the TNI, realizing its role as one of the key actors in building interstate power with its military diplomacy. Therefore, in every joint activity, the strength of the soldiers and the capabilities of the soldiers determine the smooth running of diplomacy. The diplomatic ability of each Marine Corps soldier is highly dependent on the English language ability of each individual. With different educational backgrounds, most Marine Corps soldiers experience difficulties in communicating so that the diplomacy that has been established has not worked as expected. To overcome this problem, it is necessary to provide English to soldiers who are prepared to take part in joint training. Meanwhile, in the use of materials, joint exercises between the Marine Corps and USMC use combat materials for USMC units and existing Marine Corps units of the Indonesian Navy in accordance with the training materials carried out in the field.

Field rehearsals applied by Marine Corps personnel of the Indonesian Navy and USMC personnel were carried out in accordance with the exercise plan. The background of different units and different countries of origin, in general, has a significant influence on the tactics, techniques and procedures used in carrying out practical exercises. Existing differences often appear to be obstacles when implementing material in the field. In response to these conditions, it is necessary to equalize the concept and synchronize the standard operating procedures and procedures (SOP) agreed upon between the Indonesian Navy Marine Corps and the USMC. The description above provides an overview of how important joint exercises are carried out as part of the military diplomacy efforts of the two countries involved. However, there is still much to be prepared by the two countries in their involvement in joint exercises. Joint exercises are seen as an appropriate means of improving the quality of soldiers, strengthening bilateral relations, and as an applicable form of military diplomacy. The technical and non-technical constraints above will affect various aspects of the exercise, from upstream to downstream processes. Therefore the research entitled "Effectiveness of the Indonesian Navy Marine Corps Joint Training Program with the United States Marine Corps (USMC)" explores various sources of problems from upstream to downstream in the joint training process in order to obtain a strategy for developing cooperation between the Indonesian Navy and USMC in joint exercises. The results of the study This research is expected to be applicable research to become a reference for the development of various types of exercises involving foreign countries.

### **RESEARCH METHOD**

This study used qualitative research methods. According to Creswell (2014) qualitative research is a method for exploring and understanding the meaning of discussing social or humanitarian problems from a number of individuals or groups of people. Furthermore, Sugiyono in Zamroni et al (2019), explained that qualitative research is a research method based on the philosophy of postpositivism, used to research on natural object conditions, where researchers are the key instrument, data collection techniques are carried out by triangulation (combined), data analysis is inductive or qualitative, and the results of qualitative research emphasize meaning rather than generalization. Creswell (2014) in his book entitled "Qualitative Inquiry And Research Design" reveals five qualitative research traditions, namely: biography, phenomenology, grounded theory, case studies and ethnography. This research uses case studies in an effort to understand the effectiveness of the Indonesian Navy's Marine Corps Joint Training Program with the United States Marine Corps (USMC). An in-depth case study is research conducted on a case with high uniqueness. The focus of research is on the case itself, both in terms of location, program, event or activity

The data analysis technique used in this qualitative research is clear, namely by using qualitative analysis techniques, whereby data collection, observation, interviews and data conclusions are drawn. The model in data collection used in this study is the Miles and Huberman model. Data analysis uses several steps according to the theory of Miles, Huberman and Saldana (2014), namely analyzing data in three steps: data condensation, presenting data (data display), and drawing conclusions or verification

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(conclusion drawing and verification). Data condensation refers to the process of selecting, focusing, simplifying, abstracting, and transforming data.

### **RESULTS AND DISCUSSION**

According to Sondang P. Siagian, effectiveness is the use of resources, facilities and infrastructure in a certain amount that is consciously determined beforehand to produce a number of goods for the services of the activities it carries out. Effectiveness shows success in terms of whether or not the goals set have been achieved. If the results of the activity are getting closer to the target, it means the higher the effectiveness. The opinion expressed by Hidayat (1986) explained that "Effectiveness is a measure that states how far the target (quantity, quality and time) has been achieved. The greater the percentage of targets achieved, the higher the effectiveness. This concept is one of the factors to determine whether it is necessary to make significant changes to the form and management of the organization or not. In this case, effectiveness is the achievement of organizational goals through the efficient use of available resources, in terms of input, process and output. Resources include the availability of personnel, facilities and infrastructure as well as the methods and models used.

An activity is said to be efficient if it is carried out correctly in accordance with the available resources while it is said to be effective if the activity is carried out correctly according to the procedure and produces the results as determined. The concept of effectiveness that is carried out in this joint exercise refers to Confidence Building Measures (CBM). The purpose of Latma with CBM principles is actually carried out to build good relations between countries and other countries, especially to eliminate misperceptions between countries or reduce tensions by means of mutual openness in state policies, transparency in the development of capabilities and military capabilities. Referring to the concept of effectiveness carried out in this study which means the correct use of resources to support objectives, the Marine Corps of the Indonesian Navy is aware of various deficiencies in terms of personnel, administrative systems, to equipment and weapons, but is still able to make adjustments to achieve the desired training results. in the form of mastery of basic training material, field practice, and strategy implementation. All of these things are not much different from the initial goals, so that it can be called compatibility between targets and goals to become effective results.

The following are the results of research and discussion in accordance with the theory of the effectiveness of the Indonesian Navy's Joint Marine Corps Training Program with the United States Marine Corps (USMC) according to Sondang P Siagian :

#### **1. Clarity of Purpose**

Clarity of objectives is the first key in achieving program effectiveness. The concept of the joint exercise which is used as a guide in the implementation of joint exercises with the Marine Corps of the Indonesian Navy and USMC refers to the guidebook for implementing joint TNI exercises which was ratified by the decision of the TNI Commander Number KEP/986/XII/2014 dated 18 December 2014.

- a. Definition of Joint Exercise. Joint training (Latma) is a form of joint training carried out by involving one dimension of the TNI (AD, AL, AU) together with one dimension of another country.
- b. Principles of Joint Exercise. In carrying out joint exercises, the principles that must be considered are as follows: 1) Prioritizing national interests, 2) Prioritizing aspects of national defense, 3) Beneficial for the TNI and national defense, 4) In accordance with applicable laws and regulations, 5) Mutual benefit and pay attention to equality relationship.

The main objective of the Indonesian Navy and USMC Marine Corps Joint Exercise is to prioritize national interests and prioritize the principles of national defense. Based on the 2014 Indonesian Defense White Paper, what is meant by the national interest is maintaining the upholding of the Unitary State of the Republic of Indonesia based on Pancasila and the 1945 Constitution and ensuring the smooth running of national development in order to realize national goals. The national interest is realized by taking into account three main principles. First, the order of life for the people, nation and state of Indonesia based on Pancasila and the 1945 Constitution. Second, efforts to achieve national goals are carried out through national development that is sustainable, environmentally sound and national resilience based on an archipelago insight. Third, the means used are all national potentials and strengths that are utilized in a comprehensive and integrated manner. The continued upholding of the Unitary State of the Republic of Indonesia based on Pancasila and the 1945 Constitution is Indonesia's national interest which is permanent and valid for all time. The meaning of permanent national interests is to maintain state sovereignty and maintain the territorial integrity of the Unitary State of the Republic of Indonesia by not allowing every inch of the homeland to be controlled and scattered by any party. One of the goals of the joint training program between the Marine Corps of the Indonesian Navy and the United States Marine Corps (USMC) is to create a dynamic relationship between countries that reflects friendship, harmony, equality and mutual benefit to the national interests of the two countries, Indonesia and the United States. The concept of national interest that has

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been described above, in this study is used as a basis for looking further at the goals to be achieved in the cooperative relationship carried out by the Marine Corps of the Indonesian Navy and USCM.

### **2. Clarity of Strategy to Achieve Goals**

The Joint Training Program between the Marine Corps of the Indonesian Navy and the United States Marine Corps (USMC) has a strategy and principles that serve as guidelines as follows: 1) Objective. Every implementation of joint training must have clear goals or objectives, so as not to cause doubts in the achievement of the main tasks; 2) Unity of Command and Control. All joint training activities carried out are under one command or person in charge of a designated state institution in accordance with applicable regulations; 3) Proportional. That the TNI's forces, weapons, and equipment deployed in the implementation of the joint exercises are carried out commensurately, not excessively, have clear standard operating procedures, and are prevented from acting outside the bounds of reasonableness; 4) Security. In every training exercise, safety factors and actions must always be taken into account without neglecting the realism and expected training achievements and results; 5) Legitimacy. Implementation of joint exercises carried out by the TNI and armed forces of friendly countries based on agreements between countries that are dimension or joint in nature in accordance with cooperation agreements; 6) Integration. There is a common perception and proper coordination in the implementation of the exercise so as to achieve a balanced training objective; 7) Diplomacy. Exercise must be utilized as a means of diplomacy in enhancing international cooperation; 8) Professional. Training must be able to provide and equip individual and unit skills in accordance with skill standards to support their duties and responsibilities; 9) Simple. The training is carried out by taking into account the effectiveness and efficiency of the support provided without compromising the demands of the specified training results; 10) Equality. The existence of an equal position between the TNI and the armed forces of the relevant countries in carrying out joint exercises.

### **3. Policy Analysis and Formulation Process**

The policy in question is all written and unwritten rules and guidelines with how policies and regulations from the TNI AL Headquarters (Mabes) have implications for the programs being implemented. The policy is based on several documents which form the basis for the joint training of the Marine Corps of the Indonesian Navy and the USMC, including the Indonesian Armed Forces Implementation Manual on joint exercises which was ratified by the decision of the TNI Commander Number KEP/986/XII/2014 dated 18 December 2014, Law Number 34 of 2004 regarding the Indonesian National Armed Forces, and the Decree of the TNI Commander Number Kep/2/1/2007 dated 12 January 2007 concerning the Tri Dharma Eka Karma (Tridek) Indonesian National Armed Forces Doctrine. For diplomatic relations, refer to Republic of Indonesia Law Number 37 of 1999 dated 14 September 1999 concerning Foreign Relations, Republic of Indonesia Law Number 24 of 2000 dated October 23 2000 concerning international agreements. Among the various written norms, there are unwritten norms which are like a mutually agreed upon consensus, namely many who think the same thing that the involvement of the military forces of the two countries in a joint exercise carries various kinds of agendas so that in one collaboration, many things can be achieved, starting from strengthening diplomatic relations, transfer of knowledge, expertise and technology, as well as war strategy for each soldier involved in it.

### **4. Careful Planning**

Careful planning referred to in this sub-chapter is personnel planning in the capacity to increase human resources. The issue of increasing human resource capacity has become a common topic that is the focus of an agency or organization anywhere in the world. The arrangement of human resource management in each type of organization certainly has a different character and method. The most common concept in line with what was expressed by B. H Liddle Hart about strategy is about making quality improvement end goals (goals), the Marine Corps means (as HR) by conducting training and education with America as a way (ways).

### **5. Proper Programming**

The concept of the joint exercise which is used as a guide in the implementation of joint exercises with the Marine Corps of the Indonesian Navy and USMC refers to the guidebook for implementing joint TNI exercises which was ratified by the decision of the TNI Commander Number KEP/986/XII/2014 dated 18 December 2014. Joint training (Latma) is a form of joint training carried out by involving one dimension of the TNI (AD, AL, AU) together with one dimension of another country. In carrying out joint exercises, the principles that must be considered are as follows; (1) Prioritizing the national interest; (2) Prioritizing aspects of national

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defense; (3) Beneficial for the TNI and national defense; (4) In accordance with the applicable laws and regulations; (5) Mutual benefit and attention to equality relations.

### **6. Availability of work facilities and infrastructure**

What is meant by work facilities and infrastructure are all kinds of support that has been given to make the Joint Training Program successful between the Marine Corps of the Indonesian Navy and the USMC. The support includes; a. Central Management Support (Mabes TNI AL). Very important for TNI AL Headquarters in the provision of budget, optimal utilization of Latma budget, the attitude of top management towards Latma, how often soldiers attend Latma, the percentage of soldiers with good access to the Internet, organizational efforts in exploring opportunities for Latma in the future, and the impact that felt from training. So far, the soldiers involved in the field as Latma participants feel that the support from the central management is considered good, but in order to improve the quality of the training itself the resources formed must be in accordance with the inputs included, which can be in the form of budgets, weapons support, training materials, trainers, and various other supports; b. Clarity of relationship between objectives and training plan. Based on the data obtained from all informants, it can be concluded that so far the Indonesian Navy has prepared a training plan with internal and external coordination with the USMC. The outline of Latma's planning is reflected in the achievement of good joint training, improving the skills of soldiers from the two countries, mastering new warfare techniques, mastering knowledge of modern weapons, and fostering diplomatic relations between the two countries. This goal as an outcome or output of joint training is good, but in the future Latma objectives must be prepared based on the urgency of the strategic issue which is assumed to be overcome by updating skills through joint training. Must make an orientation to increase readiness for combat with various new methods, various types of threats, battlefields, and modern combat technology; c. Adequate funding. This section fully belongs to planning at the central government level, namely the preparation of the state budget. State expenditure for the TNI, especially human development, is still not an allocation that is sufficiently considered, bearing in mind the large number of state expenditure items so that in the joint training funding model whose sources still depend on the state budget, it is necessary to carry out proportional budget planning; d. Support to apply skills and knowledge learned in on the job training. TNI AL Headquarters and the implementing units under it, including Kormar, Pasmara, and Battalions, need to make the organization the best constructive place for its personnel to apply their expertise. However, the most obvious impact of various training programs for the Marine Corps is an increase in individual capacity. However, the new capacity that has been built will be meaningless without the support of a constructive office space. This will help the organization to be more productive and progressive, because the skills and knowledge of personnel is a measure of the success of an activity program.

### **7. Effective and Efficient Implementation**

Indonesia and the United States have developed cooperation since around 1950, one of which is in the field of defense. Defense cooperation between Indonesia and America continues to develop and a lot of military equipment, such as combat aircraft and weapons, is obtained by Indonesia from America. However, some time after that trade relations in the defense sector experienced an embargo. This has had an impact on defense cooperation in other sectors, for example a reduction in aid from America, to the extent that it has had an impact on Indonesia's ability to obtain spare parts for F-16 fighter aircraft. Apart from that, defense cooperation in the field of military training has also been discontinued, so that Indonesia can no longer send its officers to study or train in America. Bilateral relations which had not gone well at that time had an impact on the decline in the strength and capability of the Indonesian military. To overcome the decline in defense diplomacy, several efforts have been made by normalizing bilateral relations between Indonesia and America or by continuing to buy defense equipment. The defense cooperation between the two countries continued to increase in the field of education and training or known as IMET (International Military Education Training) and began to reopen several military training partnerships such as the 'Garuda Shield' in 2006. The difficult period of defense diplomacy faced by Indonesia continues, during the Indonesian military personnel who are sent to America, whether to undergo education, military training, courses, and so on, must undergo a vetting process, namely a law issued by the congress in America over its objection to reopening the Indonesian embargo.

### **8. Supervision and Control System**

TNI AL Headquarters monitors and evaluates the achievements that have been formulated in the Joint Training Program between the Indonesian Navy Marine Corps and USMC. In general, this joint training program can strengthen bilateral relations through military diplomacy. This is also a form of implementation of naval diplomacy. Institutionally, to the regulator and operator groups, to consider carrying out this type of defense cooperation, in this case, military training cooperation between the Marine Corps

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and USMC, to pay attention to aspects of readiness for domestic coordination first. Some of what can be done is to involve supporting civil agencies, for example the involvement of the ministry of foreign affairs, customs, and other appropriate agencies to support smooth administration. Wanbangopstik Headquarters is expected to be able to facilitate one of the materials obtained from Latma activities. The main thing that is most important is paying attention to strengthening diplomacy, because seeing the increasingly uncertain geopolitical developments in the world, it must be accompanied by increasing the professionalism of soldiers by means of developing defense equipment to support the demands of future operational needs.

If the worst-case scenario for cooperation between Indonesia and the USMC does not continue in the next five years, the Indonesian Navy needs to see other potential, for example strengthening diplomacy by sending reliable diplomats to lobby developed countries other than America to get mutually beneficial cooperation between both sides. The Republic of Indonesia has many qualified scientists, academics, practitioners to become partners in collaborative training, education, and training programs for soldiers. In addition, utilizing domestic resources will minimize costs, but can expand choices, for example to deal with disruptions in training technology, the most crucial of which are those related to high technology. This will be relevant to the asymmetric warfare model with a broad spectrum that relies heavily on technology. Group users can take advantage of training opportunities as a platform and reference for developing tactics, techniques and operational procedures within Kormar. An important part of increasing the capabilities of Marine Corps personnel is increasing individual and collective abilities. In the process of increasing capability, the process of material input, process, and output is determined by the ability to properly accept training material so that it has an impact on soldiers themselves. Awareness of the cognitive, psychological, and spiritual aspects is shown by the awareness of soldiers carrying out orders according to instructions. Psychological aspects can be shown by processing emotions, moods and feelings that do not interfere with daily work. This training is useful for increasing focus because it tests participants to be able to separate personal problems from professional problems.

One of the main measuring levels of program success lies in the performance of personnel shown in the office. If the personnel who receive training do not show differences in performance, then it is better to do a post-training evaluation. This is useful to find out how long the impact of training can last on Marine soldiers and encourage better performance. TNI AL Headquarters as the main regulator in the TNI AL body needs to really review the suitability of the planning and achievement of the objectives of the training. The program's effectiveness is not only due to the success of field training, but also to support self-actualization and the use of skills for soldiers in the right work environment, using the principle of the right man in the right place.

### **Supporting and Inhibiting Factors for the Effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC**

#### **1. Factors Supporting the Effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC**

The supporting factors for the Effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC include.

First, central management support (Mabes TNI AL). Very important for TNI AL Headquarters in the provision of budget, optimal utilization of Latma budget, the attitude of top management towards Latma, how often soldiers attend Latma, the percentage of soldiers with good access to the Internet, organizational efforts in exploring opportunities for Latma in the future, and the impact that felt from training. So far, the soldiers involved in the field as Latma participants feel that the support from the central management is considered good, but in order to improve the quality of the training itself the resources formed must be in accordance with the inputs included, which can be in the form of budgets, weapons support, training materials, , trainers, and various other supports.

Second, the clarity of the relationship between the objectives and the training plan. Based on the data obtained from all informants, it can be concluded that so far the Indonesian Navy has prepared a training plan with internal and external coordination with the USMC. The outline of Latma's planning is reflected in the achievement of good joint training, improving the skills of soldiers from the two countries, mastering new warfare techniques, mastering knowledge of modern weapons, and fostering diplomatic relations between the two countries. This goal as an outcome or output of joint training is good, but in the future Latma objectives must be prepared based on the urgency of the strategic issue which is assumed to be overcome by updating skills through joint training. Must create an orientation to increase readiness for combat with various new methods, various types of threats, battlefields, and modern combat technology.

Third, Adequate Funding. This section fully belongs to planning at the central government level, namely the preparation of the state budget. State expenditure for the TNI, especially human development, is still not an allocation that is sufficiently



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considered, bearing in mind the large number of state expenditure items so that in the joint training funding model whose sources still depend on the state budget, it is necessary to carry out proportional budget planning.

Fourth, there is a training needs assessment (TNA). There are three steps of assessment or assessment that can be carried out in measuring the effectiveness of the implemented program by identifying based on organizational needs (Organizational Based Need Analysis), identifying based on basic job needs (Job Competencies Based Need Analysis), and identifying based on personal competence (Person Competencies Based Analysis). In this case, the TNI AL is not yet clear about providing an assessment which is aimed at choosing what kind of needs. So that in the end, in the absence of a Key Indicator, the evaluation is limited to the general idea that the training went well or not, and whether the material was appropriate or not. Key Indicators are basically made to measure standard achievements, these achievements must be made clear and not confusing or ambiguous. Basically, further modification of key indicators can be separated into three segments, namely process indicators, progress indicators, and target indicators. Process indicators are used to check the achievement of minimum standards. A progress indicator is a tool that provides measurement of key indicator units for monitoring achievement standards. Finally, the more specific target indicators examine which targets are below standard, and determine special handling immediately, because a lack of targets will endanger the program as a whole.

Fifth, Support to apply the skills and knowledge learned in training in the workplace. TNI AL Headquarters and the implementing units under it, including Kormar, Pasmars, and Battalions, need to make the organization the best constructive place for its personnel to apply their expertise. However, the most obvious impact of various training programs for the Marine Corps is an increase in individual capacity. However, the new capacity that has been built will be meaningless without the support of constructive office space. This will help the organization to be more productive and progressive, because the skills and knowledge of personnel is a measure of the success of an activity program.

Sixth, there is an assessment of the impact of training on personnel performance. Measuring the success of the main program lies in the performance of personnel shown in the office. If the personnel who receive training do not show differences in performance, then it is better to do a post-training evaluation. This is useful to find out how long the impact of training can last on Marine soldiers and encourage better performance.

### **2. Factors Inhibiting the Effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC**

One of the factors inhibiting the effectiveness of the Joint Training Program between the Indonesian Navy Marine Corps and USMC is the lack of English skills, as an international language, in bridging communication between members of the Marine Corps and USMC members, so there are obstacles in carrying out the Joint Exercise task.

## **CONCLUSION**

1. That the defense cooperation strategy in the form of joint military exercises has an impact on three things, namely diplomacy, increasing the capacity of Marine soldiers, and the quality of the training itself.
2. All findings in the field are in accordance with the concept of effectiveness according to S.P Siagian (2008) which explains in 8 aspects namely; Clarity of goals to be achieved; Clarity of strategy for achieving goals; The process of analysis and formulation of policies; Careful planning; Preparation of the right program; Availability of facilities and infrastructure; Effective and efficient program implementation; Monitoring and control system
3. The joint training program in general has had an impact on the diplomatic relations between the United States and Indonesia. The changes that have taken place are the increasing types of international cooperation ranging from military training, soldier exchanges for educational purposes, courses, and various types of assistance. Currently, the Marine Corps and USMC training programs are expected to continue for at least the next five years. As for various bureaucratic and technical obstacles, this can be done by involving various related parties, for example the immigration as an agency that knows the technical and detailed administrative requirements for the arrival of foreigners to Indonesia with various backgrounds and objectives.
4. Analysis of the condition of the Marine Corps soldiers can be classified into four quadrants, namely quadrant one for individual achievement with internal orientation, quadrant two for individual achievement with external orientation, quadrant three for collective achievement with internal orientation, and quadrant four for collective achievement with external orientation. These quadrants can help the Indonesian Navy evaluate the success of the program to increase the capacity of Marine Corps soldiers participating in joint training with the USMC.
5. Factors supporting the effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and the USMC are the support from the central management (Mabes TNI AL); there is a clear relationship between the objectives and

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the training plan; Adequate funding; there is a training needs assessment (TNA); support for applying skills and knowledge learned in on-the-job training; and the assessment of the impact of training on personnel performance.

6. While the inhibiting factor for the effectiveness of the Joint Training Program between the Marine Corps of the Indonesian Navy and USMC is the lack of English skills for members of the Marine Corps of the Indonesian Navy who carry out Joint Training tasks.

### REFERENCES

- 1) Administrator of Kent State University. Statistical & Qualitative Data Analysis Software: About Nvivo. <https://libguides.library.kent.edu/statconsulting/NVivo>.
- 2) Ouch, Phillip. January 31, 2016. Perfecting the art of qualitative coding <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/resources/blog/perfecting-the-art-of-qualitative-coding> accessed on the 22nd march 2020.
- 3) Great, Kurniawan. Public Service Transformation. Yogyakarta: Renewal. 2005.
- 4) Bandur, Augustine. Qualitative Research: Methodology, Design, and Data Analysis Techniques with NVIVO 11 Plus. Jakarta: Media Discourse Partners. 2016.
- 5) Bandur, Augustine. Qualitative Research Multi-Disciplined Studies with NVivo 12 Plus. Jakarta: Media Discourse Partners. 2019.
- 6) Indonesian Defense White Paper, Indonesian Ministry of Defence. Jakarta: Ministry of Defence. 2015.
- 7) Burger, Stuart. 2015. An Overview of the Soft Systems Methodology. Systems Thinking: Approaches and Methodologies.
- 8) Carl von Clausewitz. On War. 1976.
- 9) Chakraborti. Contemporary Relevance Of Kautilya's Mandala Theory And Diplomacy. Journal of Politicia Vol.5, No.2. (2016:3). Department of International Relations Jadapur University. 2016.
- 10) Collins, M., John. Military Strategy Principles, Practices, and Historical Perspectives. USA: Potomac Books. Inc. 2002.
- 11) Creswell, John W. Research Design: Qualitative, Quantitative, and Mixed Approaches. Jakarta: Youth Libraries. 2016.
- 12) Dougherty, J. E., & Pfaltzgraff, R. L. Contending Theories of International Relations: A Comprehensive Survey (4th Edition ed.). New York: Ed Addison Wesley Longman. 1997.
- 13) Fawaati, Synthia, et al. Indonesian Defense Diplomacy On The Cooperation Between Indonesian Ministry Of Defense Of The Republic Of Indonesia And United States Defense Institutional Reform Initiatives. Journal of International Relations Vol 1, No 1. 2018
- 14) Georgopolous, & Tannenbaum. Organizational Effectiveness. Jakarta: Erlangga. 1985.
- 15) Ginanjar, Kartasasmita. Poverty. Jakarta: Balai Pustaka. 1997.
- 16) Handyaningrat, Soewarno. Introduction to Administration and Management Studies. Jakarta: Mount Agung. 2006.
- 17) Hardjosoekarto, Sudarsono. Soft Systems Methodology (Soft Systems All-round Method). Jakarta: UI-Press. 2012.
- 18) Herdiansyah, Haris. 2010. Qualitative Research Methodology for the Social Sciences. Jakarta: Salemba Humanika.
- 19) Hidayat. Basic Concepts of Productivity and Interpretation of Results. New York: Prisma. 1986.
- 20) Holsti, K.J. International Politics: A Framework for Analysis. School of History, Philosophy, Political science and International Relations at the Victoria University of Wellington. 1969. <https://marinir.tnial.mil.id/history.php>. Accessed on April 4 2020 at 04.19 WIB.
- 21) Irawan, Prasetya. Qualitative Research. [http://web-suplemen.ut.ac.id/mapu5103/sub1\\_2.htm](http://web-suplemen.ut.ac.id/mapu5103/sub1_2.htm)
- 22) Indonesia Dictionary. <https://kbbi.web.id/strategi>.
- 23) Kaplan, Mark Allan. Toward an Integral Cinema: The Application of Integral Theory to Cinematic Theory and Practice. Journal of Integral Theory and Practice—Vol. 5, No. 4. 2010
- 24) Decision of Chief of Staff Number KEP/1111/V/2018. TNI AL JALESVEVA JAYAMAHE Doctrine. Jakarta: Indonesian Navy Headquarters. 2018.
- 25) Decision of the TNI Commander Number KEP/986/XII/2014. Handbook for Joint Training of the Indonesian Armed Forces. Jakarta: TNI Headquarters. 2014.
- 26) Lexy J, Moleong. Qualitative Research Methodology. Bandung: Rosdakarya Youth. 2005.
- 27) Presidential Regulation Number 66 article 6 of 2019. Concerning the Organizational Structure of the TNI. Jakarta, Indonesia. 2019.

## The Effectiveness of the Joint Training Program of the Marine Corps of the Indonesian National Army Navy (TNI AL) with the United States Marine Corps (USMC)

- 28) Daugther, Arum Sutrisnii. International Cooperation: Definition, Reasons, and Purpose. Wednesday, 18 December 2019. <https://www.kompas.com/skola/read/2019/12/18/170000569/kerja-sama-internasional-pengertian-alasan-dan-purpose?page=all>
- 29) Rehman, Atiq Ur, et al. Measuring Training Effectiveness: A Case Study Of Public Sector Project Management In Pakistan. *Journal of Diversity Management*. Volume 6, Number 1. 2011.
- 30) Riadi, Muchlisin. Definition, Purpose, Functions and Benefits of SOP. Retrieved on October 4, 2016 <https://www.kajianpustaka.com/2016/10/pengertian-purpose-fungsi-dan-benefit-sop.html>
- 31) Ricardianto, Prasadja. et al. Soft System Methodology (SSM) on Airport Development in West Sulawesi Province. *Journal of Transportation & Logistics Management - Vol. 04 No. 02*. 2017.
- 32) Riduwan. Thesis Compiling Methods and Techniques. Bandung: Alfabet. 2014.
- 33) Rustiana, A. (2015). Effectiveness of Training for Improving Employee Performance" in *JDM (Journal of Management Dynamics)*, 1(2). doi:<https://doi.org/10.15294/jdm.v1i2.2469>
- 34) Safi'i, I., M. and Permana, M. F. S. (2021) with the title "The Effect of Pre-assignment Training for Operations Staff at TNI Headquarters with Kormar Operations Staff on the Effectiveness of Task Force on Outer Islands". This research was published in the *Dirgantara Management Journal*. Vol 14 No 2. <https://doi.org/10.56521/manajemen-dirgantara.v14i2.274>
- 35) Satow, Sir Ernest. *A Guide to Diplomatic Practice*, Edited by Sir Neville Bland. 1961.
- 36) Seong Sun Kim. Dong Whan Oh. Hyun JungJo. Chaesin Chu. Introduction of the Republic of Korea-United States of America's Joint Exercise Against Biothreats in 2013: Able Response 13. Open Access article. 2013. Accessed on March 25 2020, 12.40 WIB., From <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3845232/>.
- 37) Sofyan, Y., Sudarya, A., Lasmono.L., 2020. The Effect of Simulator and Competency Training on the Performance of Air Wing Flight Officers 1, Halim Perdanakusuma Indonesian Air Force Base, Jakarta. *Air Defense Strategy*. Vol. 4, No. 3. DOI: <https://doi.org/10.33172/jspu.v4i3.338>
- 38) Simanjuntak, Shara Yosevina. Analysis of Bilateral Cooperation between Indonesia and Australia in Combating Terrorism as Organized Transnational Crime. *Journal of International Relations of Diponegoro University* Vol. 2(3). 2016.
- 39) Marine Corps Operations Staff. *Joint Training Data of the Marine Corps with USMC 2019*. Jakarta, Indonesia. 2019.
- 40) Steers, Richard. *Organizational Effectiveness Rules of Conduct (Magdalena Interpretation)*. Jakarta: Erlangga. 1985.
- 41) Supriyono. S. (2020) with the title "The Influence of Training and Empowerment Through Work Motivation on the Performance of TNI Soldiers at the Army Polytechnic". This research is published in the *Journal of Economics and Management*. Vol. 21 No. 2
- 42) Law Number 34 article 9 of 2004. Indonesian National Armed Forces. Jakarta. Indonesia. 2004.
- 43) Wagner, Holger Michael. *An Approaching And Framework To Synchronize Joint Exercises And Training With Military Operations*. Thesis of National Defense University Joint Forces Staff College Joint Advanced Warfighting School. 2014.
- 44) Widodo, W. (2014) with the title "Optimizing the Implementation of Training to Improve the Combat Capabilities of TNI AL Soldiers in the Context of Supporting the Implementation of the Main Tasks of the Indonesian Fleet Command in the Eastern Region (Studies in the Amphibious Ship Unit)". Research published in the *Journal of National Resilience*, 20(3), 43-63. /\*doi:<http://dx.doi.org/10.22146/jkn.6794>\*/
- 45) Presidential Regulation Number 66 Article 6 of 2019, TNI Organizational Structure
- 46) Decree of Chief of Staff Number KEP/1111/V/2018, Doctrine of TNI AL JALESVEVA JAYAMAHE
- 47) Decision of the TNI Commander Number KEP/986/XII/2014, Handbook for the Implementation of Joint TNI Training



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## Influence of Underfunding and Poor Management on Accreditation of Business Education Programmes in Public Universities and Colleges of Education



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**ABSTRACT:** The study on influence of underfunding and poor management on the accreditation of business education programmes in public universities and colleges of education in South East, Nigeria was necessitated by the need to ensure that the programmes meet the minimum academic standards in order to achieve its objectives. Two research questions and two null hypotheses guided the study. Descriptive survey research design was adopted and area of the study was delimited to South-East, Nigeria. The population consisted of 197 business educators in 13 federal and state universities and colleges of education in South-East, Nigeria. No sample and sampling techniques was adopted because the population size is manageable for the researchers. The instrument was validated by four experts. Cronbach alpha was used to determine the internal consistency of the instrument, and an overall reliability coefficient of 0.90 was obtained. The t-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that under-funding and poor management affected accreditation of business education programmes to a high extent. Business educators from universities do not differ significantly from their counterparts in colleges of education in their mean ratings on the influence under-funding and poor management on the accreditation of business education programmes in South-East, Nigeria. Based on the findings, it was concluded that under-funding and poor management affected accreditation of business education programmes for quality assurance in university and college of education. It was, therefore recommended; among others that, government should adequately fund universities and colleges of education to enable institutional administrators provide the necessary physical, human and material resources for the enhancement of quality business education programmes in university and college of education in Nigeria while waiting for accreditation.

**KEYWORDS:** Accreditation, business education programmes, under-funding and poor management.

### INTRODUCTION

Education in Nigeria is viewed as an instrument for national development and social change. It is essential for the enhancement of quality life. Perhaps, it is on the basis of this that the Federal Republic of Nigeria (FRN, 2013) states that Nigeria aims at providing education that are qualitative, comprehensive, functional and relevant to the needs of the society. This calls for quality education at all levels in the country to meet the aspirations of individuals and the society, especially in this era of knowledge driven society and global competitiveness. In realization of this fact, the Federal Government of Nigeria has put in place a robust transformation agenda in education intended to put Nigeria in a better position to be a competitive player and in the process transform all sectors of its economy through tertiary education.

Tertiary institutions where Business education programmes are offered such as universities and colleges of education in Nigeria aim at producing high level manpower to man the various sectors of the Nigerian economy. To achieve this goal, the universities and colleges of education need to carry out quality students' intake, quality teaching/learning processes, quality research and provide quality infrastructural facilities, services and resources. They need to provide quality and adequate students' support services to enhance quality learning outcomes. One way of stimulating authorities of universities and colleges of education to provide these services is through accreditation which is a quality assurance process in tertiary institutions.

Accreditation of academic programmes in business education is one of the quality assurance mechanisms initiated by the National Universities Commission (NUC) and National Commission for Colleges of Education (NCCE) to regulate academic standard and enhance quality learning in Nigeria universities and colleges of education respectively. But the dwindling quality of the

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products of university and college of education has become a matter of great concern to the nation. Accreditation, therefore, involves the process of ensuring that curricula, physical facilities, personnel, funds and so on meet the needs of the university and college of education to achieve its stated philosophy and objectives. It is a measure of quality of academic programmes aimed at strengthening business education programmes for quality assurance and quality improvement. According to Obadara and Alaka (2013), accreditation is a process that aids institutions in developing and sustaining effective and functional educational programmes and assuring the educational community, the general public and other organizations that the accredited institution and programmes has met high standard of quality and effectiveness. It is a measure of the quality of academic programmes on acceptable minimum standard provided by the accrediting agency. The objectives of accreditation of higher institutions/programmes as outlined by the NUC (2012) and NCCE (2012) include to ensure that at least the minimum academic standards documents are attained, maintained and enhanced, to assure employers and other members of the community that Nigerian graduates of all academic programmes have attained an acceptable level of competency in their areas of specialization and to certify to the international community that the programmes such as business education offered in Nigerian universities and colleges of education are of high standard and their graduates are qualified for employment and further studies.

Meanwhile, a cursory look at these objectives reveal that accreditation focuses on the production of quality graduates with needed skills, technical and professional knowledge that would enable them to contribute to national development and compete favourably in the employment market. Therefore, accreditation is supposed to enhance the provision of resources in order to achieve these objectives. The NUC (2012) and NCCE (2012) outlined the criteria for accreditation of academic programmes to include: philosophy and objectives of the programme, the curriculum, teaching staff (quality and quantity), students' admission and graduation requirements, standard of degree examination, financial support, status of physical facilities, administration of department and employers rating of graduates. It can be deduced from these criteria that accreditation of academic programmes is all embracing and involves assessing the appropriateness of business education programme philosophy and objectives, the adequacy and relevance of the curricula to the students in their specific areas of study and the world of work. It involves evaluating the status of physical facilities in terms of office accommodation, lecture halls, library facilities and the report of employers' assessment of graduates in their employ. Accreditation, therefore, is a process that involves peer review and rating of these resources in relation to the accreditation criteria for programmes which business education is a sub set.

Business education (also known as Business Teacher Education) is an educational training which encompasses knowledge, skills, competencies, structural activities, abilities, capabilities and all other structural experiences acquired through formal, on-the-job or off-the-job which is capable of enhancing recipients opportunity for securing jobs in various sectors of the economy or even enabling the person to be self-dependent. Koffi and Etukudo (2016) observed that business education comprises all organized or structured activities that aim at providing people with the knowledge, skills and competencies necessary to perform a job or a set of jobs whether or not they lead to a formal qualification. It is an educational programme which offers specialized instructions for office occupations and general business orientation. According to Osuala in Saliu (2020), it is a programme of instruction which consists of two parts: (a) office education-being a business education programme for office careers through initial refresher, and upgrading education leading to employability and advancement in and occupations and (b) general business, being a programme of instruction to provide students with information and competences which are needed by all in managing personal business affairs and in using the service of the business world. However, Business Education now includes programmes in Marketing and Distributive Education and Entrepreneurship Education. Nwazor and Udegbumam (2016) explained that Business Education programmes are the type of educational programmes that have to do with knowledge and skills which develop students physically and mentally, and finally make them self-dependent.

From the foregoing definitions, it is observed that business education is either needed for occupational purposes or for general business ideas. It is based on this that accreditation of business education programmes is highly needed to enhance quality of learning. But the questions that arise in accreditation of business education programme centre around inadequacies in the curriculum content of business education, non inclusion of the business educators in drafting business education curriculum, under funding, poor management and governance, poor implementation of the curriculum, qualification and quality of teachers and facilities. Koffi and Etukudo (2016) noted that most institutions offering business education programmes have unqualified teaching staff recruited, insufficient facilities and equipment, and incompetent teaching staff. Tunde and Issa (2013) attributed negative influences on accreditation of business education to poor funding of education in Nigeria which makes programme administrators unable to provide adequate and quality infrastructural facilities and equipment for effective teaching and learning. Tunde and Issa further stated that the non-commensurate funding with other growing indices in Nigerian universities and colleges of education have negative impact on the quality of education as the institutions are constantly being shut down as a result of staff unions agitating for one form of demand or the other. This could be why most of their graduates make little or no attempt

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to be self-employed despite the abundant business opportunities in the country. Instead, they continue to besiege government offices and other establishments in search of jobs that are either extremely few in supply or even non-existent.

Under funding by government is the first thing that comes to mind as the availability of money for meeting the need of a given project or programme is critical. It is a system of apportioning available funds belonging to an organization for meeting needs whether the fund is sufficient or not. Funding refers to a form of financial support that is given for the achievement of projects. According to Nwafor, Uchendu and Akani (2015), funding is the provision of financial resources in order to meet needs, projects or programmes. Money needed to run a project or programme in the school may be raised from within or outside the school. When funds are generated, they are usually disbursed based on the needs of the school. The process of making the acquired funds available to the units that require them either in the short or long run is referred to as funding (Ankrah, Burgess, Grimshaw & Shaw, 2013). To Dimunah (2017) the consequences of underfunding includes the increase in tuition, lack of resources for classroom and offices, insufficient finance to cover current and future expenses, overcrowding in teaching and learning environments, inadequate research and teaching materials, brain drain among highly qualified faculty and administrative staff, deteriorating library facilities, among others. Halidu (2015) reported that federal universities were seriously underfunded and the underfunding affected academic performance of students, lack of physical facilities, brain drain among highly qualified faculty members, and administrative staff, inadequate library facilities, laboratory equipment and professional development for staff. Therefore, through adequate funding by government, success of the business education programme and attainment of its goals and objectives will be achieved (Ajoma, 2018).

Another serious issue that influences accreditation of business education programmes is poor management. The way and manner some of the Nigerian universities and colleges of education, and their programmes are being managed by administrators also have consequential effects on quality assurance in the education sector to which business education is a sub-set. This problem is found in every sector of Nigerian economy. Meanwhile, bad leaders contribute in having weak managers that administer the institutions. To Amadi (2012), the problem in Nigeria is that the institutions for managing education, whether at the local or national levels, are weak and inefficient because of the democracy deficit in the polity. Akpotohwo and Ogeibiri (2018) noted that the consequences of poor management and governance has resulted to inadequate teaching facilities, inadequate teaching equipment, lack of on-the-job training for business education teachers, effective maintenance of facilities, effective quality control of facilities and programme, effective audit of material, students and staff, effective supervision of staff, effective record keeping/inventories and so on. These institutions are themselves not transparent and accountable. For most of the tertiary institutions (universities and colleges of education), management means little more than playing the role of a "Caretaker." This vital function has been largely reduced to the maintenance of the status quo. This unfortunate development negates the concept of higher education, particularly in a developing country like Nigeria. It seems certain and sure that as long as management continues to play ineffective role, business education quality assurance will continue to be jeopardized in the nation's universities and colleges of education.

The moderator variable used in this study is ownership of institutions. The variable is likely to influence accreditation of business education programmes. Ownership of institutions here refers to Federal and State Governments that own the universities and colleges of education where business education programmes are offered. Obadara and Alaka (2013) in their study reported that a significant relationship was found between accreditation and resources inputs into Nigerian universities and colleges of education, quality of output and quality of process, but no significant relationship was found between accreditation and quality of academic content. Akpan and Etor (2016) reported that school administrators believed that accreditation positively impacted on the quality of education, school improvement and quality of classroom instruction at their schools. It is against this backdrop that the researchers were motivated to find out the influences on the accreditation of business education programmes in public universities and colleges of education in South-East Nigeria.

### **STATEMENT OF THE PROBLEM**

In recent times, there is an increasing concern about the quality of Business Education graduates from the public universities and colleges of education in Nigeria among stakeholders and the general public. Observation has shown that some of the graduates are deficient in communication skills and the ability to apply technical and professional knowledge in solving personal and work-related problems. Some of them are deficient in the proficiency for time management and self control. This shows that the quality of university and college of education graduates from business education is deteriorating. This has been blamed on the politics and the poor manner in which accreditation of business education programmes are carried out in Nigerian universities and colleges of education. In some universities and colleges of education, government and management do not release money on time to departments of business education to prepare for the exercise. It seems that the Ivory towers are plagued by under-funding and

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poor management resulting to inadequate infrastructural facilities and teaching personnel for quality instructional delivery. In some institutions, facilities and equipment are borrowed and used for accreditation. The selection of members of the accreditation team is handled only by NUC and NCCE without inputs from the institutions. Similarly some business education programme contents seem to be inadequate and not relevant to the needs of the students and the labour market. Therefore, it seems accreditation of business education programmes in Nigerian universities and colleges of education does not yield any meaningful results.

The problem of this study, therefore, is that under-funding and poor management result to inadequate facilities and technologies needed for achieving quality business education programme. If this ugly situation is not averted, its adverse effects on the socio-economic development of the Nigerian universities and colleges of education (business education programmes) in South-East will persist to the detriment of students, citizens and the government. It is against this backdrop that the study sought to determine the influence of under-funding and poor management on the accreditation of business education programmes in public universities and colleges of education in South-East Nigeria.

## **Purpose of the Study**

The main purpose of this study was to ascertain the influence of under-funding and poor management on accreditation of business education programmes in public universities and colleges of education. Specifically, the study sought to ascertain the influence of:

1. Under funding on the accreditation of business education programmes.
2. Poor management on the accreditation of business education programmes.

## **Research Questions**

The following research questions guided the study:

1. What is the influence of under-funding on the accreditation of business education programmes in Public universities and colleges of education?
2. What is the influence of poor management on the accreditation of business education programmes in public universities and colleges of education?

## **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance:

1. Business educators from public universities and colleges of education do not differ significantly in their mean ratings on the influence of under-funding on the accreditation of business education programmes.
2. Business educators from public universities and colleges of education do not differ significantly in their mean ratings on the influence of poor management on the accreditation of business education programmes.

## **METHODOLOGY**

The study adopted a descriptive survey design. The researchers considered this design appropriate because data would be collected from business educators in public universities and colleges of education. The area of the study is South East Zone of Nigeria. The population of this study comprised of 197 business educators in 13 public universities and colleges of education that offer business education in South-East, Nigeria. A 20-item structured questionnaire was used for data collection. The questionnaire was structured on a five-point Likert rating scale. A pilot test was carried out. Data collected in the pilot test were analyzed using Cronbach alpha to determine the internal consistency. The reliability coefficients of 0.89 and 0.90 for clusters B1 and B2 respectively and an overall coefficient of 0.90 were obtained. The administration of the instrument was carried out personally by the researchers with the help of four research assistants. Out of 197 copies of the questionnaire administered on the respondents, a total of 193 copies were properly filled and retrieved, and used for data analysis. Data collected were analyzed using mean and standard deviation to answer the research questions, while the null hypotheses were tested using t-test at 0.05 level of significance.

## **RESULTS**

### **Research Question 1**

What is the influence of under-funding on the accreditation of business education programmes public universities and colleges of education?

Data collected to answer the research question is presented in Table 1.

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**Table 1: Mean ratings of respondents on the influence of under-funding on the accreditation of business education programmes in public universities and COE.**

S/N Under-funding by government result to	X	SD	Remarks
1. Lack of resources for classrooms and offices	4.60	0.43	SA
2. Insufficient finance to cover current and future expense	4.20	0.52	A
3. Increases in tuition fees in most institutions	4.70	0.40	SA
4. Inability of institutions to perform their duties effectively	4.69	0.41	SA
5. Overcrowded in teaching and learning environment	3.54	0.58	A
6. Inadequate research and teaching materials	4.24	0.49	A
7. Lack of physical facilities	3.20	0.63	UD
8. Deteriorating library facilities	4.50	0.47	SA
9. Lack of professional development for staff	3.36	0.49	UD
10. Inadequate attention to staff welfare	3.56	0.56	A
11. Inadequate payment of staff salaries	4.50	0.47	SA
<b>Cluster Mean</b>	<b>4.10</b>		<b>A</b>

Data in Table 1 show that from the item-by-item analysis, out of eleven items listed, five have mean scores ranging from 4.50 to 4.70 indicating that the respondents strongly agreed, while they only agreed with four, but were undecided about items 7 and 9. The cluster means score of 4.10 shows that, on the whole, business educators in the area of the study agreed that underfunding influenced the accreditation of Business Education programmes in public universities and colleges of education in the ways listed on Table 1. The standard deviations of 0.40 to 0.63 show that the respondents were not far apart in their mean ratings.

### Research Question 2

What is the influence of poor management on the accreditation of Business Education programmes in public universities and colleges of education?

Data collected to answer the research question is presented in Table 2.

**Table 2: Mean ratings of respondents on extent of poor management and governance by government towards accreditation of business education programmes.**

S/N Poor management influence accreditation	X	SD	Remarks
12. Mismanagement of funds	3.60	0.62	A
13. Frequent Increase in fees payable	4.20	0.57	A
14. Lack of on-the-job training for business teacher Educators.	3.70	0.40	A
15. Ineffective maintenance of facilities.	4.54	0.52	SA
16. Ineffective quality control of the system.	4.58	0.48	SA
17. Ineffective audit of material, students and staff	4.59	0.44	SA
18. Ineffective supervision	4.50	0.63	SA
19. Inadequate teaching equipment/facilities	4.60	0.43	SA
20. Inadequate allocation of funds	3.50	0.69	A
<b>Cluster Mean</b>	<b>4.20</b>		<b>A</b>

From the data in Table 2, the respondents strongly agreed with items 15, 16, 17, 18 and 19; and agreed with items 12, 13, 14 and 20. The Standard Deviation ranging from 0.43 to 0.69 indicate that the respondents were not far apart in their responses on the influence of poor management on the accreditation of Business education programmes.



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## Testing of Hypotheses

### Hypothesis 1

Business educators from Federal and State owned universities and colleges of education do not differ significantly in their mean ratings on the influence of under-funding on the accreditation of business education programmes.

**Table 3: Summary of t-test analysis of the responses of business educators from public universities and colleges of education in their mean ratings on the influence of under-funding on the accreditation of business education programmes.**

Ownership of Institution	N	$\bar{X}$	SD	$\alpha$	df	p-value	Decision
Federal	131	3.21	.19	0.05	191	.10	Not Significant
State	62	3.17	.14				

Data in Table 3 indicates that at 191 degree of freedom, p-value obtained was 0.10. Since the p-value of .10 was greater than the alpha value (0.05), it means that business educators from Federal and State owned universities and colleges of education do not differ significantly in their mean ratings of the influence of under-funding on the accreditation of business education programmes. The null hypothesis was, therefore, not rejected.

### Hypothesis 2.

Business educators from Federal and State owned universities and colleges of education do not differ significantly in their mean ratings on the influence of poor management on the accreditation of business education programmes.

Data collected to test the hypothesis is presented in Table 4.

**Table 4: Summary of t-test analysis of the mean responses of business educators from federal and state owned universities and colleges of education on the influence of poor management on the accreditation of business education programmes.**

Ownership of Institution	N	$\bar{X}$	SD	$\alpha$	df	p-value	Decision
Federal	131	3.07	0.17	0.05	191	0.35	Not Significant
State	62	3.46	0.19				

From Table 4, at 191 degree of freedom, the p-value obtained was 0.35. Since the p-value of 0.35 was greater than alpha value (0.05), it means that business educators from Federal and State owned universities do not differ significantly from their counterparts in colleges of education in their mean ratings of the influence of poor management on the accreditation of business education programmes. The null hypothesis was, therefore, not rejected.

## DISCUSSION OF FINDINGS

Findings of the study revealed that under-funding influenced accreditation of business education programmes in public universities and colleges of education. This finding is in line with Dimunah (2017) who noted the consequences of underfunding to include increase in tuition fees, lack of resources for classroom and offices, inadequate finance to cover capital and recurrent expenditures, overcrowding of teaching and learning environment, inadequate research and teaching materials, brain drain among highly qualified faculty members and administrative staff, deteriorating library facilities, among others.

The test of the first hypothesis revealed that business educators from public universities do not differ significantly from their counterparts public colleges of education in their mean ratings on the influence of under-funding on the accreditation of business education programmes in South-East, Nigeria. This is in line with the findings of Obadara and Alaka (2013) who found a significant relationship between accreditation and resources inputs into Nigerian universities and colleges of education, quality of output and quality of the process, but no significant relationship between accreditation and quality of academic content.

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Findings of the second research question revealed that poor management affected accreditation of business education programmes in South-East, Nigeria. This finding is in line with Akpotohwo and Ogeibiri (2018) who revealed that the consequences of poor management included inadequate teaching facilities, inadequate teaching equipment, lack of on-the-job training for business education teachers, ineffective maintenance of facilities, lack of effective quality control of facilities in the programmes, ineffective audit of material, students and staff, ineffective supervision of staff, ineffective record keeping/inventories and so on.

The test of the second hypotheses revealed that business educators from universities do not differ significantly from their counterparts in colleges of education in their mean ratings on the influence of poor management on accreditation of business education programmes in South-East, Nigeria. **This is in line with the findings of Akpan and Etor (2016) who reported that school administrators believed that accreditation positively impacted on the quality of education, school improvement and quality of classroom instruction at their schools.**

### **CONCLUSION**

Based on the findings of this study, it was concluded that under-funding and poor management affect accreditation of business education programmes for quality assurance in public universities and colleges of education. In other words, accreditation of business education programmes with positive results could enhance quality business education graduates, while negative influence of the result of accreditation can also negatively affect the quality of the products of Business Education programmes.

### **RECOMMENDATIONS**

Based on the findings of the study, the following recommendations are made:

1. That the National Universities Commission (NUC) and the National Commission for Colleges of Education (NCCE) should intensify efforts in ensuring that accreditation of business education programmes is carried out regularly in order to ensure quality improvement in business education programmes in public universities and colleges of education in Nigeria.
2. Government should adequately fund universities and colleges of education to enable institutional administrators provide the necessary physical, human and material resources for the enhancement of quality business education programmes in Nigeria while waiting for accreditation.

### **REFERENCES**

- 1) Ajoma, U. C. (2018). Funding strategy for improving business education in a globalized society. *ABEN Book of Readings*, 8(1), 29-36.
- 2) Akpan, P. C. & Etor, R. C. (2016). Accreditation of academic programmes and quality university education in South-South Nigeria. *International Journal of Educational Studies*, 13(2), 37-46. Retrieved from <http://fssh-journal.org>
- 3) Akpotohwo, C. F. & Ogeibiri, C. (2018). Business educators and students perception of funding impact on quality assurance in the business education programme in Niger Delta University, Bayelsa State. *International Journal of Advanced Research in Social Engineering and Development Strategies (IJARSEDS)*, 5(1), 54-62.
- 4) Amadi, S. (2012). Education for transformational leadership and national development. *International Journal of Educational Research Development*, 4(1), 30-38.
- 5) Ankrah, S. N., Burgess, T. F., Grimshaw, P. & Shaw, N. E. (2013). Asking both university and industry actors about their engagement in knowledge transfer: What single-group studies of motives Omit. *Technovation*, 33(2-3), 50-65. <http://doi.org/10.1016/j.technovation.2012.11.001>
- 6) Dimunah, O. V. (2017). *Underfunding of federal university in Nigeria and perceived impact on administration: An exploratory case study*. Unpublished Ph.D thesis submitted to the School of Education, College of Professional Studies, Northeastern University, Boston, Massachusetts.
- 7) Nwafor, E. N., Uchendu, E. E. & Akani, O. C. (2015). Need for adequate funding in the administration of secondary education in Nigeria. *Global Journal of Educational Research*, 14(1), 119-124. Retrieved from [www.globaljournalseries.com](http://www.globaljournalseries.com).
- 8) Nwazor, J. C. & Udegbumam, E. O. (2016). Utilization of e-Learning tools as teaching strategies by business educators in tertiary institutions in South-East Nigeria. *NAU Journal of Technology and Vocational Education*, 1(1), 74-85.
- 9) Obadara, O. E. & Alaka, A. A. (2013). Accreditation and quality assurance in Nigerian universities. *Journal of Education and Practice*, 4(1), 13-41.

## Influence of Underfunding and Poor Management on Accreditation of Business Education Programmes in Public Universities and Colleges of Education

- 10) Saliu, A. D. (2020). Issues and concerns in the use of system wide accreditation as the major quality control mechanism in Nigerian Universities. *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 7(1), 42-48. Retrieved from: <http://dx.doi.org/10.20431/2349-0381.0701005> [www.arcjournals.org](http://www.arcjournals.org).
- 11) Tunde, O. K. & Issa, A. (2013). The quality of Nigerian higher education and the funding of library resources. *Ozean Journal of Social Sciences*, 6(2), 43-53.



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## Procurement Analysis of Pharmaceutical Supplies with Lean Hospital Approach in Pharmacy Department of Hospital "X" Tegal, Indonesia



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**ABSTRACT:** Pharmacy Departments in hospitals are one of the biggest revenue contributors in hospitals. But on the other hand, pharmaceutical departments are also one of the biggest expenditure sources in hospitals, so it needs to be done well management. Then we need an analysis to identify wasteful activities.

The method used is direct observation to observe the process of selection, planning, procurement, and received of medicines. Then conducted in-depth interviews with structural involved in the process of managing pharmaceutical supplies, see routine reports, Standard Operating Procedures (SOP), Policies, Guidelines for Hospital Pharmacy Services and Organization, and other supporting documents. Waste data analysis from interviews was conducted with current state mapping, root problem analysis with Root Cause Analysis and system improvement designs made in the form of Future State Mapping.

In this study, it was found that waste occurred in the process of selection, planning and procurement, and received of medicines, including waste of waiting, waste of inventory, waste of human potential, waste of defect, waste of transportation, and waste of over processing. Proposed improvement in the selection, planning, procurement, and received process is the creation of an ITbased system and improvement of effective and efficient procedures to accommodate the work of managing pharmaceutical supplies, particularly in the selection, planning, procurement, and received process.

**KEYWORDS:** Management, pharmaceutical supplies, lean hospital, waste, procurement, .

### INTRODUCTION

Medicine costs are a component of costs that are relatively easy to intervene. in countries with high income levels, the government spends around 10% of the budget on medicines, whereas in countries with low-income levels, the government spends 25% on drug budgets. About one third of the annual hospital budget is spent on materials and supplies, including medicines. The Pharmacy Department is one of the most widely used therapeutic facilities in hospitals and one of the few areas where large sums of money are spent on repeat purchases. For this reason, methods are needed to improve the process and reduce waste. One method that can be used is lean.

The Pharmacy Department of Hospital "X" Tegal is one of the biggest revenue contributors in the hospital. In January - June 2021, Pharmacy Department contributed 46.25% of total hospital revenue. But on the other hand, pharmacy Department is also one of the biggest sources of expenditure in hospitals, in January - June 2021, Pharmacy costs amounted to 40.82% of the total hospital costs. So, it needs to be done well management. From the 2020 Pharmacy Department performance data, it is known that the Inventory Turn Over Ratio in 2019 is 14.5 times, the average deadstock value of the drug is 7.25%, still above the established standard of  $\leq 5\%$ , there is a vacancy of the drug which can be seen from the percentage of drugs delivered to patients is not 100%, and the average pharmaceutical inventory inventory value for January - June 2021 is 40.27% when compared to pharmaceutical revenue, it is still far compared to the established standard of  $\leq 20\%$ .

Based on the background above, this research was conducted to identify waste in the process of managing pharmaceutical supplies and their causes at the Pharmacy Department of Hospital "X" Tegal and to provide alternative proposals for improvements to eliminate waste from the process. This research can be used in improving the management of pharmaceutical supplies so that they are more efficient and improve the quality of service, as well as providing optimal satisfaction to stakeholders. The purposes of this study are: Identify the flow of pharmacy supply management processes in Hospital "X" Tegal when reviewed using the Lean Hospital approach, analyzing the root cause of waste in the process of managing pharmaceutical supplies in the

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Pharmacy Department of the Hospital "X" Tegal and propose improvements with the lean hospital approach to reduce or eliminate waste to stakeholders in the Pharmacy Department of Hospital "X" Tegal.

## METHOD

This type of research used in this research is descriptive method. The data obtained in the form of qualitative data. The study was conducted for 6 months from February to June 2022 at Hospital "X" Tegal. The research was carried out by observing the implementation of the drug management process, namely by observing the processes that occur during selection, planning, procurement, and received. Then conducted in-depth interviews with the Pharmacy Therapy Team, as well as pharmacists and Pharmaceutical Technical Personnel at the Pharmacy Department of the Hospital "X" Tegal to find waste in the process of managing drugs with a lean hospital approach and the root causes of waste. Activities in drug management are identified into three categories, namely value added, necessary but non-value added, and non-value added. Identification is carried out during in-depth interviews with informants. The results of identification of these activities are illustrated by value stream mapping. Then for the root cause analysis is presented in the form of a fishbone diagram. Proposed improvements made with future state mapping.

## RESULT AND DISCUSSION

In this research, what will be analyzed is waste and the root causes of the problems in the process procurement. The Lean Hospital method is used in this study because it can find out waste activities in the process of medications management in the Pharmacy Department of Hospital "X" Tegal.

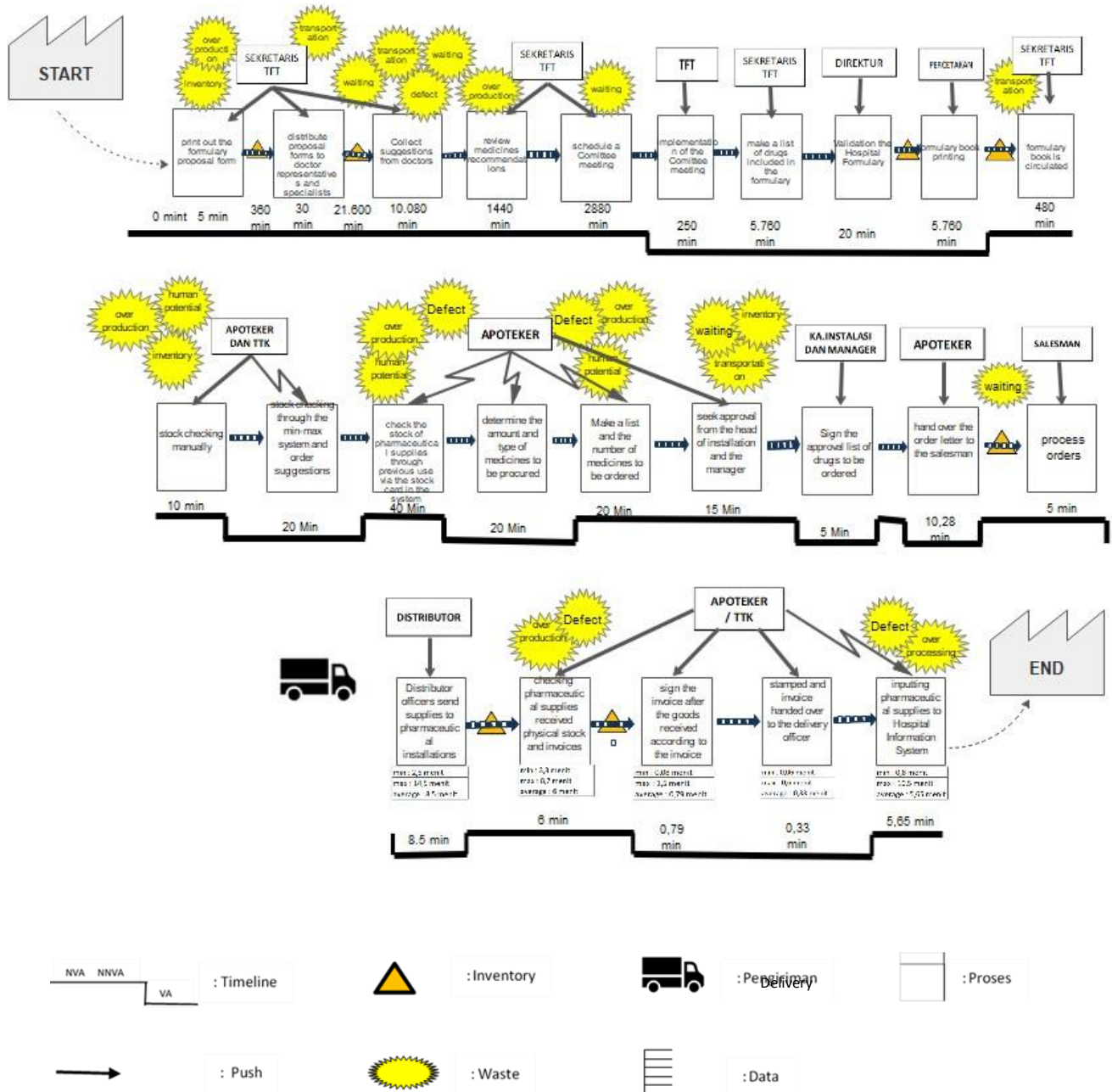
The selection process at Hospital "X" Tegal takes 54,125 minutes or around 55 days. Of this total time, activities that fall into the value-added category only require 5 days or 11.25%, while non-value-added values are 88.75%. It appears that the percentage of waste is greater than 30% so the selection process is still not efficient. Waste that occurs in the selection process is waste transportation because the proposal form is still manual, waste waiting, because collecting the proposal form must wait, waste of inventory, and waste of defect. After analyzing the root cause of the problem, it appears that the cause of waste is the Pharmacy and Therapy Committee secretary having difficulty communicating with the doctors, the proposed drug in the form of handwriting, the proposed medicine does not include scientific reasons, the Pharmacy and Therapy Committee archive has not been organized.

The planning process at Hospital "X" Tegal takes 90 minutes. Activities that fall into the non-value-added category are 40 minutes or 55.56%. The percentage of time for activities that are included in the value-added category is 50 minutes or 44.44%. The waste that occurs in the planning process is waste of inventory, waste of human potential, waste of overprocessing in the stock checking process because it is done repeatedly, waste of defects because checking stock by defects has the potential to be missed, and waste of transportation when asking for the signature of the head of the installation. and manager. After analyzing the root cause of the problem, it can be seen that the cause of waste is that the pharmacy staff is not focused on planning activities, the pharmacy staff does not understand the technical planning, the amount of planning for pharmaceutical supplies is missed (insufficient or excessive) and uses the defecta book as a planning proposal.

The time required for the process of procurement of pharmaceutical supplies at Hospital "X" Tegal is 55 minutes. Activities included in the non-value-added category were 72.73%. The percentage of time for activities that are included in the valueadded category is 27.27%. The high non-value added is due to waste of defects due to lock orders, waste of waiting due to waiting for officials to sign their approval. After analyzing the root cause of the problem, it can be seen that the cause of waste is that the pharmacy officers are not focused on procurement activities, and the buffer stock has missed.

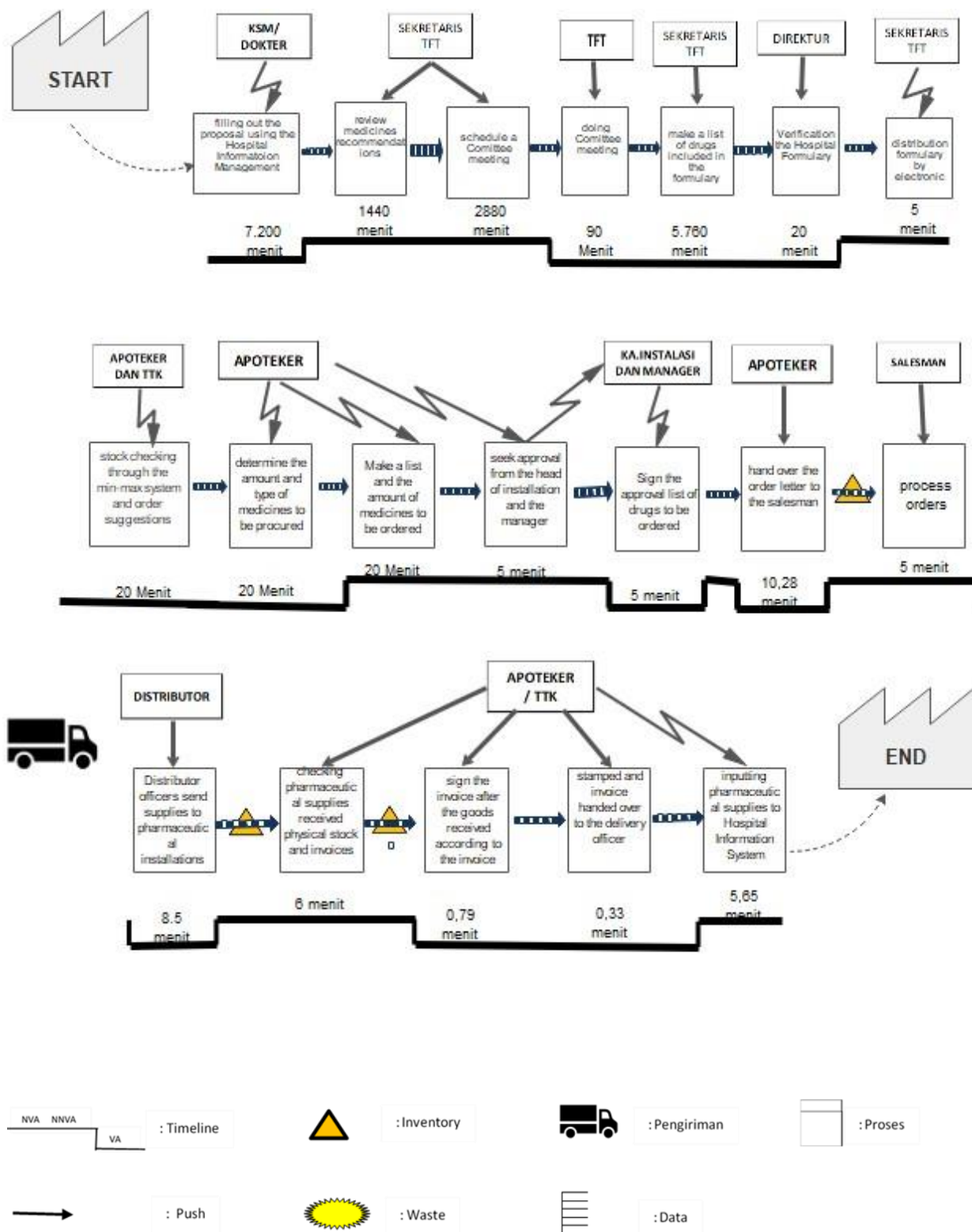
The time needed for the process of receiving pharmaceutical supplies at Hospital "X" Tegal is 21.27 minutes. Activities included in the non-value-added category were 54.77%. The percentage of time for activities that are included in the value-added category is 45.23%. waste of waiting when the process of waiting for the arrival of drugs from the distributor, waste of defects if there is a delay in drug arrival, and waste of inventory. The root of the problem with waste in the admissions process is the absence of special admissions officers.

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Picture 1. Current State Mapping Procurement Process in Pharmacy Department of Hospital "X" Tegal, Indonesia

**Procurement Analysis of Pharmaceutical Supplies with Lean Hospital Approach in Pharmacy Department of Hospital “X” Tegal, Indonesia**



**Picture 2. Future State Mapping Procurement Process in Pharmacy Department of Hospital “X” Tegal, Indonesia**

**CONCLUSION**

There is a lot of waste in the procurement process of pharmacy supplies in Hospital “X” Tegal, including waste of overproduction, waste of inventory, waste of defect, waste of motion, waste of transportation, waste of human potential. Analysis of the root of the problem using a fishbone diagram shows the following results are: the root of the problem in the selection process are the secretary of Pharmacy and Therapy Committee has difficulty communicating with doctors, the proposed drug in the form of handwriting, the proposed medicine does not include scientific reasons, the Pharmacy and Therapy Committee archive has not been organized; the root of the problem in the planning process are that pharmacists are not focused on planning activities, pharmacy

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officers do not yet understand the technical planning, the number of pharmaceutical supplies is missed (less or too much), and uses a defect book as a planning proposal; and the root of the problem in the procurement process are the absence of a special procurement officer and buffer stock inaccuracy. The root of the problem in the received process are the accumulation of goods at the time of receipt, delays in arrival of the goods, goods received not in accordance with the order letter and / or invoice. Improvements that need to be done include changing the flow of activities to be shorter, and the use of electronic systems so that they become more effective and efficient.

### REFERENCES

- 1) Andersen, B dan Ferhaug, T., 2006. *Root Cause Analysis : Simplified Tools and Techniques*, 2nd ed, ASQ Quality Press, Milwaukee.
- 2) Creswell, J. W., 2015. *Penelitian Kualitatif dan Desain Riset*, Edisi 3. Pustaka Pelajar, Yogyakarta.
- 3) Denscombe, M., 2014. *The Good Research Guide For Small-Scale Social Research Projects*, 5th Ed. Open University Press, England.
- 4) Endsley, S., Magill, K. M., Godfrey, M. M, 2006. *Creating a Lean. Family Practice Management*, 13(4), 34-38.
- 5) Gaspersz, Vincent, 2007. *Lean Six Sigma for Manufacturing and Services Industries*. Gramedia Pustaka Utama, Jakarta.
- 6) George. M.L., 2003. *Lean Six Sigma for services* New York. McGraw Hill, Inc.
- 7) Graban, M, 2011. *Lean in Hospitals: Improving Quality, Patient Safety, and Employee Engagement*, 2nd edition. CRC Press, Boca Raton
- 8) Harding, J., 2013. *Qualitative Data Analysis From Start to Finish*, 1st ed, SAGE, London.
- 9) Hines, P., Taylor, D., 2000. *Going Lean*. Lean Enterprise Research Centre, Cardiff, pp. 3 – 43.
- 10) Jimmerson, C., 2010. *Value Stream Mapping For Healthcare Made Easy*. Productivity Press, New York.
- 11) Juran, J.M. dan Godfrey, A.B., 1999. *Juran's Quality handbook*, 5th ed., McGraw-Hill Companies, Inc, Newyork.
- 12) Kant S, Pandaw CS, Nath LM, 1997. *A management technique for effective management of medical store in hospitals. Medical store management technique*. *J Acad Hosp Adm*; 9:41-7
- 13) Kementerian Kesehatan Republik Indonesia. 2009. *Undang-Undang Republik Indonesia Nomor 36 Tahun 2009 Tentang Kesehatan*. Jakarta.
- 14) Kementerian Kesehatan Republik Indonesia. 2010. *Pedoman Pengelolaan Perbekalan Farmasi di Rumah Sakit*. Direktorat Jendral Bina Kefarmasian dan Alat Kesehatan, Jakarta.
- 15) Kementerian Kesehatan Republik Indonesia, 2016. *Peraturan Menteri Kesehatan Republik Indonesia Nomor 72 Tahun 2016 Tentang Standar Pelayanan Kefarmasian di Rumah Sakit*, Kemenkes RI, Jakarta.
- 16) Kim, C.S., Spahlinger D.A., Kin, J.M., Billi, J.E., 2006. *Lean health care : what can hospitals learn from a world-class automaker?* , *J.Hosp.Med*, May; 1(3):191-9
- 17) Koning. H. De., Verver, J. P. S., Heuvel, V. J., Bisgaard. S., Does, R, 2006. *Lean Six Sigma in Healthcare*. *Journal for Healthcare Quality*, 28(2), 4-11.
- 18) Kundurs GD, Gopinath S, Katakam A., 2000. *Planning and designing supportive services-Pharmacy*. In: *Hospitals: Planning, Design and Management*. New Delhi: Tata McGraw-Hill Publishing Company; p. 273-81.
- 19) Nancy, 2014. *Pendekatan Lean Hospital Untuk Perbaikan Berkelanjutan (Continuous Improvement) Proses Pelayanan Instalasi Farmasi RS Bethesda Yogyakarta*, Thesis, Universitas Gadjah Mada Yogyakarta.
- 20) Prasetya, T.J.T., Kristin, E., Lestari, T., 2015. *Waste in Drug Seleksi, perencanaan, pengadaan Process in Pharmacy Department Santa Maria Hospital Pemalang, Indonesia*. *Int. J. Pharm. Sci. Rev. Res.*, 31(1), March-April 2015; No.35, p. 174-178.
- 21) Rother, M., Shook, J., 2003. *Learning to See*. Brooklin, MA: Lean Enterprise Institute.
- 22) Sugiyono, 2016. *Metoda Penelitian Pendidikan*. CV. Alfabeta, Bandung
- 23) Tague, N. R., 2005. *The Quality Toolbox*, 2nd ed., ASQ Quality Press, Milwaukee.
- 24) Taylor, J.R.A., 2010. *The Handbook of Quality and Service Improvement Tools*, NHS Institute for Innovation and Improvement, Great Britain.
- 25) Watson, G., 2004. *The Legacy of Ishikawa*, *Quality Progress*, Vol. 37, pp 54-54.
- 26) Wilson, L., 2010. *How Implementation Lean Manufacturing*. McGraw Hill, Newyork.
- 27) Womack, P.J., Byrne, P.A., Fiume, J.O., Kaplan, S., Toussaint, G., 2005. *Going Lean in Healthcare*. Institute for Healthcare Improvement. In *Institute for Healthcare Improvement Calls to Action Series*. Cambridge, Massachusetts.



## Procurement Analysis of Pharmaceutical Supplies with Lean Hospital Approach in Pharmacy Department of Hospital “X” Tegal, Indonesia

- 28) Womack, P.J., Daniel, T.J., 2003. Lean Thinking. New York: Free Press; p. 19
- 29) Vorley, G., 2008. Mini guide To Root Cause Analysis. Quality Management & Training Ltd, United Kingdom.
- 30) Zidel, T., 2006. a Lean Guide to Transforming Healthcare: How to Implement lean principles in hospitals, medical offices, clinics, and other Healthcare Organizations. ASQ Quality Press, Milwaukee.



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## Body, Sociability and the Construction of the Polis in Spinoza: Consequences for Education



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**ABSTRACT:** According to Dutch philosopher Spinoza (1631-1677), the body is a power of acting. This force of existence can be affected (checked or stimulated) by the mechanisms of subjection that discipline the body, with obvious consequences for our development and well-being. These were the questions for inquiry: what importance should be attributed to Spinoza in the ecology of existential knowledge? What kind of body experience does he advocate? What lessons for education can be drawn from his thinking? In this sense, we highlight as an axial objective: To discuss Spinoza's importance in the idea of body as ecology of knowledge. As sources we used the published works of Spinoza. To achieve our goals, we adopted a methodological strategy that is enacted in an approximation between phenomenology and historical hermeneutics (in the wake of Husserl, Heidegger and Gadamer). It is a question of inquiring how the body is revealed to consciousness (disconcealment), because it plays an important role in the production of truth. As a conclusion we will say that Spinoza knew how to distance himself from the legacy of the process of body mortification and he also knew how to position himself critically vis-à-vis the ideas of modernity. He helps us find a more ecological type of education so we can establish healthier relationships.

**KEYWORDS:** Spinoza; body; feeling, ecology; education

### INTRODUCTION

As is known, Spinoza wrote nothing about education. However, despite having written nothing, he said much about education. Moreover, having lived in an extremely hostile context, marked by fanaticism, intolerance, obscurantism, and having been placed between "the sword or the cross", in other words, between death and conversion, Spinoza chose to say so much when one could only say so little.

Spinoza, a 17th-century philosopher, is an indomitable free spirit. For a long time, he was despised by both political and ecclesiastical authorities. Not only that, he was also marginalized by philosophers. The Netherlands was at the time a refuge for many thinkers of the time, due to its religious tolerance. This allowed him to level criticism at the philosophical tradition, particularly in relation to the body and the Cartesian thinking that would be at the root of modern philosophy. Still, even in this context, he was banished from the Jewish community and persecuted by the Catholic authorities.

Following the disappointment at his religious upbringing and after his great master, Franciscus Van den Enden, had been hanged, he decided to follow up on his concerns, seeking the path of truth and happiness. That's what Spinoza tells us:

After experience had taught me the hollowness and futility of everything that is ordinarily encountered in daily life, and I realised that all the things which were the source and object of my anxiety held nothing of good or evil in themselves save insofar as the mind was influenced by them, I resolved at length to enquire whether there existed a true good, one which was capable of communicating itself and could alone affect the mind to the exclusion of all else, whether, in fact, there was something whose discovery and acquisition would afford me a continuous and supreme joy to all eternity.<sup>1</sup>

It is in this extremely antagonistic juncture and in free search happiness that Spinoza (1962, p.85) denounces the ignorance of the power of the body. This contempt for the body comes from Christianity (with the help of Platonism), which called for the abandonment of the body, reinforced by Descartes' rationalism. Spinoza is a voice that stands against the prevalent morality of renunciation. In the context in which he lived, contempt for the body was required to ensure the salvation of the soul. A process of vigilance, punishment and mortification was need to achieve this goal. This mortification was not understood as a one-off act, but as a process (regime) made at the expense of suffering. This process required feeding daily doses that could not be forgotten.

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To paraphrase Foucault, we will say that we have here a regime practice as art of living. The manner in which human existence is conducted in this regime presupposed a number of skills to be trained. Foucault<sup>ii</sup> underlines:

“Regimen—was a fundamental category through which human behavior could be conceptualized. It characterized the way in which one managed one's existence, and it enabled a set of rules to be affixed to conduct; it was a mode of problematization of behavior that was indexed to a nature which had to be preserved and to which it was right to conform. Regimen was a whole art of living”.

This “savoir-faire” determines the victories and defeats of each individual over him/herself. The relationship with the body is one of renunciation, making asceticism a permanent fight to reach the way of being legitimized by truth.

Spinoza takes a position against this regime of understanding the body and life. The predominant body-soul dualism is a false issue. The major problem lies in the cleavage of the joy-sorrow affections and the role they have in quality of life. He is completely innovative in his approach. The dominant knowledge about man and life is completely wrong. Neither mechanistic organicism nor ascetic spirituality. Spinoza<sup>iii</sup> refers to the need for us not to be deceived in the way we access knowledge. It is necessary to overcome the imperfect stage of knowledge in order to know how to promote joy. To address this problem, we need the correction of the intellect, which is a first step to help a certain understanding of things. In his *Treatise on The Emendation of the Intellect*, in paragraph 25, Spinoza states that choosing the best way to perceive requires “To have an exact knowledge of our nature which we wish to perfect, and at the same time to know as much of the nature of things as is necessary”.

Knowing nature is, therefore, a requirement and a matrix that is put to reflection. As stated by Spinoza<sup>iv</sup> the nature of a thing is nothing more than the essence itself. Man is distinguished from other beings because he is in his essence but in communication with all that exists in nature. This makes what he is, and not something different. It means that man has particularities, he has his “disposition”, which we should know. But man, in nature, is part of nature, and that does not give him privilege because he obeys the same laws as other living beings. We are just different modes, expression. It is in this effort to understand that we find the paths that Spinoza aims to point out.

The questions for inquiry asked are as follows: What does Spinoza bring that is unheard of with the claim of the study of nature? What does he mean by the condemnation he expresses about ignoring the body's power? What was Spinoza's innovative aspect in changing the notion of body? What kind of body experience does he advocate? What place does he assign the body in the development of civility? What lessons should be drawn from Spinoza's philosophy for the field of education?

In this sense, the goals of our article are the following: To identify the innovative aspect of Spinoza's philosophy; To reflect on the relationships he established with the dominant ideas; To analyse the impact of his ideas; To discuss Spinoza's contribution to the ecology of existential knowledge, and to education in particular.

To achieve our goals, a methodological strategy was adopted that is enacted in an approximation between phenomenology and historical hermeneutics (in the wake of Husserl, Heidegger and Gadamer). We strive to make a comprehensive analysis as a broad dialogue dissolved in the hermeneutic circle. This search for understanding the body is made by a combination of *archê* and *telos*. The body assumes a problematic nature in the world, and its knowledge is in the process of disconcealment, in bringing to light, in coming-to-presence. It is to say that presence, of what the body is, depends on our understanding of the process of making it come out of the darkness. In this inquiry, we seek the meaning to give the body from the following angles (eidetic variation) of analysis: 1<sup>st</sup> the meaning of the body; 2<sup>nd</sup> the regime of the body; 3<sup>rd</sup> the individual and collective power to act; 4<sup>th</sup> starting from the interpretation of the meanings of the previous items (essence – phenomenological reduction), we will draw the consequences for education (*telos*).

### A NEW REGIME OF MEANING TO THE SENSE-MAKING OF THE BODY

Spinoza<sup>v</sup> considers it necessary to reform the intelligence in order to access the highest level of the highest wisdom. The truth does not come from outside, it springs from intelligence, so it becomes necessary to know it. That is what is really important to Spinoza. Reforming intelligence has the aim of reaching truth. Only in this way can one achieve wisdom, the vision of man's totality. To achieve good thinking, we need to regulate our reflection from the universal order of ideas. The starting point of man's knowledge must lie in understanding nature.

Starting from this concern, Spinoza presents three key concepts for understanding the body: Substance (eternal order, nature, God), attribute (thought and extension) and mode (the temporal order of perishable things). Starting from this framework, the body-mind is analysed as modes of immanent activity of two attributes of the single and infinite Substance, namely, thought and extension. They are expressions of the same and only cause, that is, the substance whose respective attributes are expressed distinctively.

In definition III of book I, Spinoza<sup>vi</sup> tells us “By substance I mean that which is in itself and is conceived through itself; that is, that the conception of which does not require the conception of another thing from which it has to be formed”. It can be said

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that there is little originality in this. But let us observe that he draws a peculiar path not yet laid down previously. If we consult Descartes in *The Principles of Philosophy*<sup>vii</sup> we find that he states that we can conceive by substance “nothing other than a thing which exists in such a way that it needs no other thing in order to exist.” Although there is some influence, Spinoza stresses the fact that it exists in itself and is conceived by itself.

In Definition IV of Book I, Spinoza states “By attribute I mean that which the intellect perceives of substance as constituting its essence.” And “By mode I mean the affections of substance, that is, that which is in something else and is conceived through something else.” With this Spinoza defends a substantial monism, with its attributes and modes. Despite having different positions, Aristotle<sup>viii</sup> in *Metaphysics* had already devoted much importance to this issue, having stated that “something is said to be in many ways, but all in reference to one starting-point. For some things are said to be because they are substances, others because they are attributes of substances (...) Being and one are the same and one nature, in that they follow along with each other(...).”

Going back to what was stated above, we will say that Spinoza, when defining the modes, such as substance affections, considers them to be ontologically dependent on substance. In this sense, body and mind are isonomic, in other words, equal and governed by the same law, despite expressing themselves differently. Between one and the other there is a correspondence relationship.

Substance is absolute (and unique) and identifies with God, not anthropomorphic, not transcendent, but immanent to natural reality. He is considered absolute power of the production of all things. Spinoza<sup>ix</sup> in Part I, proposition 20, states: “that which constitutes the essence of God at the same time constitutes his existence”. His essence and existence are identical and they are also identical to his power or force to exist for himself and in himself indefinitely (being, acting and existing are the same thing). In his action he makes himself exist and makes things exist as an expression of himself. It is this identity of the existence, the power and the essence of substance that is called eternity.

In part I, Proposition 10, Spinoza<sup>x</sup> states that “Each attribute of one substance must be conceived through itself.” There is one single substance that is constituted by a multitude of modes and attributes, which are its properties and characteristics, where the attribute is infinite in its kind, of which the only known to man are thought and extension. But thought and extension are not finite and distinct substances, they are two expressions of the same reality, of substance. Finite things are simple modifications produced by God in himself since he is immanent cause. The thought attribute is the activity of power that produces the infinite mode of God’s intellect. This produces all finite modes of thought that are the ideas, or minds, or souls. The extension attribute is the activity of the power that produces the infinite mode of the Material Universe, which are the bodies to which the proportions of motion and rest are given. Ideas and bodies are finite ways, and express substance in a determined manner and according to the necessary order that governs all beings of the universe.

In Part II, Proposition 1, Spinoza<sup>xi</sup> with the term *Natureza Naturante*, refers to the substance and its attributes as an infinite activity that produces the totality of what is real. On the other hand, thought is an attribute of God; to put it differently, God is a thinking thing; and in Part II, Proposition 2, Spinoza<sup>xii</sup>, extension is an attribute of God; so, God is an extended thing. With the term *Natureza Naturada*, he refers to the totality of the modes produced by the attributes. Therefore, there is no separation between cause and effect after having produced them, but immanent and efficient causes of his modes and through them it expresses itself and they express it.

Thus, the body is a mode, which is to say any particular shape or figure that reality assumes transiently. All beings (and also men) are defined by a certain proportion of movement and rest. This acting force, impulse for everything to preserve its being is *conatus* (desire as power, dream, lack, affirmation of energy, affirmation of power). This differentiating force is conflicting and vigilant, it contains an integrating element. It is the fulfilment of the same dynamic reality that imbues all nature and has in each individual (mode) a certain proportion. The identity of each one can, in the relationship between the different *conatus*, cause conflict, but tends towards a dynamic balance. Neuroscientist António Damásio<sup>xiii</sup> resumes this idea of homeostasis.

Their action on our body is a constant stimulus, indispensable for human development. Such bodies are organized sets of elements, dynamic beings that change in a permanent effort to maintain their own individuality. It is a dynamism that obeys a strict structuring order, which leads them to establish relations of cause and effect. The substance is explained in its attributes, and these, on the other hand, are realized in infinite modes. Whether we face it from thought or from extension, we come across the same order imbuing bodies and minds. Spinoza challenges philosophers to look into this correspondence between physical and mental. And he helps them by providing them with elements that allow them to take a complete approach to reality, which requires a dual perspective on substance.

In Part III, Proposition 6, Spinoza<sup>xiv</sup> states that “Each thing, insofar as it is in itself, endeavors to persist in its own being.” This means that there is a natural and spontaneous tendency to remain in existence, and all the effort that is made to exist (*conatus*). Spinoza goes beyond conservation when he uses the concept of *conatus* from stoicism. For Spinoza it is more than self-

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preservation, it is desire, it is appetite and, of course, as he argues in Part III, proposition 7, “The conatus with which each thing endeavors to persist in its own being is nothing but the actual essence of the thing itself” (Spinoza, 1962, p.283). Conatus is used in the positive sense and not for self-destruction. The existence of nature is a positive, affirmative reality. Conatus does not separate from the thing, it is the very essence of the thing, it is natural and intrinsic power.

The notion of body is particularly elaborated in book II of Ethics. Specifically, Spinoza<sup>xv</sup> tells us, “By body, I understand a mode that expresses in a definite and determinate way God’s essence insofar as he is considered an extended thing.” In Part I, proposition 15, Spinoza<sup>xvi</sup> argues “Whatever is, is in God, and nothing can be or be conceived without God.” And further below, in Part I, Proposition 18, he clarifies that “God is the immanent, not the transitive, cause of all things.”<sup>xvii</sup> . And then, in Proposition 25, he emphasises that “God is the efficient cause not only of the existence of things, but also of their essence.”<sup>xviii</sup> .

Both bodies and ideas reveal God. Therefore, we must not devalue matter by making it secondary in relation to thought. In Part II, Proposition 1, Spinoza<sup>xix</sup> specifies that “Thought is an attribute of God; i.e., God is a thinking thing” and in Proposition 2, he also considers that “Extension is an attribute of God; i.e., God is an extended thing.” This implies that matter is inherent to him, materialising itself in the infinite bodies it constantly produces and with which we constantly relate. Following Spinoza<sup>xx</sup>, in Part II, Proposition 11, he underlines “That which constitutes the actual being of the human mind is basically nothing else but the idea of an individual actually existing thing.” The essence of man is constituted by certain modes of God's attributes (thinking, thinking like love, desire or any other feeling of the soul...). And with Proposition 12, “(...) if the object of the idea constituting the human mind is a body, nothing can happen in that body without its being perceived by the mind.” This is revolutionary, because it went against everything that had ever been said. This leads us to understand the relationship between mind and body as modes of the immanent activity of two attributes of the single and infinite Substance – thought and extension. Expressions of the same cause (substance). There is isonomy, which means that they are dependent on the same order, despite expressing themselves differently. Spinoza<sup>xxi</sup>, with Proposition 7, states that “The order and connection of ideas is the same as the order and connection of things”, which leads us to understand that whether we conceive nature under the attribute of extension, or under the attribute of thought, we will always find one and the same order, a single connection of causes. Spinoza<sup>xxii</sup> expresses this relationship well in Proposition 13, “The object of the idea constituting the human mind is the body – i.e., a definite mode of extension actually existing, and nothing else.”

## 2 – PROMOTING AND RECONCILING THE POWER OF INDIVIDUAL AND COLLECTIVE ACTING - THE POLIS

Spinoza revolutionized the notion of body by placing himself in a different position from the philosophical tradition. He stands against the despisers of the body because they diminish the potential of life. He goes from the monism of substance (thinking and extended) and makes us establish unprecedented connections. For Spinoza, unity is not enclosed in the link between body and mind, it is also established with the universe and God (infinite totality).

The body wants its power to act increased, but this can only be achieved through the polis. Polis is understood here to be the great city. Spinoza's idea of polis differs from the Greek one. The idea of a self-governing community, instead of nullifying individual freedom, seeks to make the individual and collective compatible, fostering both natures (*natura naturante* and *natura naturada*). The part is not sacrificed to the whole. The community does not exist to subjugate the parties, but to empower them, to make them exist on a higher level. This is not, as was the case in Ancient Greece, the predominance of public over private life<sup>xxiii</sup> . In addition to this new dynamic, Spinoza's idea of polis is not circumscribed to a small territorial area, rather it is elevated to cosmic dimensions. The polis for Spinoza is the great city where we live, which includes the relationship of one with all others, with the universe and with God. The polis is not so much a territory, but rather implies the relationship with everything that surrounds us, in order to satisfy the demands of a civilized life. The dignity of men comes from this relationship (good encounters). As we are all born in this great “city” we are all “naturalized” in this possibility of being citizens.

The individual power that exists in each body must be articulated with the political power that exists in society. Human achievement is made at both individual and political level. Nature is integrated into the whole of which it is part in order to be able to express itself in its fullness. The State offers everyone the possibility of fulfilment, facilitating (depending on the regime...) a way of living which is not achievable outside this framework. We act from being inserted into a political body. This insertion has the ability to affect men positively or negatively. Each one of us has his own path of liberation. Good encounters reinforce, foster, conatus. Collective power (social, political...) forms the body. That's why the body is in permanent construction, due to conatus (to good encounters).

Living in society inevitably implies affection in its double sense. It means that the bodies are united with one another and all of them form a body. Actually, the human body is distinguished from other bodies by the union it establishes with other bodies. In this regard, Spinoza<sup>xxiv</sup> tells us that everything is a composite. The human body is a double composite – by the union it establishes with others and with itself<sup>xxv</sup> . The human body needs a large number of other bodies by which it is as if continuously

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regenerated<sup>xxvi</sup>. This dynamic depends on the conatus that exists in each of the bodies. We have to seek (and provide) convenient encounters, which increase the power (of the body) and avoid inconveniences, which decrease it.

Good sociability (civility) produces positive feelings, which reinforces conatus. The power of encounters feeds on pleasure (pleasure promotes the expansion of conatus while pain checks it) which means:

I shall understand by pleasure “the passive transition of the mind to a state of greater perfection,” and by pain “the passive transition of the mind to state of less perfection.” The emotion of pleasure when it is simultaneously related to mind and body I call Titillation [titillatio] or Cheerfulness [hilaritas]; the emotion of pain when it is similarly related I call Anguish [dolor] or Melancholy [melancholia]<sup>xxvii</sup>.

Pleasure is a power relationship with the world, it is a movement of amplitude. The functioning of societies can also improve from here. That is why he advocates political regimes that allow men to live happily. For him, nature is good (tends towards homeostasis) and, in this sense, the political regime must help its fulfilment (happiness).

Happiness is the goal of conduct and not renunciation, castration, denial, mortification. To access this state, argues Spinoza, it is essential to reverse the logic of operation, we need another reference. For Spinoza, we should not avoid or renounce pleasure because it is nothing more than the transition from a lower state of perfection to a higher state (the reverse for pain). In this passage, emotion is the modification of the body through which the power of action of the body is increased or decreased. Emotion is good if it increases the body's power to act. Virtue is a power to act, an ability.

Spinoza moves away from the Christian ethical tradition because he believes that a moral system that teaches man to be weak is devoid of value. He highlights the virtues associated with the ability to act and with power. It is not virtue as reward (of Christianity) but virtue in itself. Therefore, thought should not lack the warmth of desire, nor should desire lack the light of thought – contrary to the position that Kant (1724-1804), the main philosopher of the modern age, will have on reason and emotion almost a century later.

He establishes a relationship between reason and passion: passion without reason is blind, and reason without passion is killed. An emotion can only be stopped or removed by another emotion, contrary and stronger. Instead of uselessly opposing reason to passion, Spinoza opposes disordered passions to the passions coordinated by reason and perfectly regulated by the total perspective of the situation. It is not an accident that António Damásio<sup>xxviii</sup> seeks to meet Spinoza, confirming today through neuroscience research much of what he said.

Good sociability also has a positive effect on "idea-affections". For Spinoza, knowledge, (of first level kind-more basic) is formed from "ideas-affection". Affection (affectus) is the continuous variation of the force of existing and is determined by the ideas one has. An idea is the representation of anything (the more perfect, the more it coincides with reality). By affection, says Spinoza<sup>xxix</sup> he understands “the affections of the body, by which the body's power of activity is increased or diminished, assisted or checked, together with the ideas of these affections”. Therefore, there are multiple ways of power and action being increased or diminished. Spinoza<sup>xxx</sup> states that pleasure (laetitia) is “the passive transition of the mind to a state of greater perfection.” With the opposite affection, pain (tristitia) occurs the transition from greater perfection to less perfection.

Spinoza situated the body as arché. Pre-Socratic philosophers such as Tales of Miletus (625-558 a.C.), Anaximander (610 - 547 a.C.), Anaxímenes of Miletus (585—528 a.C.), had already sought to enquire what the generating element of all nature would be. We are using the term arché in Spinoza, not to consider water, the ápeiron (that which results from opposites) or the air as the main generating principles nature, but because he situated the body as a new organizing principle of men's lives. The body as arché means that in it lies the power to act, matrix of action. Our ability to act will depend on the strength we are able to give it. By this Spinoza means that we must develop good feelings. Good feelings generate a dynamic of good feelings. And, consequently, bad feelings have an opposite effect. When we love someone, we strive and we do everything to achieve reciprocity. Anyone who thinks he's hated by someone will hate that person as a result. Hatred is increased by mutual hatred.

As Foucault<sup>xxxi</sup> warned us, the body is immersed in a political field. The body acquires a political dimension, because in it are inscribed values of the regimes of truth (of the construction city). Through this we understand how marked, directed it is, what signs are required of it. That's why we have to relate the biological dimension with the regimes of truth that determine the aptitudes of the body.

Spinoza was precocious in this understanding. He believes that the state must create conditions and ensure good sociability, it must adopt a regime that promotes pleasure and, in this way, build the city, the polis. Man lived without law or social organization, with no idea of what is just and unjust. Law and strength were all the same. State intervention is necessary. However, what is the right point for state intervention? Is the state's job to secure or sacrifice freedom? This point drives Spinoza away from Hobbes (1588-1679), because the latter considers that man is a wolf of a man, which justifies the existence of the state to prevent men from devouring one another. For Hobbes<sup>xxxii</sup> the state must suppress the power to act in each body. Salvation lies in the state, and man must discard natural right.

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Spinoza believes that laws must not stifle individual initiative. Above all, Spinoza defends the freedom of the word. Without it, all laws become unjust, because man ceases to respect the laws when he cannot criticize them. By adding the political dimension, he clarifies the need for the democratic regime, in which freedom plays a decisive role in the process of fostering thinking and acting. But it is important that in this whole process man is driven by reason. The dictates of reason (Spinoza<sup>xxxiii</sup> “[demand] nothing contrary to nature, it therefore demands that every man should love himself, should seek his own advantage (I mean his real advantage), should aim at whatever really leads a man towards greater perfection”. And there is nothing more advantageous in this effort for the perfection and preservation of his being than to be all in such agreement that one single soul and one single body can be formed – that all strive in the search for the common usefulness of all (the polis). Spinoza<sup>xxxiv</sup> argues that “there is nothing better, by which one may give evidence of skill and talent, than instructing men in such a way that they may live, finally, under the empire of their own reason.

### CONSEQUENCES FOR EDUCATION

With Spinoza, education gains a relational and ecological dimension. We learn to argue that nature's education cannot neglect feelings, or the relationship with others and the universe. He was the great forerunner of the issue of emotional and environmental education. With his eco-humanism, a battle began that tried to break away from dualisms, hierarchies, attributing to the man-body its human value which it had been deprived of.

Spinoza helps us to know human nature integrated into the greater nature, to understand what our place in the polis and the cosmos is. The environmental crisis we are experiencing today makes us rethink the meaning and value that Spinoza attributed to nature. This interconnection that he establishes among men and between man and nature arises with great relevance. The grandeur and beauty of nature are so sublime that it is confused with God. This profound unity and communion imply knowledge and the need for an ecological education, a respect for all the manifestations of nature, where man (and his feelings) is included. The body is in the grandeur of this ecological intelligence, a fractal of the cosmic architecture as the great city. In the pantheistic ethos one lives the search for sustainable knowledge that respects the balance by the ecosystem. It is in the search for this balance that education must be enacted.

Spinoza rescues the endeavour (conatus), this force that each one has in himself and which leads him to go towards the light, and which cannot be alienated. However, this force of existence can be affected by the mechanisms of subjection that discipline the body, with evident consequences for our well-being. This means that this power to act can be neutered or exalted, resulting in different ways of being with the other human beings in the polis, with the universe, with God...

Spinoza is against the way of organizing the body that had prevailed – mortification of the body. His concern points in the opposite direction – letting the potential of the body flow. He is against the organic organization of the body, advocated by Plato, by Christianity, by Descartes, by Hobbes... and by so many others. He is against any incorporation of the excess of containment that limits and petrifies the organization (polis).

Education must be at the service not of mortification, not of the loss of its vitality, but of the reinvention of life itself (construction of the polis). Reverting what has been imposed, exploring the virtual dimension (flows, connections, affections), so as to overcome the limitation that one is. Following this line of reasoning, it is this potential that education must explore, appealing to a new experience, to a new practice, a new policy that is able to give back to the polis the joy that the tyranny of powers stole from us.

Spinoza taught us to associate conatus to feelings, and to keep in mind the role they play in the homeostasis of the body, of the polis, of the cosmos. When this innate imperative is in danger, it expresses negative and positive feelings when well-being reigns. In this sense, they function as sentries. They tell us what we need to know. Actually, they function as mental assistants of homeostasis. Indeed, feelings play an important role in the invention of culture and of the homeostasis of the life of each and every one (polis). That is why Damásio<sup>xxxv</sup> stresses that he “rejects the traditional view of the brain as the single origin of the mind.” And in another passage Damásio<sup>xxxvi</sup> tells us that “without a body there is no mind”. The nervous system does not create the mind by itself, but in collaboration with the rest of the organism. It is the entire body that contributes to homeostasis, having been refined throughout man's evolution process. Mind and culture are connected. The cultural homeostasis that is life in the polis depends on the civilizational effort.

Damásio<sup>xxxvii</sup> argues that we are governed by two worlds. In one of the worlds, we are governed by the invisible hands of the natural rules of life regulation – pain and pleasure. The other world concerns the cultural means we have invented to guide life. Culture represents this cumulative effort that is life in the polis. In the variety of cultural organisms (ethnic diversity...), we find the seed of conflict. In very competitive, individualistic and self-centred cultures such as ours, people and social groups, due to rivalry and hostility, tend to clash, making life in the polis unbearable. The machinery of affections can awaken fury, anger,

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hatred, jealousy, envy, revulsion, anger, which may revert us to animal emotion. This is where education can play an important role, and revert the course of events enhancing well-being in the polis.

The civilizational effort, which has been made thanks to education, has led man to overcome conflicts, to live in a regime of peace and not of hostility and war. In the absence of civilizational effort, people will fight for what they want. The only way we can overcome this conflicting issue, fierce competition, is to promote cooperative cultures. Hence the need for education to foster these values of common life in the polis.

We haven't abandoned the realm of biology. We still hold on to the machinery of affections. However, it is important to invert the type of feelings. Only through education can we promote positive feelings – honesty, kindness, empathy, gratitude, modesty. The reading we make of Spinoza recommends that education must promote healthy environments (school cultures), encouraging ethical and civic behaviour for a new polis. Culture can play a crucial role in controlling violence and negative feelings, favouring and developing positive feelings. This is the great challenge faced by education. The problem is that education remains blind to affections. What future can we build if we do not feel it? What Spinoza wanted to tell us is that we should not want a human mind similar to the logic of artificial intelligence. What would the world be devoid of feelings and conscience? What makes man be a man is precisely self-consciousness (Sacarrão<sup>xxxviii</sup>), but one must add that feeling plays a vital role in this process<sup>xxxix</sup>. Education will only be truly fulfilling its role if it seeks more humanity in the unfinished being that is man, in other words, fostering feelings and consciousness for the life in the polis.

Spinoza advocates a relation between feeling and reason. Thinking homeostasis through more and better culture. With this relation, he aims to emphasise positive emotions and avoid negative ones. Spinoza argues that the human mind should not follow the logic of artificial intelligence, nor should we be prisoners of instincts.

At this point, Spinoza moves away from Kant. According to Kant<sup>xl</sup>, reason cannot be contaminated by feelings. Reason governs our will and our will is practical reason. Following Spinoza, we will say that education cannot exclude the ability to feel. That is what Spinoza told us, and what Damásio<sup>xli</sup> now proves. It is necessary to understand the biological base of the cultural mind. For Spinoza, goodwill is felt and this can only be achieved with education.

Man does not let himself be determined exclusively by what is natural. Man is moved by passions and by freedom. The former leads him to seek the satisfaction of selfish desires. Freedom arises to limit (law) the strength of passions. Freedom is not the absence of a limit. It is the production of a reality that leads man to live in conformity with it.

Education should take advantage of conatus, but by promoting healthy cooperation, in opposition to destructive competition. Education is part of this exercise of searching for greater perfection in ordinary life. Education must produce a new alchemy. This demand must be harmonious in order to promote collective and individual power.

## CONCLUSION

At a moment when the dualist and disintegrating perspective dominated, Spinoza strongly advocated integration and unity. He placed nature as a reference for reflection, in such a way that it has become an important issue that is still being valued today. Take, for example, the recently republished work, but already released in the twentieth century, by Helmuth Plessner<sup>xlii</sup>, in which this author tells us that, in order to understand human nature, we cannot fail to consider laughter and crying, two important aspects of expressive behaviour. Bergson<sup>xliii</sup> also dedicated his attention to this problem by stating that man is “an animal that laughs” or makes others laugh. In Schopenhauer's<sup>xliv</sup> theory of the ludicrous, known as the incongruity theory, we find a reference to laughter – he analyses the cognitive aspects of laughter. Freud<sup>xlv</sup> also talked about the importance of laughter for the psychic economy. Freud examined the different techniques of jokes and their cataloguing system. Everything that is laughable is related to what is human. The study of laughter is a peculiar way of studying human nature. This issue calls for a community of feelings. But to explain laughter you necessarily have to explain what is at stake in the thought process. Many authors have resumed feelings as a fundamental issue of the human condition. Still, the great forerunner of the issue of affections was Spinoza.

We can say that Spinoza stands against all the education taught. Spinoza's conception has consequences for education, and for physical education in particular, because it expands the idea of body-organism. The concern of educational work extends to affective, cultural and environmental concerns.

Education must follow the path of pleasure, of the power of pleasure. Spinoza was important in the ecology of knowledge because he invites us to a new relationship of each one with himself, with others, with society. It is no longer a question of manufacturing docile and submissive bodies<sup>xlvi</sup> but of taking advantage of each individual's potential. His notion calls into question all educational technology. Taking advantage of this new relationship implies a new, more ecological knowledge, capable of promoting a healthier body. Spinoza had a ground-breaking role and was able to position himself as a defender of freedom as political regime of the body, unlike the regime advocated by Hobbes. Finally, we make a point of mentioning António Damásio's importance and topicality, since he draws on Spinoza's theses to research brain neurology.



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### REFERENCES

- 1) Spinoza, B. (1969). *Tratado da reforma do entendimento*. Lisboa: Edições 70.
- 2) Foucault, M. (1994). *Dits et écrits*. Paris: Gallimard, p.117.
- 3) Spinoza, B. (2000). *Tratado da correção do intelecto*. São Paulo: Nova Cultura.
- 4) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.25.
- 5) Espinosa, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p. 25.
- 6) Espinosa, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.217.
- 7) Descartes, R. (2003). *Meditações Metafísicas*. São Paulo: Martins Fontes, p.23.
- 8) Aristóteles (2002). *Metafísica*. São Paulo: Edições Loyola, pp. 47-48.
- 9) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p. 230.
- 10) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.221.
- 11) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.9
- 12) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.10.
- 13) Damásio, A. (2017). *Ao encontro de Espinosa*. Lisboa: Círculo de Leitores.
- 14) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.283.
- 15) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.244.
- 16) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.244.
- 17) Espinosa, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.229.
- 18) Spinoza, B. (1960). *Ética. Demonstrada à maneira dos géometras. Parte I. De Deus*. Coimbra: Atlântida, p.232.
- 19) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.245.
- 20) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.250.
- 21) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.247.
- 22) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.251.
- 23) Jaeger, W. (1989). *Paidéia*. Martins Fontes: Editora Universidade de Brasília, p.77.
- 24) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.255.
- 25) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.256.
- 26) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*, Coimbra: Atlântida, p.258.
- 27) Spinoza, B. (2009). *Tratado político*. São Paulo: Martins Fontes, p.107.
- 28) Damásio, A. (2017a). *A estranha ordem das coisas*. Lisboa: Círculo de Leitores.
- 29) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.278.
- 30) Spinoza, B. (1962). *Ética. Demonstrada à maneira dos géometras. Parte II. Da natureza e da origem da alma; Parte III Da origem e da natureza das afecções*. Coimbra: Atlântida, p.285.
- 31) Foucault, M. (1994). *História da sexualidade II. O uso dos prazeres*. Lisboa: Relógio D'Água.
- 32) Hobbes, T. (2002). *O leviatã*. Lisboa: Casa da Moeda.
- 33) Spinoza, B. (1965). *Ética. Demonstrada à maneira dos géometras. Parte IV. Da servidão humana ou das forças das afecções. Parte V. Da potência da inteligência ou da liberdade humana*. Coimbra: Atlântida, p.330.
- 34) Spinoza, B. (1965). *Ética. Demonstrada à maneira dos géometras. Parte IV. Da servidão humana ou das forças das afecções. Parte V. Da potência da inteligência ou da liberdade humana*. Coimbra: Atlântida, p.91.
- 35) Damásio, A. (2017). *Ao encontro de Espinosa*. Lisboa: Círculo de Leitores, p. 45.
- 36) Damásio, A. (2017). *Ao encontro de Espinosa*. Lisboa: Círculo de Leitores, p. 99.
- 37) Damásio, A. (2017). *Ao encontro de Espinosa*. Lisboa: Círculo de Leitores, p. 309.
- 38) Sacarrão, F. (s.d.). *A biologia do egoísmo*. Lisboa: Publicações Europa-América, p.141.
- 39) Damásio, A. (2020). *Sentir & pensar*. Lisboa: Círculo de Leitores.
- 40) Kant, I. (2002). *Fundamentação da ética dos costumes*. Lisboa: Edições 70, p.47.

- 41) Damásio, A. (2020). *Sentir & pensar*. Lisboa: Círculo de Leitores.
- 42) Plessner, H. (1970). *Laughter and crying: a study in the limits of human behavior*. Evanstone: Northwestern University Press.
- 43) Bergson, H. (1983). *O riso*. Rio de Janeiro: Zahar Editores.
- 44) Schopenhauer, A. (s.d.). *O mundo como vontade e representação*. Porto: Rés.
- 45) Freud, S. (1996). *Os chistes e suas relações com o inconsciente*. Rio de Janeiro: IMAGO.
- 46) Foucault, M. (2005). *Vigiar e Punir*. Petrópolis: Vozes, p.119.



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## Study Physiology and Immunology Emergency Clinic Diseases in Patients Experiencing Clinical Consideration and Contamination.



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**ABSTRACT:** Emergency clinic diseases or medicinal services related contaminations happen in patients experiencing clinical consideration. This contamination happens worldwide in both created and creating nations. Generally, Staph, Streptococcus, and Escherichia coli have been triple clinic diseases. Emergency clinic pneumonia, careful injury contaminations, and vascular-related septicemia made access most illnesses and passings in medical clinic patients; concentrated consideration units were the focal point of anti-infection obstruction. The procured antimicrobial opposition is the primary issue, and the obstruction of Staphylococcus aureus is the greatest concern. The move to outpatient care departs the most powerless patients in medical clinics, with emergency clinic disease representing 7% in created nations and 10% in creating nations. Since this disease happens during medical clinic remain, it causes delayed remain, incapacity and financial weight. Visit diseases incorporate focal line circulatory system contaminations, urinary tract diseases related with a catheter, careful site contaminations and ventilation-related pneumonia. Clinic pathogens incorporate microscopic organisms, infections, and contagious parasites. As indicated by WHO gauges, almost 15% of all patients endure in medical clinics these contaminations. During hospitalization, the patient is presented to pathogens through an alternate asset condition, human services work force, and other contaminated patients.

### INTRODUCTION

The expression "Nosocomial" is utilized for any malady a patient gets under clinical consideration. It is a contamination gotten in an emergency clinic or other medicinal services office. To affirm both medical clinic and non-emergency clinic settings, it is now and then called a human services related contamination. [1] Such diseases can be gotten in the emergency clinic, nursing home, restoration office, outpatient facility, symptomatic research center, or other clinical setting. In a clinical situation, contamination can spread to a patient in danger in different ways. Social insurance laborers likewise spread the disease, just as sullied gear, bed cloth or air drops. The disease can emerge from the outside condition, or another tainted patient, or a working gathering that might be contaminated, or at times, the wellspring of the sickness can't be settled. At times, microorganisms start from the patient's skin germs, and become astute after medical procedure or different techniques that imperil the defensive skin boundary. In spite of the fact that the patient may have had a disease of his skin, the contamination is as yet thought of nosocomial as it creates in the human services condition.

Frequently level of tainted patients inside the emergency unit 51% [2]. In view of broad investigations in the USA and Europe, apparently the power of disease with HCAI disorder ran from 13.0 to 20.3 scenes per thousand days of patients [3]. Contaminations that are acquired by means of the placenta because of certain maladies, for example, rubella, toxoplasmosis, cytomegalovirus or syphilis, and seem 48 hours after birth [6]. Medical clinic obtained diseases showed up before the foundation of emergency clinics and turned into a medical issue during the marvel of anti-microbials. Because of these wounds, not exclusively did the costs increment, however the utilization of anti-toxins likewise expanded with the augmentation of hospitalization. This prompted high horribleness and death rate. Studies in various pieces of the world show that in Europe and North America, 5% to 10% of all medical clinics lead to emergency clinic contaminations.

With expanded contamination, there is an expansion in long hospitalization, long haul handicap, expanded antimicrobial opposition, expanded social and financial issue, and an expanded death rate. There is reinforcement data on the weight of clinic disease because of poor checking frameworks and non-existent control strategies. For example, While caring for various diseases, numerous The patients are Likely going to build up a respiratory disease and it gets upsetting to find the pervasiveness of any medical clinic contamination in a proceeding with essential consideration office [4]. These contaminations are possibly seen when they become plague, however no establishment or nation may profess to have tackled this endemic issue [5].

## **Study Physiology and Immunology Emergency Clinic Diseases in Patients Experiencing Clinical Consideration and Contamination.**

### **2- Types of hospital infection**

The National Health Care Safety Network with the CDC has characterized medical clinic contamination destinations into 13 sorts, with 50 disease locales, recognized dependent on organic clinical criteria. Basic locales incorporate urinary tract disease, careful tissue contaminations and delicate, meningitis, respiratory contaminations and gastroenteritis [8]. An adjustment in clinic contamination destinations can be handily recognized after some time because of the high utilization of malignant growth chemotherapy, immunotherapy, propels in organ transplants and intrusive procedures for symptomatic and treatment purposes. The perfect model can be found on account of pneumonia, where the predominance of pneumonia in clinics expanded from 17% to 30% inside five years [9].

### **MATERIALS AND METHODS**

#### **Central Line-Associated Bloodstream Infections (CLABSI)**

CLABSIs are a deadly medical clinic contamination with a passing pace of 12% \_ 25% [8]. Catheters are put in the focal line to give liquids and drugs, yet delayed use can cause genuine diseases in the circulation system, jeopardizing wellbeing and expanding the expense of care [9]. Despite the fact that there is a 46% discount in CLABSI from 2008 - 2013 in American clinics, an expected 30,100 CLABSI still happen in the emergency unit intense office offices in the United States every year [10].

#### **Catheter Associated Urinary Tract Infections (CAUTI)**

CAUTI is the most widely recognized kind of emergency clinic contamination all inclusive [11]. As indicated by 2011 insights for Acute Care Hospital, urinary tract contamination represents over 12% of announced wounds [12]. CAUTI cases are brought about by neighborhood indigenous microscopic organisms of the patients. The catheters set inside fill in as a channel for microbes section, while deficient seepage of the catheter holds some pee volume in the bladder, giving solidness to the microorganisms [11]. CAUTI can form into confusions, for example, orchitis, epididymitis, male prostatitis, cystitis, meningitis in all patients and pyelonephritis [12].

#### **Surgical Site Infections (SSI)**

SSIs are an emergency clinic disease that diminishes by 2% - 5% of patients experiencing medical procedure. This is the second most regular kind of medical clinic contamination essentially brought about by *Staphylococcus aureus*, which prompts delayed hospitalization and the danger of death [13]. Pathogens that cause SSI emerge from the patient's own microorganisms. The disease rate might be 20% high relying upon the technique and the checking criteria utilized [14].

#### **Ventilator Associated Pneumonia (VAP)**

VAP is the medical clinic's pneumonia found in 9-27% of patients who utilize a mechanical respirator. It for the most part happens inside 48 hours After hatching the trachea [15]. 86% of pneumonia in medical clinics is related with ventilation [16]. bronchial voices, Fever, and leukopenia are regular indications of VAP [17].

#### **Epidemiology of Nosocomial Infections**

Emergency clinic contamination influences countless patients internationally, which extraordinarily builds mortality and money related misfortunes. As per detailed WHO gauges, roughly 15% of all emergency clinic Patients suffer from the negative effects of this disease [23]. This contamination is liable for 4% to 56% of all reasons for death in babies, with an occurrence pace of 75% in Sub-Saharan Africa and Southeast Asia . The frequency rate is sufficiently high in high-pay nations, for example somewhere in the range of 3.5% and 12% while it extends somewhere in the range of 19.1% and 5.7% in low pay and center nations. The recurrence of all out diseases in low-salary nations is multiple times higher than in high-pay nations, while this rate is 3-20 times higher in neonates [24].

Determinants The hazard factors that decide emergency clinic disease rely upon the earth where care is given, quiet affectability and condition, and an absence of attention to this contamination common among staff and medicinal services suppliers.

### **RESULTS AND DISCUSSION**

The innate immune system constitutes the body's first line of defense against pathogens. Coded at the germline level, the so-called Pattern Recognition Receptors (PRRs), are used by innate immunity cells to recognize highly conserved structures present in microorganisms, collectively called Pathogen-Associated Molecular Patterns (PAMPs). The recognition of fungal PAMPs by PRRs induces in immune cells the induction of intracellular pathways that promote their activation, the production of different mediators and the induction of effector functions. This recognition stage is also important in establishing the onset of the adaptive

## **Study Physiology and Immunology Emergency Clinic Diseases in Patients Experiencing Clinical Consideration and Contamination.**

immune response and is essential in defining its profile. This innate recognition system allows discrimination between those fungal elements of commensal fungi against which the immune system must remain tolerant, from those from pathogenic agents against which it must exercise efficient protection.

The skin and mucosal surfaces constitute the physical barriers that prevent the entry of pathogens into the internal environment. Different preformed immune mediators and innate immunity cells possess key locations at different anatomical sites and are important in maintaining immunological surveillance against microorganisms, in basic commensalism arrangements, and in protection during invasion. Epithelial cells (EC) form an active barrier that protects the different tracts from the aggression of different pathogens and maintains balance with the commensal flora. ECs produce a broad spectrum of antimicrobial peptides (MAPs) that are constitutively present on mucosal surfaces, and respond rapidly to exposure to inflammatory or pathogenic stimuli by increasing their concentration and variety.

The expression of PRR in the EC allows to detect the presence of different microorganisms and induce the activation of intracellular pathways that promote the secretion of alarmins, PAMs and immune mediators such as IL-1 $\beta$ , IL-6, IL-8, and TNF $\alpha$ . An interesting experience with oral CE revealed that these cells can discriminate between the saprophytic form of *C. albicans* and its transition to the hyphal phase, and induce activation of intracytoplasmic signaling pathways in response to the pathogenic phenotype. In this way, the yeast morphotype is tolerated and the emission of the pseudohifa is considered a danger signal before which, the CE initiates the local inflammatory response. These cells also contribute to the recruitment of PMNs. The release of alarmins and IL-8 by the vaginal EC in response to *Candida* favor the infiltration of PMN and contribute to the appearance of symptoms in CVV. Epithelial cells from other anatomical locations, such as those of the pulmonary epithelium, not only act as an efficient barrier but also have the ability to phagocytize *Aspergillus* conidia.

### **Components of insusceptible reaction to contamination**

The resistant reaction assumes a fundamental job in securing against irresistible specialists. This is the primary impediment against a typical contamination that is normally connected with a high passing rate. For practically all irresistible ailments the quantity of people in danger is a lot higher than the individuals who are as of now experiencing the sickness. This demonstrates a great many people can obliterate these microorganisms and consequently forestall the improvement of contamination.

As opposed to immunodeficiency, regardless of whether from natural invulnerability (phagocytic brokenness or reciprocal lack) or versatile insusceptibility (diminished counter acting agent creation or diminished T cell work), it is firmly identified with expanded vulnerability to contamination.

In spite of the fact that the insusceptible reaction is fundamental to securing against most irresistible specialists, proof has gathered throughout the years about how the major neurotic parts of numerous irresistible infections are not identified with the immediate activity of the attacker, but instead to the anomalous invulnerable reaction. In a considerable lot of these cases, the extreme touchiness response with a misrepresented and unmodified invulnerable reaction is the aftereffect of tissue harm. In different cases, irresistible specialists, either by reenacting the antigens themselves, by duplicating self-responsive cells or by expanding articulation of MHC and co-incitement atoms in influenced cells, can prompt immune system infections.

Various sorts of organisms have been found with various parts of the resistant reaction since the mid 1950s, when the significance of antibodies in extracellular microbes demolition was first reported. Despite the fact that antibodies alone and separate can't pulverize microscopic organisms, they may kill microorganisms by keeping them from authoritative to the host tissue. In addition, in mix with supplement, antibodies may discharge microscopic organisms and go about as opsonin, in this way encouraging phagocytosis. Neutrophils, eosinophils and macrophages are broadly polished by organisms against different kinds of operators and are significant cells for have security. Documentation of how phagocytic cells express receptor layers, for example, TLRs, which are especially connected with the sub-atomic examples present in various irresistible specialists [8], make it off base to assign an intrinsic safe reaction uncertain. Neutrophils assume a fundamental job for germs against microorganisms. Macrophages are significant cells for safeguard against intracellular variables (protozoa and intracellular microorganisms). Eosinophils are fundamental not because of phagocytic movement as cytotoxic action against helminths. White blood cell intervened reaction is exceptionally compelling for an insurance system against intracellular elements, for example, infections, protozoa, growths, and intracellular microscopic organisms. Immune system microorganisms may work through cell harmfulness by CD8 + cells or by discharging cytokines, which actuate macrophages to wreck factors inside cells. Different components that might be engaged with the security against irresistible operators incorporate keratinocytes and Langerhans cells, as the skin is frequently attacked by different microorganisms. Keratinocytes can emit incalculable cytokines, subsequently invigorating and selecting provocative cells and skin lymphocytes. The Langerhans cell, thusly, assumes a major job in observing the skin area, coercing everything from explicit unbending proteins to including infections, microscopic organisms, or other attacking

## Study Physiology and Immunology Emergency Clinic Diseases in Patients Experiencing Clinical Consideration and Contamination.

microorganisms. After phagocytosis, the Langerhans cell moves to the provincial lymph hub to make an antigen introduction of lymphocytes, which starts to create explicit defensive invulnerability, resistance, or excessive touchiness.

With the expanding weight of emergency clinic contamination and antimicrobial opposition, it has gotten progressively hard for human services offices and disease control panels to arrive at the objective of killing time interims. Be that as it may, by rehearsing sheltered and solid techniques for conveying care planned by contamination control boards of trustees and controlling the transmission of this disease utilizing fitting strategies for the utilization of antimicrobials, the opposition of rising pathogens against antimicrobials can be decreased without any problem. In the time of anti-microbials, emergency clinic disease stays wild.

### CONCLUSION

Emergency clinic disease control is the execution of measures for the medicinal services division, and proof based administration can be a reasonable methodology. For those experiencing ventilation or medical clinic obtained pneumonia, emergency clinic indoor air quality control and checking ought to be on the organization's agenda,] while for emergency clinic rotavirus contamination, a hand cleanliness convention ought to be applied. Transmission of this disease ought to be confined for counteraction. Clinic squander fills in as a potential wellspring of pathogens and about 25% of emergency clinic squander is portrayed as dangerous. Medical clinic contamination can be controlled through disease control projects, confirmation and protection from antimicrobial use, and reception of an anti-microbial strategy.

### REFERENCES

- 1) Krishna Prakash S. Nosocomial infection-an overview. [Online] Available from: [http://www.researchgate.net/publication/18951524\\_Nosocomial\\_infections\\_an\\_overview](http://www.researchgate.net/publication/18951524_Nosocomial_infections_an_overview) [Accessed on 10th October, 2014]
- 2) Brusaferro S, Arnoldo L, Cattani G, Fabbro E, Cookson B, Gallagher R, et al. Harmonizing and supporting infection control training in Europe. *J Hosp Infect* 2015; 89(4): 351-6.
- 3) Obiero CW, Seale AC, Berkley JA. Empiric treatment of neonatal sepsis in developing countries. *Pediatr Infect Dis J* 2015; 34(6): 659-61.
- 4) Murray PR, Rosenthal KS, Pfaller MA. *Medical microbiology*. 5th ed. Missouri: Mosby Inc; 2005.
- 5) Lolekha S, Ratanaubol B, Manu P. Nosocomial infection in a teaching hospital in Thailand. *Phil J Microbiol Infect Dis* 1981; 10: 103-14.
- 6) Festary A, Kourí V, Correa CB, Verdasquera D, Roig T, Couret MP. Cytomegalovirus and herpes simplex infections in mothers and newborns in a Havana maternity hospital. *MEDICC Rev* 2015; 17(1): 29-34.
- 7) World Health Organization. *Prevention of hospital-acquired infections: a practical guide*. Geneva: World Health Organization; 2002. [Online] Available from: <http://www.who.int/csr/resources/publications/whodcscsreph200212.pdf> [Accessed on 8th February 2015]
- 8) Raka L, Zoutman D, Mulliqi G, Krasniqi S, Dedushaj I, Raka N, et al. Prevalence of nosocomial infections in high-risk units in the university clinical center of Kosova. *Infect Control Hosp Epidemiol* 2006; 27(4): 421-3.
- 9) Duque AS, Ferreira AF, Cezário RC, Filho PPG. Nosocomial infections in two hospitals in Uberlandia, Brazil. *Rev Panam Infectol* 2007; 9(4): 14-8.
- 10) Gatermann S, Fünfstück R, Handrick W, Leitritz L, Naber KG, Podbielski A, et al. [MIQ 02: Urinary Tract Infections: Quality standards for microbiological infections]. München: Urban & Fischer; 2005, p. 8-21. German.
- 11) Horan TC, Andrus M, Dudeck MA. CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control* 2008; 36(5): 309-32.
- 12) Gordon RJ, Lowy FD. Pathogenesis of methicillin-resistant *Staphylococcus aureus* infection. *Clin Infect Dis* 2008; 46(Suppl 5): S350-9.
- 13) Klein E, Smith DL, Laxminarayan R. Hospitalizations and deaths caused by methicillin-resistant *Staphylococcus aureus*, United States, 1999- 2005. *Emerg Infect Dis* 2007; 13(12): 1840-6.
- 14) Shinagawa N, Taniguchi M, Hirata K, Furuhashi T, Fukuhara K, Mizuguchi T, et al. [Bacteria isolated from surgical infections and its susceptibilities to antimicrobial agents-special references to bacteria isolated between April 2010 and March 2011]. *Jpn J Antibiot* 2014; 67(5): 293-334. Japanese.
- 15) Vandenesch F, Lina G, Henry T. *Staphylococcus aureus* hemolysins, bi-component leukocidins, and cytolytic peptides: a redundant arsenal of membrane-damaging virulence factors? *Front Cell Infect Microbiol* 2012; 2: 12.
- 16) Al Laham N, Mediavilla JR, Chen L, Abdelateef N, Elamreen FA, Ginocchio CC, et al. MRSA clonal complex 22 strains

## Study Physiology and Immunology Emergency Clinic Diseases in Patients Experiencing Clinical Consideration and Contamination.

harboring toxic shock syndrome toxin (TSST-1) are endemic in the primary hospital in Gaza, Palestine. PLoS One 2015; 10(3): e0120008.

- 17) Lausch KR, Fuursted K, Larsen CS, Storgaard M. Colonisation with multi-resistant Enterobacteriaceae in hospitalised Danish patients with a history of recent travel: a cross-sectional study. *Travel Med Infect Dis* 2013; 11(5): 320-3.
- 18) Zhao W, Yang S, Huang Q, Cai P. Bacterial cell surface properties: role of loosely bound extracellular polymeric substances (LB-EPS). *Colloids Surf B Biointerfaces* 2015; 128: 600-7.
- 19) Karki S, Leder K, Cheng AC. Should we continue to isolate patients with vancomycin-resistant enterococci in hospitals? *Med J Aust* 2015; 202(5): 234-6.
- 20) Kaiser L, Emonet S, Huttner A, Vetter P, Toutous Trelu L, Uriel Valladares Bickel P, et al. [Infections disease update: 2014 is viral]. *Rev Med Suisse* 2015; 11(456-457): 72-7. French.
- 21) Sood S, Malhotra M, Das BK, Kapil A. Enterococcal infections & antimicrobial resistance. *Indian J Med Res* 2008; 128(2): 111-21.
- 22) Lin YT, Wang YP, Wang FD, Fung CP. Community-onset *Klebsiella pneumoniae pneumonia* in Taiwan: clinical features of the disease and associated microbiological characteristics of isolates from pneumonia and nasopharynx. *Front Microbiol* 2015; 9: 122.
- 23) Bălăşoiu M, Bălăşoiu AT, Mănescu R, Avramescu C, Ionete O. *Pseudomonas aeruginosa* resistance phenotypes and phenotypic highlighting methods. *Curr Health Sci J* 2014; 40(2): 85-92.
- 24) Kim J, Kang JO, Kim H, Seo MR, Choi TY, Pai H, et al. Epidemiology of *Clostridium difficile* infections in a tertiary-care hospital in Korea. *Clin Microbiol Infect* 2013; 19(6): 521-7.



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## Ways to Strengthen the Competitiveness of National Financial Markets in the Context of Financial Globalization



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**ABSTRACT:** The financial market mobilizes free funds and turns them into financial resources, idle money in the hands of the population into a source of income. The financial market, which includes deposits, bills, foreign exchange, stock, bond, derivative and insurance markets, is usually the driving force of the economy. It serves to solve social problems by developing the financial market, improving the competitive environment, promoting the use of new types of financial management, attracting investments to business entities, and creating additional jobs.

**KEYWORDS:** financial market, stock market, transnational corporations, international financial relations.

### INTRODUCTION

Despite the extensive research of international models of corporate governance related to the organization of financial markets, this scientific and practical experience is poorly applied in the real sector of our country's economy. As a result, the conditions of corporate governance are not sufficiently fulfilled in the activities of joint-stock companies. Financial market liquidity is not as required and the current state of secondary market efficiency weakens the activity of the population and other participants of the securities market in the financial market.

In the conditions of the market economy, the essence of economic concepts is defined by scientists and experts through debates, scientific-theoretical views, combined with the ideas of that time, its functions, principles, specific features, characteristic aspects, market segments and their from the point of view of economic relations between its participants, a deeper scientific justification is being improved and brought into a system, it is being developed on a scientific basis in accordance with the requirements of the time and fundamental factors.

In particular, the economic essence of the international financial market was created by economists who lived in different periods through their different ideas. However, each economic category is constantly improving based on modern factors. Today, the international financial market also performs new and diverse functions in an additional way. From this point of view, a deeper study of its economic essence, taking into account the theoretical scientific views of several economists, current modern factors and other specific aspects, indicates the relevance of the topic.

Different authors do not interpret the term international financial market in the same way. Often, this concept is used in the plural: international financial markets. In addition, it is common to compare the international financial market with the concept of the world loan capital market. The definition of the term international financial market in different interpretations is its broad or narrow interpretation. In this case, the broad or narrow interpretation is also understood in different ways. For example, the famous scientist L.N. Krasavina notes that "International financial markets in a broad sense are the field of market relations that ensure the accumulation and redistribution of money capital between countries. In essence, this concept refers to the interaction of the interests of its participants, which determine the terms of international financial transactions. The international financial market is a stock market in a narrow sense, that is, a market for transactions with securities" [1]. Also, Krasavina presented the structure of international financial markets in relation to national and international actors (Table 1).

**Table 1. Structure and participants of international financial markets [1]**

<i>National participants</i>	<i>Market structure</i>	<i>International participants</i>
1	2	3
Corporations	Currency markets, including the Eurocurrency market	International corporations, TMK



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Banks and specialized credit and financial institutions, including insurance companies	Debt capital markets: a) money market; b) capital market; c) euro market	International banks, TNC, specialized credit and financial institutions, including insurance companies
Stock and commodity exchanges	Stock markets	Major stock and commodity exchanges International currency credit and financial organizations
	Insurance markets	
	Gold markets	

A well-known scientist in the field of international financial relations D.M. Mikhaylov shows the international financial market from the point of view of the instruments in circulation in it. In his opinion, the global debt capital market and the international financial market are "conceptually more similar categories in the practical use of this concept", and in the international financial market debt capital, debt instruments and derivative contracts appear as objects of trade [ 2].

The similarity of the concepts of the financial market and the credit market can be found in other sources. For example, "Financial market (loan capital market) is a mechanism of redistribution of capital between creditors and debtors with the help of intermediaries, based on demand and supply of capital. In practice, it represents a collection of credit and financial institutions that direct the flow of funds from owners to debtors and vice versa. It is possible to meet the concept that the main task of the financial market is the transformation of inactive funds into loan capital" [3].

Uzbek economists A.Vahobov, N.Jumayev, U.Burkhanov in the textbook "International Financial Relations" write "International financial markets are based on the principles of protecting the national interests of countries, which is a comprehensive interstate cooperation." international financial markets and their global markets in the form of stock, or states as a set of markets implementing a single financial and credit policy [6].

Also, J.Kh. Ataniyazov, E.D. Alimardonov's textbook "International financial relations" gives an opinion on the structure of the international financial market and the mechanism of entering this market. In particular, it recognizes that the international financial market consists of the national financial market and the international financial market. The authors focus on the sum of foreign securities, i.e., the set of markets that arise through the international circulation of Eurobonds in countries [7].

### ANALYSIS AND RESULTS

The high level of organization of the financial market is determined by its special mechanism of operation. This mechanism is determined by the results of the direct participation of all participants of the financial market on the basis of the full application of the laws and categories of the economy and on the basis of the regulatory policy of the state, and is jointly implemented by the state and economic entities.

As of 2020, a significant share of the financial market is distributed among a small number of countries. The largest of these are the USA (40%), Japan (8%), "Science and Education" Scientific Journal / Impact Factor 3,848 (SJIF) February 2023 / Volume 4 Issue 2 China (7%), Hong Kong (7%), Great Britain (4%), France (3%), Germany (3%) are the most powerful countries in the world.

It can be seen that two-thirds of the world's financial market belongs to most developed countries. One of the main segments of the world financial market is the stock exchange or securities (capital) market.

The development of the financial market and modern financial infrastructure is one of the main conditions for the transition to the path of innovative development. Only under such conditions will it be possible to activate investment activities and generate investment flows, and then redirect them to the field of high technologies. Direct investment, which is one of the main factors of economic growth, cannot be achieved without creating the basic elements of modern financial markets.

Compliance with the main principles of the financial market is ensured on the basis of harmonization of the rules developed by the stock exchanges and associations of market participants along with the regulatory measures of the state.

On the other hand, the mobilization of money as capital for production strengthens the economic potential, accelerates innovation, scientific and technical progress and, on this basis, serves to further increase the well-being of the people.

### CONCLUSION

In the conditions of financial globalization, the main goal of the development of the financial market is to increase the export potential of manufactured goods, to provide consumers with goods that meet global requirements, and to ensure the stability of the country's monetary policy.

## Ways to Strengthen the Competitiveness of National Financial Markets in the Context of Financial Globalization

In the measures for the development of the capital market in our country, it is necessary to form a comprehensive strategy for the development of this market, to assist in the formation of its effective infrastructure, and to activate practical actions aimed at the rapid development and expansion of the secondary securities market, to improve the corporate management system based on advanced foreign experiences, capital issues such as the development of international relations in the field of market regulation should be given special priority.

A large amount of investments will be necessary to further deepen the economic reforms being carried out in our country. Investments can be brought through the financial market and the stock market. That is why the role of the financial market and securities in the economic growth of the country is extremely large.

### REFERENCES

- 1) Dli M. I., Kakatunova T. V. procedure of distribution of results of innovative activity in regions // Journal of legal and economic research. 2010. No. 1. P. 5-9.
- 2) Kirillova E. Structural model of interaction of the system of material and technical support of nuclear power plants at various stages of innovative processes. Scientific review.2016. No. 2. P. 131-135.
- 3) Dli M. I., T. V. Khachaturova ensure the effective interaction of the elements of the innovation environment of the region // the Integral. 2008. No. 2. P. 92-93.
- 4) Kirillova E. A. Improvement of processes of management of material and technical resources at implementation of innovative projects in nuclear power // Economic Sciences.2016. No. 134. P. 97-100.
- 5) A.Abdukayumov. Ways to improve financial support of pension supply system in uzbekistan// N.Khudayberdiyev, and A.Abdukayumov. Студенческий вестник, 2019, № 21-9, С. 21-9.
- 6) A.Abdukayumov. Various ways of solving extremum problems // S.S Aktamovich, K Dilbar, A.A Nizomjonovich - South Asian Journal of Marketing & Management ..., 2021. №8, С. 14-21.
- 7) A.Abdukayumov. Понятие денег, их роль и значение в рыночной экономике, X.Хакимов - Galaxy International Interdisciplinary Research Journal, 2022. №9, С. 102-104.



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## The Role of Parents in Supporting Children's Achievements in Swimming Training at the Yogyakarta Swimming Club



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**ABSTRACT:** The role of psychological aspects, especially in providing social support to children, is an important factor that affects sports achievement. This study aims to determine the role of parents in supporting children's achievements in swimming training. This research is descriptive quantitative. The study population was the parents of swimming athletes totaling 52 people. The sampling technique used total sampling. The instrument used a questionnaire. Data analysis using descriptive percentage. The results showed that the role of parents in supporting children's achievements in swimming training was in the "very less" category of 1.92% (1 person), "less" by 34.62% (18 people), "enough" by 23.08% (12 people), "good" by 40.38% (21 people), and "very good" by 0.00% (0 people). The role of parents in supporting children's achievements in swimming training based on an average value of 82.02 is in the moderate category.

**KEYWORDS:** parental role, child achievement, swimming training

### INTRODUCTION

One of the most popular sports in Indonesia is swimming. Swimming is one way to avoid one of the dangers arising from nature, namely the dangers that come from water. (Meshel, 2020). Since ancient times it has been known that water is an inseparable part of a biological life for humans, animals and plants, it would not be able to live if water did not exist. Swimming is a physical activity that has a relationship with the limbs in performing regular movements. Swimming is an individualized and measurable sport (Kos & Umek, 2018); (Wilkins & Havenith, 2017).

Swimming is one of the sports that is done in water using only the body. Swimming is one of the sports that combines several factors such as muscle strength, coordination, rhythm, technical skills, speed rhythm, explosive power and correct technique. (Aktug et al., 2018); (Ilham et al., 2021). Swimming is a movement performed by a person to cover a certain distance on the surface of the water. (Veiga & Roig, 2017). Swimming is not only a recreational sport but also an achievement sport. Sports achievement is the result of the training process that athletes display according to their abilities. Achieving maximum achievement will not come just like that but is obtained with hard work. It takes careful preparation both in the aspects of physical condition, technique, tactics and mental maturity in competing and does not escape the support of parents.

The role of parents in the development of growing children is inseparable in supporting children's activities. Role is a dynamic aspect of position (status), a position that is appropriate if someone carries out their rights and obligations, then a role can be carried out by that person. (Kim, 2020). Children's activities if fully supported by parents are the most important factor, because the future of their children will have a big influence from their parents. Parents have a big share in the future of their children.

Parents play a very important role in supporting their children's achievements in sports, especially swimming. The family environment is the first and main medium that directly or indirectly affects behavior in child development. ((Tiwery, 2021). Parents play a very important role in guiding and accompanying children in their daily lives. It is the duty of parents to create a conducive environment, so as to bring out the child's potential, intelligence, and self-confidence, and not to forget to understand the stage of child development and the need to develop the potential intelligence of each child.

Child development is inseparable from the role of parents in supporting children's activities. Swimming also requires facilities and infrastructure. Sports facilities and infrastructure are very important in the process of activities to improve athlete performance. Facilities and infrastructure are the main pillars in supporting every activity related to sports activities. Swimming sports facilities and infrastructure that athletes must have include swimming goggles, swimsuits, frog legs, float boards, hand paddles, pull buoys. Where support, existence, as well as parental assistance related to sports facilities and infrastructure is very

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important in supporting children during training and competition. (Strandbu et al., 2019); (Stefansen et al., 2018). However, what is seen during training is that there are still many parents who do not want to accompany their children to practice, rarely also provide motivation and encouragement during training, especially when competing, there are still many children who come alone to the training ground. Some parents only focus on the results achieved by children rather than being involved in the process of achieving children's achievements.

The lack of parental involvement in supporting children who practice can have a negative impact on children's habits where their achievements can decrease, become lazy during training, and children feel that they are not cared for by their parents. Children who train often participate in inter-club championships, both at the regional, regional and national levels. To face these championships, training is carried out in the hope of obtaining maximum results. However, in recent years there has been a decline in achievement. This is because there are still many parents who have not given permission for children to compete outside the city, even though the child has great potential to become an outstanding athlete. Based on this, the researcher is interested in conducting a study entitled "The Role of Parents in Supporting Children's Achievements in Swimming Training".

### METHOD

This research is quantitative descriptive research. The population in this study were parents of swimming athletes. Samples were taken based on random sampling techniques totaling 52 people. The data analysis technique used is descriptive percentage. The parental role instrument uses a questionnaire. Instrument grids in table 1.

**Table 1. Instrument Grid**

Variable	Factor	Indicator	Item	
			Favourable	Unfavourable
The role of parents in supporting children's achievements in swimming training	Attention	Spontaneous attention	2, 3, 4,	1
		Reflective attention	5, 7, 8	6
		Intensive attention	9, 10, 11	
		Non-intensive attention		12
		Focused attention	13, 14	
		Radiated attention	16, 17	15
	Nutrition	Nutritional fulfillment	18, 19, 21, 22,	20, 23
	Facilities and Infrastructure	Facilities and infrastructure for training/matches	24, 25, 26	27
	Environment	Family environment	28, 29, 30, 31	
		Training environment	32, 33	
<b>Total</b>			<b>33</b>	

### RESULT

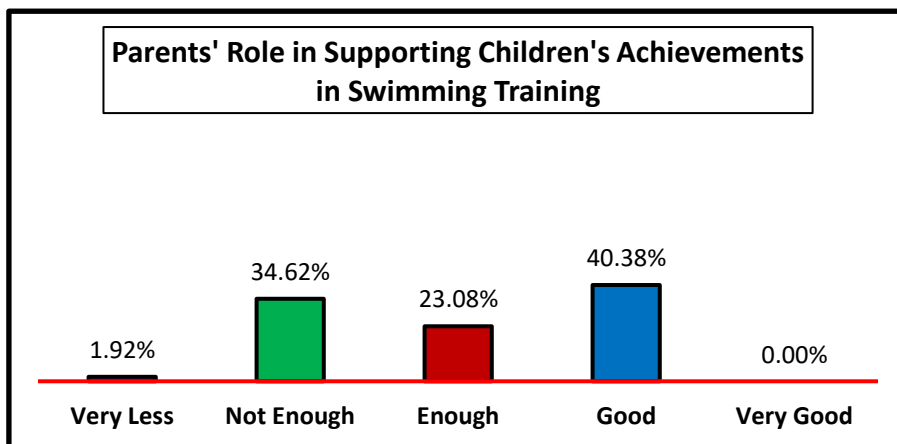
The results of this study are intended to describe the data, namely the role of parents in supporting children's achievements in swimming training. The results of the analysis of the role of parents in supporting children's achievements in swimming training are explained as follows:

**Table 2. Descriptive Statistics of Parents' Role in Supporting Children's Achievements in Swimming Training**

Statistics	
Mean	82.02
Median	80.00
Mode	98.00
Std. Deviation	15.11
Minimum	40.00
Maximum	106.00

Based on table 2 above, the role of parents in supporting children's achievements in swimming training can be seen in figure 1 as follows:

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**Figure 1. Bar Diagram of Parents' Role in Supporting Children's Achievements in Swimming Training**

Based on table 2 and figure 1 above, it shows that the role of parents in supporting children's achievements in swimming training is in the "very less" category of 1.92% (1 person), "less" by 34.62% (18 people), "enough" by 23.08% (12 people), "good" by 40.38% (21 people), and "very good" by 0.00% (0 people).

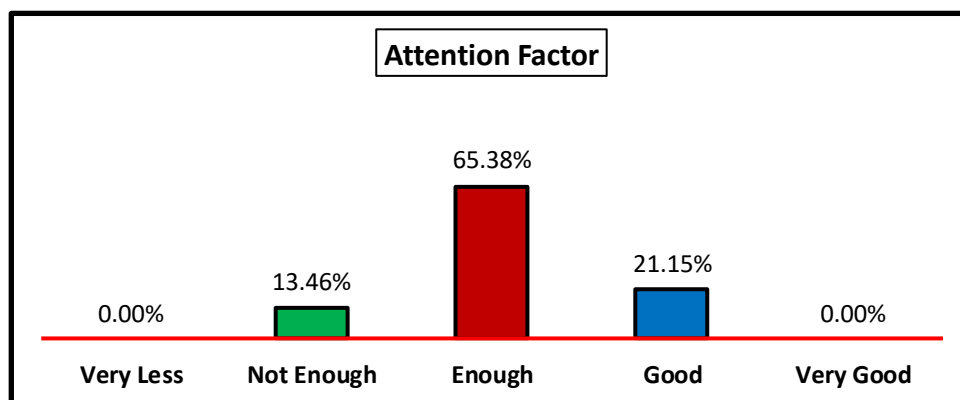
**Attention Factor**

Descriptive statistics of research data on the role of parents in supporting children's achievements in swimming training based on attention factors in table 3 as follows:

**Table 3. Descriptive Statistics of Attention Factor**

Statistic	
N	52
Mean	41.54
Median	40.50
Mode	51.00
Std. Deviation	7.88
Minimum	21.00
Maximum	51.00

Based on table 3, the role of parents in supporting children's achievements in swimming training based on attention factors can be seen in figure 14 as follows:



**Figure 2. Bar Diagram Attention Factor**

Based on table 3 and figure 2 above, it shows that the role of parents in supporting children's achievements in swimming training based on the attention factor is in the "very less" category of 0.00% (0 people), "less" of 36.00% (9 people), "enough" of 28.00% (7 people), "good" of 24.00% (6 people), and "very good" of 12.00% (3 people).

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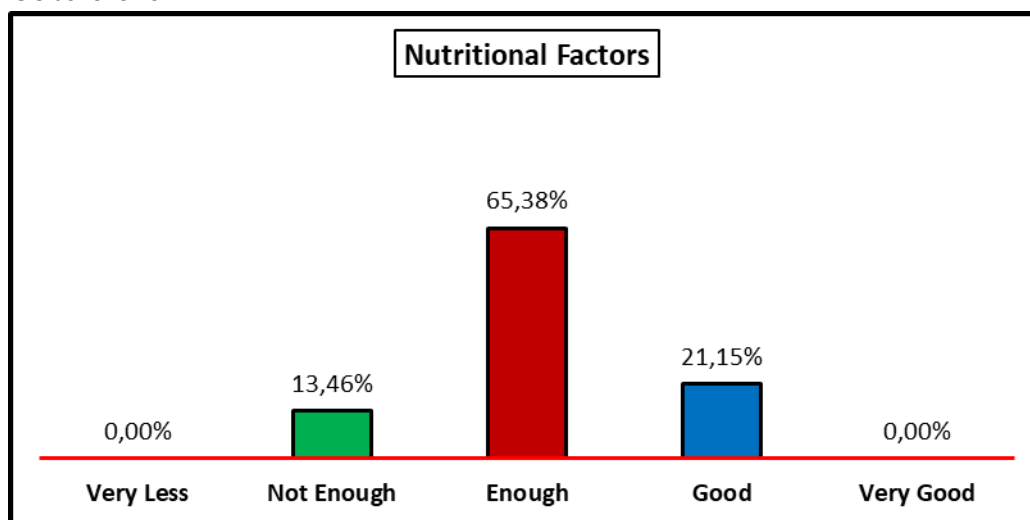
## Nutritional Factors

Descriptive statistics of research data on the role of parents in supporting children's achievements in swimming training based on nutritional factors in table 4 as follows:

**Table 4. Descriptive Statistics of Nutritional Factors**

Statistics	
N	52
Mean	15.85
Median	15.50
Mode	14.00
Std. Deviation	3.26
Minimum	7.00
Maximum	22.00

Based on table 4, the role of parents in supporting children's achievements in swimming training based on nutritional factors can be seen in figure 3 as follows:



**Figure 3: Bar Diagram of Nutritional Factors**

Based on table 4 and figure 3 above, it shows that the role of parents in supporting children's achievements in swimming training based on nutritional factors is in the "very less" category of 0.00% (0 people), "less" by 13.46% (7 people), "enough" by 65.38% (34 people), "good" by 21.15% (11 people), and "very good" by 0.00% (0 people).

## Facilities and Infrastructure Factors

Descriptive statistics of research data on the role of parents in supporting children's achievements in swimming training based on facilities and infrastructure factors can be seen in table 5 as follows:

**Table 5. Descriptive Statistics of Facilities and Infrastructure Factors**

Statistics	
N	52
Mean	10.13
Median	10.00
Mode	12.00
Std. Deviation	2.08
Minimum	4.00
Maximum	14.00

## The Role of Parents in Supporting Children's Achievements in Swimming Training at the Yogyakarta Swimming Club

Based on table 5, the role of parents in supporting children's achievements in swimming training based on facilities and infrastructure factors can be seen in figure 4 as follows:

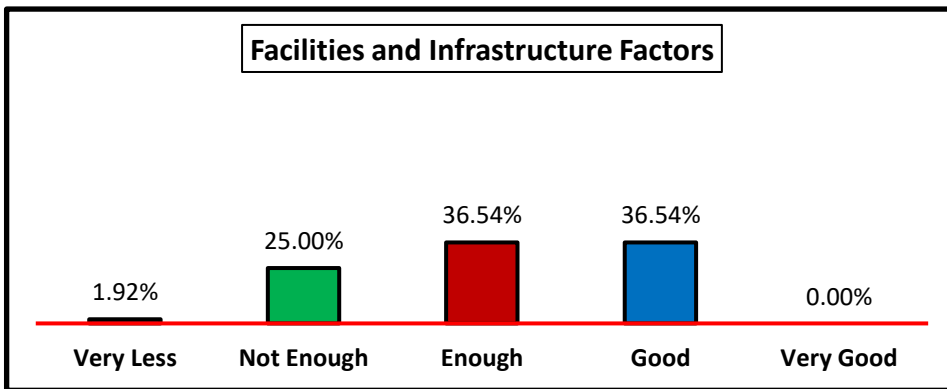


Figure 4: Bar Diagram of Facilities and Infrastructure Factors

Based on table 5 and figure 4 above, it shows that the role of parents in supporting children's achievements in swimming training based on the facilities and infrastructure factor is in the "very less" category of 1.92% (1 person), "less" by 25.00% (13 people), "enough" by 36.54% (19 people), "good" by 36.54% (19 people), and "very good" by 0.00% (0 people).

### Environmental Factors

Descriptive statistics of research data on the role of parents in supporting children's achievements in swimming training based on environmental factors can be seen in table 6 as follows:

Table 6. Descriptive Statistics of Environmental Factors

Statistics	
N	52
Mean	14.50
Median	14.00
Mode	14.00
Std. Deviation	2.82
Minimum	8.00
Maximum	24.00

Based on table 6, the role of parents in supporting children's achievements in swimming training based on environmental factors can be seen in figure 5 as follows:

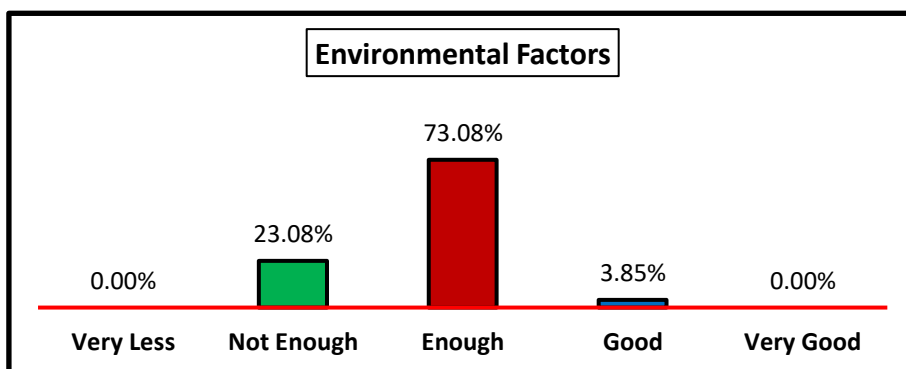


Figure 5. Bar Chart of Environmental Factors

Based on table 6 and figure 5 above, it shows that the role of parents in supporting children's achievements in swimming training based on environmental factors is in the "very less" category of 0.00% (0 people), "less" by 23.08% (12 people), "enough" by 73.08% (38 people), "good" by 3.85% (2 people), and "very good" by 0.00% (0 people).

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## DISCUSSION

This study aims to determine the role of parents in supporting children's achievements in swimming training. Based on the results of the study, it shows that the role of parents in supporting children's achievements in swimming training based on an average value of 82.02 is in the sufficient category. More details, namely the role of parents in supporting children's achievements in swimming training is good by 40.38%, less by 34.62%, and enough by 23.08%. Low parental involvement in supporting children who practice can have a bad impact on children's habits where their achievements can decrease, become lazy during training, and children feel that their parents are not cared for. Children who train often participate in inter-club championships, both at the regional, regional and national levels. To face these championships, training is carried out in the hope of obtaining maximum results. However, in recent years swimming has experienced a decline in achievement. This is because there are still many parents who have not given permission for children to compete outside the city, even though the child has great potential to become an outstanding athlete.

Achieving an achievement in sports has several components that support it, such as the state of the body and strategy, conditions during the match, athlete skills, and infrastructure. For many athletes, parental support for sports activities is very important. Parental guidance is the most important influence on a child's development, both directly and indirectly. Parental support and encouragement are essential for the development of a child's intelligence and self-confidence. The support provided by parents is not only in a competition. The main supporting factors in the progress of this athlete's own achievements are infrastructure, nutrition, motivation and parental support. (Aldapit & Suharjana, 2019).

The role of parents in developing the abilities of their children is very important, in the sense that the steps taken by parents play an important role in improving and developing the abilities of their children, as a positive effort for the development of their children. The role of parents is one of the motivations for their children in developing their ability to participate in sports training. (Witt & Dangi, 2018); (McGarty & Melville, 2018). The role and support of parents in encouraging their children to take part in sports training that they are interested in has a very big influence on the child, both in the form of moral encouragement, providing the facilities needed for their children to practice, and their social environment.

Role is a dynamic aspect of position (status), a position that is appropriate if someone carries out their rights and obligations, then a role can be carried out by that person. Children's activities if fully supported by parents are the most important factor, because the future of their children will have a big influence from their parents. At the time of training and competing where the presence, support and motivation of parents are most important in terms of supporting children. Many also when other children when doing training still look parents or siblings no one wants to accompany or support children training, little is also given motivation and a sense of enthusiasm when doing training, so it looks a lot of children at the training ground come alone.

Given the important role of parents in educating children, several studies have proven that parents have a very large share in the ability of children in the scope of sports. Like the results of research (Terok & Huwae, 2022) The results showed that the role of parents towards their children participating in sports training organized by rural sports activist youth is: 1) provide moral encouragement; 2) fulfill the needs of the facilities needed by their children; 3) provide social support from their environment. Furthermore, the results of the research (Haqi & Irsyada, 2022) shows that the attention factor is sufficient with a percentage of 67% (16 people), the nutritional factor is fairly good with a percentage of 37.6% (9 people), the facilities and infrastructure factor is very good with a percentage of 54.2% (13 people), environmental factors 67% (16 people) are fairly good. Based on these results, it can be concluded that the support of parents of PUBG Mobile esports athletes in the Bigetron Esports Team is in the good category of the four support factors.

### Attention Factor

Based on the results of the study, it shows that the role of parents in supporting children's achievements in swimming training based on attention factors is in the "less" category of 36.00%, "enough" of 28.00%, "good" of 24.00%, and "very good" of 12.00%. Parents are able to pay attention to children's progress both physically and psychologically, and do not forget that parents can also facilitate children who have talents and interests from a child. The success of children through attention from parents is indeed important and not underestimated, because it is very influential for later children. The description and types of attention both through the facilities provided to children should parents give up special forms of attention in different ways according to the character of the child in order to increase the enthusiasm of children's training in supporting sports achievements. Parents must take full responsibility for their children, starting from nurturing, raising and also being responsible for the physical and mental needs of a child. (Albrecht, 2019). This need can be in the form of attention from parents, either in the form of direct affection or in other forms of attention. In this case, what is meant by parents is not only limited to biological parents but also foster parents who care for, pay attention to, and are responsible for the child.



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## Nutritional Factors

Based on the results of the study, it shows that the role of parents in supporting children's achievements in swimming training based on nutritional factors is in the "less" category by 13.46%, "enough" by 65.38%, and "good" by 21.15%. Parents provide food according to the child's taste. This is because parents do not bother about their children's food. Parents know nutritious food but not the right provision for athletes when training and competing. Based on the results of interviews with coaches, there are parents of athletes who pay attention to nutritional intake to athletes when training, although only a small proportion of parents. This is because most parents do not know what good nutrition for athletes should be. Every child in determining their healthy lifestyle must be different, for example in food selection. The choice of food for each person is different. Determination of the right food during a pandemic when before doing exercise for the body needs to be considered the time and type of exercise intensity levels. Energy needs in the body before and after exercise must pay attention to the content of food consumed, especially foods with a high carbohydrate content. Hunger can be avoided by consuming food one hour before doing the exercise.

## Facilities and Infrastructure Factors

Based on the results of the study, it shows that the role of parents in supporting children's achievements in swimming training based on facilities and infrastructure factors is in the "less" category of 25.00%, "enough" of 36.54%, and "good" of 36.54%. The results of the study correspond to that what is seen during training is that there are still many parents who do not want to accompany their children to practice, rarely also provide motivation and enthusiasm during training, especially when competing, there are still many children who come alone to the training ground. Some parents only focus on the results achieved by children rather than being involved in the process of achieving children's achievements. Sports facilities and infrastructure are very important in the process of activities to improve athlete achievement. Facilities and infrastructure are the main pillars in supporting every activity related to sports activities. (Chalip et al., 2017). Swimming sports facilities and infrastructure that athletes must have include swimming goggles, swimsuits, frog legs, float boards, hand paddles, pull buoys. Where support, existence, as well as parental assistance related to sports facilities and infrastructure is very important in supporting children during training and competition. Facilities and infrastructure are issues that must be met for any sports organization, achievements will support if the facilities will be supported by progress or improvement, at least the provision of proper facilities will foster the spirit of training.

## Environmental Factors

Based on the results of the study, it shows that the role of parents in supporting children's achievements in swimming training based on environmental factors is in the "less" category by 23.08%, "enough" by 73.08%, and "good" by 3.85%. The physical and spiritual growth of children is very large through the influence of the environment both from the family and the environment. The responsibility of parents in educating their children at home will be based on love. The main perspective in terms of education in realizing lofty expectations is the suitability of responsibility as parents in the family. The family environment is the first and main medium that directly or indirectly affects behavior in child development. (Chalimah et al., 2019). Parents play a very important role in guiding and accompanying children in their daily lives. It is the duty of parents to create a conducive environment, so as to bring out the child's potential, intelligence, and self-confidence, and not to forget to understand the stage of child development and the need to develop the potential intelligence of each child.

## CONCLUSIONS

Based on the results of data analysis and discussion, it can be seen that the role of parents in supporting children's achievements in swimming training is in the "very less" category of 1.92% (1 person), "less" by 34.62% (18 people), "enough" by 23.08% (12 people), "good" by 40.38% (21 people), and "very good" by 0.00% (0 people). The role of parents in supporting children's achievements in swimming training based on an average value of 82.02 is in the sufficient category. The results of this study can be used to expand knowledge for readers and as a reference for other researchers who conduct further research on the role of parents in supporting children's achievements in swimming training. Parents are expected to always provide support for their children in doing positive activities, so that children can develop the talents that exist in their children, especially swimming.

## REFERENCES

- 1) Aktug, Z. B., Iri, R., & Top, E. (2018). The Investigation of the Relationship between Children's 50m Freestyle Swimming Performances and Motor Performances. *Asian Journal of Education and Training*, 4(1), 41–44.
- 2) Albrecht, N. J. (2019). Responsibility for nurturing a child's wellbeing: Teachers teaching mindfulness with children. *Asia-*

## The Role of Parents in Supporting Children's Achievements in Swimming Training at the Yogyakarta Swimming Club

*Pacific Journal of Teacher Education*, 47(5), 487–507.

- 3) 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.
- 4) Chalimah, S. N., Martono, S., & Khafid, M. (2019). The saving behavior of public vocational high school students of business and management program in Semarang. *Journal of Economic Education*, 8(1), 22–29.
- 5) Chalip, L., Green, B. C., Taks, M., & Misener, L. (2017). Creating sport participation from sport events: Making it happen. *International Journal of Sport Policy and Politics*, 9(2), 257–276.
- 6) Haqi, D. A., & Irsyada, M. (2022). Peran Orang Tua dalam Mendukung Prestasi Atlet PUBG Mobile di Tim Bigetron Esports. *Jurnal Prestasi Olahraga*, 5(7), 33–39.
- 7) Ilham, M., Iqroni, D., Karakauki, M., Ali, S. K. S., Kristiyanto, A., Nasrulloh, A., Pratama, K. W., Festiawan, R., Burhaein, E., & Phytanza, D. T. P. (2021). Effects of resistance band exercise on student's freestyle swimming skills. *Sport Science*, 15(1).
- 8) Kim, J. (2020). Learning and teaching online during Covid-19: Experiences of student teachers in an early childhood education practicum. *International Journal of Early Childhood*, 52(2), 145–158.
- 9) Kos, A., & Umek, A. (2018). Wearable sensor devices for prevention and rehabilitation in healthcare: Swimming exercise with real-time therapist feedback. *IEEE Internet of Things Journal*, 6(2), 1331–1341.
- 10) McGarty, A. M., & Melville, C. A. (2018). Parental perceptions of facilitators and barriers to physical activity for children with intellectual disabilities: A mixed methods systematic review. *Research in Developmental Disabilities*, 73, 40–57.
- 11) Meshel, T. (2020). Swimming against the current: Revisiting the principles of international water law in the resolution of fresh water disputes. *Harv. Int'l LJ*, 61, 135.
- 12) Stefansen, K., Smette, I., & Strandbu, Å. (2018). Understanding the increase in parents' involvement in organized youth sports. *Sport, Education and Society*, 23(2), 162–172.
- 13) Strandbu, Å., Stefansen, K., Smette, I., & Sandvik, M. R. (2019). Young people's experiences of parental involvement in youth sport. *Sport, Education and Society*, 24(1), 66–77.
- 14) Terok, E. R., & Huwae, A. (2022). Motivasi berprestasi atlet bulutangkis di kabupaten tolitoli ditinjau dari dukungan sosial orang tua, teman, dan pelatih. *Journal Of Sport Education (JOPE)*, 5(1), 48–57.
- 15) Tiwery, W. Y. (2021). Role Of Family For Children's Education During A Pandemic In Eastern Indonesia. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(7), 1522–1527.
- 16) Veiga, S., & Roig, A. (2017). Effect of the starting and turning performances on the subsequent swimming parameters of elite swimmers. *Sports Biomechanics*, 16(1), 34–44.
- 17) Wilkins, E. L., & Havenith, G. (2017). External heating garments used post-warm-up improve upper body power and elite sprint swimming performance. *Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology*, 231(2), 91–101.
- 18) Witt, P. A., & Dangi, T. B. (2018). Why children/youth drop out of sports. *Journal of Park and Recreation Administration*, 36(3).



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## Physical Fitness as a Predictor of Concentration Level of Students of Public Junior High Schools in Bantul



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**ABSTRACT:** This study aims to determine Physical Fitness as a Predictor of Concentration Level of State Junior High School Students in Bantul. This type of research is quantitative with a correlational approach. The sample in this study were students in Bantul State Junior High School totaling 146 students. The instrument used to measure physical fitness is the TKJI test for children aged 13-15 years, while concentration is measured using the Grid Concentration Test. Data analysis techniques using Pearson Correlation Product Moment analysis. The results showed that there was a significant relationship between physical fitness and the concentration level of students in Bantul State Junior High School. The contribution of physical fitness to the concentration level of students in Bantul State Junior High School is 32.20%, while the remaining 67.80% is influenced by other factors outside this study. Seeing the tendency of students who lack movement activities so that physical fitness, we hope that schools and educational institutions will encourage students to get more movement activities by utilizing extracurricular sports activities with maximum attention. For other researchers, research can be conducted with other independent variables, so that more variables that affect physical fitness can be identified.

**KEYWORDS:** physical fitness, concentration

### INTRODUCTION

In this era of modernization, learning is no longer a routine that students like to do. This is because there are many things that make students lazy or bored in learning. Learners prefer to play cell phones, online games, or other activities that come from the surrounding environment. Students feel very comfortable playing these games without feeling bored for a long period of time. The use of smartphones also has a negative impact on the development of learners which is characterized by lazy learners in doing movement activities and interacting (Nayak, 2018).

Students who are active in sports or in other ways, students who have high physical fitness will produce longer concentration levels than students who have low physical fitness (Edwards et al., 2017); (García-Hermoso et al., 2020). The study conducted (Nuryadi et al., 2018) also states that physical fitness has a correlation to concentration with the results of the correlation test of  $r = 0.4338$  and the coefficient of determination of 9.18%. Physical fitness has a considerable contribution to concentration ability, that children who are active in sports in other words children who have high physical fitness will produce a longer concentration level compared to children who have low fitness.

Weak physical fitness results in reduced productivity in carrying out daily activities (Duke & Montag, 2017). A person's physical fitness level will affect their physical and mental readiness to be able to accept the workload. This also applies to students, students with good physical fitness levels will be able to carry out their learning activities smoothly (Esentürk, 2021). A good level of physical fitness will make a student able to work effectively and efficiently, not susceptible to disease, learn more passionately and enthusiastically, and can optimally and be able to face challenges in life both in the school environment and society (Casey et al., 2017); (Whittle et al., 2018).

The most basic problem of learning is that it requires high concentration. Learners are required to stay concentrated until the lesson is over. Concentration is one of the main factors that can affect learning. The higher a person's concentration, the more effective the learning activities, but on the contrary, if the concentration is low, the results obtained are not optimal (Illeris, 2018). Concentration is the ability to focus attention on a task by not being distracted and affected by external and internal stimuli, while its implementation refers to a broad dimension and focus on specific tasks (Attia et al., 2017); (Gaillard, 2018); (Stevenson et al., 2018). So important is concentration for learners, so concentration can be a prerequisite for learners in learning to successfully achieve learning goals.

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Through good physical fitness, students will be able to receive and absorb every lesson given by the teacher, so that the purpose of education can be achieved. In addition, through good physical fitness, it is expected that each learner will also have confidence in learning activities. Learners will not get tired easily or easily fall ill due to decreased endurance and certainly not easily lose concentration. This is also stated in research (Nuryadi et al., 2018) that another impact of physical fitness causes significant changes in the endocrine system. The results of the study also stated that the higher the physical fitness, the lower the cortisol response in the sense of concentration and the ability to release anxiety is also higher.

Concentration is a person's ability to focus when doing an activity until it is completed at a certain time, so that the person is able to remember well all the work that is going on. Concentration is a person's ability to maintain focus on activities contained in a rapidly changing atmosphere in his mind about the past and future (Rahiem, 2021). Having good concentration must of course have a good level of fitness, because when physical fitness is good it is likely that the person will easily feel tired and will be susceptible to disease, thus having an impact on learning concentration and academic achievement that will be achieved. The level of physical fitness is needed to support daily activities, so that someone has a good level of fitness, then will not have significant fatigue. Therefore, all human activities demand physical fitness.

Based on observations of researchers at junior high school in Bantul Regency with details of 9 men and 6 women. Based on the results of the preliminary study, the researcher found that all students surveyed owned and used smartphones. The results of the study found that 9 students were excessive smartphone users with an average use of 3-8 hours / day, 5 students were moderate users with an average use of 2-3 hours / day and the rest were light users with an intensity of use of less than 1 hour per day. Learners prefer to play online games rather than other activities such as sports or extracurricular activities.

Based on the expression of a Roman poet Decimus Iunius Juvenalis, namely "Mens Sana In Corpore Sano", healthy students should be active in the learning process of movement and should foster the spirit of the soul and a clear mind, so as to support concentration in learning. Based on the explanation of the results of these observations, this study intends to find out more about "Physical Fitness as a Predictor of the Concentration Level of State Junior High School Students in Bantul Regency".

### METHOD

This type of research is correlational research. Correlational research is research conducted to determine whether there is a relationship between two or more variables. The method used in this research is the survey method, while the techniques and data collection use questionnaires and learning outcomes. The survey method is an investigation held to obtain facts from existing symptoms and look for deficiencies factually. The sample in the study were students in Bantul State Junior High School totaling 146 students. The sampling technique used random sampling. The instrument or tool used to measure physical fitness is the TKJI test for children aged 13-15 years, while concentration is measured using the Grid Concentration Test. The data analysis technique used is a prerequisite test consisting of normality test, linearity test, multicollinearity test, while the hypothesis test uses partial and simultaneous tests. The analysis was conducted using SPSS 23.

### RESULTS

The results of descriptive analysis aimed to determine the physical fitness and concentration of public junior high school students in Bantul. The complete results are in Table 1.

**Table 1. Descriptive Statistics of Physical Fitness**

Statistics	
<i>N</i>	146
<i>Mean</i>	13,23
<i>Median</i>	13,00
<i>Mode</i>	13,00
<i>Std. Deviation</i>	2,01
<i>Minimum</i>	10,00
<i>Maximum</i>	19,00

When displayed in the form of Norms of Assessment, the physical fitness of students in Bantul state junior high school is presented in Table 2.

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**Table 2. Physical Fitness Assessment Norms**

No	Interval	Category	Frequency	Percentage
1	22 - 25	Excelent	0	0,00%
2	18 - 21	Good	7	4,80%
3	14 - 17	Medium	53	36,30%
4	10 - 13	Less	86	58,90%
5	5 - 9	Very poor	0	0,00%
<b>Total</b>			<b>146</b>	<b>100%</b>

Based on table 2 above, it shows that the level of physical fitness of students at Bantul state junior high school is in the category of "very poor" by 0.00% (0 students), "less" by 58.90% (86 students), "moderate" by 36.30% (53 students), "good" by 4.80% (7 students), and "very good" by 0.00% (0 students).

Descriptive statistics of students' concentration data at Bantul state junior high school are shown in Table 3.

**Table 3. Descriptive Statistics of Concentration**

Statistics	
<i>N</i>	146
<i>Mean</i>	12,84
<i>Median</i>	12,50
<i>Mode</i>	12,00
<i>Std. Deviation</i>	2,97
<i>Minimum</i>	6,00
<i>Maximum</i>	22,00

When displayed in the form of Norms of Assessment, the concentration of students in Bantul state junior high schools is presented in Table 4.

**Table 4. Concentration Assessment Norms**

No	Interval	Category	Frequency	Percentage
1	21 ≤	Good	2	1,37%
2	11-20	Medium	117	80,14%
3	0-10	Less	27	18,49%
<b>Total</b>			<b>146</b>	<b>100%</b>

Based on table 4 above, it shows that the concentration level of students at Bantul state junior high school is in the "less" category of 18.49% (27 students), "enough" of 80.14% (117 students), and "good" of 1.37% (2 students).

The data normality test in this study used the Kolmogorov-Smirnov method. The results of the data normality test conducted on each group were analyzed with the SPSS version 20.0 for windows software program with a significance level of 5% or 0.05. The data summary is presented in Table 5.

**Table 5. Normality Test Results**

No	Variable	<i>p</i>	<i>Sig</i>	Description
1	Physical Fitness (X)	0,111	0,05	<b>Normal</b>
2	Concentration (Y)	0,116	0,05	<b>Normal</b>

Based on the statistical analysis of the normality test that has been carried out using the Kolmogorov-Smirnov test in Table 6, the physical fitness and concentration variables of students obtained normality test results with a significance value of  $p\text{-value} > 0.05$ , which means that the data is normally distributed.

Testing the linearity of the relationship is done through the F test. The relationship between the independent variable (X) and the dependent variable (Y) is declared linear if the sig value  $> 0.05$ . The results of the linearity test can be seen in Table 6:

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Table 6. Linearity Test Results

Functional Relationship	<i>p</i>	<i>Sig.</i>	Description
Physical Fitness (X)* Concentration (Y)	0,419	0,050	Linier

From Table 6 above, it can be seen that the p-value is  $0.419 > 0.05$ . So, the relationship between the physical fitness variable and the concentration of students is declared linear.

The correlation coefficient significance test is carried out by consulting the r table. If r count is consulted with r table using an error rate of 5%. If the significance value of  $p < 0.05$ , then the hypothesis is accepted and the  $p\text{-value} > 0.05$ , then the hypothesis is rejected. If r count is greater than r table, then there is a positive and significant relationship between the variables tested. The results of the hypothesis test are presented as follows.

Table 7. Correlation Test Results

Functional Relationship	<i>r</i> hitung	Significance	Description
Physical Fitness (X) Concentration (Y)	0,567	0,000	Significan

Based on the analysis results in table 7 above, it can be seen that the value of r count is 0.567 and the value of r table (df  $146-1 = 145$ ) is 0.162, while the p-value is  $0.000 < 0.05$ , then  $H_0$  is rejected, so  $H_a$  which reads "There is a significant relationship between physical fitness and the concentration level of students in Bantul State Junior High School", is accepted. The correlation is positive, meaning that if physical fitness is good, then the level of concentration will also be better. The coefficient of determination or R Square is 0.322 or 32.20%. This means that the contribution of physical fitness to the concentration level of students in Bantul State Junior High School is 32.20%, while the remaining 67.80% is influenced by other factors outside this study, such as intelligence factors, knowledge factors, and experience factors.

### DISCUSSION

Based on the results of the study, it shows that there is a significant relationship between physical fitness and the level of concentration of students in Bantul State Junior High School. The contribution of physical fitness to the concentration level of students in Bantul State Junior High School is 32.20%, while the remaining 67.80% is influenced by other factors outside this study. The results of this study are supported by research conducted (Krissanthy et al., 2020) which shows that there is a significant relationship between the level of physical fitness and the concentration level of class X students of State Senior High School 9 Bekasi City. The coefficient of determination obtained was 33.4% and the rest of the calculation of 66.6% of the concentration level was determined by other factors. The study (Putra, 2019) concluded that there is a relationship between physical fitness and the concentration level of students at State Junior High School 1 Gondang, Mojokerto, with a significance value of 0.01. Furthermore, the study (Hermawan et al., 2022) showed that there was a relationship between physical fitness and concentration level. In the study (Nuryadi et al., 2018) also stated that physical fitness has a relationship to concentration with the results of the correlation test of  $r = 0.4338$  and the coefficient of determination of 9.18%.

Based on descriptive analysis, it shows that most of the physical fitness levels of students in Bantul Regency State Junior High School are in the less category, which is 58.90% or 86 students. This lack of physical fitness is because students are excessive smartphone users with an average use of 3-8 hours / day, 5 students are moderate users with an average use of 2-3 hours / day and the rest are light users with an intensity of use of less than 1 hour per day. Learners prefer to play online games rather than other activities such as sports or extracurricular activities. High intensity in playing online games can make learners addicted, so that it has an impact on the laziness of learners to do activities. Students even very rarely do sports activities, especially during the Covid-19 pandemic.

Based on descriptive analysis, it shows that most of the concentration levels of students in Bantul Regency State Junior High School are in the sufficient category, which is 80.14% or 117 students. These results are in accordance with observations made by researchers, showing that of the 15 students 12 of them stated that it was difficult to concentrate and were often sleepy when participating in online learning. Students also often lose concentration if they are doing assignments.

Physical fitness has a positive correlation with academic achievement and learning outcomes. Physical fitness can improve concentration and focus at least in a short time so that it can contribute positively to the academic achievement of students at school (De Greeff et al., 2018); (Fidan & Tuncel, 2019); (Watson et al., 2017), so that physical fitness is closely related to physical condition or physical endurance, so with good physical fitness, it is hoped that students will be able to absorb more knowledge from each subject at school.

## Physical Fitness as a Predictor of Concentration Level of Students of Public Junior High Schools in Bantul

Concentration is needed in daily activities. Concentration is a skill that is learned not to react or be distracted by irrelevant stimuli, where our minds must be directed to a point in a job. Concentration is how a person focuses on doing something, so that the work can be done within the specified time. A person's ability to concentrate is also different, according to his age (Huang et al., 2020). Concentration is one aspect that supports students to achieve good achievement and if this concentration is reduced, then following lessons in class and learning personally will be disrupted.

Learners with good concentration must have a good fitness level because when someone does not have a good level of physical fitness, it is likely that the person will easily feel tired and will be susceptible to disease, so that their health level will have an impact on learning concentration and academic achievement. The level of physical fitness is needed to support daily activities, so that someone has a good level of fitness, then will not have significant fatigue. Therefore, all human activities demand physical fitness (Chen et al., 2020).

Physical fitness can be improved through exercise. Sport is a physical training activity, namely physical activity to enrich and improve the ability and skills of basic movement and movement skills (sports). This activity is a form of approach to the aspect of physical well-being or physical health, which also means dynamic health, which is healthy accompanied by the ability to move to meet all the demands of daily life. This means that everyone who does physical education through sports activities and has an adequate level of physical fitness. The more exercise increases, the concentration will also increase. This is in accordance with the theory that says that someone who often exercises has a better metabolic function than someone who rarely exercises or does not exercise at all. Exercise can facilitate the circulation system, so that nutritional and energy needs for the brain are fulfilled and make the brain work optimally (Woods et al., 2020).

### CONCLUSIONS

The conclusion of this study is that there is a significant relationship between physical fitness and the level of concentration of students in State Junior High School in Bantul. The contribution of physical fitness to the concentration level of students in Bantul State Junior High School is 32.20%, while the remaining 67.80% is influenced by other factors outside this study. Seeing the tendency of students who lack movement activities so that physical fitness, we hope that schools and educational institutions will encourage students to get more movement activities by utilizing extracurricular sports activities with maximum attention. For other researchers, research can be conducted with other independent variables, so that more variables that affect physical fitness can be identified.

### REFERENCES

- 1) Attia, N. A., Baig, L., Marzouk, Y. I., & Khan, A. (2017). The potential effect of technology and distractions on undergraduate students' concentration. *Pakistan Journal of Medical Sciences*, 33(4), 860.
- 2) Casey, A., Goodyear, V. A., & Armour, K. M. (2017). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society*, 22(2), 288–304.
- 3) Chen, P., Mao, L., Nassis, G. P., Harmer, P., Ainsworth, B. E., & Li, F. (2020). Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*, 9(2), 103.
- 4) De Greeff, J. W., Bosker, R. J., Oosterlaan, J., Visscher, C., & Hartman, E. (2018). Effects of physical activity on executive functions, attention and academic performance in preadolescent children: a meta-analysis. *Journal of Science and Medicine in Sport*, 21(5), 501–507.
- 5) Duke, É., & Montag, C. (2017). Smartphone addiction, daily interruptions and self-reported productivity. *Addictive Behaviors Reports*, 6, 90–95.
- 6) Edwards, J., Jeffrey, S., May, T., Rinehart, N. J., & Barnett, L. M. (2017). Does playing a sports active video game improve object control skills of children with autism spectrum disorder? *Journal of Sport and Health Science*, 6(1), 17–24.
- 7) Esentürk, O. K. (2021). Parents' perceptions on physical activity for their children with autism spectrum disorders during the novel Coronavirus outbreak. *International Journal of Developmental Disabilities*, 67(6), 446–457.
- 8) Fidan, M., & Tuncel, M. (2019). Integrating augmented reality into problem based learning: The effects on learning achievement and attitude in physics education. *Computers & Education*, 142, 103635.
- 9) Gaillard, A. W. K. (2018). Concentration, stress and performance. In *Performance under stress* (pp. 75–92). CRC Press.
- 10) García-Hermoso, A., Hormazábal-Aguayo, I., Fernández-Vergara, O., González-Calderón, N., Russell-Guzmán, J., Vicencio-Rojas, F., Chacana-Cañas, C., & Ramírez-Vélez, R. (2020). A before-school physical activity intervention to improve cognitive parameters in children: The Active-Start study. *Scandinavian Journal of Medicine & Science in Sports*, 30(1), 108–116.
- 11) Hermawan, I., Sonjaya, A. R., & Raswan, M. S. (2022). Hubungan antara tingkat kebugaran jasmani dengan konsentrasi

## Physical Fitness as a Predictor of Concentration Level of Students of Public Junior High Schools in Bantul

belajar pendidikan jasmani siswa. *Holistic Journal of Sport Education*, 1(2), 52–59.

- 12) Huang, T., Hochbein, C., & Simons, J. (2020). The relationship among school contexts, principal time use, school climate, and student achievement. *Educational Management Administration & Leadership*, 48(2), 305–323.
- 13) Illeris, K. (2018). A comprehensive understanding of human learning. In *Contemporary theories of learning* (pp. 1–14). Routledge.
- 14) Krissanthy, A., Kurniawan, F., & Resita, C. (2020). Hubungan Kebugaran Jasmani Terhadap Tingkat Konsentrasi Siswa di SMAN 9 Bekasi. *Jurnal Literasi Olahraga*, 1(1).
- 15) Nayak, J. K. (2018). Relationship among smartphone usage, addiction, academic performance and the moderating role of gender: A study of higher education students in India. *Computers & Education*, 123, 164–173.
- 16) Nuryadi, N., Negara, J. D. K., Juliantine, T., Slamet, S., & Gumilar, A. (2018). Hubungan kebugaran jasmani dengan kemampuan konsentrasi dan respon kortisol. *Jurnal Pendidikan Jasmani Dan Olahraga*, 3(2), 122–128.
- 17) Putra, E. P. (2019). Hubungan Kebugaran Jasmani Terhadap Tingkat Konsentrasi Peserta Didik (Studi Pada Peserta Didik Smp Negeri 1 Gondang Mojokerto). *Jurnal Pendidikan Olahraga Dan Kesehatan*, 7(3).
- 18) Rahiem, M. D. H. (2021). Remaining motivated despite the limitations: University students' learning propensity during the COVID-19 pandemic. *Children and Youth Services Review*, 120, 105802.
- 19) Stevenson, M. P., Schilhab, T., & Bentsen, P. (2018). Attention Restoration Theory II: A systematic review to clarify attention processes affected by exposure to natural environments. *Journal of Toxicology and Environmental Health, Part B*, 21(4), 227–268.
- 20) Watson, A., Timperio, A., Brown, H., Best, K., & Hesketh, K. D. (2017). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 14, 1–24.
- 21) Whittle, R. J., Telford, A., & Benson, A. C. (2018). Teacher's Perceptions of how they Influence Student Academic Performance in VCE Physical Education. *Australian Journal of Teacher Education*, 43(2), 1–25.
- 22) Woods, J. A., Hutchinson, N. T., Powers, S. K., Roberts, W. O., Gomez-Cabrera, M. C., Radak, Z., Berkes, I., Boros, A., Boldogh, I., & Leeuwenburgh, C. (2020). The COVID-19 pandemic and physical activity. *Sports Medicine and Health Science*, 2(2), 55–64.



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## Development and Dynamics of State Administration in Indonesia: The Struggle of the Discourse of the “State” Administration vis a vis the “Public” Administration



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**ABSTRACT:** Since Woodrow Wilson “stirred up” the United States public through his writing entitled *The Study of Administration* (1887) in the journal *Political Science Quarterly*, state administration began to develop worldwide, including to Indonesia. Since the 1990s, the state administration has grown considerably compared to Wilson's time. It cannot be denied that the development of State Administration Science is so massive in its home country of the United States and other Anglo-Saxon countries such as England, Canada, Australia and New Zealand. While in developing countries, the dynamics of State Administration is not so intense because there is still strong political, bureaucratic and cultural control. The concept of “State Administration” is not “public administration” for a while until the author can accept the logic thinking (epistemology) of Public Administration as the mainstream science of State Administration in Indonesia today. In theory, concepts and paradigms, state administration is experiencing a fairly rapid development. Many contemporary theories have emerged in the repertoire of State Administration that criticize and enrich classical theories such as theories about Organization and bureaucracy. That development is something natural considering that state administration is part of the social sciences that have dynamic characteristics, unlike the Natural Sciences which tend to be passive and positivistic. This development should be appreciated because it indicates that the state administration is able to exist in the midst of increasingly complex community problems and needs concrete solutions.

**KEYWORDS:** State Administration, Public Administration

### I. INTRODUCTION

The development of theories, concepts and paradigms in administration is also very diverse (distinct) and unique (Aneta, 2012; Gow & Dufour, 2000). Every ingenious-scholar of State Administration has a theory and concept of State Administration with arguments and interpretations that are different from each other, so that the dynamics of State Administration thinking is so much felt (Cristofaro, 2020). In addition, the condition of an increasingly globalized world where the increasingly unclear geographical boundaries of the country thanks to the information technology revolution, also influenced the development of theories, concepts and paradigms of State Administration (Nur et al., 2022). More and more theories, concepts and paradigms of State Administration have been co-opted with the ideology of globalization that wants every country, into a territorial unity in a non-physical. That is, there are no more barriers or national borders that are too far to reach because everything can be explored in a short time by utilizing information technology media.

This dynamic has had a great influence on the science of State Administration in various parts of the world. Not only in his home country and in other developed countries, in developing countries, especially Indonesia, the discourse of State Administration scientists is developing rapidly and is so dynamic (Lutfi, 2020). Conceptually there has been a very significant development in the theory and paradigm of State Administration in Indonesia (Soehartono et al., 2021). This development is of course pioneered by campus academics who are engaged in state administration and the wider community who have a concern for state administration. This fact can be traced from the dynamics of scientific development in various public, private and official universities that organize State Administration programs. Each place that organizes State Administration Education has its own horizon and is different from each other. This dynamic is more due to the different interpretations of theories, concepts and paradigms of State Administration that develop in the science of State Administration.

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It cannot be denied that the theories, concepts and paradigms of State Administration that develop in Indonesia are imported from outside. Public policy theory, Public Management Theory and governance theory are theories that were born in the West, which were later adopted by academics and practitioners of State Administration in Indonesia. Until now, the author has not found a single writing or book about the theory of State Administration that is “native” to Indonesia. Mostly, books about the theory of State Administration written by Indonesians and circulating in Indonesia are books that include theories of State Administration from outside with slight modifications (threat) and additions here and there with the case of Indonesia. This phenomenon if allowed to last for a long period of time can result in the loss of independence and identity of the Indonesian state administration.

State Administration Science in Indonesia took place in a dynamic condition has been felt since the political reform in Indonesia (Thoha, 2017), which was marked by the overthrow of the New Order in 1998 (Ginting & Haryati, 2011) until now, the dialectic of Administrative Science occurred so warmly. Each department/Department / study program that offers state administration education in universities in Indonesia has a different scientific horizon from each other. Furthermore, this raises a different perspective in looking at and running state administration education. In the current context, a very interesting development and dynamic to highlight is the dialectic and debate about “state” administration and “public” administration. At first glance, this issue seems simple because it only concerns the problem of the name (label). However, more than that, these developments and dynamics have long philosophical and historical roots and deserve to be analyzed as they relate to the identity of the Indonesian state administration itself.

### **II. METHODS**

This research will essentially highlight the development and dynamics of State Administration in Indonesia, including its scientific discourse in this case is driven by the campus world developed by each university in Indonesia, its thinking and especially on the struggle of “State” Administrative discourse vis a vis public administration. Before entering on the main issue, this paper will review the nature of State Administration, the development of its paradigm and theory in order to find the state of the art of State Administration. As a comparison material, this study will also look at the development of State Administration scientists in the United States, England, the Netherlands, Australia, Singapore and Malaysia as an outward looking effort and identify the dynamics of the discourse of State Administration scientists in developed countries which due to the influence of globalization often becomes the “mecca” of State Administration for developing countries, including Indonesia. In the end this study will be closed with an input for the development of State Administration in Indonesia in order to find the identity of the state administration” Indonesia”.

### **III. RESULT AND DISCUSSION**

#### **A. Nature State Administration**

To manage and implement government, of course, requires a reliable public administrator, this administrator is now known as bureaucracy (Bozeman & Feeney, 2011; Shafritz et al., 2016). The difference is that public problems in those days were not as complex as now so that the tasks and functions of State Administration were not too prominent (Wahab, 2021).

As an independent discipline and separate from political science, State Administration only found itself as a science in the 19th century (Johan, 2018), administration is understood as the implementation of routine government tasks and implementing public policy (Kurhayadi et al., 2020). Thus, the administration must be separated from politics. It was this thought that inspired the emergence of the paradigm of the political-administrative dichotomy.

In its classic sense, State Administration is understood as the implementation of policies made by public officials (Ramdhani & Ramdhani, 2017), the use of power to impose rules to guarantee the public good and the relations between the public and the bureaucracy that has been appointed to carry out the common good. The state administration is formed to organize the public interest and serve the public (Nuraini, 2020). In principle, the state administration is formed to serve the public and should not side with any one political interest, for any reason. The state administration must be neutral and non-partisan so that service to the public can be carried out fairly without discriminating one's social status, position and political preferences.

Then at this point the question arises, who is the public? Public is everything related to the wider community and the interests of the crowd (Nuraini, 2020). Public can mean the state along with its authorities and equipment, civil society organizations, private organizations (Saglie & Sivesind, 2018), educational organizations (Pratomo, 2022), religious organizations (Aziz et al., 2023), even the smallest organizations such as the neighborhood unit (RT) even though it is a manifestation of the public. So it is wrong if there is an opinion that states that the public is only the state, outside the state is not public. The concept

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of the public itself is not only a state monopoly, but more than that the public is a domain that deals with the interests of society at large.

### B. The Development of Paradigms and Theories of State Administration

State administration has paradigms that can be divided based on the context of the time of its appearance. Henry divided the paradigm of State Administration into five diachronic paradigms. According to Henry (2015) paradigm in state administration consists of:

1. Political-administrative dichotomy (1900-1926);
2. Principles of administration (1927-1937);
3. Administration as political science (1950-1970);
4. State administration as management (1956-1970);
5. State administration as State Administration (1970-?).

Looking at Henry's (2015) opinion in Public Administration and Public Affairs, it seems that there is a break in the idea of the fifth paradigm because Henry only mentioned that the fifth paradigm began in 1970, but it is not clear when it will end. Even in the sixth revision of his book, Henry has not dared to reveal whether the paradigm of State Administration as state administration is still relevant today. Whereas the dynamics of State Administration took place very quickly because of the increasingly turbulent times (turbulence). The question we have to ask is, is the state administration still in the fifth paradigm? Is the fifth paradigm still relevant or not for the current situation?

To answer the above question, Denhardt and Denhardt's writing, *The New Public Service: Serving, not Steering*, written in 2003, can be used as a reference. Denhardt and Denhardt divided the state administration paradigm into 3 paradigms, namely, Old Public Administration (OPA), New Public Management (NPM) and New Public Service (NPS). The OPA paradigm cannot be separated from the classical paradigms in state administration proposed by Henry, while the idea of NPM is covered from Osborne and Gaebler's entrepreneurial government thoughts (Denhardt & Denhardt, 2003).

The most current paradigm in state administration according to Denhardt and Denhardt is the NPS. In general, the NPS mindset opposes previous paradigms (OPA and NPM). The theoretical basis of the NPS paradigm is developed from the theory of democracy, with more respect for differences, participation and human rights of citizens. In NPS the concept of public interest is the result of dialogue of various values that exist in society. Values such as fairness, transparency and accountability are values that are upheld in public service. The NPS paradigm holds the view that the responsiveness (responsibility) of bureaucracy is more directed to citizens not clients, not constituents and not customers (Ulum, 2018). The government is required to view its people as citizens who pay taxes. In a country that adheres to the notion of democracy, actually citizens are not only seen as customers who need to be served with certain standards, but more than that, they are the owner of the government that provides these services.

**Table 1. Paradigm Shift of State Administration**

Aspect	Old Public Administration	New Public Management	New Public Service
Theoretical foundations and foundations of epistemology	Political theory	Economic theory	Democratic theory
The concept of public interest	Public interest is politically explained and expressed in the rule of law	The public interest represents the aggregation of individual interests	Public interest is the result of dialogue of various values
Responsiveness of the public bureaucracy	Clients and constituents	Customer	Citizen
Government role	Rowing	Steering	Serving
Accountability	Administrative hierarchy with a firm level	Work in accordance with market requirements (customer desires)	Multi-faceted: legal accountability, values, community, political norms, professional standards
Organization structure	Bureaucracy characterized	Decentralization of the	Collaborative

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	by top-down authority	organization with the main control is on the agents	structure with shared ownership internally and externally
Assumptions about the motivation of employees and administrators	Salary and benefits, protection	Entrepreneur spirit	Public service with the desire to serve the community

Source: Denhardt dan Denhardt, 2003 : 28-29

The development of these paradigms in turn had an influence on the development of the theory of State Administration. The development of the theory of State Administration can be traced from the flow or paradigm that develops in the science of State Administration. Tjokrowinoto very consistently notes about the flow (schools) that develop in the science of State Administration that affects the theories of State Administration (Tjokrowinoto, 1996).

The theories of State Administration did not arise by themselves, but they were born due to the development of the dialectic of paradigms, thoughts and currents in state administration. From the development of paradigms and streams (schools) emerged many theories in state administration. However, today only a few theories have become mainstream in state administration. These theories are public policy theory, Public Management Theory and governance theory.

### C. State Administration and Public Policy

Public policy is often defined as whatever the government chooses to do and not do. In other words, the government's “silence” is also part of the policy, that is, it does not take any action (status quo). For example, the Sumatran causeway that has been badly damaged but never repaired by the government. Government actions that do not repair damaged roads are part of government policy. The government can not do anything because of several factors. First, from the point of view of the government not taking a policy is the most effective option to solve a problem. Second, the budget is limited so that it is not possible for the government to take a policy. Third, related to the political risks that will be accepted when the government takes a policy. Fourth, the government is silent and does not take a policy because of public pressure.

Public policy is structured by scientific methods to solve public problems. There are several activities in the process of preparing public policy. According to Dunn, the policy formulation process consists of several activities as follows:

- 1. Problem formulation:** the Government must be able to identify the problems that are being faced by the public. The results of the identification is followed by formulating public problems to be solved.
- 2. Forecasting:** forecasting the impact, benefits, solvency and analyze the level of difficulty of the implementation of a policy to be taken;
- 3. Policy recommendations:** provide policy alternatives that have the highest benefits and recommend them to policy makers;
- 4. Monitoring:** the activity of monitoring the results and impact of a policy that has been implemented;
- 5. Evaluation:** assess the performance of policies in general in accordance with the standards that have been determined.

The state administration is responsible for formulating excellent public policies that are able to benefit the public at large. The strong demand that the state administration can produce quality policies has triggered the birth of public policy analysis studies. Public policy analysis is an Applied Social Science discipline that uses a variety of multiple assessment methods in the context of political argumentation and debate to create, critically assess and communicate policy-relevant knowledge. Policy analysis is the work of calculating, assessing and selecting Policy Alternatives that have the highest net benefit in order to solve public problems with a specific set of criteria and methods.

People who work on formulating and analyzing public policy are often referred to as policy analysts. The job as a policy analyst is both a difficult job and an important one. It is difficult because policy analysts must carefully search and determine the identity of the policy problem, only then can they formulate the policy correctly. A problem must be defined, structured, laid out, within certain limits and named. How this process occurs is crucial for the handling of a particular problem through policy.

Furthermore, in order to be able to make conclusions about the “goodness” of a policy, an analyst is required to conduct research of adequate quality around the policy issue he is studying. In addition, policy analysts are often faced with the logic of power, group interests and pressure in formulating policy alternatives. However, his position is important and honorable because it is from his hands that smart and solutive policies are born. There are various designations of policy analysts in government organizations. Sometimes policy analysts are referred to as consultants and expert staff.

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### D. State Administrative Scientist in Several Countries

State administration in developed countries such as in the United States, the United Kingdom, Australia, the Netherlands and Singapore has shown very rapid development, both in theoretical and practical terms. Most theories about public policy, public management, governance, and development management come from these countries. Indonesia at this stage is still only a follower of these “foreign” theories.

The state administration education system in developed countries has also shown significant development as an effort to respond to changing times. Currently, there are many new programs that are branches of Administrative Science as a separate study program, among them can be seen in the following table:

**Table 2. Education Master (graduate) of State Administration in several Countries**

No	Country	University	Department	Programs offered
1	United States	Harvard University Princeton University	John F. Kennedy School of Government Woodrow Wilson School of Public Affairs	Master of Public Administration (MPA) Master of Public Policy (MPP) Ph.D Master in Public Administration (MPA) Master in Public Policy (MPP) Ph.D in Public Affairs
2	England	York University	Atkinson Faculty of Liberal and Professional Studies	Master of Public Policy, Administration and Law (MPPAL)
3	Dutch	Leiden University Erasmus Mundus University	- -	Master of Science in Public Administration (M.Sc) Master of Arts in Public Policy (MA)
4	Australia	Australian National University Monash University Flinders University	- - -	Master of Public Policy (MPP) Master of Development Administration (MDA) Master of Public Policy and Management (MPPM) Master of Policy and Administration (M.Pol.Admin) Ph.D
5	Singapore	National University of Singapore	Lee Kuan Yew School of Public Policy	Master of Public Administration (MPA) Master of Public Policy (MPP) Master of Public Management (MPM) Ph.D
6	Malaysia	Malaya University University Sains Malaysia Universiti Utara Malaysia	School of Bussines and Administration - College of Law, Government and International Studies	Master of Public Administration (MPA) Master of Public Administration (MPA) Ph.D Master of Public management (MPM) Ph.D

**Source:**[www.hks.harvard.edu/degrees/masters/mpp](http://www.hks.harvard.edu/degrees/masters/mpp);[www.spp.nus.edu.sg/Master\\_Public\\_Policy.aspx](http://www.spp.nus.edu.sg/Master_Public_Policy.aspx);[www.princeton.edu/academics/](http://www.princeton.edu/academics/);[www.monash.edu.au/study/coursefinder/course/1065/](http://www.monash.edu.au/study/coursefinder/course/1065/);[www.um.edu.my/?pfct=ips&modul=Programmes\\_Offered&pilihan=Faculties&subpilihan=Master\\_of\\_Public\\_Administration\\_\(MPA\)](http://www.um.edu.my/?pfct=ips&modul=Programmes_Offered&pilihan=Faculties&subpilihan=Master_of_Public_Administration_(MPA));[www.yorku.ca/pubadmin/graduate.html](http://www.yorku.ca/pubadmin/graduate.html);[www.en.mastersinleiden.nl/programmes/publicadministration/en/introduction/](http://www.en.mastersinleiden.nl/programmes/publicadministration/en/introduction/)

The progress was spearheaded by the existing universities in the country, especially those that carry out state administration education, both at the bacheloriat, Master's and Ph.D. It was the scientists of the state administration from this college who gave birth to works and ideas that were exported to other countries. The theory of Public Policy Analysis developed by William,

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for example, is a theory born from the campus of The Graduate School of Public and International Affairs (GSPIA) of Pittsburgh University (BYERS, 1980; Herbert, 2004; Karazsia, 2012; Picard et al., 2015; Soraya, 1980).

### E. State Administration in Indonesia: Identity Crisis

State Administration scientists in Indonesia are currently faced with a debate on the discourse of “state” administration versus “public” administration (Mahsyar, 2011). Many parties support the change of terminology from state administration to public administration, but not a few are opposed to it. As a result, there are two extreme poles in the current state administration: those who maintain the status quo and those who want a change to public administration (Ibrahim, 2019). Long before that, there has actually been a difference of perspective among theory of Indonesian state administration in translating the word “public” in the word public administration. There are those who equate this public term with the state, society and government. However, many also consider that the public is a broad meaningful public, not only government, but also private and civil society organizations.

The impact of this difference in perspective has led to dynamics in naming majors and awarding degrees to its alumni. Universitas Indonesia, for example, enjoys using the name of Administrative Sciences and a Bachelor's degree in Political Science (S.IP), but Gadjah Mada University and Padjadjaran University use the term state administration and its alumni are awarded a Bachelor of Political Science (S.IP). While Universitas Brawijaya has long been using the name of Public Administration with an academic degree of Bachelor of Public Administration (S.AP). Recently, Diponegoro University and Jenderal Sudirman University, which was previously named state administration, also joined the name of Public Administration. As a result, there is often confusion among prospective students and students studying state administration.

The name change will not mean anything if there is no transformation in the educational institutions of State Administration in Indonesia (Pasolong, 2014). That is, the name change should be followed by changes in Curriculum (Djubaedi et al., 2023), Lecture system (Rochmat et al., 2022), learning methods (Supriatin et al., 2022) and mechanisms. In addition, the changes made must have a foundation of thinking that is logical, rational and can be accounted for scientifically.

**Table 3. List of Public Administration Education Provider Universities with Superior Ranking in Indonesia**

No	University	Faculty	Department	Level (Strata)
1	Brawijaya University	FIA	Public Administration	S1, S2
2	Parahyangan Catholic University	FISIP	Public Administration Science	S1
3	National Veteran Development University of East Java	FISIP	Public Administration	S1
4	Yogyakarta State University	FISHIPOL	Public Administration	S1
5	Airlangga University	FISIP	Public Administration	S1
6	Hasanuddin University	FISIP	Public Administration	S1, S2, S3

Source: [www.banpt.or.id](http://www.banpt.or.id)

Currently, the mainstream that is developing is the strong support for public administration rather than state administration. This happened because of the very strong agitation of some academics in well-known universities in Indonesia. Universitas Brawiya and Universitas Gadjah Mada are among the universities that are proactive in changing state administration to public administration. Universitas Brawijaya has long been using the concept of public administration than other universities, but Universitas Brawijaya is not too eager to promote public administration. This can be proven from the writings and thoughts of academics of Public Administration Universitas Brawijaya. In contrast, academics at other universities are so vociferous in promoting public administration. Many state administration literatures written by academics from various universities use the concept of Public Administration.

Dwiyanto (2004) can be called a pioneer of the change of State Administration to public administration because through his writings the concept of public administration, especially governance-oriented public administration, is academically justified. In essence, Dwiyanto argues that public administration needs to increase its orientation into a science that not only examines bureaucracy, government, policy, public management, but also concerns public issues. This means that public administration needs to be understood as a dynamic science that is highly responsive to issues not only related to government, but also concerns civil society, market mechanisms and the private sector provided that they provide for public needs and act in the public interest and are oriented to the public. More details, Dwiyanto wrote as follows:

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“In the study of governance, Public Administration is defined as the process of using administrative, political and economic power to solve public problems. The institutions of Public Administration are no longer limited to other institutions, such as market mechanisms and civil society organizations. All institutions, both governmental and nongovernmental, are subject to the study of Public Administration insofar as they operate in response to public concerns and interests. In other words, the criteria for distinguishing whether an institution it becomes a locus of the science of Public Administration are not determined by its ownership and status, whether they are government, market or voluntary association, but are determined by its behavior and orientation. If the institution organizes public goods and operates to achieve the objectives that are part of the public interest, then it should be the subject of the study of Public Administration.

...By defining the science of Public Administration as the study of governance, the science of public administration becomes very powerful in explaining contemporary problems in public administration”.

From the foregoing is a continuation of what was once expressed by Denhardt. Denhardt said that in order for state administration to exist in the world of practice, the state administration must have insight into publicness (public-oriented) because the field of State Administration is different from the private sector and the non-profit sector. A public administrator should be effective and responsive to the needs of the public. Effective and responsive is the core of governance teachings delivered by Dwiyanto above.

“The features in turn all derive from the simple fact that the public or nonprofit manager is pursuing public purposes. In terms of the actions and experiences of the public administrator, therefore, we may say that it is the “publicness’ of the work of the public or nonprofit manager that distinguishes public administration from other similar activities. The view of the administrator’s role suggests that, as a public or nonprofit manager, you must operate with one eye toward managerial effectiveness and the other toward the desires and demands of the public. It recognizes that you are likely to experience an inevitable tension between efficiency and responsiveness as you work in governmental or nongovernmental organizations, a tension that will be absolutely central to your work.”

If studied further, the roots of this concept of governance was born in the West. The concept of governance assumes that the power of the state is not only centered on one power, namely the government, but has begun to be dispersed to other powers outside the government, namely civil society and the private sector. These two sectors can take part in governance and public policy. Governance here is defined as the mechanisms, practices and procedures of government and citizens to manage resources and solve public problems. In the concept of governance, the government is only one actor and not always the most decisive actor. That is, the public at large, the private sector and other sectors outside the government can participate in determining solve public problems. The concept of governance was then adopted by the World Bank (World Bank), the United Nations Development Program (UNDP), the International Monetary Fund (IMF) and other donor institutions into good governance. The principles contained in good governance include; efficiency, effectiveness, transparency, accountability, fairness, responsiveness and responsibility. The World Bank is so active that these principles are embraced by developing countries if they want to get loans from them. In fact, good governance is used as a standard in providing assistance to developing countries.

Indeed, there is nothing wrong because good governance can increase government responsiveness and community participation, but keep in mind that the grafting of governance ideas into state administration will not always run smoothly because of differences in government, social and cultural characteristics between developed countries and developing countries. In addition, it should be borne in mind that the World Bank’s good governance projects in some countries have proven to fail, such as in Sudan, Zimbabwe and Ethiopia which remain poor despite implementing good governance from the World Bank. Moreover, we need to criticize the efforts of the World Bank and other banks to promote good governance as an attempt to undermine the role of government in an effort to smooth out the project of neo-liberalism and neo-colonialism of Western countries to developing countries. Therefore, we must reflect on the son’s advice below:

“Good governance acts as an ideology that will smooth out the ideology that will pave the way for the spread of a wider path for the entry of neo-liberalism into the consciousness of citizens of nations around the world. Like commandos who serve as pioneer troops to pave the way for regular troops, the concept of good governance is an elite unit that will undermine the most core basis of the defense of anti-liberalism and anti-neoliberalism consciousness, namely the concept of what is good in the management of the nation-state.”

Basically, the values of transparency, justice, effectiveness and efficiency have long existed in the Indonesian state, from the first Indonesian people have implemented the principles of transparency, accountability, responsibility, responsiveness in a simple format, but have never been institutionalized. There are still many other practices in other parts of the archipelago that can be strengthened because Indonesia is rich in local values (local wisdom) that can be lifted to the surface and used as a

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basis for compiling theories of State Administration in order to form its own independence and identity. Thus, it is time for us to change course from a more outward-looking perspective of State Administration to an inward-looking one.

### V. CONCLUSIONS

The theory and concept of State Administration has developed rapidly. In terms of science, the scientific discourse of State Administration in several developed countries and in Indonesia experienced a very intense dynamic. However, we still take many theories from the outside to form a theory. One of the theories of State Administration that has become mainstream is the theory of Public Policy. Public policy theory teaches how to formulate good and correct public policies. In formulating public policy, the role of policy analysis is vital in choosing Policy Alternatives that have the most-high benefits. As an effort to establish the independence and identity of State Administration in Indonesia, it is time for state administration academics to explore local values that develop in Indonesia in order to design theories that reflect our identity as a nation.

### REFERENCES

- 1) Aneta, A. (2012). Perkembangan teori administrasi negara. *Jurnal Inovasi*, 9(01).
- 2) Aziz, A., Hidayat, A., Herlina, E., & Ernawati, W. (2023). Oligopoly Market and Monopolistic Competition in the Digital Era: Shariah Economic Perspective. *Quality - Access to Success*, 24(193), 61–67. <https://doi.org/10.47750/QAS/24.193.07>
- 3) Bozeman, B., & Feeney, M. K. (2011). *Rules and red tape: A prism for public administration theory and research*. ME Sharpe.
- 4) BYERS, L. G. (1980). *The Graduate School of Public and International Affairs at the University of Pittsburgh in the Litchfield era*. University of Pittsburgh.
- 5) Cristofaro, M. (2020). “I feel and think, therefore I am”: An Affect-Cognitive Theory of management decisions. *European Management Journal*, 38(2), 344–355.
- 6) Denhardt, J. V, & Denhardt, R. B. (2003). *The New Public Service: Serving, Not Steering*. Armonk, New York: ME Sharpe. Inc.
- 7) Djubaedi, D., Rohadi, T., & Kodama, Y. (2023). Core Entrepreneurial Competencies for Local Content Curriculum. *International Journal of Educational Qualitative Quantitative Research*, 2(1 SE-Articles), 12–17. <https://doi.org/10.58418/ijeqqr.v2i1.38>
- 8) Dwiyanto, A. (2004). *Reorientasi Ilmu Administrasi Publik: Dari Government ke Governance*. Yogyakarta: Gadjah Mada University.
- 9) Ginting, R., & Haryati, T. (2011). Reformasi birokrasi publik di Indonesia. *CIVIS: Jurnal Ilmiah Ilmu Sosial Dan Pendidikan Kewarganegaraan*, 1(2).
- 10) Gow, J. I., & Dufour, C. (2000). Is the New Public Management a Paradigm? Does it Matter? *International Review of Administrative Sciences*, 66(4), 573–597. <https://doi.org/10.1177/0020852300664002>
- 11) Henry, N. (2015). *Public administration and public affairs*. Routledge.
- 12) Herbert, A. W. (2004). Transforming public service in a world without boundaries. *Public Administration Review*, 64(4), 390–394.
- 13) Ibrahim, J. T. (2019). *Sosiologi Pedesaan*. UMMPress.
- 14) Johan, T. S. B. (2018). *Perkembangan Ilmu Negara dalam Peradaban Globalisasi Dunia*. Deepublish.
- 15) Karazia, Z. (2012). *Peace Inc.? The Role of Contractors in International Peace Operations*. University of Pittsburgh Graduate School of Public and International Affairs, 11.
- 16) Kurhayadi, H., Rohayati, Y., & Bambang Sucipto, M. M. (2020). *Kebijakan Publik di Era Digitalisasi*. Insan Cendekia Mandiri.
- 17) Lutfi, M. (2020). Legal politics and public policies in the industrial era 4.0 (an Indonesian legal civilization discourse perspective of prophetic science religiosity). *IOP Conference Series: Earth and Environmental Science*, 456(1), 12084.
- 18) Mahsyar, A. (2011). Masalah pelayanan publik di Indonesia dalam perspektif administrasi publik. *Otoritas: Jurnal Ilmu Pemerintahan*, 1(2).
- 19) Nur, A. C., Akib, H., & Niswaty, R. (2022). *EKSISTENSI ADMINISTRASI PUBLIK PADA ARUS GLOBALISASI*. Badan Penerbit UNM.
- 20) Nuraini, S. (2020). Penerapan etika administrasi publik sebagai upaya dalam mewujudkan good governance. *Jurnal Ilmiah Magister Administrasi*, 14(1).
- 21) Pasolong, H. (2014). *Teori administrasi publik*. Alfabeta Bandung.



## Development and Dynamics of State Administration in Indonesia: The Struggle of the Discourse of the “State” Administration vis a vis the “Public” Administration

- 22) Picard, L. A., Buss, T. F., Seybolt, T. B., & Lelei, M. C. (2015). Sustainable development and human security in Africa: Governance as the missing link (Vol. 196). CRC Press.
- 23) Pratomo, H. W. (2022). Educational Leadership: Islamic Religious, Philosophy, Psychology, and Sociology Perspectives. *International Journal of Social Science and Human Research*, 05(05). <https://doi.org/10.47191/ijsshr/v5-i5-26>
- 24) Ramdhani, A., & Ramdhani, M. A. (2017). Konsep umum pelaksanaan kebijakan publik. *Jurnal Publik: Jurnal Ilmiah Bidang Ilmu Administrasi Negara*, 11(1), 1–12.
- 25) Rochmat, C. S., Yoranita, A. S. P., & Putri, H. A. (2022). Islamic Boarding School Educational Values in Efforts to Realize Student Life Skills at University of Darussalam Gontor. *International Journal of Educational Qualitative Quantitative Research*, 1(2), 6–15. <https://doi.org/10.58418/ijeqqr.v1i2.18>
- 26) Saglie, J., & Sivesind, K. H. (2018). Civil society institutions or semi-public agencies? State regulation of parties and voluntary organizations in Norway. *Journal of Civil Society*, 14(4), 292–310.
- 27) Shafritz, J., Russell, E. W., Borick, C., & Hyde, A. (2016). *Introducing public administration*. Routledge.
- 28) Soehartono, K. T., Aldyan, A., & Indriyani, R. (2021). The establishing paradigm of dominus litis principle in Indonesian administrative justice. *Sriwijaya Law Review*, 5(1), 42–55.
- 29) Soraya, N. (1980). Factors related to academic advisement of international graduate students at the University of Pittsburgh. University of Pittsburgh.
- 30) Supriatin, S., Rithpho, P., Asiah, A., & Hikhmat, R. (2022). Blended Learning to Improve the Physical Examination Ability of Nursing Students. *International Journal of Educational Qualitative Quantitative Research*, 1(2), 23–30. <https://doi.org/10.58418/ijeqqr.v1i2.20>
- 31) Thoha, M. (2017). *Dinamika ilmu administrasi publik*. Kencana.
- 32) Tjokrowinoto, M. (1996). *Perkembangan Mutakhir Ilmu Administrasi Negara. Teori-Teori Politik Dewasa Ini*.
- 33) Ulum, M. C. (2018). *Public Service: Tinjauan Teoretis dan Isu-Isu Strategis Pelayanan Publik*. Universitas Brawijaya Press.
- 34) Wahab, S. A. (2021). *Analisis kebijakan: dari formulasi ke penyusunan model-model implementasi kebijakan publik*. Bumi Aksara.



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## Factors Impacts the Students to Choose Entrepreneurship as their Career of Choice in Malaysia.



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**ABSTRACT:** The purpose of this research is to investigate what drives young people to choose entrepreneurship as a profession. Young people are increasingly drawn to entrepreneurship to more autonomy, creative expression, and financial independence. This research reviews the literature to highlight the personal traits, cultural values, education, social and economic environment, and access to resources that contribute to young people's decisions to pursue entrepreneurship. Lack of experience, insufficient financial resources, and regulatory impediments are only few of the issues that young entrepreneurs confront and are discussed in this article. The study's subjects were undergraduates at Kelantan University, and the study's questions made use of both nominal and ordinal scales. The corrective analysis is used to check for a correlation between the variables. The study recommends programmatic interventions that can help young people achieve their entrepreneurial goals and compete in today's fast-paced, highly competitive business environment. Keywords: Entrepreneurship, Business, Start up, Career

### 1.0. INTRODUCTION

Business is a very important career field not only in Malaysia but throughout the country. Most career options are business-related, either self-employment or assisting other individuals' enterprises. The Malaysian government places a high value on entrepreneurs to assist further develop the country by creating job opportunities. According to Yusof (2010), entrepreneurs are an essential category that society accepts for the country's growth and as a change to the national economy. According to Malaysia 2020's vision, the government wants to populate this nation with creative and inventive entrepreneurs (Zulfakar et al., 2010). Malaysia is committed to transforming its society into a self-employed one and reducing its reliance on the government. The government advises people, especially recent graduates, to start their own businesses. This is so that they may perform the tasks of entrepreneurs while they are still physically fit and young. Much research has been conducted to investigate the elements that impact student interest in the subject of entrepreneurship. However, previous research is still insufficient when students are surrounded by different unique elements such as university atmosphere, level studies, study specialties, and assistance from others. As a result, further research on entrepreneurial tendencies among university students is required.

### 1.1. Problem Statement

This study is based on the perception of factors that influence interest in entrepreneurship among University Malaysia Kelantan students. Therefore, the main thing that an entrepreneur needs to have been the ability and seriousness to achieve the goals that have been set. This implies a keen interest in the field of entrepreneurship. It is also often associated with the main influence on an individual's actions. Interest is also associated with the tendency for a person to know, learn, and practise something that leads them to the desired choice. There are four main factors that contribute to students' interest in entrepreneurship, namely the desire for independence, family background, motivation, and entrepreneurship education. In this study, the researcher wants to examine the factors that influence interest in entrepreneurship among students at University Malaysia Kelantan.

### 1.2. Research Questions

- 1) Does the relationship between motivation and entrepreneurship affect interest in entrepreneurship among students at University Malaysia Kelantan?
- 2) Does the relationship between family background and entrepreneurship affect interest in entrepreneurship among students at University Malaysia Kelantan?
- 3) Does the relationship between desire for independence and entrepreneurship affect interest in entrepreneurship among students at University Malaysia Kelantan?

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- 4) Does the relationship between entrepreneurship education and entrepreneurship affect interest in entrepreneurship among students at University Malaysia Kelantan?

### **1.3. Research Objectives**

- 1) To identify motivational factors affecting students' interest in the field of entrepreneurship.
- 2) To identify family background factors affecting students' interest in entrepreneurship.
- 3) To identify the factors of entrepreneurship education that influence students' interest in the field of entrepreneurship.
- 4) To identify the factors of desire for independence that affect students' interest in the field of entrepreneurship.

### **1.4. Scope of the Study**

The study's scope is limited to recruiting 100 students aged 18 and over who will be sent a link to a Google form via WhatsApp. This recruitment phase will run no more than one week and will conclude until either 100 participants are found or one week has elapsed. Each research participant will be asked to complete a brief questionnaire to assess the factors that impact their interest in entrepreneurship.

### **1.5. Significant of the Study**

This study will give unique insight through into realities that underpin student interest in entrepreneurship. The community will know in the future because of this research that interest in entrepreneurship may be influenced by a variety of circumstances and can be cultivated.

This study will specifically aid the country's economy by recognising how to inspire all young people to become involved in the business sphere. As we all know, business is one of the most important pillars for a country's development.

Furthermore, a complete presentation on the elements that impact entrepreneurship interest in this paper may be used as a basis for future studies to reinvent existing methods for attracting generation of young people in business industries.

### **1.6. Limitation of the Study**

This study primarily focuses on the involvement of diploma, bachelor's degree, and master's student responses for the batch 2022 on the factors that impact students in entrepreneurship and what attracts them to be interested in taking this course as the qualification. The restriction of this study in terms of data collection is related to the information collected through the online survey, which is a Google form. We cannot conduct face-to-face interviews since many students continue to refrain from staying on campus because they are learning online. It is difficult to gather many volunteers in a short period of time since some of the students to whom we offer the link may be unwilling to fill out the form.

### **1.7. Dependent Variable**

#### **✓ Factor of Interest in Entrepreneurship**

Variables whose values are reliant on other factors. To create new jobs and increase innovation and competitiveness in the labor market, entrepreneurship has been recognized as a major contributor and economic engine for any country (Barba-Sánchez et al., 2022). More and more developed and developing nations are recognizing the benefits of encouraging and supporting entrepreneurial endeavors. As a country's government is unlikely to be able to provide sufficient employment possibilities for all college grads in the future (Reuel Johnmark et al., 2016), graduates will need to change their focus from finding work to generating jobs. According to recent studies (Nuan and Xin, 2012; Jiang and Sun, 2015), students at all levels of education should shift their focus to the entrepreneurial revolution.

### **1.8. Independent Variable 1 & Dependent Variable**

#### **✓ Relationship between Desire for Independence and Interest In Entrepreneurship**

Desire in entrepreneurship provides the definition of the common denominator and genuinely a tremendous flexibility to select where and what their organization will be, the way they want to operate the business, and the technique they prefer to build the business. Individuals with a strong demand for independence, according to Lee and Wong (2004), will seek out jobs with more flexibility. According to Xue Fa Tong's (2011) journal, pupils who have a tremendous desire for autonomy are more likely to have entrepreneurial goals. Thus, someone who launches a company has a more flexible existence than someone who works for others, which is constantly bound to time and always includes our private lives.

### **1.9. Independent Variable 2 & Dependent Variable**

#### **✓ Relationship between Family Background and Interest in Entrepreneurship**

Family is one of the factors that motivates a person to be interested in entrepreneurship. Most students are interested in the field of entrepreneurship because their families have their own businesses. According to the study of Collins (2002), Chinese entrepreneurs in Australia are growing day by day. According to him, they are more interested in running a business with their

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own family than working under the supervision of other individuals. This happens because the family gives more trust, commitment, and support than other individuals. In addition, the family also provides a positive view of things such as the abilities and capabilities expected in entrepreneurship. The results of the study also show that the entrepreneurial experience owned by the family will have a positive view of behavioural control and attitude towards one's own work. As a result, there is a positive relationship between family background and job interest. Family background factors are accepted and can be used in this study.

### 1.10. Independent Variable 3 & Dependent Variable

#### ✓ Relationship between Motivation and Interest in Entrepreneurship

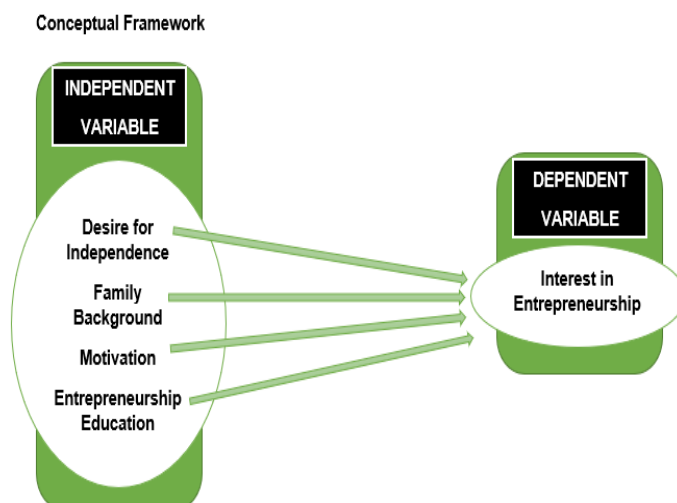
In this research, the urge for success was found to be a significant factor in the decision to start a business. Need for accomplishment is a form of psychological motivation first described by McClelland (1976). A person's "need for achievement" can be defined as their drive to succeed in challenging endeavors and meet or exceed stringent criteria set for themselves. McClelland proposed that the term "gambler" be used to highly successful people. They dared to dream big and risk failure in order to make their dreams a reality. Such workers constantly sought improved methods for doing their tasks. They were more interested in succeeding than making money. The traits of successful business owners mirror those outlined in McClelland. In conclusion, this research set out to better understand what influences engineering technology students toward an entrepreneurial mindset. It has been shown that students majoring in engineering technology have an optimistic view of starting their own businesses. The results show that students who consider becoming entrepreneurs do so with optimism. If a person has a favorable opinion of self-employment, it's because they prefer it to working for an organization.

### 1.11. Independent Variable 4 & Dependent Variable

#### ✓ Relationship between Entrepreneurship Education and Interest in Entrepreneurship

According to the findings, learning about business ownership might spark an interest in starting your own. Increased enthusiasm for starting businesses is correlated with exposure to entrepreneurship courses. Education plays a crucial part in inspiring young people to pursue entrepreneurial opportunities. The research findings have substantial bearing on the design, implementation, and assessment of educational policy. Interest in starting a business is strongly influenced by exposure to entrepreneurship courses. Lestari and Wijaya (2012) and Richard Denanyoh (2015) found that students who took courses on entrepreneurship developed values and traits indicative of the entrepreneurial mindset that served to deepen their enthusiasm for the field. That's why it's important to have a genuine passion for creating and running businesses, since that's what will ultimately determine how you handle risk (Suhartie et al, 2011).

### 1.12. Framework



### 1.13. Literature Analysis

Author	Article Title	Study Method	Findings/Recommendation
Tong, X. F., Tong, D. Y. K., Loy, L. C., 2011	Factors Influencing Entrepreneurial Intention Among University Student	Experimental survey	The study conducted by focused on perceptions of university students generally and not specifically examine perceptions of students who are born in entrepreneurs' parents.

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Denanyoh, R., Adjei, K., & Nyemekye, G. E., 2015	Factors That Impact on Entrepreneurial Intention of Tertiary Students in Ghana	Experimental survey	The study suggest Polytechnics should encourage the development of creative ideas for being an entrepreneur and provide the necessary knowledge about entrepreneurship.
Mohammad, S. N., Bahari, A., 2020	A Study on the Factors Influence Student's Intention to be an entrepreneur: Conceptual Paper	Experimental case study	Higher educations are recommended to add entrepreneur courses in the syllabus.
Watiri, M. S., 2012	Factors that Influence Student Participation in Entrepreneurship among University Students; The Case of Strathmore University Undergraduate Students	Review	Good example by family also one of contributions to higher entrepreneurship inclinations.
Che Mat, S., Maat, S. M., Mohd, S., 2015	Identifying Factors that Affecting the Entrepreneurial Intention among Engineering Technology Students	Experimental survey	High attitude towards self- employment indicates that the respondent is more in favour of self-employment than organizational employment (Kolvereid,1996).
Purwati, T., Prasetyo, N. E., Sefaverdiana, P. V., Suryono, J., 2020	Factors Influencing Students' Entrepreneurial Intention	Experimental survey	Entrepreneurial interest influence entrepreneur intention.
Herdjiono, I., Puspa, Y. H., Maulany, G., 2017	The Factors Affecting Entrepreneurship Intention	Experimental survey	The study is conducted through questionnaire to a college students.
Caska. N., Indrawati, H., 2018	Analysis of Factors Affecting Entrepreneurial Interest of Vocational High School Students in Pekanbaru	Experimental survey	The study shows that the factors that affect the interests in entrepreneurship are categorized by two types; external factors, and internal factors.

### 1.14. Research Design

This analysis focuses on the researcher's approach to solving research issues by integrating different aspects of the study into a unified theoretical framework (Adi Bhat, 2018). There are two main types of research designs: qualitative and quantitative. Interest in entrepreneurship among UMK students was used as the dependent variable, and quantitative research was used because of its objectivity in examining the relationship between the independent variables (desire for independence, family background, motivation, and entrepreneurship education). The information used in this study came from both primary and secondary sources. To supplement the main data, researchers also gather secondary data from relevant sources such as scholarly journals, books, government reports, and online resources. Since this uses already-collected data, it is considered a fast and simple method of data acquisition. In this study, we have used both primary and secondary sources.

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### **1.15. METHODS AND SOURCES**

#### **1.15.1 Research Instruments**

Research instruments, as defined by Takona (2002, p. 73), include questionnaires and interviews and are recommended for use in educational research because of their efficacy in measuring variables like opinion, attitude, concept, attitude, composition, and so on. This research will include two parts: a demographic analysis of the respondents and a scale item analysis of the questionnaire. Section A will include demographic information such as respondent's age, race, educational background, major, and year in school. In the meanwhile, the questionnaire is described in Section B. On a scale from 1 (strongly disagree) to 5 (strongly agree), the questionnaire will be assessed. On a scale from 1 to 5, 1 means severely disagree, 2 means disagree, 3 means neutral, 4 means agree, and 5 means strongly agree. Subsection C focuses on what motivates UMK students to pursue business. A five-point Likert scale was used to analyze the C-section items.

#### **1.15.2. Measurement Scale**

The quantitative information supplied by a measurement scale in statistical analysis. There are four basic types of scales that may be used to collect data: nominal, ordinal, interval, and ratio.

Numbers in a nominal scale serve only as "tags" or "labels" for the purpose of identification or classification. This scale is rarely used except for non-numerical (qualitative) variables or in cases when numerical values are meaningless. This study uses respondent level, which is broken down into four categories: diploma, bachelor's degree, master's degree, and doctoral.

In contrast to the nominal scale, which emphasizes distinctions between categories, the ordinal scale ranks categories in order. Non-numerical notions such as frequency, pleasure, happiness, pain, and so on are frequently represented by means of these scales. It is common practice to use a Likert-scale inquiry to gauge respondents' levels of agreement or disagreement with a given statement or topic.

A quantitative measuring scale having order, a meaningful and equal difference between two variables, and the occurrence of zero is called an interval scale. The participants' responses will be categorized as either "strongly disagree," "disagree," "neutral," "agree," or "strongly agree" on a 5-point Likert scale. It is a standard technique for gathering information and creating estimates because of its simplicity and general applicability. The data is reliable and accurate, and it will reveal where the responder disagrees or agrees with the questionnaire.

#### **1.15.3. Pre-testing of the Instrument**

To ensure that the data collecting instrument works well before it is used on the entire population, a small sample is surveyed first. If problems are found during the trial run, they will very certainly be replicated in the production setting. The questionnaire was developed using standard procedures and pretested for readability, face validity, and content validity, and 1,224 responses were selected at random for analysis. A total of 102 students from UMK participated in the online survey.

### **1.16. Data Collection**

Information about certain system variables is gathered through data collection, allowing targeted queries to be answered and results to be evaluated. In this study, a sizable empirical survey will be used to investigate the connections between individual and organizational context variables, debiasing measures in the supplier selection choice, and the cost-effectiveness of the supplier selection deciding. The 102 respondents who took the time to fill out the survey are listed below. The degree to which one is interested in starting their own business is the dependent variable, whereas motivation, family dynamics, the need for autonomy, and formal training in entrepreneurship are the independent factors. Primary data will be gathered using instruments like questionnaires and forms in this investigation.

### **1.17. Sampling**

#### **1.17.1. Population, Sample, and Subject**

Researchers typically use some sort of sample design to determine what proportion of the population to survey. According to Stephanie (2021), the process of sample design is a mathematical technique that provides an estimate of the probability of selecting a specific sample. Population size refers to the desired number of similar groupings that a researcher hopes to form. Even though sample sizes are inherently smaller than the entire population. The research sample sizes will be proportional to the size of the study's overall population. The participants in this study will be undergraduates at UMK. A random selection of 1,224 individuals served as the basis for the initial sample. One hundred and two students from UMK participated in an online survey. Therefore, 85.3% of responders offer a satisfactory answer.

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Table 1: Respondent Demographics

Table 3.1  
Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Note: N is Population Size; S is Sample Size  
Source: Krejcie & Morgan, 1970

### 1.18. Techniques (random, purposeful, snowball)

A random sample is a subset of a population that is chosen at random. Each member of the population has the same probability of being picked under this kind of sampling. Because it only includes one random pick and requires minimal background information about the population, it is the simplest of the probability sampling techniques. The use of randomization in the selection of study participants reduces the likelihood of research biases including sampling bias and selection bias, and increases the internal and external validity of the study.

In purposeful sampling, sometimes called judgmental, selective, or subjective sampling, the researcher uses his or her best judgment to pick participants from the community at large. When "elements selected for the sample are chosen by the judgment of the researcher," we have a non-probability sampling approach known as "purposeful sampling." In order to save time and money, researchers frequently assume that they can create a representative sample simply by applying their common sense. When a small number of persons can be interviewed for primary data because of the study's design and objectives, purposive sampling may be the best option. The researcher may use his or her own discretion in selecting senior level managers to participate in in-depth interviews for study examining the effects of personal tragedy, such as family loss, on the performance of senior level managers.

New units are brought into the sample by other units, making snowball sampling a non-probability approach. People with certain qualities (such as those with a rare condition) might be difficult to identify, but snowball sampling can help researchers find them. Snowball sampling, also known as chain sampling or network sampling, starts with a single person or a small group of people and spreads from there. The program then expands by word of mouth from individuals enrolled. This procedure is repeated until the target population is reached. In qualitative research, snowball sampling is frequently used for examining inaccessible communities.

### 1.19. Analysis plan

The data analysis methods concerning the objectives of the study have been classified into a table below and the explanation of the other methods of data collection has been discussed as well.

Objectives	Data Analysis Method
To determine the parallel between entrepreneurship education and interest in entrepreneurship among UMK students	Pearson Correlation
To identify motivation between interest in entrepreneurship among UMK students	Pearson Correlation
To recognize the family background between interest in entrepreneurship among UMK students	Pearson Correlation
To discover the independence between interest in entrepreneurship among UMK students	Pearson Correlation

In the section labelled "Descriptive Statistics," participants are asked for demographic information such as their gender, age, marital status, race, education level, major, and graduation year. Therefore, the descriptive statistics will aid in achieving the primary goal of the research through various assessments of the replies.

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Alpha reliability was used to assess the internal consistency of the independent and dependent variables in this study. However, according to Nunnally (1967), the acceptable Coefficient alpha should be more than 0.7.

This study used Pearson's Correlation Coefficient to examine the factors influencing UMK students' enthusiasm for entrepreneurship.

### 1.19. Research Testing Tools

To answer the research questions at hand and assess the findings, questionnaires are used in this investigation. The goal of data collection is to test hypotheses about the cause of a problem. Google Forms were utilized as research testing instruments for this study. With the help of Google Forms, we can design robust forms to collect the data we need. With Google Forms, we can design and build our own own web forms. Use the Google Form online questionnaire form template to get actionable trends and quantifiable results. We may use this survey form to learn more about your target market, enhance consumer familiarity with your brand, or both. The downloadable form template may be modified in a jiffy and costs nothing.

### 1.20 Hypothesis Statement

1. Entrepreneurship education is positively related to the interest in entrepreneurship.
2. Student how have related in entrepreneurial family background have higher changed in someone interest in entrepreneurship.
3. By having high and great motivation make someone interest in entrepreneurship.
4. Someone that have great desire to become powerful person by their own are highly possessed to be business owner.

### 1.21. Testing of Hypothesis

Table No.1. correlation between the variables

		DV1	DV2	DV3	DV4	IV1.1	IV1.2	IV2.1	IV2.2	IV3.1	IV3.2	IV4.1	IV4.2
DV1	Pearson Correlation	1	.439**	.385*	.378**	.384**	.160	.318**	.544**	.237*	.365**	.318**	.372**
	Sig. (2-tailed)		.000	.000	.000	.000	.109	.001	.000	.017	.000	.001	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
DV2	Pearson Correlation	.439**	1	.409*	.408**	.362**	.389**	.212*	.352**	.409**	.431**	.367**	.409**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.032	.000	.000	.000	.000	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
DV3	Pearson Correlation	.385**	.409**	1	.582**	.385**	.081	.308**	.503**	.426**	.382**	.311**	.384**
	Sig. (2-tailed)	.000	.000		.000	.000	.420	.002	.000	.000	.000	.001	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
DV4	Pearson Correlation	.378**	.408**	.582**	1	.221*	.180	.384**	.459**	.470**	.440**	.472**	.467**
	Sig. (2-tailed)	.000	.000	.000		.025	.071	.000	.000	.000	.000	.000	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV1.1	Pearson Correlation	.384**	.362**	.385*	.221*	1	.249*	.318**	.451**	.439**	.383**	.421**	.279**
	Sig. (2-tailed)	.000	.000	.000	.025		.012	.001	.000	.000	.000	.000	.004
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV1.2	Pearson Correlation	.160	.389**	.081	.180	.249*	1	.006	.194	.244*	.323**	.461**	.255**
	Sig. (2-tailed)	.109	.000	.420	.071	.012		.936	.051	.013	.001	.000	.010
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV2.1	Pearson Correlation	.318**	.212*	.308*	.384**	.318**	.008	1	.481**	.371**	.363**	.261**	.262**
	Sig. (2-tailed)	.001	.032	.002	.000	.001	.936		.000	.000	.000	.008	.008
	N	102	102	102	102	102	102	102	102	102	102	102	102



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IV2.2	Pearson Correlation	.544**	.352**	.503*	.459**	.451**	.194	.481	1	.379**	.537**	.314**	.414**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.051	.000		.000	.000	.001	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV3.1	Pearson Correlation	.237*	.409**	.425*	.470**	.439**	.244*	.371	.379**	1	.573**	.372**	.488**
	Sig. (2-tailed)	.017	.000	.000	.000	.000	.013	.000	.000		.000	.000	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV3.2	Pearson Correlation	.385**	.431**	.382*	.440**	.383**	.323**	.363	.537**	.573**	1	.402**	.482**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000	.000	.000		.000	.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV4.1	Pearson Correlation	.318**	.367**	.311*	.472**	.421**	.461**	.261	.314**	.372**	.402**	1	.428**
	Sig. (2-tailed)	.001	.000	.001	.000	.000	.000	.008	.001	.000	.000		.000
	N	102	102	102	102	102	102	102	102	102	102	102	102
IV4.2	Pearson Correlation	.372**	.409**	.384*	.467**	.279**	.255**	.262	.414**	.488**	.482**	.428**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.004	.010	.008	.000	.000	.000	.000	
	N	102	102	102	102	102	102	102	102	102	102	102	102
**. Correlation is significant at the 0.01 level (2-tailed).													
*. Correlation is significant at the 0.05 level (2-tailed).													

All the four hypotheses were tested using Pearson's correlation test to examine the level of association between interest in entrepreneurship and contextual factors (desire for independence, family background, motivation, and entrepreneurship education). In shows table analysis of correlation between interest in entrepreneurship and constitutive relations factors. To avoid ambiguity, each of theory is discussed individually. The first hypothesis predicted that interest in entrepreneurship is positively related to desire for independence. The result presented in table shows there are a positive relationship between interest in entrepreneurship and desire for independence at  $r = 0.384$ ,  $p < 0.001$  level. Result holds the implication that when the students desire for independent, they will surely have a high interest in entrepreneurship. The next hypotheses stated that interest in entrepreneurship is relates with family background. A significant positive relationship between interest in entrepreneurship and family background at  $r = 0.318$ ,  $p < 0.001$  level. The result shows that whenever family have the background in entrepreneur industry, naturally the students also will be more attached to involve in entrepreneurship. The third hypotheses predicted that interest in entrepreneurship is positively related to motivation. The result presented in table 1 shows a positive relationship between interest in entrepreneurship and motivation at  $r = 0.237$ ,  $p < 0.05$  level. This shows that whoever motivated with something especially their role model, they are automatically interested with this field. The last hypotheses stated that interest in entrepreneurship is relates with entrepreneurship education. Table 1 shows a significant positive relationship between interest in entrepreneurship and entrepreneurship education at  $r = 0.318$ ,  $p < 0.01$  level. Result holds the implication that when entrepreneurship education provides in education institution, it will be increasing the interest of student in entrepreneurship.

### 1.22. Practical Implications

The main purpose of this study is to examine factors that influence interest in entrepreneurship among students at University Malaysia Kelantan. We have done it as a survey through a Google Form, where we put questions related to our research and they will answer them. In addition, we also reviewed related research articles and journals, with particular attention to practice, where this makes us knowledgeable for all practical purposes, as determined by our specific objective goals. This research can help students to know that there are many factors from various aspects that can influence a person to be interested in or venture into this field of entrepreneurship.

### 1.23. Contributions to Knowledge

The findings of the survey confirm the factors that influence interest in entrepreneurship among UMK students are motivation, family background, entrepreneurship education and desire for independence. This variable creates a relationship between UMK students from the level of education seen in the data study is related and affects the interest in UMK students. On the other hand, the findings also reveal the relationship between variables that can increase students' interest in becoming entrepreneurs. However, the findings show that the relationship between motivation has more impact on UMK students than desire for independence, family background and entrepreneurship education. In this chapter, we summarize our proposed research to expand interest in entrepreneurship among UMK students and discuss the consequences of factors that influence interest entrepreneurship among UMK students. This study has an important factor in interest in entrepreneurship among UMK students.

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### REFERENCES

- 1) Griffee, R. (2011). 5 key factors that influence entrepreneurship. Chron.com. <https://smallbusiness.chron.com/5-key-factors-influenceentrepreneurship-18541.html>
- 2) Maheshwari, G., Kha, K. L., & Arokiasamy, A. R. A. (2022). Factors affecting students' entrepreneurial intentions: a systematic review (2005–2022) for future directions in theory and practice. Management Review Quarterly. <https://doi.org/10.1007/s11301-022-00289-2>
- 3) Su, Y., Zhu, Z., Chen, J., Jin, Y., Wang, T., Lin, C.-L., & Xu, D. (2021). Factors Influencing Entrepreneurial Intention of University Students in China: Integrating the Perceived University Support and Theory of Planned Behaviour. Sustainability, 13(8), 4519. <https://doi.org/10.3390/su13084519>
- 4) FACTORS THAT INFLUENCE STUDENT PARTICIPATION IN BY MUIGAI SARAH WATIRI A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS • «IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI (2012). [http://erepository.uonbi.ac.ke/bitstream/handle/11295/6795/Muigai\\_Factors%20that%20influence%20student%20participation%20in%20entrepreneurship.pdf?Sequence=1](http://erepository.uonbi.ac.ke/bitstream/handle/11295/6795/Muigai_Factors%20that%20influence%20student%20participation%20in%20entrepreneurship.pdf?Sequence=1)
- 5) Joseph, I. (2017). Factors Influencing International Student Entrepreneurial Intention in Malaysia. American Journal of Industrial and Business Management, 07(04), 424–428. <https://doi.org/10.4236/ajibm.2017.74030>
- 6) Mat, S. C., Maat, S. M., & Mohd, N. (2015). Identifying Factors that Affecting the Entrepreneurial Intention among Engineering Technology Students. Procedia - Social and Behavioral Sciences, 211, 1016–1022. <https://doi.org/10.1016/j.sbspro.2015.11.135>
- 7) Tong, X. F., Tong, D. Y. K., & Loy, L. C. (2010). FACTORS INFLUENCING ENTREPRENEURIAL INTENTION AMONG UNIVERSITY STUDENTS. INTERNATIONAL JOURNAL OF SOCIAL SCIENCES AND HUMANITY STUDIES.
- 8) Denanyoh, R., Adjei, K., & Nyemekye, G. E. (2015b). Factors That Impact on Entrepreneurial Intention of Tertiary Students in Ghana. International Journal of Business and Social Research, 5(3), 19–29. <https://doi.org/10.18533/ijbsr.v5i3.693>
- 9) Scribbr - Site Maintenance. (n.d.). <https://www.scribbr.com/methodology/simple-random-sampling/>
- 10) Scribbr - Site Maintenance. (n.d.-b). <https://www.scribbr.com/methodology/simple-random-sampling/>
- 11) Nikolopoulou, K. (2022, December 2). What Is Snowball Sampling? | Definition & Examples. Scribbr. <https://www.scribbr.com/methodology/snowball-sampling/>
- 12) Nurmaliza, N., Caska, C., & Indrawati, H. (2018). Analysis of Factors Affecting Entrepreneurial Interest of Vocational High School Students in Pekanbaru. JOURNAL OF EDUCATIONAL SCIENCES, 2(2), 42. <https://doi.org/10.31258/jes.2.2.p.42-51>



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## The Influences of Social Media Marketing, E-Wom, and Information Quality on Purchasing Decisions through Trust as The Mediation



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**ABSTRACT:** Purchasing decision is a selection of behavioural alternatives from two or more alternatives. Companies need to know and understand what factors can influence purchasing decisions. This research was conducted in the city of Yogyakarta, involving 140 respondents as samples who were selected using purposive sampling. The data were collected using an instrument in the form of a questionnaire and analysed using the path analysis and Sobel test. Based on the analysis results, it was found that social media marketing, E-WOM, information quality, and trust provide a positive and significant impact on purchasing decisions. In detail, social media marketing indirectly affects purchasing decisions through trust, E-WOM has a positive and significant effect on purchasing decisions if mediated by brand trust, and the quality of information indirectly affects purchasing decisions through consumer trust in Happy Bee Restaurant.

**KEYWORDS:** purchasing decisions, social media marketing, e-wom, information quality, trust

### INTRODUCTION

The increasing number of Indonesian citizens is also followed by the increasing consumption level of goods and services, especially in the food sector. This high demand from the public has encouraged companies to compete to meet this demand and eventually led to the rapid development of the food industry. This intense competition in the food industry encourages business owners to survive and innovate. However, apart from this competition among local food industry owners, many multinational food industry companies are also participating. Various marketing strategies are carried out through social media, word-of-mouth, or printed media. Furthermore, the most important thing is how these entrepreneurs can attract readers' interest and seize the target market. Companies that can survive in the food industry competition are able to develop their creativity to create various types of food creations, create competitive advantages for their products, and carry out appropriate marketing strategies. In addition, good marketing can encourage consumers to decide to purchase the offered business. Social media marketing for several industries, such as culinary and fashion, can facilitate interaction with consumers because industry owners get suggestions and input directly from consumers regarding the products being marketed (Utama, 2019). Social media marketing aims to grow brand awareness through marketing efforts and is carried out by using online social media and communities to reach a broader target. Therefore, it can foster intentions for people, mainly social media users, to buy the products (Rochmatin Lailatis Sholawati & Tiarawati, 2022).

Business competition from various sectors requires all managers to be involved in the digital era. Traditional methods such as mouth-to-mouth or word-of-mouth (WOM) marketing are suitable for marketing the products offered. Still, the presence of digital media, such as social media, is the best tool to convey the advantages of the products. Another challenge business people face is that their products must have benefits that can attract the attention of social media users, considering the competitiveness of business people in social media is very competitive. One of the advantages of a business that can be offered is a varied product. Monotonous products will make consumers feel bored. Therefore, companies must innovate creatively to create new products to prevent consumer boredom (Nofiani & Mursid, 2021). This opinion is one of the theories that support the statement that in the business world, repeated monotonous products will cause consumer boredom. The culinary or food and beverage (F&B) business currently indirectly uses digital media to reach target consumers. By utilizing digital media, business people can promote their products through various platforms to develop the business they started (Hidayah et al., 2021). The reach of F&B business consumers is one of the keys to whether the business or businesses get optimal profits. This is because a wide range of consumers

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will increase the value of consumer knowledge of the products offered so that, in the end, each consumer decides to buy the product, or is called a purchasing decision.

Purchasing decision is the final stage desired by all company managers. Marketing efforts in various ways to win business competition carried out by companies can be seen in consumer purchasing decisions for the products being marketed. If marketing uses digital media, WOM techniques can be included in digital marketing media called E-WOM. Instagram and Google Maps are digital media that can apply E-WOM as a marketing medium. Google maps provides a review column that consumers can use to provide testimonials related to products and other supporting factors such as business location, availability of parking space, and services provided. Almost the same as Google maps, Instagram provides a place for consumers to do E-WOM in the comments column, where all consumers are free to write about their experiences after buying or using the products offered. A group sees that the development of digital marketing, primarily through Instagram, provides business opportunities for Macro, Small, and Medium Enterprises (B. S et al., 2021). Instagram is a social media platform that has supporting features for the continuity of business partners that are very effective and efficient.

One restaurant that is trying to survive in this tough competition is Happy Bee Restaurant. Happy Bee Restaurant sells Japanese-inspired fast food. Happy Bee Restaurant was founded in 2003 under the auspices of CV. Adiputra Investama, based on Jl. Kebonagung No. 166 Mlati, Sleman, Yogyakarta. Currently, Happy Bee Restaurant implements a franchise system that most other restaurants have implemented. The convenient location and strategic location of the shop, which is in Galeria Mall Yogyakarta, is one of the attractions of this restaurant. In addition, Happy Bee Restaurant can also meet the needs and demands of consumers by providing fast food that maintains health and hygiene.

Happy Bee Restaurant conducts sales and marketing through Instagram social media. Kertajaya in Iswara (2016) argues that entrepreneurs who do not use the internet to promote their products will lose money and be displaced because marketing via the internet is very effective and cheap. Because internet users in Indonesia are predicted to be 175.4 million in 2020, marketing via the internet can be a practical step for companies to survive. Happy Bee Restaurant uses Instagram as its marketing medium because it eases them to promote their products. Consumers will also get much information about the items promoted. Another reason for using Instagram for marketing media is that Instagram users in Indonesia in May 2020 reached 69 million accounts, with 25 million accounts coming from young people, which is the target age of Happy Bee Restaurant. The appearance of this clear and colorful image is one of the attractive factors for Instagram Happy Bee Restaurant. In addition, many promos and conveniences are offered. Information about products, how to order, and locations can be easily seen through the bio and captions of each uploaded photo. From the description above, the researchers chose "The Influence of Social Media Marketing, E-WOM, and Information Quality on Purchase Decisions through Trust as Mediation at Happy Bee Restaurant".

### **METHOD**

The study utilized quantitative data obtained from survey methods and information from respondents using a closed questionnaire, in which the respondents could only choose answers provided by the researchers. The object of this research was Happy Bee Restaurant, and the subjects who acted as informants or resource persons included consumers of Happy Bee Restaurant. The population in this study were all consumers who had made purchases at Happy Bee Restaurant. Meanwhile, the sample in this study was some consumers who had made purchases at Happy Bee Restaurant and were selected using nonprobability sampling. Through this technique, each member of the population had a different opportunity to be selected than the research sample (Sugiyono, 2019). The sampling technique used was purposive sampling which has advantages in terms of the research sample obtained in line with the research objectives (Lenaini, 2021). The sample selection criteria in this study involved respondents who live in Yogyakarta, are aged 18-35 years, have social media, and have made purchases at Happy Bee Restaurant in the last two years. The independent variables in this study were social media marketing (X1), E-WOM (X2), and quality of information (X3). The dependent variables were purchasing decisions, and the intervening variable was consumer trust in Happy Bee Restaurant. The researchers tested the hypothesis in this study using path analysis.

### **RESULT AND DISCUSSION**

#### **1. Model One Analysis**

The path analysis of this one model was used to determine the effect of social media marketing (X1), E-WOM (X2), quality of information (X3), and trust (Z) on purchasing decisions (Y). The test results are as follows:

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**Table 1. Results of Path Analysis Model One**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.662	.774		2.147	.034
	Trust	.391	.074	.407	5.259	.000
	Social Media Marketing	.094	.044	.152	2.122	.036
	E-Wom	.069	.032	.135	2.179	.031
	Information Quality	.116	.031	.283	3.798	.000
a. Dependent Variable: Purchasing decision						

Based on the table above, it can be seen that:

a. The regression equation from the calculation above is:

$$Y = 0,094X_1 + 0,069X_2 + 0,116X_3 + 0,391Z + 0,476$$

- b. The coefficient value of social media marketing (X1) on purchasing decisions was positive, and the number was 0.094, indicating that there was a positive influence of social media marketing on purchasing decisions. This means that the better the social media marketing offered by Happy Bee Restaurant, the more consumer purchasing decisions will increase.
- c. The coefficient value of E-WOM (X2) on purchasing decisions was positive and equal to 0.069, indicating that there was a positive influence of E-WOM on purchasing decisions. This result means the better the E-WOM owned by Happy Bee Restaurant, the more purchasing decisions will increase.
- d. The coefficient value of information quality (X3) on purchasing decisions was positive and equal to 0.116, indicating that there was a positive influence of information quality on purchasing decisions, meaning that the better the quality of the information displayed by Happy Bee Restaurant, the more purchasing decisions will increase.
- e. The coefficient of trust (Z) on purchasing decisions was positive and equal to 0.391, indicating that there was a positive influence of trust on purchasing decisions, meaning that the higher the consumer confidence in Happy Bee Restaurant, the purchasing decision will increase.
- f. The significant value of information quality (X3) and trust (Z) on purchasing decisions (Y) was 0.000. The significance values of social media marketing (X1) and E-WOM (X2) on purchasing decisions (Y) were 0.036 and 0.031, which means that the four variables had a significant influence on purchasing decisions. Where  $0.000 < 0.05$ ;  $0.036 < 0.05$  and  $0.031 < 0.05$ , with 0.05 as the significance level.

## 2. Model 2 Path Analysis

Path analysis of these two models was applied to determine the effect of social media marketing (X1), E-WOM (X2), and quality of information (X3) on trust (Z).

**Table 3. Results of Path Analysis Model Two**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.265	.905		2.504	.014
	Trust	.214	.050	.331	4.308	.000
	Social Media Marketing	.180	.038	.212	2.582	.016
	E-Wom	.205	.032	.478	6.428	.000
a. Dependent Variable: Trust						

Based on the table above, it can be seen that:

a. The regression equation from the calculation above is:

$$Y = 0,214X_1 + 0,180X_2 + 0,205X_3 + 0,550$$

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- b. The coefficient of social media marketing (X1) on trust was positive and equal to 0.214, indicating that there was a positive influence of social media marketing on trust. This means that the better the social media marketing offered by Happy Bee Restaurant, the more consumer trust will increase.
- c. The coefficient number of E-WOM (X2) on trust was positive and equal to 0.180, indicating that there was a positive effect of E-WOM on trust. So, the better the E-WOM Happy Bee Restaurant owns, the more trust will increase.
- d. The coefficient number contained in the quality of information (X3) on trust was positive and equal to 0.205, indicating that there was a positive influence of information quality on trust. This means that the better the quality of the information displayed by Happy Bee Restaurant, the more trust will increase.
- e. The significance value of social media marketing (X1) and information quality (X3) on trust (Z) was 0.000, and the significance value of E-WOM (X2) on trust (Z) was 0.016, which means that the three independent variables had a significant influence on trust as the dependent variable. Where  $0.000 < 0.05$  and  $0.016 < 0.05$ , with 0.05 as the significance level.

### 3. Path Analysis

**Table 3. Indirect Effect Test Results**

NO	Variabel	Standardized	Unstandardized	Std. eror	Signifikansi
1	X <sub>1</sub> ke Y	0,152	0,094	0,044	0,000
2	X <sub>2</sub> ke Y	0,135	0,069	0,032	0,036
3	X <sub>3</sub> ke Y	0,283	0,116	0,031	0,031
4	X <sub>1</sub> ke Z	0,331	0,214	0,050	0,000
5	X <sub>2</sub> ke Z	0,212	0,180	0,038	0,016
6	X <sub>3</sub> ke Z	0,478	0,205	0,032	0,000
7	Z ke Y	0,407	0,391	0,074	0,000
8	X <sub>1</sub> ke Z ke Y		0,214 x 0,391 = 0,084		Signifikan (partial mediated)
9	X <sub>2</sub> ke Z ke Y		0,180 x 0,391 = 0,070		Signifikan (partial mediated)
10	X <sub>3</sub> ke Z ke Y		0,205 x 0,391 = 0,080		Signifikan (partial mediated)

Based on the path analysis above, it can be seen that all independent variables have a direct and significant influence on purchasing decisions.

Based on the calculation above, therefore:

$$\begin{aligned} \text{Direct effect of X}_1 \text{ to Y} &= 0,094 \\ \text{Indirect effect of X}_1 \text{ to Z to Y} &= 0,084 \\ \text{Total effect} &= 0,178 \end{aligned}$$

Based on the calculation above, it is known that the total effect is 0.178, while the direct effect value is 0.094. Thus, the total effect value > the direct effect value, so it can be concluded that there is a mediating effect.

$$\begin{aligned} \text{Direct effect of X}_2 \text{ to Y} &= 0,069 \\ \text{Indirect effect of X}_2 \text{ to Z to Y} &= 0,070 \\ \text{Total effect} &= 0,139 \end{aligned}$$

Based on the above calculation, it is known that the total effect is 0.139, while the direct influence value is 0.069. Thus the total influence value > the direct influence value, it can be concluded that there is a mediating influence.

$$\begin{aligned} \text{Direct effect of X}_3 \text{ to Y} &= 0,116 \\ \text{Indirect effect of X}_3 \text{ to Z to Y} &= 0,080 \\ \text{Total effect} &= 0,196 \end{aligned}$$

Based on the above calculation, it is known that the total effect is 0.196 while the direct influence value is 0.116. Hence, the total influence value > the direct influence value, it can be concluded that there is a mediating influence.

Based on the path analysis above, it is known that social media marketing has an indirect influence on purchasing decisions through trust as mediation. The influence is equal to 0.084.

Testing the significance of the indirect effect of social media marketing on purchasing decisions through trust as mediation can be tested through the Sobel test with the following formula:

## The Influences of Social Media Marketing, E-Wom, and Information Quality on Purchasing Decisions through Trust as The Mediation

$$\begin{aligned}
 S_{ab} &= \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \\
 S_{p5p4} &= \sqrt{p4^2 sp5^2 + p5^2 sp4^2 + sp5^2 sp4^2} \\
 S_{p5p4} &= \sqrt{(0,391)^2 (0,050)^2 + (0,214)^2 (0,074)^2 + (0,050)^2 (0,074)^2} \\
 &= \sqrt{0,1529.0,0025 + 0,0458.0,005476 + 0,0025.0,005476} \\
 &= \sqrt{0,0003822025 + 0,000250778896 + 0,00001369} \\
 &= 0,02542973448544 = 0,0254
 \end{aligned}$$

Based on the results of sp5p4, the t statistical value of the effect of mediation can be calculated as follows:

$$\begin{aligned}
 t &= \frac{ab}{S_{ab}} \\
 t &= \frac{\rho5p4}{S_{p5p4}} \\
 t &= \frac{0,084}{0,020} \\
 t &= 4,2
 \end{aligned}$$

From the results of the Sobel test above, the t value is 4.2, and the t table is 1.98. Because the t value obtained is  $4.2 > 1.98$  and the significance level is 5%, it can be proven that trust mediates the effect of social media marketing on purchasing decisions indirectly.

Based on the path analysis above, it is known that e-WOM has an indirect effect on purchasing decisions through trust as mediation. The magnitude of the influence is 0.070. Testing the significance of the indirect effect of E-WOM on purchasing decisions through trust as mediation can be tested through the Sobel test with the following formula:

$$\begin{aligned}
 S_{ab} &= \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \\
 S_{p6p4} &= \sqrt{p4^2 sp6^2 + p6^2 sp4^2 + sp6^2 sp4^2} \\
 S_{p6p4} &= \sqrt{(0,391)^2 (0,038)^2 + (0,180)^2 (0,074)^2 + (0,038)^2 (0,074)^2} \\
 &= \sqrt{0,152.0,0014 + 0,0324.0,0054 + 0,001444.0,0054} \\
 &= \sqrt{0,000220760164 + 0,0001774224 + 0,000007907344} \\
 &= 0,020151672585669 = 0,020
 \end{aligned}$$

Based on the results of sp5p4, the t statistical value of the effect of mediation can be calculated as follows:

$$\begin{aligned}
 t &= \frac{ab}{S_{ab}} \\
 t &= \frac{\rho6p4}{S_{p6p4}} \\
 t &= \frac{0,070}{0,015} \\
 t &= 4,67
 \end{aligned}$$

The results of the Sobel test above determined that the t value was 4.67 and the t table was 1.98. Because the t value obtained is  $4.67 > 1.98$  and the significance level is 5%, it can be proven that trust mediates the effect of E-WOM on purchasing decisions indirectly.

Based on the path analysis above, it is known that the quality of information indirectly influences purchasing decisions through trust as mediation. With an effect of 0.195, testing the significance of the indirect effect of information quality on purchasing decisions through trust as mediation can be tested through the Sobel test with the following formula: =

$$\begin{aligned}
 S_{ab} &= \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \\
 S_{p7p4} &= \sqrt{p4^2 sp7^2 + p7^2 sp4^2 + sp7^2 sp4^2} \\
 S_{p7p4} &= \sqrt{(0,391)^2 (0,032)^2 + (0,205)^2 (0,074)^2 + (0,032)^2 (0,074)^2} \\
 &= \sqrt{0,1528.0,0010 + 0,042025.0,0054 + 0,0010.0,0054} \\
 &= \sqrt{0,000156550144 + 0,0002301289 + 0,000005607424} \\
 &= 0,019806222961484 = 0,0198
 \end{aligned}$$

Based on the results of sp5p4, the t statistical value of the effect of mediation can be calculated as follows:

$$\begin{aligned}
 t &= \frac{ab}{S_{ab}} \\
 t &= \frac{\rho7p4}{S_{p7p4}} \\
 t &= \frac{0,080}{0,013} \\
 t &= 6,15
 \end{aligned}$$

The results of the Sobel test above determined that the t value was 6.15, and the t table was 1.98. Because the t value obtained is  $6.15 > 1.98$  and the significance level is 5%, it can be proven that trust mediates the effect of information quality on purchasing decisions indirectly.

## The Influences of Social Media Marketing, E-Wom, and Information Quality on Purchasing Decisions through Trust as The Mediation

### CONCLUSION

Based on the results of the research above regarding the influence of social media marketing, E-WOM, and the quality of information on purchasing decisions through trust as mediation, it can be concluded that:

1. Social media marketing has a positive and significant influence on purchasing decisions directly on consumers of Happy Bee Restaurant in Yogyakarta.
2. E-WOM has a positive and significant impact on purchasing decisions directly on consumers of Happy Bee Restaurant in Yogyakarta.
3. The quality of information has a positive and significant impact on purchasing decisions directly on consumers of Happy Bee Restaurant in Yogyakarta.
4. Trust has a positive and significant influence on consumer purchasing decisions at Happy Bee Restaurant in Yogyakarta.
5. Social media marketing has a positive and significant influence on consumer trust directly at Happy Bee Restaurant in Yogyakarta.
6. E-WOM has a positive and significant impact on consumer trust directly at Happy Bee Restaurant in Yogyakarta.
7. The quality of information has a positive and significant influence on consumer trust directly at Happy Bee Restaurant in Yogyakarta.
8. Social media marketing has a positive and significant influence on purchasing decisions through trust as mediation for consumers of Happy Bee Restaurant in Yogyakarta.
9. E-WOM has a positive and significant influence on purchasing decisions through trust as mediation for consumers of Happy Bee Restaurant in Yogyakarta.
10. The quality of information has a positive and significant influence on purchasing decisions through trust as mediation for consumers at Happy Bee Restaurant in Yogyakarta.

Based on the conclusions above, the researchers suggest that the quantity test results show that the E-WOM variable has the minor influence on purchasing decisions through trust. The current generation tends to trust product reviews more from other consumers, and one of the things that often gets the attention of other consumers is related to service. Reliable service is one factor that influences a brand's strength (Suripto, 2019). Research by Asti & Ayuningtyas (2020) found that good or bad service quality strongly influences customer satisfaction. Therefore, to be able to maintain consumer confidence, researchers can provide advice to Happy Bee Restaurant to evaluate the service. This is because most of the negative reviews of Happy Bee Restaurant consumers on Google My Business are about the queue length, which takes more than 30 minutes to order. Research by Saputra & Ardani (2020) produces data in the form of a service quality variable with a positive coefficient value of 0.515 so that there is a positive influence between service quality and purchasing decisions. Happy Bee Restaurant can apply for orders via notes or notes made at each table to reduce the length of the queue at the cashier because some people are still not sure what product they want to order.

In addition, researchers provide suggestions based on quantitative testing of the information quality variable on trust with the lowest coefficient value among other variables. Happy Bee Restaurant must routinely update its information with an attractive appearance on its Instagram page. This is in line with Gumilar's (2015) research which shows that 78% of fashion industry managers in Bandung consider updating information via Instagram regarding lists and product quality is essential. The level of accuracy of information must also be considered and maintained so that consumers will more easily trust the company. Information from business owners must contain details about the culinary products offered with the differences between these products and other culinary products (Mulyansyah & Sulistyowati, 2020).

Updating information is one of the most essential things in the world of marketing. Digital marketing technology will benefit consumers, such as they can find the latest information regarding the selected product or service (Yasmin et al., 2015). Based on the opinion above, updating information is the advantage consumers expect when a company uses digital marketing techniques. If the use of digital marketing marketing strategies does not maximize information updates related to the products being marketed, this marketing strategy will not work optimally.

Information updates can be linked to the use of E-WOM. Uploading photos and videos from former consumers can increase other consumer confidence in the future (Sa'ait et al., 2016). Consumer trust in brands plays an essential role in mediating the influence of social media on purchasing decisions. Therefore, it is important to frequently use social media to share interactive and informative posts because the primary goal of advertising and marketing promotion is to build brand trust and stimulate consumer buying behavior (Hanaysha, 2022). Photos and videos, especially from consumers, cannot be used as a definite hope for a manager, considering that all consumers do not necessarily have free time to make reviews accompanied by photos or videos. Another way the company can do this is to constantly update information by taking photos or videos of the company's current



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condition or the new and superior products offered so that purchasing decisions arise from consumers as a result of uploading photos and videos from the company.

### REFERENCES

- 1) Asti, E. G., & Ayuningtyas, E. A. (2020). PENGARUH KUALITAS PELAYANAN, KUALITAS PRODUK DAN HARGA TERHADAP KEPUASAN KONSUMEN (EFFECT OF SERVICE QUALITY, PRODUCT QUALITY AND PRICE ON CONSUMER SATISFACTION). *EKOMABIS: Jurnal Ekonomi Manajemen Bisnis*, 01(01), 1–14.
- 2) B. S, D. G., Natanael, F., Enrico, I. J., Maliki, L., & Valentino, T. (2021). DIGITAL MARKETING CALENDER UNTUK
- 3) BISNIS KULINER : PENDAMPINGAN SOCIAL MEDIA INSTAGRAM @IniDapurMakwaw UNTUK KEBERLANGSUNGAN DI ERA NEW NORMAL. *Jurnal AKAL: Abdimas Dan Kearifan Lokal*, 2(1), 38–61. <https://doi.org/10.25105/akal.v2i1.9037>
- 4) Gumilar, G. (2015). PEMANFAATAN INSTAGRAM SEBAGAI SARANA PROMOSI OLEH PENGELOLA INDUSTRI KREATIF FASHION DI KOTA BANDUNG. *Jurnal Ilmu Politik Dan Komunikasi*, V(2), 77–84.
- 5) Hanaysha, J. R. (2022). Impact of social media marketing features on consumer's purchase decision in the fastfood industry: Brand trust as a mediator. *International Journal of Information Management Data Insights*, 2(2), 100102. <https://doi.org/10.1016/j.ijime.2022.100102>
- 6) Hidayah, I. N., Rohmah, N. F., & Saifuddin, M. (2021). EFFECTIVENESS OF DIGITAL PLATFORMS AS FOOD AND BEVERAGE MARKETING MEDIA DURING THE COVID-19 PANDEMIC. *Airlangga Journal of Innovation Management*, 2(2), 122–130.
- 7) Iswara, D. (2016). PENGARUH KEPERCAYAAN, KEMUDAHAN, KUALITAS INFORMASI, DAN PERSEPSI RISIKO TERHADAP KEPUTUSAN PEMBELIAN (STUDI KASUS PADA PENGGUNA MEDIA SOSIAL INSTAGRAM DI KOTA YOGYAKARTA). Universitas Negeri Yogyakarta.
- 8) Lenaini, I. (2021). Teknik Pengambilan Sampel Purposive Dan Snowball Sampling. *Jurnal Kajian, Penelitian & Pengembangan Pendidikan Sejarah*, 6(1), 33–39. p-ISSN 2549-7332 %7C e-ISSN 2614-1167%0D
- 9) Mulyansyah, G. T., & Sulistyowati, R. (2020). Pengaruh Digital Marketing Berbasis Sosial Media terhadap Keputusan Pembelian Kuliner di Kawasan G-Walk Surabaya. *Pendidikan Tata Niaga*, 9(1), 1097–1103. <https://jurnalmahasiswa.unesa.ac.id/index.php/jptn/article/view/36056>
- 10) Nofiani, P. W., & Mursid, M. C. (2021). Pentingnya Perilaku Organisasi Dan Strategi Pemasaran Dalam Menghadapi Persaingan Bisnis di Era Digital. *Jurnal Logistik Bisnis*, 11(2), 71–77. <https://ejurnal.poltekpos.ac.id/index.php/logistik/article/view/1563>
- 11) Rochmatin Lailatis Sholawati, & Tiarawati, M. (2022). Pengaruh Social Media Marketing Dan Brand Awareness Terhadap Niat Beli Produk Di Restoran Fast Food. *Ilmu Manajemen*, 10(4), 1098–1108.
- 12) Sa'ait, N., Kanyan, A., & Nazrin, M. F. (2016). The Effect of E-WOM on Customer Purchase Intention. *International Academic Research Journal of Social Science*, 2(1), 73–80.
- 13) Saputra, G. W., & Ardani, I. G. A. K. S. (2020). PENGARUH DIGITAL MARKETING, WORD OF MOUTH, DAN KUALITAS PELAYANAN TERHADAP KEPUTUSAN PEMBELIAN. *E-Jurnal Manajemen*, 9(7), 2596–2620.
- 14) Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif dan R&D. ALFABETA.
- 15) Suropto, T. (2019). Kajian Literatur Efektifitas Pemasaran Produk Dengan Menggunakan Sistim Online Marketing di Era Disruption. *JESI (Jurnal Ekonomi Syariah Indonesia)*, 8(2), 120. [https://doi.org/10.21927/jesi.2018.8\(2\).120-128](https://doi.org/10.21927/jesi.2018.8(2).120-128)
- 16) Utama, I. D. (2019). Analisis Strategi Pemasaran Usaha Mikro Kecil dan Menengah (UMKM) pada Era Digital di Kota Medan. *EQUILIBRIUM*, 7(1), 1–10. <https://doi.org/10.47467/visa.v1i2.834>
- 17) Yasmin, A., Tasneem, S., & Fatema, K. (2015). Effectiveness of Digital Marketing in the Challenging Age: An Empirical Study. *The International Journal of Management Science and Business Administration*, 1(5), 69–80. <https://doi.org/10.18775/ijmsba.1849-5664-5419.2014.15.1006>



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## Effect of Financial Literacy, Risk Tolerance, and Overconfidence on Sandwich Generation Investment Decisions in the City of Surabaya



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**ABSTRACT:** The growing elderly dependency ratio in Indonesia has led to the emergence of the sandwich generation. Generations that share their resources with their families and aging parents. This study aims to determine the effect of financial literacy, risk tolerance, and overconfidence on sandwich generation investment decisions. Collecting data in this study using the method of distributing questionnaires and analyzed using the Partial Least Square (PLS) application. The results of this study are financial literacy are not a significant influence to the investment decision. Risk tolerance and overconfidence has positive influence on investment decision sandwich generation.

**KEYWORDS:** Sandwich Generation; Investment Decision, Financial Literacy, Overconfidence, Risk Tolerance

### INTRODUCTION

In general, Indonesian people do investment activities as a source of their side income outside of their main income from work. A person's income is not necessarily only used for the individual to meet their needs, it can also be used to meet the needs of family, children, and parents. Based on information quoted from <https://www.suara.com/> the number of productive-aged people who bear the financial burden of elderly family members, sandwich generation, is increasing. Data from the Central Statistics Agency (BPS) shows that the dependency ratio of the elderly (aged 60 years and over) continues to increase from 14.02 in 2017 to 16.76 in 2021. Thus, it can be concluded that every 100 people of productive age (15-59 years) must bear at least 17 elderly people.

Hernandez et al, (2019) defines the sandwich generation as individuals who are in a fit state to work and are "caught" between family responsibilities and professional responsibilities. Furthermore, according to Broady (2019), the sandwich generation divides their resources for their children and parents who have entered old age. Sandwich generation status makes individuals have more dependents or expenses than those who are not sandwich generation. The number of dependents or more expenses cause the sandwich generation to have a high financial burden and have less free time than the non-sandwich generation (quoted from <https://money.kompas.com/>). As the sandwich generation is psychologically stressed and can affect their physical health, it is not only their financial life that needs to be improved, but also their health. In addition, it is important to break the chain of the sandwich generation, they are required to start learning to invest. A lot must be prepared before starting to invest, one of which is an understanding of the basic concepts of good finance. As said by Lusardi, (2008) that good financial planning is influenced by the level of individual literacy. Meanwhile, investment planning is influenced by one's understanding of basic financial concepts.

According to Eduardus Tandililin (2010: 2) investment is a commitment to a number of funds or other resources made at that time, with the aim of obtaining some benefits in the future. Investments are divided into two types, namely real assets in the form of land and buildings, precious metals, real estate, deposits. While financial assets can be in the form of stocks, bonds, mutual funds, etc. Financial assets include long-term investments, by investing in the capital market investors will expect large returns, the size of the desired return depends on the investor's risk tolerance. Joko Salim (2010:9) explains that the more money or funds for an investment, the higher the investment income, the longer the individual invests, the higher the investment income, the higher the interest rate applicable to investment, the higher the investment income obtained, but the higher the income level, the greater the risk he must face.

Investment decisions are dilemmas that occur regarding the placement of funds in the form of investment to obtain higher returns in the future (Wulandari & Irmani, 2014). According to Budiarto & Susanti (2017) investment decisions are policies taken by investors to benefit in the future after making several calculations or alternatives. Investment decisions need to

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be considered because investment decisions have a long period of time (Mandagie et al., 2020). Moreover, investment is an activity that has risks, meaning that investment activities do not always generate profits but can generate losses for investors.

In research conducted by Muis Murtadho (2016) shows that the level of financial inclusion of the Surabaya City community is very high at 73.6% while the level of financial literacy of the Surabaya City community is quite high as evidenced by the public's knowledge of banking services and banking products is quite good and it can be seen that many people use banking services either to save money or to find financing. An investor will always consider his decision in making an investment, because in investing not only the benefits that will be obtained but also there are risks that loom in investing. Rational investors expect profit (return) with a low level of risk or high profit (return) with a certain level of risk. Risk is a consequence or impact that arises due to uncertainty, the risk is in the form of loss. Risk tolerance is how much risk can be borne and faced by investors in carrying out investment activities (Pratiwi, 2016). Investments that have a low level of risk provide low returns. Investments that have a high level of risk will provide high returns as well. Tolerance level plays an important role in investing. In addition, there is another factor that can be a determinant in investing which is overconfidence.

Overconfidence is a feeling of overconfidence that investors have. Overconfidence is a bias towards situations when someone believes and assumes that their abilities are greater than the abilities they actually have (Rahman & Gan, 2018). According to Budiarto & Susanti (2017) overconfidence is a person's unreasonable belief in intuitive reasoning, judgment and cognitive abilities.

### **GREAT THEORY**

#### **Prospect Theory**

Prospect theory was developed by Kahneman and Tversky in 1974 which basically covers two disciplines, namely psychology and economics which is an analysis of a person's behavior in making economic decisions between existing choices. According to Kahneman & Tversky (1979) mentioned as an alternative model of expected utility theory. Expected utility theory is referred to as a theory that discusses risky decision making which is dominated by normative models of rational choice and is widely applied in economic behavior description models (Kahneman & Tversky, 1979). Kahneman & Tversky (1979) state that prospect theory is an alternative model in choosing between risky prospects when the basic principles of utility theory show inconsistencies in their effects. The purpose of prospect theory is how individuals make a decision from a choice of prospects that contain risk. "The prospect theory holds that individuals are more influenced by the possibility of a loss than the prospect of an equivalent gain". Prospect theory can be said to be a theory that discusses the irrational actions of a person in deciding on an investment. It is said to be irrational because individuals tend to maintain their position when the price drops or is in a loss position and will sell it when the price rises slightly or small from the purchase price. This action is largely influenced by individual psychology, especially affective or psychomotor, although it is not separated from cognitive (Yuniningsih, 2020). Levy (1992) states that prospect theory is said to be a theory of decision making in risky conditions so that a consideration is needed. The consideration is because the individual's position is in two domains, namely the loss domain and the gain domain. These two risky conditions encourage immediate action even though the action is from a decision that tends to be irrational.

### **HYPOTHESIS**

#### **The Effect of Financial Literacy on Investment Decisions**

Financial literacy according to Romadoni (2015) can be interpreted as financial knowledge, which aims to achieve welfare. Financial knowledge is very important for each individual so that they are not wrong in making financial decisions. Margaretha and Pambudi (2015) state that the term financial literacy is the ability of individuals to make decisions in their personal financial arrangements. People's financial knowledge can be seen from how much financial literacy they have (Tsalisa and Rachmansyah, 2016). Investors who have a good level of financial literacy will have better control in making various investment decisions because they have better information and understanding (Upadana & Herawati, 2020).

The results of research by Ramadhan (2022) state that financial literacy has a positive effect on investor investment decisions in Yogyakarta. This means that the higher a person's level of financial literacy, the better the investment decisions made. In addition, research by Hardianto & Lubis (2022) also states that financial literacy has a positive effect on stock investment decisions.

**H1: Financial literacy has a positive effect on investment decisions.**

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## The Effect of Risk Tolerance on Investment Decisions

Risk tolerance is how much risk can be borne and faced by investors in carrying out investment activities (Pratiwi, 2016). An investor will always consider his decision in making an investment, because in investing not only the benefits that will be obtained but there are also risks that loom in investing. Rational investors expect profit (return) with a low level of risk or high profit (return) with a certain level of risk. According to Wardani & Lutfi (2019) investors with a high level of risk tolerance will tend to choose to invest in instruments that have high risk in the hope of getting high profits as well. Meanwhile, investors with low risk tolerance in choosing investment instruments tend to be cautious because they are afraid of risk.

The results of Salwah's research (2020) show that risk tolerance has a positive effect on investment decisions. This shows that investors with a high level of risk tolerance will be bolder in making investment decisions. Zahida's research (2021) also shows that risk tolerance has a positive effect on student investment decisions. This means that students who have a high level of risk tolerance will choose high-risk investments as well.

**H2: Risk tolerance has a positive effect on investment decisions.**

## The Effect of Overconfidence on Investment Decisions

According to Budiarto & Susanti (2017) overconfidence is a person's unreasonable belief in intuitive reasoning, judgment and cognitive abilities. Overconfidence is a feeling of excessive self-confidence possessed by investors. Overconfidence is a bias towards situations when someone believes and assumes that their abilities are greater than the abilities they actually have (Rahman & Gan, 2018). Investors believe that investing will get higher profits with low risk, but this is not guaranteed and does not necessarily occur as expected, therefore overconfidence can affect investors in making investment decisions (Jannah & Ady, 2017).

The results of research by Ramadhan (2022) show that overconfidence has a positive effect on investment decisions. This shows that having a high level of confidence in his abilities and skills for his investment will increase his investment decisions. The results of research by Hardianto & Lubis (2022) also show that overconfidence has a positive effect on stock investment decisions.

**H3: Overconfidence has a positive effect on investment decisions.**

## METHOD

### Population and samples

According to Sugiyono (2018) Population is a generalization area consisting of objects or subjects with certain qualities and characteristics set by researchers to study and then draw conclusions. The subjects that will be used as the population in this study are the people of Surabaya City aged 25 - 44 years, totaling 973,766 people including men and women. To determine the sample size, researchers used the Slovin formula. That makes of total samples are 100 people. The type of data used in this research is primary data. Primary data is data obtained from respondents through questionnaires, focus groups, and panels, or also data from researcher interviews with sources. The data collection method in this study was carried out by survey method through questionnaires distributed to the Surabaya City Community. The variable measurement scale used in this study is an ordinal scale or often referred to as a rating scale. The technique for determining the score in this research questionnaire uses the Likert scale technique. The Likert scale according to Sugiyono (2018) is a scale used to measure the attitudes, opinions, and perceptions of a person or group of people about social phenomena.

### Variable indicators

#### Financial literacy

Financial literacy according to Romadoni (2015) can be interpreted as financial knowledge, which aims to achieve welfare. Financial knowledge is very important for each individual so that they are not wrong in making financial decisions. Indicators of financial literacy in this study include:

- a. Basic financial knowledge (X1.1)
- b. Financial management (X1.2)
- c. Credit management (X1.3)
- d. Savings and investment (X1.4)
- e. Risk management (X1.5)

#### Risk tolerance

Risk is a consequence or impact that arises due to uncertainty, the risk is in the form of loss. Risk tolerance is how much risk can be borne and faced by investors in carrying out investment activities (Pratiwi, 2016). An investor will always consider his decision

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in making an investment, because in investing not only the benefits that will be obtained but there are also risks that overshadow investing. Risk tolerance indicators in this study include:

- a. Willingness to invest in high, moderate, and low risk. (X2.1)
- b. Choosing high risk investments to get high returns (X2.2)
- c. Profit is more important than security (X2.3)
- d. Believe that risk does not always result in loss (X2.4)
- e. Willing to accept if the investment fails (X2.5)

### Overconfidence

According to Budiarto & Susanti (2017) overconfidence is a person's unreasonable belief in intuitive reasoning, judgment and cognitive abilities. Overconfidence is a feeling of excessive self-confidence possessed by investors. Overconfidence is a bias towards situations when someone believes and assumes that their abilities are greater than the abilities they actually have (Rahman & Gan, 2018). Indicators of overconfidence in this study include:

- a. Having confidence in the success of the plan (X3.1)
- b. Having more ability than other investors (X3.2)
- c. Believe in your own abilities (X3.3)
- d. Believe in the knowledge you have (X3.4)
- e. Confidence in choosing an investment (X3.5)

### Investment Decision

According to Hartono (2017) investment is a delay in current consumption to be included in productive assets over a certain period. Parties who make investments are called investors. According to Putra et al. (2016) there are two attitudes in making investment decisions among investors, namely rational attitudes and irrational attitudes. A rational attitude is the attitude of an investor who thinks based on common sense. Meanwhile, an irrational attitude is the attitude of an investor who is not based on common sense. Indicators of investment decisions in this study are:

- a. Acceptable risk (Y.1)
- b. Feeling safe when investing (Y.2)
- c. Time to invest (Y.3)
- d. Updating knowledge about investment (Y.4)

## RESULTS

### Convergen Validity

From the results of data tabulation, the description of the data can be seen from the convergen validity as follows.

**Table 1: Convergent Validity**

	Factor Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))
X1.1 <- financial literacy	0.813	0.812	0.038	21.408
X1.2 <- financial literacy	0.873	0.873	0.028	31.452
X1.3 <- financial literacy	0.865	0.863	0.040	21.445
X1.4 <- financial literacy	0.871	0.869	0.032	27.599
X1.5 <- financial literacy	0.859	0.859	0.031	27.761
X2.1 <- risk tolerance	0.840	0.839	0.033	25.679
X2.2 <- risk tolerance	0.824	0.818	0.056	14.841
X2.3 <- risk tolerance	0.535	0.530	0.108	4.938
X2.4 <- risk tolerance	0.810	0.805	0.065	13.147
X2.5 <- risk tolerance	0.754	0.747	0.060	12.540
X3.1 <- overconfidence	0.662	0.651	0.083	7.991
X3.2 <- overconfidence	0.856	0.857	0.029	29.239
X3.3 <- overconfidence	0.938	0.938	0.012	79.765
X3.4 <- overconfidence	0.935	0.935	0.013	70.433
X3.5 <- overconfidence	0.829	0.829	0.035	23.436
Y1.1 <- investment decision	0.692	0.690	0.059	11.627
Y1.2 <- investment decision	0.581	0.573	0.084	6.905
Y1.3 <- investment decision	0.766	0.760	0.056	13.689
Y1.4 <- investment decision	0.835	0.836	0.030	27.652

Source: Data processed

## Effect of Financial Literacy, Risk Tolerance, and Overconfidence on Sandwich Generation Investment Decisions in the City of Surabaya

From the table above, the validity of the indicator is measured by looking at the Factor Loading value from the variable to the indicator, it is said that the validity is sufficient if it is greater than 0.5 and or the T-Statistic value is greater than 1.96 (Z value at  $\alpha = 0.05$ ). Factor Loading is the correlation between indicators and variables, if it is greater than 0.5, it is considered that the validity is fulfilled as well as if the T-Statistic value is greater than 1.96, the significance is fulfilled. Based on the outer loading table above, all reflective indicators on the Financial Literacy (X1), Risk Tolerance (X2), Overconfidence (X3) and Investment Decision (Y) variables, show factor loading (original sample) greater than 0.50 and or significant (T-Statistic value more than the Z value  $\alpha = 0.05$  (5%) = 1.96), thus the estimation results of all indicators have met Convergent validity or good validity.

### Hypothesis Test Results

The implementation of the resampling method, allows the applicability of freely distributed data, does not require the assumption of normal distribution, and does not require a large sample (recommended sample of at least 30). The test is carried out with a t-test, if a p-value  $\leq 0.05$  (alpha 5%) is obtained, it can be concluded that it is significant and vice versa. If the results of hypothesis testing on the outer model are significant, this indicates that the indicator is considered usable as a latent variable measuring instrument. Meanwhile, if the test results on the inner model are significant, it means that there is a meaningful influence of latent variables on other latent variables.

**Table 2: Hypothesis Test Results**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
X1 -> Y	0.204	0.203	0.112	1.825	0.069
X2 -> Y	0.226	0.238	0.096	2.366	0.018
X3 -> Y	0.373	0.374	0.109	3.413	0.001

Source: Data processed

## DISCUSSION

### The Effect of Financial Literacy on Investment Decisions

The results of hypothesis testing using the Bootstrapping method prove that financial literacy has an insignificant effect on the investment decisions of the sandwich generation in Surabaya City. So that the first hypothesis is rejected. This means that having good financial literacy or not, has an insignificant effect on investment decisions. This is in line with research conducted by Wardani and Lutfi (2016) with the title "The Effect of Financial Literacy, Experienced Regret, Risk Tolerance, and Motivation on Family Investment Decisions in the Perspective of Balinese People. In Salwah's research (2020) with the title "The Effect of Financial Literacy, Overconfidence, and Risk Tolerance on Investment Decisions for Capital Market Products in Makassar City" also shows that financial literacy has an insignificant effect on investment decisions. In addition, there is also research conducted by Irjayanti (2017) with the title "The Effect of Financial Literacy, Representativeness, Familiarity, and Risk Perception on Investment Decision Making in Surabaya and Sidoarjo Investors" which states that financial literacy has an insignificant effect on investment decisions.

This insignificant result can be possible because the current sandwich generation to make investment decisions mostly follow someone who spreads their personal analysis on social media because it is easier and faster. The convenience is then utilized for investment decision making because the sandwich generation sees an opportunity to make decisions faster. This is because the burden carried by the sandwich generation is quite heavy so they need something that can help them invest easily and quickly. This results in the emergence of biased behavior in making investment decisions because they only follow what is available and spread on social media.

### The Effect of Risk Tolerance on Investment Decisions

The results of hypothesis testing using the Bootstrapping method prove that risk tolerance affects the investment decisions of the sandwich generation in Surabaya City. So that the second hypothesis is accepted. This means that the higher the risk tolerance, the bolder the investment decision. With a high risk tolerance, someone will tend to make bolder decisions than people with a low level of risk tolerance. This is in line with research conducted by Salwah (2020) with the title "The Effect of Financial Literacy, Overconfidence, and Risk Tolerance on Investment Decisions for Capital Market Products in Makassar City". Research conducted by Wardani and Lutfi (2016) with the title "The Effect of Financial Literacy, Experienced Regret, Risk Tolerance, and Motivation on Family Investment Decisions in the Perspective of Balinese People" also shows the same results that risk tolerance has a significant effect on investment decisions. This is also shown in research conducted by Wardani and Lestari (2020) with the title "The Effect of Financial Literacy, Risk Tolerance, and Employment Status on Investment Decisions".

## **Effect of Financial Literacy, Risk Tolerance, and Overconfidence on Sandwich Generation Investment Decisions in the City of Surabaya**

Risk tolerance is how much risk can be borne and faced by investors in carrying out investment activities (Pratiwi, 2016). An investor will always consider his decision in making an investment, because in investing not only the benefits that will be obtained but there are also risks that overshadow investing. In this study, it has been proven that the higher the risk tolerance, the bolder the investment decision.

### **The Effect of Overconfidence on Investment Decisions**

The results of hypothesis testing using the Bootstrapping method prove that overconfidence affects the investment decisions of the sandwich generation in Surabaya City. So that the third hypothesis is accepted. This means that investors who have a high level of overconfidence will increase their investment decisions. This is in line with research conducted by Ramadhan (2022) with the title "The Effect of Financial Literacy, Overconfidence, Experienced Regret, and Demographic Factors on Investment Decisions (Case Study on Investors in Yogyakarta)". In addition, the same results are also found in Lubis's research (2022) with the title "Analysis of Financial Literacy, Overconfidence and Risk Tolerance on Stock Investment Decisions". In research conducted by Bangun (2020) with the title "The Effect of Financial Literacy, Risk Perception and Overconfidence on Investment Decisions (Case Study on Millennial Generation in Yogyakarta)" also shows that overconfidence significantly affects investment decisions.

The higher the level of overconfidence a person gives confidence and trust in the skills and knowledge possessed in investing so that he feels that his investment plan is successful and also feels that the information he has is superior and reasonable compared to other investors. However, this overconfidence can harm investors as well. This is because they are closed to the risks they face even though risk is part of financial planning and also they make excessive transactions (Gill et al., 2018).

### **CONCLUSIONS**

Based on the results of tests conducted using PLS analysis to examine the effect of Financial Literacy, Risk Tolerance, and Overconfidence on Sandwich Generation Investment Decisions in Surabaya City and the results described, it can be concluded that:

- a. Financial literacy has no effect on the investment decisions of the sandwich generation in Surabaya City.
- b. Risk tolerance affects the investment decisions of the sandwich generation in Surabaya City.
- c. Overconfidence affects the investment decisions of the sandwich generation in Surabaya City.

### **RECOMMENDATIONS**

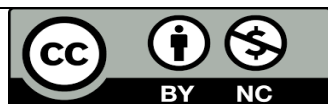
- a. For further research, it is hoped that it can conduct research on different respondents with a larger number of respondents.
- b. For further research, it is also hoped that research can be carried out by adding other independent variables.
- c. For readers to always consider every step taken in the world of investment and always enrich knowledge about investment so that in the future the investment made is successful and free from the sandwich generation label.

### **REFERENCES**

- 1) Anwar, M. C. (2021, august 8). Generasi Sandwich itu apa? pahami arti dan dampak Generasi sandwich. Retrieved from suara.com: <https://money.kompas.com/read/2021/12/08/102751426/generasi-sandwich-itu-apa-pahami-arti-dan-dampak-generasi-sandwich?page=all>
- 2) Anwar, M., & Purwanto, E. (2022). Application of the edu finance model to improve financial literature in creative industry in Sidoarjo district. *Jurnal Siasat Bisnis*.
- 3) Badan Pusat Statistik Kota Surabaya
- 4) Broady, T. (2019). The Sandwich generation: Caring for Oneself and Others at home and at work. *internal journal of care and caring*.
- 5) Fahmi, I. (2015). *Analisis Laporan Keuangan*. Bandung: Alfabeta.
- 6) Halim, A. (2003). *Analisis Investasi*. Jakarta: Salemba Empat.
- 7) Hardianto, & Lubis, S. H. (2022). Analisis Literasi Keuangan, Overconfidence dan Toleransi Risiko Terhadap Keputusan Investasi Saham. *e jurnal akuntansi*.
- 8) hasil survei literasi dan inklusi keuangan nasional meningkat. (2019). Retrieved from sikapiuangmu: [/sikapiuangmu.ojk.go.id/FrontEnd/CMS/Article/20549](https://sikapiuangmu.ojk.go.id/FrontEnd/CMS/Article/20549)
- 9) Hernandez, W., Marjanen, P., & Riina, K. (2019). Caring and Sandwich Generation in Finland.

## Effect of Financial Literacy, Risk Tolerance, and Overconfidence on Sandwich Generation Investment Decisions in the City of Surabaya

- 10) Khairunizam, & isbanah, Y. (2019). Pengaruh Financial Literacy dan Behavioral Finance Factors Terhadap Keputusan Investasi (Studi Terhadap Investor Saham Syariah pada Galeri Investasi Syariah UIN Sunan Ampel Surabaya). *Jurnal Ilmu Manajemen*.
- 11) Lestasi, M. D., & Wardani, D. K. (2020). Pengaruh Literasi Keuangan, Risk Tolerance dan Status Pekerjaan Terhadap Keputusan Investasi. *Jurnal Keuangan dan Bisnis*.
- 12) Mamduh, M. H. (2005). *Manajemen Keuangan*. Yogyakarta: BPFE.
- 13) Martono, N. (2015). *Metode Penelitian Kuantitatif*. Jakarta: PT Rajagrafindo Persada.
- 14) Mariana, D., Purwanto, E., & Wikartika, I. (2022). Pengaruh Perilaku Pengelolaan Keuangan terhadap Penerima Kartu. *Jurnal Ilmiah Universitas Batanghari Jambi*
- 15) Monalisa, A. (2016). Penggunaan Metode Resampling Bootstrap untuk Data Simulasi Time Series Model Arima.
- 16) Putri, N. M., & Rahyuda, H. (2017). Pengaruh Tingkat Financial Literacy dan Faktor Sosiodemografi Terhadap Perilaku Keputusan Investasi Individu. *E-Jurnal Ekonomi dan Bisnis Universitas Udayana*.
- 17) Radianto, W. E. (2020). a determinants of financial behavior on accounting student. *international journal of education, psychology and counselling (IJEPC)*.
- 18) Ramadhan, R. M. (2022). Pengaruh Literasi keuangan, Toleransi Risiko, Overconfidence, Experienced Regret, dan Faktor Demografi Terhadap Keputusan Investasi (Studi Kasus pada Investor di Yogyakarta).
- 19) Rasudu, A. (2021). Pengaruh Inflasi, Suku Bunga, Kurs, Coupon Rate, dan Likuiditas Obligasi Terhadap Harga Obligasi Pemerintah (Surat Utang Negara) Periode 2014 - 2016. *Jurnal Ilmu Manajemen Sosial Humaniora*.
- 20) Rubaltelli, & al, e. (2015). *Moral Investing: Psychology Motivations and Implications Judgement and Decision Making*.
- 21) Salim, J. (2010). *Investasi Gampang dan Paling Aman*. Jakarta: VisiMedia.
- 22) Serfianto, R., & dkk. (2013). *Investasi dan Gadai Emas*. Jakarta: PT Gramedia Pustaka Utama.
- 23) Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: CV Alfabeta.
- 24) Sukirno, S. (2007). *Pengantar Teori Makro Ekonomi*. Jakarta: Bina Grafika.
- 25) Surya, B., & Nasher, T. (2011). Analisis Pengaruh Tingkat Suku Bunga SBI, Exchange Rate, Ukuran Perusahaan, Debt to Equity Ratio dan Bond Terhadap Yield Obligasi Korporasi di Indonesia. *Jurnal Manajemen Teknologi*.
- 26) Suryanto. (2017). Pola Perilaku Keuangan Mahasiswa di Perguruan Tinggi. *Jurnal Ilmu Politik dan Komunikasi*.
- 27) Sutanto, T. (2013). *Hari Gini Gak Bisnis Properti?* Yogyakarta: Buku Pintar.
- 28) Tandelin, E. (2010). *Portofolio dan Investasi Teori dan Aplikasi*. Yogyakarta: Kanisius.
- 29) Yuniningsih. (2020). *Perilaku Keuangan dalam Berinvestasi (Laboratorium Experiment dan Field Experiment)*. Sidoarjo: Indomedia Pustaka.
- 30) Yuningsih, Y., & Taufiq, M. (2019). INVESTOR BEHAVIOR IN DETERMINING INVESTMEN ON REAL ASSET. *MIX : Jurnal Ilmiah Manajemen*.
- 31) Wahid, A. R. (2020). Optimalisasi Penerbitan Surat Berharga Syariah Negara (SBSN) pada Industri Keuangan Syariah. *Jurnal Al Qardh*.
- 32) Wulandari, D. A. (2014). Studi Experienced Regret, Risk Tolerance, Overconfidence dan Risk Perception pada Pengambilan Keputusan Investasi Dosen Ekonomi. *journal of business and banking*.



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## Intention to Use Induction Electric Stove According to Theory of Trying



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**ABSTRACT:** This research was conducted to examine the intention to use an induction electric stove according to the theory of trying. The variables involved in the analysis are traits, theory of trying, the attitude of adopting an induction electric cooker (AM) and the desire to adopt an induction electric cooker (IM). Traits are general self-confidence (GSC) and cynicism (Cyn). Theory trying is attitude towards success (AS), attitude towards failure (AF), attitude towards learning (IA).

Respondents are 197 of the respondents in Indonesia. Respondents who deserved to be processed were 124. The questionnaire used Google form media. The analysis technique used is PLS SEM with the help of WarpPLS 7.0 software.

The results obtained are Attitude towards success has a significant positive effect on the attitude of adopting an induction electric stove. Attitude towards failure has no negative and insignificant effect on attitude towards induction cooker adoption. Attitudes toward learning to use an induction cooker have a significant positive effect on attitudes towards the adoption of an induction cooker. Attitudes towards the adoption of induction hobs have a positive impact on the intention to adopt induction hobs. Confidence in general has a significant positive effect on attitudes towards success. Self-confidence in general has a significant negative effect on attitudes towards failure. Confidence in general has a significant positive effect on attitudes towards learning to use an induction electric stove. Cynicism has a significant negative effect on attitudes towards success. Cynicism has a significant positive effect on attitudes towards failure. Cynicism has a significant positive effect on attitudes toward learning to use an induction hob. There is a pattern that is different from previous research related to conversion plans, namely the obligation of the state and government support, both equipment and direct cash assistance related to the conversion program.

**KEYWORDS:** general self-confidence, cynicism, attitude towards adoption, adoption intention, attitude towards success, attitude towards failure, attitude towards learning

### INTRODUCTION

#### 1.1. Background

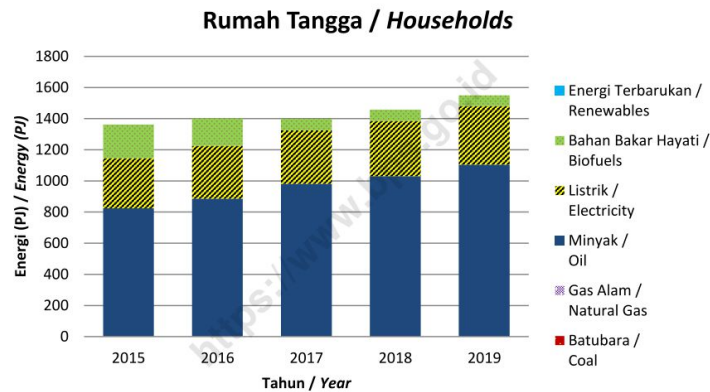
Ratification of Law No. 16 of 2017 concerning ratification of the Paris Agreement To The United Nations Framework Convention On Climate Change (Paris Agreement On The United Nations Framework Convention On Climate Change) on October 24, 2016 shows the commitment of the Indonesian government together with other countries in the world to maintain global temperature rise below 2oC and in an effort to limit global temperature rise to 1.5oC above pre-industrial levels. The Government of Indonesia in 2030 has made a commitment to reduce greenhouse gas (GHG) emissions by 834 million tons of CO<sub>2</sub> or 29% of the conditions of Business as Usual (BaU). Emission sources include emissions from fuel combustion in various sectors and fugitive emissions. The sectoral approach to emissions is calculated according to the activity sector, such as energy production (electricity, (ESDM Energy and Mineral Resources Data and Information Center, 2020).

An atmosphere containing high levels of CO<sub>2</sub> results in various health problems, such as inflammation, altered bone composition, kidney disorders, respiratory acidosis, altered behavior and physiology, and oxidative stress. (Jacobson et al., 2019). Infants and children are especially vulnerable to increased CO<sub>2</sub> in the atmosphere because they take in more air than they weigh to grow and develop (Faustmann et al., 2000). Rapidly increasing CO<sub>2</sub> can replace oxygen in the atmosphere so that it can cause rather severe hypoxemia and result in things that are not good for health (Beheshti et al., 2018).

BPS data for 2021 obtained information that in the period 2015 – 2019, there was an increase in the use of energy products from year to year by households. Households use 1,365 PJ of energy products in 2015. Meanwhile, their use in 2019 is

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1,550 PJ. Figure 1.1 shows data that in the period 2015 – 2019 households used their main energy product from oil, namely gasoline for their personal transportation needs. In addition, the use of other energy products by households is electricity, LPG, and biofuels.



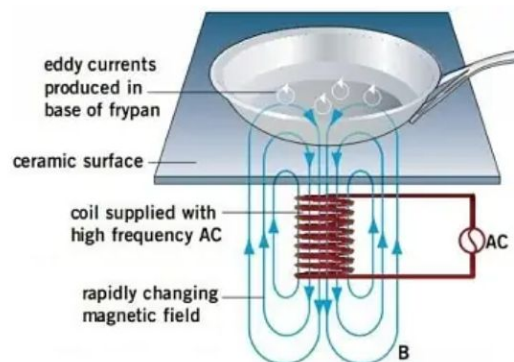
**Figure 1.1 Distribution of Use of Household Energy Products (PJ) 2015-2019**

The Indonesian government continues to encourage the use of induction electric stoves for clean energy use. The switch from using LPG fuel to an induction electric stove for cooking was able to save gas subsidies worth Rp. 4.8 trillion in 5 years according to information from the Secretary General of the Ministry of Energy and Mineral Resources, Ego Syahril. The target of the government's efforts in diverting the use of LPG fuel to induction electric stoves is 71.7 million household customers PT PLN (Persero)(Spaceenergi.com, 2020). Moreover, at the COP26 meeting in Glasgow, England on 1 – 12 November 2021, where the Indonesian government's commitment is to reduce greenhouse gas emissions by 29% (by the Indonesian government) and 41% (with international support) in 2030(Indicators, 2021).

An induction electric stove is a stove that allows a person to cook without using a burning fire, but electrical energy which is a source of heat energy. Apart from being said to be more economical and safe, induction electric stoves are also easier to clean. An induction electric stove is a stove that uses electrical energy as heat energy. The induction electric stove works when the cooking utensil is placed on the stove, then an alternating electric current is passed from inside the stove body through a coil of wire. Then, the heat generated is directly channeled into the cooking utensil so that when it comes into contact with the limbs, it does not feel hot and is relatively safe.

The induction electric stove has a higher level of efficiency compared to the gas stove, because the induction electric stove induces magnetic flux to the stainless steel pot or pan used for cooking. The mechanism of the induction electric stove induces magnetic flux to the bottom of the pot so that eddy currents occur, because a stainless steel pot or pan has a large resistance it will generate heat. This does not produce heat that goes out into the environment like a gas stove that gives off heat to the environment. Therefore induction electric stoves are more environmentally friendly(Hasanah & Handayani, 2016).

The induction electric stove has a working principle like Figure 1.2, namely when cooking utensils made of stainless steel are placed on the stove, wherein the induction electric stove contains coils/coils which are energized by alternating current electricity (AC) so as to produce an oscillating magnetic field and generate eddy currents through the resistance of stainless steel cookware and make it hot so that it can be used for cooking. This heat is less spread to the surrounding environment.



**Figure 1.2 The Working Principle of an Induction Electric Stove**

Source : <https://yaletools.com/id/all-kinds-of-stoves/>

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Research on induction cookers is mostly about the technical specifications or the technical side compared to the marketing side, such as; Comparison of energy efficiency and cost of induction electric stoves against electric stoves and gas stoves (Hasanah & Handayani, 2016), Performance Test of Induction Electric Stoves and Gas Stoves on Energy Consumption and Their Economical Aspects (Azzahra et al., 2020), The Effect of Power Factor Improvement on the Performance of Induction Electric Stoves (Subekti, 2012), and many more technical studies of induction electric stoves.

The conversion of the use of induction electric stoves has internal and external barriers to users in Indonesia. Internally related to an increase in electric power that requires costs and an increase in cost per kwh, demands for the purchase of cooking equipment other than stoves, related to cleaning expertise and the cooking process. The user's external constraints are the reliability of the electricity network (voltage stability and unscheduled blackouts). Results require consideration of the benefits of the results obtained. This requires a theory of trying approach.

In addition to attitudes, the trait view needs to be involved. The trait is related to general self-confidence and cynicism. Cynicism is associated with views that tend to be negative for someone towards other people or the surrounding environment. Confidence will encourage someone to do an attitude that will eventually form a behavior.

Human behavior has been studied and produced a number of theories, such as: the theory of reasoned action which has been studied by Fishbein and Ajzen (Fishbein & Ajzen, 1975), the theory of planned behavior researched by Ajzen (Ajzen, 1988), and there is also the theory of trying which was researched by Bagozzi and Warshaw (Bagozzi & Warshaw, 1990). The two theories, namely the theory of reasoned action (TRA) and the theory of planned behavior (TPB) have been applied in various fields of behavior, this is different from the theory of trying (TT). *Theory of trying* Alone intended to explain the relationship between intention and behavior by investigating people who try hard to carry out a behavior with internal and external constraints (Bagozzi & Kimmel, 1995).

The induction electric stove is a relatively new technology in Indonesia, where there are still very few users and the availability of induction electric stoves on the market is also very limited. Research on induction electric stoves can be considered as a new technology that will be adopted by society. Research like this is also carried out such as; The determinants of the online banking adoption behavior by the theory of trying in developing countries: The case of Pakistani banks (Malik et al., 2019), Explaining the adoption of mobile banking with the theory of trying, general self-confidence, and cynicism (Chaouali et al., 2017), Theory of Trying – Implications for Marketing New-concept Products (NA and M. Agarwal, 2003). Research by Malik and Chaouali together with their friends (Malik et al., 2019) and (Chaouali et al., 2017) which assumes acceptance of a new technology using Theory of Trying obtains several variables, namely; General Self-Confidence (GSC), Cynicism (CYN), Attitude Towards Success (AS), Attitude Towards Failure (AF), Attitude Towards Learning To Use New Technology (AL), Attitude Towards New Technology Adoption (AM), Intention To Adopt New Technology (IA).

The general definition of self-confidence (General Self-Confidence) is a person's attitude towards something, both a positive attitude and a negative attitude (Rosenberg, 2015). There is an opinion that self-confidence is related to individual behavior and decisions in general (Bearden et al., 2001). Confidence is also an individual's belief in being able to properly assess a decision (Tan & Tan, 2007). People who are trying for the first time and have never tried are very suitable to have general self-confidence (Ritu Agarwal et al., 2000). High self-confidence (General Self-Confidence) will certainly encourage people or someone to intend to use an induction electric stove.

Cynicism is a form of attitude that shows disbelief in a sincerity or good action or other human action that is positive towards him which then the person manifests it in the form of an attitude of doubt, distrust, contempt or ridicule. (Regoli, 1976). A low level of cynicism will encourage people or someone to intend to use an induction electric stove.

Attitude towards Trying and Succeeding/As, respondents indicated how pleasant/unpleasant and how pleasant/disgusting "trying and succeeding at losing weight over the next week will make me feel." The seven-point scale has the same response alternatives noted earlier and is also used with our Af and Ap scales (Bagozzi & Warshaw, 1990, p. 134).

Attitude towards Trying and Failing (Af), subjects rated on a seven-point scale how pleasant/unpleasant and how pleasant/disgusting I would feel trying but failing to lose weight over the next week" (Bagozzi & Warshaw, 1990, p. 134).

Attitude towards Process (Ap), again, with seven-point items of likeable/unfavorable and pleasant/repulsive, respondents indicated how "I try to lose weight over the next week, regardless of whether I actually lose weight." weight, will make me feel" (Bagozzi & Warshaw, 1990, p. 134).

The research-related gap occurs in the attitude aspect. Chouli (2017) found that several studies are inconsistent because the concept of attitude is only one dimensional, so that multiple dimensions are needed as in the theory of trying. When it is associated with the product acceptance model according to several studies the results are also inconsistent. This is according to Faqih (2016) the reason is that in less developed countries the problem is using perceptions of product usability and ease of use instead of intention.

## Intention to Use Induction Electric Stove According to Theory of Trying

Therefore this research is entitled "Intentions to Use an Induction Electric Stove According to Theory of Trying".

### 1.2. Formulation of the problem

The background above which has explained the existing problems, we submit the following problem formulation, namely:

1. Does attitude toward success have a positive impact on attitudes towards induction hob adoption?
2. Do attitudes toward failure negatively impact attitudes toward adopting an induction hob?
3. Does the attitude towards learning to use an induction electric stove have a positive effect on the attitude towards the adoption of an induction electric stove?
4. Does attitude towards induction hob adoption have a positive impact on intention to adopt induction hob?
5. Does self-confidence in general have a positive impact on attitudes towards success?
6. Does self-confidence in general have a negative impact on attitudes toward failure?
7. Does self-esteem in general have a positive impact on attitudes toward learning to use an induction cooker?
8. Does cynicism have a negative impact on attitudes towards success?
9. Does cynicism have a positive impact on attitudes toward failure?
10. Does cynicism have a negative impact on attitudes toward learning to use an induction hob?
11. What is the barrier for people to switch to using an induction electric stove?

### 1.3. Research purposes

Based on the formulation of the problem above, the objectives of this study are as follows:

1. To analyze that the attitude towards success has a positive impact on the attitude towards the adoption of induction cookers.
2. To analyze that the attitude towards failure has a negative impact on the attitude towards the adoption of induction electric cookers.
3. To analyze that the attitude towards learning to use an induction electric stove has a positive effect on the attitude towards the adoption of an induction electric stove.
4. To analyze that the attitude towards the adoption of induction electric stove has a positive impact on the intention to adopt an induction electric stove.
5. To analyze that self-confidence in general has a positive impact on attitudes towards success.
6. To analyze that self-confidence in general has a negative impact on attitudes towards failure.
7. To analyze that self-confidence in general has a positive impact on attitudes towards learning to use an induction electric stove.
8. To analyze that cynicism has a negative impact on attitudes towards success.
9. To analyze that cynicism has a positive impact on attitudes towards failure.
10. To analyze that cynicism has a negative impact on attitudes towards learning to use an induction electric cooker.
11. To analyze people's barriers to switching to using an induction electric stove.

### 1.4. Benefits of research

#### 1.4.1. Theoretical Benefits

- a. It is hoped that the general public and students who read this research will be able to add insight and knowledge about behavioral theory that has not been widely used, namely Theory of Trying.
- b. Researchers who read this research can use this research as reference material or develop this research further.

#### 1.4.2. Practical Benefits

- a. For induction electric stove manufacturers who read this research, they can determine the right strategy to market their products so that their consumers can accept them well.
- b. For the government or other policy makers who read this research, it is hoped that it can help in making the right policies for people to switch to using induction electric stoves to reduce CO2 emissions.

## LITERATURE REVIEW

### 2.1. Theory of Trying

*Theory of trying* intended to explain the relationship between intention and behavior by investigating people who try hard to carry out a behavior or achieve a goal, especially those that are very difficult (Bagozzi & Warshaw, 1990). This means that when people try to achieve a goal they see it as a potential burden that has only the possibility of success; that is, they are concerned with the outcome (outcome) according to the sacrifices required to carry out the behavior.

## Intention to Use Induction Electric Stove According to Theory of Trying

Bagozzi and Warshaw (1990), argue that goal attainment is determined by trying, namely cognitive and behavioral activities that mediate the expression of intention to achieve a goal and actual achievement. So, experiments are effective tasks that are the basis for achieving a goal (Eagly & Chaiken, 1993). It is a behavior-based approach that considers one's planning to achieve far-reaching goals. This is also what is the focus of behavioral analysis on implementing rules.

*Theory of Reasoned Action* (TRA) in its development made adjustments to existing knowledge so as to produce a new theory, namely Theory of Trying (TT) namely by Bagozzi and Warshaw (Bagozzi & Warshaw, 1990). Bagozzi and Warshaw changed the behavior variable in TRA to a trying variable. They postulate that attitude towards trying, social norm towards trying and frequency of past trying determine the variable intention to trying which together with the variable recency of past trying past) determines the trying variable.

In addition, the theory of attitudes in the past is considered or reviewed as only one component or unidimensional. This theory states that an attitude is not constrained by factors from within a person's self or from outside himself. This theory forms an attitude whose probability of success is higher than the probability of failure. (Taylor et al., 2001); (Xie et al., 2008)]. In contrast to the previous theory, the Theory of Trying (theory of trying) views that a person's attitude is an attitude that is influenced by many factors either from within him or outside himself or multidimensional. Bagozzi and Warshaw developed their theory to study the process of behaving when facing a problem, where a person has difficulty in determining his attitude in behaving that is influenced by internal and external factors. (Taylor et al., 2001); (Xie et al., 2008); (Al-Somali et al., 2009); (Laukkanen & Cruz, 2009); (Dey et al., 2016)]. Discussion in terms of attitudes influenced by various factors or multidimensional research has been carried out in several fields, such as in the field of entrepreneurship (Carsrud et al., 2017), the health sector, namely weight loss for diet (Bagozzi et al., 2004), attitude in adopting a technology (Ahuja & Thatcher, 2005) and many more research in other fields.

*Theory of Trying* or the theory of trying is different from other attitude theories, where problematic behaviors can be handled by the coexistence of a hierarchically different attitude (Bagozzi, 2007). The theory of trying a person may be able to try a particular product or service, but he does not buy or use it (Bagozzi, 1992). Meanwhile, attitudes towards a technology that is newly recognized in society is the influence of several attitudes, namely; (i) attitude towards trying and succeeding, (ii) attitude towards trying and failing, and (iii) attitude towards learning using technology [(Bagozzi, 1993); (Bagozzi, 1992); (Hinsz & Ployhart, 1998); (Xie et al., 2008)].

### 2.1.1. Attitude

The theory tries to conceptualize attitude as a multidimensional concept (Bagozzi et al., 1992). It is assumed that people's attitudes toward technology adoption are a function of three sub-attitudes, namely attitudes toward success, attitudes toward failure, and attitudes toward learning to use technology. The conceptualization of attitudes as a multidimensional concept seems to better explain the adoption of new technologies by consumers in developing and developing country contexts. As some experts report their adoption of this new service is faced with internal deficiencies (e.g., strong habit of gas stoves, need for new equipment and possible additional costs) as well as possible external environment (e.g., electricity infrastructure) (Akhlq and Ahmed, 2013; Cruz et al., 2010a, 2010b). Bagozzi et al. (1992) and Xie et al. (2008) further argued that individuals in developing countries will have different considerations of success, failure, and learning to use a new product.

## 2.2. Traits (Characteristic)

### 2.2.1. General self-confidence

Determining a choice, an individual can be faced with complex circumstances (Bearden et al., 2001). In these complex conditions, the role of self-confidence plays a very decisive role in making a decision. A study was produced that the attitude of an individual is determined by a self-confidence that exists in that individual (Benabou & Tirole, 2020). There are also studies that link individual self-confidence with a propensity for risk and uncertainty (Chuang et al., 2013).

The general definition of self-confidence is a person's attitude towards something, both a positive attitude and a negative attitude (Rosenberg, 2015). There is an opinion that self-confidence is related to individual behavior and decisions in general (Bearden et al., 2001). Confidence is also an individual's belief in being able to properly assess a decision (Tan & Tan, 2007). People who are trying for the first time and have never tried are very suitable to have general self-confidence (Ritu Agarwal et al., 2000).

Someone who has more general self-confidence will show himself with great self-esteem and increase his self-esteem and image. (Chuang et al., 2013), (Dodd et al., 2005)]. In uncertain situations and with all the risks, people with high self-confidence are able to make decisions, are keen to take advantage of opportunities, are confident in their choices, are able to get rid of their anxiety and overcome frustration. (Chuang et al., 2013), (Dodd et al., 2005)]. In the end, someone who has self-confidence is able to convince himself that he is able to intend to use induction cooker technology (Barber et al., 2006).

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Whereas someone who has little general self-confidence, he will tend to have a view if he is marginalized, unimportant, does not dare to take risks, thinks negatively and feels deprived, the result is uncomfortable when making a decision, lacks adaptation to change and feels that he will fail in making a decision [(Chuang et al., 2013),(Dodd et al., 2005)]. As a result, people like this do not have confidence that they are capable of intending to use induction electric stove technology(Barber et al., 2006).

Bell's research on Self-Confidence and Persuasion in Car Buying(Bell, 1967)stated that generalized confidence was measured by items used by Day and Hamblin and others(Day & Hamblin, 1964)Subjects were asked how much they agreed or disagreed with the following questions:

1. I feel capable of handling myself in most social situations.
2. I am seldom afraid that my actions will cause others to have a low opinion of me.
3. It's fine for me to enter a room where other people are already gathered and talking.
4. When in group discussions, I usually feel that my opinion is inferior.
5. I don't make a good first impression on people.
6. When confronted by a group of strangers, my first reaction is always embarrassment and low self-esteem.
7. It is very uncomfortable to accidentally go to a formal party in street clothes.
8. I don't spend a lot of time worrying about what people think of me.
9. When in a group, it is very rare to express opinions for fear of being seen as ridiculous.
10. I am never at a loss for words when I am introduced to someone.

### 2.2.2. Cynicism(Cynicism)

Cynicism is a form of attitude that shows disbelief in a sincerity or good action or other human action that is positive towards him, which in turn manifests it in the form of an attitude of doubt, distrust, contempt or ridicule.(Regoli, 1976).

Consumer factors to use or purchase new products or services, one of which is influenced by this cynicism [(Chylinski & Chu, 2010),(Darke & Ritchie, 2007),(Tan & Tan, 2007)]. There has been research conducted that individuals often generalize their suspicions about a product or service that they just know as a strategy of defense/defensive [(Chylinski & Chu, 2010),(Darke & Ritchie, 2007)Cynical individuals have concluded that a new product or service might feel cheated.(Chylinski & Chu, 2010),(Dean et al., 1998)]. Cynic individuals will pay more attention to the results of not using or buying a product or service that is newly known than the consequences of using or buying a new product or service. A cynical person's evaluation of failure will be greater than his or her view of success. They think that trying and failing is greater than trying and succeeding. Cynic individuals also think learning to use new products or services is useless and harmful.

Soo-Jiuan Tan and Khai-Ling Tan's research(Tan & Tan, 2007)states that in cynicism there are 7 variables, namely:

1. People would be lying if they could benefit from it.
2. People claim to have ethical standards of honesty and morality, but few adhere to them when money is at stake.
3. People pretend to care about each other more than they really do.
4. It's sad to see such an unselfish person in today's world because so many people take advantage of him.
5. Most people only care about themselves.
6. Most people at heart do not like to put themselves in the shoes of helping others.
7. Most people are dishonest by nature.

Research Taylor and his friends(Taylor et al., 2001)stating that the attitude towards success is my business and success in adopting mobile banking will make me feel ; "very unpleasant/very pleasant"; "very bad/very good"; and "very unhappy/very happy".

Research Taylor and his friends(Taylor et al., 2001)stating that the attitude towards the process is learning to use mobile banking will make me feel ; "very unpleasant/very pleasant"; "very bad/very good ; and "very unhappy/very happy".

Research Taylor and his friends(Taylor et al., 2001)stating that the attitude towards failure is that I try but fail in adopting mobile banking will make me feel ; "very unpleasant/very pleasant"; "very bad/very good"; and "very unhappy/very happy".

Research Taylor and his friends(Taylor et al., 2001)stating that the attitude towards mobile banking is adopting mobile banking will make me feel ; "very unpleasant/very pleasant"; "very bad/very good"; and "very unhappy/very pleased".

Chemingui and Ben Lallouna's research(Chemingui & Lallouna, 2013)stating that the intention to adopt online banking with statements, namely; "I plan to adopt mobile banking in the future"; "I will most likely adopt mobile banking in the future"; and "I think I'd better adopt mobile banking".

### 2.3. The Effect of Three Attitudes on Attitudes and Intentions To Adopt Induction Electric Stoves

There are internal barriers (risk aversion, few skills to learn new technology, distrust with government, and low levels of income, etc.) and external barriers (e.g., poor electrical infrastructure, voltage stability and unplanned or unreliable outages etc.) which makes the adoption behavior of induction electric cooker conversion problematic in less technologically developed countries

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(Ahuja & Thatcher, 2005; Chaouali et al., 2017; Alalwan et al., 2017; Roy et al., 2017; Al - Ajam & Md Nor, 2015; Akhlaq & Ahmed, 2013; Chemingui & Ben lallouna, 2013; Benamati & Serva, 2007). Therefore, the three attitudes towards the conversion of induction electric stoves are outlined in the theory of trying (attitudes towards failure, attitudes towards learning, and attitudes towards success) are heavily influenced by external and internal barriers of this kind which in turn result in overall or general attitudes towards induction hob conversion. This general attitude towards induction hobs, in turn, ultimately determines the adoption of induction hob selection behavior (Benamati & Serva, 2007; Ahuja & Thatcher, 2005; Bagozzi & Warshaw, 1990).

### 2.4. Previous Research

This previous research is supported by several previous studies. Table 2.1 describes some that have similarities in variables.

**Table 2.1 Comparison with Previous Research**

No	Researcher/ Year	VARIABLES							Research methods	Research result
		exogenous		ENDOGEN						
		X 1	X2	Y1	Y2	Y3	Y4	Y5		
1	(Malik et al., 2019)	✓	✓	✓	✓	✓	✓	✓	This research method uses Structural Equation Modeling with Partial Least Squares (PLS-SEM) analysis	The results show that in the developing context of Pakistan, all factors - attitudes and traits - are significant predictors of online banking adoption behavior
2	(Chaouali et al., 2017)	✓	✓	✓	✓	✓	✓	✓	This research method uses Smart PLS analysis	The results showed that the intention to adopt mobile banking was determined by attitudes towards mobile banking, which in turn were determined by attitudes towards success, attitudes towards failure, and attitudes towards learning to use mobile banking. The last three attitudes are significantly influenced by general self-confidence and cynicism
3	(Zaza & Junglas, 2016)	✓	✓				✓	✓	An exploratory study with IT professionals, along with a pre-pilot and two pilot studies to evaluate the suitability and validity of the questionnaire	The results of the study show that (a) IT self-service is a separate concept, (b) is driven by the level of IT empowerment and subjective norms, (c) manifests itself in the level of innovative work behavior.
4	(Bay & Daniel, 2003)								Preliminary analysis was conducted to test the predictive value of the three antecedent variables (attitudes toward success, attitudes toward failure, and attitudes toward	There are important differences in the results compared to previous tests of the theory tries. Most importantly, attitudes toward failure are highly significant and attitudes toward process are not.

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									process) on attitudes toward effort.	
5	(Ahuja & Thatcher, 2005)								This research method uses Partial Least Squares (PLS) analysis	The results provide evidence that overload and autonomy are antecedents for trying to innovate with information technology. Furthermore, the findings confirm that autonomy interacts with overload to determine trying to innovate with IT and that this relationship varies by gender. Implications for research and practice are offered.
6	(Sandve & Øgaard, 2013)						✓		SPSS Version 19 was used for data analysis and multiple regression analysis was run to test the model.	The results show that the model receives moderate empirical support when testing the explanatory power of the theory of trying CSR decision-making processes. Attitudes toward trying, self-efficacy, subjective norms and past behavior are all to varying degrees predictors of the decision-making process,
7	(Mada, 2018)		✓	✓	✓	✓	✓	✓	Structural Equation Modeling (SEM) Method	The results of the study show that customers will have the intention to buy a new product if they have a strong motivation to achieve a certain goal, in this case trying to get good hair.
8	(Xie, 2008)		✓	✓	✓	✓	✓	✓	Structural equation modeling (SEM) is used to test theoretical and general frameworks across situations and cultures. LISREL 8.54 was used for analysis.	These findings provide insight into why people prosume. The results show that global values affect domain-specific values in food perceptions. Furthermore, domain-specific values have a stronger impact on attitudes than global values and mediate the influence of global values on attitudes.
9	(Suroso, 2009)		✓	✓	✓	✓	✓	✓	<i>Elicitation study</i>	The findings show that attitudes toward success significantly influence attitudes to try at higher and lower level goals. Meanwhile, attitude towards failure does not significantly affect attitude towards trying both at lower level and higher level goals. The results also show that the intention of students at LIA to complete their studies is more influenced by external motivation, while the intention of students in trying to learn the next subject is more influenced by self-awareness.
10	(Sihombing, 2004)		✓	✓	✓	✓	✓	✓	Data were analyzed with Structural Equation	Based on statistical tests, the results show that TT is more fit than TPB in explaining choosing a brand phenomenon. The results of this



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									Modeling (SEM). Maximum Likelihood (ML) is applied as a method-appropriate estimate.	study also show that direct measures and belief-based measures provide different results. However, the position taken by the researcher is to apply direct action to test the hypothesis. The reason is that these measures provide greater accuracy and reliability than belief-based measures.
11	Kurniawan(2022)	✓	✓	✓	✓	✓	✓	✓		

Source: Summary based on several journals, data processed (2022)

Information :

- X1 : *General Self-Confidence(GSC)*
- X2 : *Cynicism(CYN)*
- Y1 : *Attitude Towards Success(US)*
- Y2 : *Attitude Towards Failure(AF)*
- Y3 : *Attitude Towards Learning To Use New Technology(AL)*
- Y4 : *Attitude Towards New Technology Adoption(AM)*
- Y5 : *Intention To Adopt New Technology(HE)*

The techniques used generally use structural equation modeling (SEM) with slight variations with regression. The use of SEM is based on covariance and component basis (PLS/partial lest square).

The location of the research was carried out in less developed countries (South Asia and the Middle East) as well as on mobile banking service products. This research directs Indonesia as a country in the Southeast Asia region.

### CONCEPTUAL FRAMEWORK AND HYPOTHESIS

#### 3.1. conceptual framework

One of the main things in a technology acceptance model is to imagine that a view of usability and ease of use will result in a positive attitude and ultimately produce great intentions. However, this image does not apply in a poor and developing country [(Faqih, 2016),(Faqih & Jaradat, 2015)]. Meta-analysis studies have found that utilitarian understanding has a low and insignificant influence on attitudes or intentions of people in a developing country when compared to developed countries.(Schepers & Wetzels, 2007),(Yousafzai et al., 2007a),(Yousafzai et al., 2007b),(Zhang et al., 2012)].

The difference between people in developed countries with high technology and people in developing countries where technology is high is that there is a non-linear relationship between attitudes and intentions where perceived benefits and ease of use have an insignificant impact. In real terms, in developing countries there are environmental factors that hinder or harm such as the existing technological infrastructure in the country, the country's political and economic conditions.(Abou-Shouk et al., 2016),(Laukkanen & Cruz, 2009),(Cruz, Neto, et al., 2010),(Cruz, Salo, et al., 2010),(Faqih, 2016),(Faqih & Jaradat, 2015)]. Environmental problems as mentioned above will create a barrier to public acceptance of the satisfaction of consuming or using a product or service for example the convenience of using mobile banking such as access, unlimited space/can be anywhere, cost-effective and so on. Research conducted by Lee and Lu and friends(Lee & Wan, 2010)And(Lu et al., 2008), results that the acceptance of new technologies such as mobile banking is greatly affected by a mistake so that people have unfavorable attitudes and intentions for these new technological products.

Countries with low or medium per capita income, acceptance of new technologies that replace conventional or old model services is very less desirable, such as customer acceptance of mobile banking in replacing previous conventional services(Akhlaq & Ahmed, 2013),(Chemingui & Lallouna, 2013). For people who do not use a new technology product or service, there are internal and external obstacles that make the assumption that new technology products or services such as mobile banking are a problem in behaving.(Laukkanen & Kiviniemi, 2010). The above studies form the basis that the Theory of Trying is very useful in developing countries as a solution to behavior that is considered problematic. As explained in the Theory of Trying, society, in this case as consumers, has a tendency to as a whole on the acceptance of a new technology product or service based on attitudes towards success (try and succeed), attitudes towards failure (try and fail) and attitudes towards learning to accept new technology products or services.

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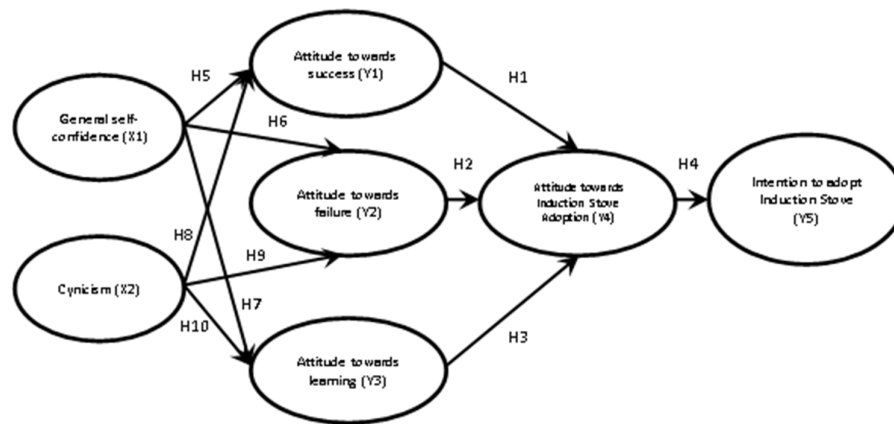


Figure 3.1 Conceptual Framework

Table 3.1 Source of variables in the Conceptual Framework

Variable	Source
Conceptual framework (overall)	(Chaouali et al., 2017)
General self-confidence(X1)	(Malik et al., 2019);(Chaouali et al., 2017);(Zaza & Junglas, 2016)
Cynicism(X2)	(Malik et al., 2019);(Chaouali et al., 2017);(Zaza & Junglas, 2016)
Attitude towards success(Y1)	(Malik et al., 2019);(Chaouali et al., 2017);(Mada, 2018);(Xie, 2008);(Suroso, 2009);(Sihombing, 2004)
Attitude towards failure(Y2)	(Malik et al., 2019);(Chaouali et al., 2017);(Mada, 2018);(Xie, 2008);(Suroso, 2009);(Sihombing, 2004)
Attitude towards learning(Y3)	(Malik et al., 2019);(Chaouali et al., 2017);(Mada, 2018);(Xie, 2008);(Suroso, 2009);(Sihombing, 2004)
Attitude towards Induction Stove Adoption(Y4)	(Malik et al., 2019);(Chaouali et al., 2017);(Zaza & Junglas, 2016);(Sandve & Øgaard, 2013);(Mada, 2018);(Xie, 2008);(Suroso, 2009);(Sihombing, 2004)
Intention to adopt Induction Stove(Y5)	(Malik et al., 2019);(Chaouali et al., 2017);(Zaza & Junglas, 2016);(Mada, 2018);(Xie, 2008);(Suroso, 2009);(Sihombing, 2004)

Source: Summary based on several journals, data processed (2022)

### 3.2. hypothesis

This research was conducted by researchers, having several assumptions as the grand theory of the Theory of Trying. First, if the public has a positive assessment of success, then they will tend to give an overall positive assessment of the acceptance of a new technological product or service such as an induction electric stove. But conversely, when people give a positive attitude towards a failure, they tend to give a negative assessment of the acceptance of a new technological product or service such as an induction electric stove. Furthermore, when the public or consumers have a positive attitude towards learning to use an induction electric stove, then they will have a positive attitude towards using an induction electric stove. (Reeti Agarwal et al., 2009), (Badrinarayanan et al., 2014), (Davis et al., 1989) And (Wagner et al., 2016).

Individuals with high general self-confidence show high self-esteem and increased self-image and self-esteem. (Chuang et al., 2013; Dodd et al., 2005).

H1: Attitudes toward success have a positive impact on attitudes toward induction hob adoption

H2: Attitude towards failure has a negative impact on attitude towards adoption of induction cookers

H3: Attitudes towards learning to use an induction electric stove have a positive effect on attitudes towards the adoption of an induction electric stove.

H4: Attitudes towards the adoption of induction hobs have a positive impact on the intention to adopt induction hobs

This research also assumes that the attitude towards the intention to use an induction electric stove is also determined by factors of self-confidence and cynicism in general. It will also discuss attitudes towards success, attitudes towards failure as well as attitudes towards learning that are influenced by self-confidence and cynicism from society or consumers in general.

Someone who feels he has more self-esteem than other people or feels his self-image is high, this is a reflection of someone's high self-confidence. (Chuang et al., 2013), (Dodd et al., 2005)]. People who have high self-confidence, have characteristics or characters capable of being decision makers, good at reading opportunities and taking advantage of them,

## Intention to Use Induction Electric Stove According to Theory of Trying

accustomed to risks, confident in their choices, adaptable to uncertain environmental situations, not easily anxious or panicky and not easy to stress (Chuang et al., 2013), (Dodd et al., 2005). And finally, someone with high self-confidence will certainly be able to intend to use new technology such as induction electric stoves (Barber et al., 2006). And vice versa, for those who have low self-confidence, it will be difficult to make decisions, hesitate, worry and think that they will end in failure. Such people will not have the confidence to intend to use new technology such as induction cookers.

So that people with high self-confidence will have a positive attitude towards success, a negative attitude towards failure and a positive attitude towards learning to use new technologies such as induction electric stoves. Considering the things above, the researcher makes the following hypothesis:

H5: Confidence in general has a positive impact on attitudes towards success.

H6: Confidence in general has a negative impact on attitudes toward failure

H7: Confidence in general has a positive impact on attitudes towards learning to use an induction electric stove

As self-confidence there is also another factor, namely cynicism. There are several studies that have concluded that cynicism is an important factor influencing people's or consumers' decisions to use or use relatively new technological products or services. (Chylinski & Chu, 2010), (Darke & Ritchie, 2007), (Tan & Tan, 2007). There is also research that concludes that the public or consumers are more inclined to generalize their suspicious thoughts about new technological products or services, in an attempt to survive because they are not yet familiar with these products or services. (Chylinski & Chu, 2010), (Darke & Ritchie, 2007). In addition, people or consumers who have high cynicism will conclude that they are being fooled by a new product or service, in this case the induction electric stove. (Chylinski & Chu, 2010), (Dean et al., 1998). Society or consumers who have high cynicism will tend to have a negative attitude towards success, a positive attitude towards failure and also a negative attitude towards learning to use new technology products or services such as induction electric stoves. Researchers hypothesize, as follows:

H8: Cynicism has a negative impact on attitudes towards success

H9: Cynicism has a positive effect on attitudes towards failure

H10: Cynicism has a negative impact on attitudes toward learning to use an induction hob

## RESEARCH METHODOLOGY

Researchers in carrying out their research follow a series of processes which are all systematically interconnected, for that it requires well-planned and well-organized research stages. At each stage of the research, various theories and other research results that are relevant to the research that the researcher is conducting are used as reference material.

### 4.1. Types and Places of Research

#### 4.1.1. Types of research

Researchers in conducting this study used a type of quantitative research. Quantitative research does not require detailed information, but what is needed is the quantity or amount of data that has been successfully obtained from a population under study and is expected to create the results being researched or sought. (Sugiyono, 2013).

#### 4.1.2. Research place

For this study, researchers took the place to take samples from Indonesia in general.

#### 4.1.3. Population and Sample Size

The definition of population is all individuals who according to researchers are taken because of certain characteristics and then analyzed to produce conclusions (Sugiyono, 2013).

The population is a combination of all elements in the form of events, things or people who have similar characteristics which are the center of attention of a researcher because they are seen as a research universe. (Ferdinand, 2006). In this research, the population is all Indonesian people who are customers of PT PLN (Persero), namely PLN household customers throughout Indonesia, totaling 75,701,985 customers.

The sample is part of the number and characteristics possessed by the population (Sugiyono, 2013). If the population is large, it is impossible for the researcher to study everything in the population. The sample is part of the population, consisting of several members of the population (Ferdinand, 2006).

### 4.2. Sampling technique

The sampling technique used in this study was non-random sampling or non-probability sampling. Non-probability sampling is a sampling technique that does not provide equal opportunities or opportunities for all members or elements of the population to be sampled (Ferdinand, 2006).

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Researchers used one of the non-probability sampling techniques, namely purposive sampling. Purposive sampling is a sample selected with a specific purpose or objective. Someone was chosen as the sample because the researcher considered that the person had relevant information for his research, and met the criteria set by the previous researcher (Ferdinand, 2006). The criteria used in this study are respondents or customers who use a minimum of 3,500 VA electricity or who are willing to increase their subscription power to a minimum of 3,500 VA.

Taking the number of samples has a close relationship with the SEM analysis tool. The use of SEM does not clearly determine how many samples are needed. Research Hulland and his friends (Hulland et al., 1996) revealed that the number of 100 to 200 is a sufficient number in using SEM analysis tools.

The sampling technique uses the Tora Yamane formula as in the book by Riduwan et al (Riduwan et al., 2006), that is :

$$n = \frac{N}{1 + Nd^2}$$

Information:

n = the number of samples taken

N = total population (PLN household customers throughout Indonesia as many as 75,701,985 customers)

D = the precision (determination) is set at 0.1 or 10% with a 95% confidence level. The confidence interval in this study is 95 percent with a critical value of  $z = 1.96$  (A. Hair et al., 2000)

$$d^2 = 0.1 \times 0.1 = 0.01$$

$$n = \frac{75.701.985}{1 + (75.701.985 \times 0,01)}$$

$$n = \frac{75.701.985}{1 + 757.019,85}$$

$$n = \frac{75.701.985}{757.020,85}$$

$$n = 99,99$$

From the results of calculations using the Tora Yamane formula, a sample of 99.99 is obtained or if it is rounded up, it is 100 samples. The researcher took a minimum sample size of 100 people because this was still within the range of 100 to 200 samples.

Researchers used an online questionnaire that is using the Google form. The online questionnaire was distributed using a social network, namely the Whatsapp application. The researcher used the Whatsapp Group (WAG) of the PLN Workers' Union, the WAG of the Indonesian Smart Energy Society (MECI), the WAG of a PLN classmate, the WAG of a classmate at the Magister of Management University of gastric Mangkurat, the Nganjuk PLN WAG, and other WAGs. The results of the questionnaire that returned were 197 respondents. After checking according to the respondent criteria required in this study, the remaining 124 respondents were processed using WARP PLS.

### 4.3. Research Variables and Operational Definitions of Variables

Variables are anything that is observed in a study that can be a concept that varies in value. In a study the variables used must be operationally explained. The operational concept of a variable is explained as part of a research that can explain operational variables to be observed and measured. Santoso's book explains the definition of an exogenous variable is an independent variable that affects the dependent variable. In the SEM model, these exogenous variables are marked with arrows from these variables to endogenous variables and there is no influence from other variables (Santoso, 2014). While endogenous variables are independent variables (exogenous) that affect the dependent variable. In the SEM model it is marked with an arrow pointing to the variable, where the nature of this endogenous variable is influenced and simultaneously influences other variables (Santoso, 2014). In this study there are seven variables with two exogenous variables and five endogenous variables. The table below shows the operationalization of this research, as follows:

**Table 4.1 Operational Definition of General Self Confidence (GSC) Variable**

Variable	Indicator	Question Items	Source
General Self-Confidence (GSC)(X1) - The general	1. Self-nature	I feel able to handle myself in most social	(Bell, 1967)
	2. Take risks	I am seldom afraid that my actions will cause others to have a low opinion of me	
	3. Dare to gather	I am confident to enter a room where other people are already gathered	

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definition of self-confidence is a person's attitude towards something, both a positive attitude and a negative attitude.	4. Role in the group	When in group discussions, my opinion is well received
	5. First	I make a good first impression on others
	6. Interaction with strangers	When dealing with a group of strangers, my first reaction is always embarrassment
	7. Official events	It's embarrassing to accidentally go to a formal event in inappropriate clothes
	8. Concern	I don't spend a lot of time worrying about what people think of me
	9. Team work	When in a group, I am very confident in expressing opinions
	10. Lots of chat	I am never at a loss for words when I am introduced to someone

**Table 4.2 Variable Operationalization Cynicism(CYN)**

Variable	Indicator	Question Items	Source
<i>Cynicism(CYN)(X1)</i> - is a form of attitude that shows distrust of a sincerity or good action or other positive human action towards him which then the person manifests it in the form of an attitude of doubt, distrust, contempt or ridicule.	1. Not easy to believe	I think other people will usually lie about the recognition of other people's success	(Tan & Tan, 2007)
	2. Materialistic	People claim to have ethical standards of honesty/morality, but few adhere to those ethical standards when it comes to money	
	3. Pretend	People only pretend to care more about each other when in reality it's the other way around	
	4. Selfishness	It's sad to see selfless people in today's world when so many people take advantage of them	
	5. Show yourself	Most people only stick out for themselves	
	6. Ignorance	Most people at heart do not like to put themselves in the shoes of helping others	
	7. dishonesty	Most people are dishonest by nature	

**Table 4.3 Variable Operationalization Attitude Towards Success(US)**

Variable	Indicator	Question Items :	Source
<i>Attitude Towards Success (USA)(Y1)</i> - Attitude is a function of beliefs about the consequences of behavior on success or normative beliefs, perceptions of the consequences of a behavior on success and assessment of behavior on success.	Pleasant	I will try and if it works using an induction hob it will make my feelings	(Taylor et al., 2001)
	Good	I will try and if it works using an induction hob it will make my feelings	
	Happy	I will try and if it works using an induction hob it will make my feelings	

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**Table 4.4 Variable Operationalization Attitude Towards Failure(AF)**

Variable	Indicator	Question Items :	Source
<i>Attitude Towards Failure (AF)(Y2)</i> - Attitude is a function of beliefs about the consequences of behavior towards failure or normative beliefs, perceptions of the consequences of a behavior towards failure and evaluation of behavior towards failure.	Pleasant	I will try and if it fails using an induction hob will make my feelings	(Taylor et al., 2001)
	Good	I will try and if it fails using an induction hob will make my feelings	
	Happy	I will try and if it fails using an induction hob will make my feelings	

**Table 4.5 Variable Operationalization Attitude Towards Learning To Use New Technology(AL)**

Variable	Indicator	Question Items :	Source
<i>Attitude Towards Learning To Use New Technology(AL)(Y3)</i> - Attitude is a function of beliefs about the consequences of behavior on learning or normative beliefs, perceptions of the consequences of a behavior on learning and assessment of behavior on learning.	Pleasant	Learning to use an induction cooker will make me feel.	(Taylor et al., 2001)
	Good	Learning to use an induction cooker will make me feel	
	Happy	Learning to use an induction cooker will make me feel	

**Table 4.6 Variable Operationalization Attitude Towards New Technology Adoption(AM)**

Variable	Indicator	Question Items :	Source
<i>Attitude Towards New Technology Adoption(AM)(Y4)</i> - Attitude is a function of beliefs about the consequences of behavior towards adoption or normative beliefs, perceptions of the consequences of a behavior towards adoption and judgments about behavior towards adoption.	Pleasant	Had I used an induction hob it would have made my feelings	(Taylor et al., 2001)
	Good	Had I used an induction hob it would have made my feelings	
	Happy	Had I used an induction hob it would have made my feelings	

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**Table 4.7 Variable Operationalization/Intention To Adopt New Technology(HE)**

Variable	Indicator	Question Items	Source
<i>Intention To Adopt New Technology(IA)(Y4)</i> - This attitude is the result of considering the loss of the intention's behavior.	Planned	I plan to use an induction hob in the future.	(Chemingui & Lallouna, 2013)
	Possibility	I will most likely use an induction hob in the future.	
	Think	I think it's better for me to use induction electric stove.	

### 4.4. Variable Measurement

Measurement of this variable will be carried out in a way where respondents will answer questionnaire questions by selecting the answers that have been provided from Strongly Disagree to Strongly Agree. This is a Likert scale which has 7 choices, namely Strongly Disagree, Disagree, Somewhat Disagree, Undecided, Somewhat Agree, Agree and Strongly Agree. The answer choices on the Likert scale have a rating weight, namely:

1. Strongly Disagree (STS), has a value of 1
2. Disagree (TS), has a value of 2
3. Somewhat Disagree (ATS), has a value of 3
4. Undecided (R), weighted 4
5. Somewhat Agree (US), rated 5
6. Agree (S), has a value of 6
7. Strongly Agree (SS), has a value of 7

The method of collecting data in this study was by means of a questionnaire, namely by distributing questions to all customers of PT PLN (PERSERO) in Indonesia online using a google form by distributing the google form questionnaire link via Whatsapp (WA) social media.

### 4.5. Method of collecting data

This study uses primary data, namely by using a survey. The survey was carried out by the researchers directly distributing questionnaires to the respondents. The definition of a questionnaire is a tool for collecting data where the questionnaire is a collection of questions compiled by researchers to be filled in by respondents (Sugiyono, 2013).

The questionnaire uses closed questions as well as open questions, where respondents are asked to answer open and closed questions as conveyed by the researcher in the Google form link. The contents of this questionnaire have two parts, where the first part is the personal data of the respondent and the second part is related questions and research variables.

### 4.6. Data Analysis Techniques

#### 4.6.1. Structural Equation Modelling

*Structural Equation Modelling* (SEM) is a multiple variable method that is capable of simultaneously analyzing both exogenous and endogenous latent variables (Bollen, 1989). SEM is capable of analyzing multiple sets of variables simultaneously, making it an efficient statistical tool to use.

SEM has characteristics where each variable influences each other, including:

#### 1. Latent Variable

This variable is a major concern in SEM. This latent variable is a variable that is not directly measurable, for example; feelings, traits, actions or motivations.

There are two types of this latent variable, namely;

- a. Exogenous latent variable or independent latent variable, which in all equations in SEM is symbolized by a circle with an arrow facing outward. In this study, the variables General self-confidence (GSC) and Cynicism (Cyn);
- b. Endogenous latent variable or dependent latent variable, where this is symbolized by a circle with arrows facing outward and/or arrows facing inward. In this study, the variables were attitude towards success, attitude towards failure, attitude towards learning, attitude towards Induction Stove Adoption, and variables intention to adopt an induction stove (intention to use an induction electric stove).

The arrows describe a causal relationship, where the base of the arrow indicates the trigger, while the tip of the arrow indicates the effect variable.

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### 2. Observed Variables

This variable is a variable that can be observed or measured theoretically and pronounced as a variable. This observed variable is a dimension of a latent variable, where exogenous variables are denoted by the letter "X" and endogenous variables are denoted by the letter "Y". In this study, namely; General Self-Confidence (X1), Cynicism (X2), Attitude Towards Success (Y1), Attitude Towards Failure (Y2), Attitude Towards Learning (Y3), Attitude Towards Induction Stove Adoption (Y4) and Intention To Adopt Induction Stove (Y5)

Data analysis in this study will use software, namely WarpPLS.

#### 4.6.2. Reasons for Using the Method

This study uses SEM with the consideration that the SEM method is able to analyze the relationship of two or more variables where some of them are variables that can be measured directly or indirectly. On the other hand, this research also looks for the relationship between variables and their dominant indicators.

SEM is used in this study with the following considerations; (1) This study examines the relationship between constructs to test the theory. This is very appropriate because SEM is a confirmation technique (Fidell et al., 1996) which is based on a theory-based approach (Bentler PM & Chou Chih-Ping, 1987); (Aaker & Bagozzi, 1979). Analysis in SEM includes analysis that has links including theory, methodology and statistics (Bagozzi, 1981); (2) SEM is able to measure the relationship between latent variables and variables that are directly observed (Hoyle & Panther, 1995); (3) Errors in measurement can be controlled with SEM which ultimately can be tested without bias the relationship between constructs (MacKenzie, 2001) & (Steenkamp & Baumgartner, 1998).

#### 4.7. Outer model test (Validity and Reliability Test)

The outer model test is an indicator test related to latent variables. The result is to determine whether the indicator can be continued in the calculation and analysis of the inner model. Two tests, namely the Validity Test and Reliability Test to evaluate the measurement scale used.

##### 4.7.1. Validity test

To measure the ability of the questionnaire to be able or not to explain the meaning or purpose contained in the questionnaire, a validity test was used (Ghozali & Latan, 2015, p. 45). Validity can be measured by construct validity test, namely Confirmatory Factor Analysis (CFA).

Convergent validity is declared passed if the loading value is at least 0.5 and the significant value (p value) is below the maximum 0.05 (Kock, 2020, p. 87). Requirements that must be met loading factor must be significant, then the standardized loading estimate must be equal to 0.50 or more and ideally it must be 0.70 (Ghozali, 2008). This states that the indicators used are valid to measure what should be measured in the research model.

Discriminant validity is a way of assessing how different a construct is from another construct, which can be determined by comparing the AVE values of the two constructs with the squared value of the correlation between the two constructs tested. Discriminant validity is measured from the average variance extracted (AVE) value. The size used is a value greater than 0.5 (Joe F. Hair et al., 2014).

##### 4.7.2. Reliability Test

A data collection tool or questionnaire is declared reliable or reliable if the respondent's answers about a statement in the questionnaire are consistent from time to time. In SEM, high reliability indicates that indicators have high consistency in measuring their latent constructs. Reliability in PLS can be known through Composite Reliability (CR) and Cronbach's Application. The Composite Reliability value is said to be good if it has a value  $> 0.7$ . An indicator is said to have good indicator reliability against its construct if the outer loading value is  $\geq 0.70$ . Construct reliability can also be seen from the Cronbach's Alpha value, if the value is  $> 0.7$  (Joe F. Hair et al., 2010). Kock (2020) adds that the criteria can be at least 0.6.

#### 4.8. Latent Variable Descriptive Analysis

Data that has been collected from the results of the questionnaire filled out by respondents on a Likert scale will be given a value according to the respondent's answer. The results of the respondents' answers will give effect to each variable, both independent and dependent. This study used loading analysis and item contributions to latent variables. This was chosen according to the rules of the structural approach. Loading and item contributions take the average and standard deviation values into account in the calculations.

The measure of the value of the indicator item on the latent variable uses the calculation results in the indicator weight table (Kock, 2020, pp. 90-92). The concern is on value *Indicator weight-loading signs* (WLS), and Effect sizes (ES). WLS must have a positive value, meaning it shows a positive contribution to the indicator R squared. ES is the indicator's contribution to R squared. The ES value must be above 0.02, below that it cannot be used in practice.



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### 4.9. Outlier Test

There are four types of outliers (JF Hair et al., 1995), namely: (1) outliers caused by errors in entering data; (2) outliers due to the emergence of explainable extremes; (3) outliers that arise due to extreme things that cannot be explained; and (4) outliers that arise due to combination with other variables in the study.

This study will carry out an outlier test which will begin by testing the univariate distribution of each variable. Outliers are declared to exist if there are observations that fall outside the distribution range. The criterion is that any standardized variable value that exceeds 4 is an outlier (JF Hair et al., 1995).

Multivariately Wasserman (2022) explains the need for diagrams. scatter to see it. Table 4.1 shows the four data patterns. The lower right image shows the outliers that affect the model. Other patterns don't show problematic outliers. Especially the top right pattern shows non-linear symptoms. Non-linear requires different techniques or indications of other variables that change the direction of influence.

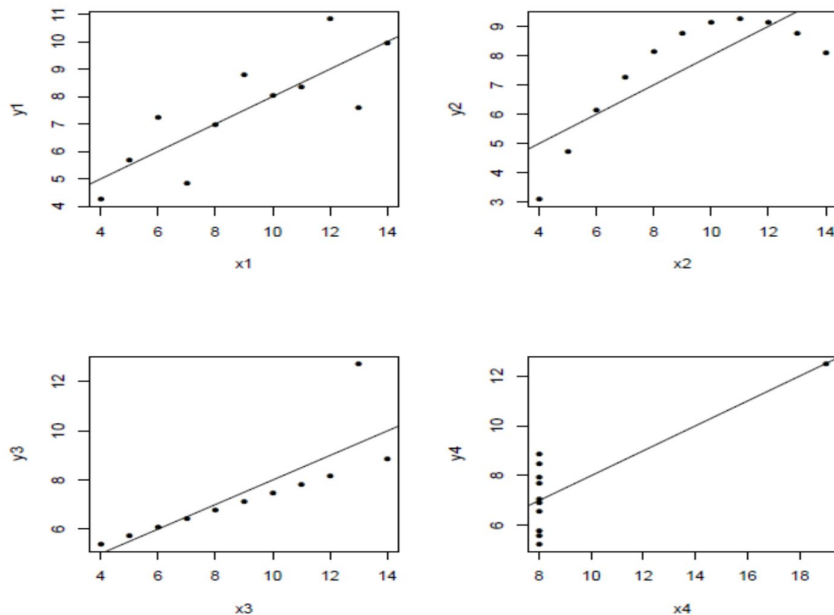


Figure 4.1 Multivariate Outlier Pattern

### 4.10. Model Fit and Goodness Test

The PLS warp used as an analysis tool requires 10 criteria that must be met by a model so that it can be said to be good for use in examining the variables used. Goodness of fit (GoF) test is used to test the inner model. Table 4.8. display GoF criteria and quality indices.

Table 4.8 Model of Fit and Quality Indices

No	Indikasi Model fit & Quality Indices	Kriteria Fit
1	Average Path Coefficient (APC)	$p < 0.05$
2	Average R-squared (ARS)	$p < 0.05$
3	Average adjusted R-squared (AARS)	$p < 0.05$
4	Average Block VIF (AVIF)	diterima jika $\leq 5$ , idealnya $\leq 3.3$
5	Average full collinearity VIF (AFVIF)	diterima jika $\leq 5$ , idealnya $\leq 3.3$
6	Tenenhaus GoF (GoF)	Kecil $\geq 0.1$ Medium $\geq 0.25$ Besar $\geq 0.36$
7	Sympson's paradox ratio (SPR)	Diterima jika $\geq 0.7$ , idealnya = 1
8	R-squared contribution ratio (RSCR)	Diterima jika $\geq 0.9$ , idealnya = 1
9	Statistical suppression ratio (SSR)	Diterima jika $\geq 0.7$
10	Nonlinear bivariate causality direction ratio (NLBCDR)	Diterima jika $\geq 0.7$

Source: (cock, 2020)

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### 4.11. Inner Model Test (Hypothesis and Effect Size)

The inner model test is related to the hypothesis testing of the research. Direction of influence and significant value can be analyzed. Influence can be positive or negative from exogenous variables to endogenous. The significant value used is a maximum of 0.05 (Kock, 2020, pp. 82-83).

The inner model test also involves Effect Size (ES) to see the contribution of each path to R Squared (Cock, 2020, pp. 84-85). The pathway in question is the pathway of the explanatory in the endogenous variables AS, AF and AL. The next line is the one that goes to AM. The last path is the path to IA.

### 4.12. Determination Coefficient Test

R Squared or the coefficient of determination is also used (Kock, 2020, p. 94). This is to see how much the ability of the endogenous variables is explained by the predictor variables. The rest is explained by other variables not involved in the study. This is important for evaluating the power of the model and possibly considering other variables in practice.

## RESEARCH RESULTS AND DISCUSSION

### 5.1. General Description of the Research Object

#### 5.1.1. Research Object Identity

This study chose respondents, namely household customers of PT PLN (Persero) throughout Indonesia where a total of 75,701,985 customers had a subscription power of 3500 VA or other subscription power who were willing to increase the power to 3500 VA and above. General criteria for respondents, namely gender is not limited, domicile in all provinces in Indonesia, age from 18 years to more than 54 years, marital status is not limited, education from elementary school to doctoral degree or other, type of work is not limited, and PLN subscription power from 450 VA up to more than 3500 VA.

### 5.2. Description of Respondents

#### 5.2.1. Gender

The gender of the respondents in Table 5.1 is mostly male (69%), female (30%), and 1% of respondents who did not fill in. The online questionnaire using the Google form is not specific to a particular gender because it is distributed using the WhatsApp (WA) application. The majority of respondents were male, naturally even though it was not intentional because the researchers used a network of friends of researchers who hung out more with male friends.

Table 5.1 Gender of Respondents

Jenis Kelamin	Frekuensi	Presentasi
Pria	86	69%
Wanita	37	30%
Tidak Mengisi	1	1%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

#### 5.2.2. domicile

The results of the questionnaires that were distributed by researchers online, obtained data that the questionnaires were filled in by respondents from 18 provinces in Indonesia from 34 existing provinces. Table 5.2 can be seen that the majority of respondents live in South Kalimantan as much as 40.32%, this is influenced by the researcher's domicile in Banjarbaru, South Kalimantan. There are many WAG researchers with networks around South Kalimantan and Central Kalimantan which are the research work areas, namely PT PLN (Persero) Main Unit Distribution of South Kalimantan and Central Kalimantan.

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Table 5.2 Respondent's domicile

No	Domisili	Frekuensi	Presentasi
1	Nusa tenggara Timur	1	0,81%
2	Bangka Belitung	1	0,81%
3	Sulawesi Tengah	1	0,81%
4	DI Yogyakarta	1	0,81%
5	Lampung	1	0,81%
6	Kalimantan Barat	1	0,81%
7	Jawa Tengah	1	0,81%
8	Sulawesi Selatan	2	1,61%
9	Kalimantan Timur	2	1,61%
10	Papua	3	2,42%
11	Banten	5	4,03%
12	Jawa Barat	5	4,03%
13	Sulawesi Utara	7	5,65%
14	Kalimantan Tengah	8	6,45%
15	Jawa Timur	10	8,06%
16	DKI Jakarta	12	9,68%
17	Nusa tenggara Barat	12	9,68%
18	Kalimantan Selatan	50	40,32%
19	Tidak Mengisi	1	0,81%
<b>Jumlah</b>		<b>124</b>	<b>100,00%</b>

Source: Primary data processed in 2023

### 5.2.3. Age

Table 5.3 can be seen that the majority of respondents are aged between 36-44 years by 32% and between 27-35 years by 31%. This is also in line with the status of respondents who are married as much as 86% as shown in table 5.4. The age range from 27 to 44 years is the normal age for marriage/marriage.

Table 5.3 Age of Respondents

Umur	Frekuensi	Presentasi
18 - 26 Tahun	11	9%
27 -35 Tahun	39	31%
36 - 44 Tahun	40	32%
45 - 53 Tahun	29	23%
Lebih 54 Tahun	5	4%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.2.4. Marital status

Respondents in table 5.4 show that 86% of respondents are married, as explained above in line with the age of the respondents, which is a normal age for marriage in Indonesia.

Table 5.4 Marital Status

Status	Frekuensi	Presentasi
Kawin	107	86%
Tidak Kawin	16	13%
Tidak Mengisi	1	1%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.2.5. Education

The educational level of the respondents, as shown in table 5.5, varied from junior high school or its equivalent to master's or equivalent, where the majority were bachelor's or equivalent education at 62%. With the education level of the majority S1 or equivalent, it is expected that filling out the questionnaire can meet the expectations of the researcher.

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Table 5.5 Level of Education

Pendidikan	Frekuensi	Presentasi
SD atau Sederajat	0	0%
SMP atau Sederajat	0	0%
SMA atau Sederajat	22	18%
S1 atau Sederajat	77	62%
S2 atau Sederajat	20	16%
S3 atau Sederajat	0	0%
Lainnya	5	4%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.2.6. Work

The distribution of the types of work of the respondents is in table 5.6 where the majority are other jobs of 52%, this is also in line with the education of the respondents, the majority of whom are S1 or equivalent, all have jobs other than the type of work that exists (Students/students, ASN or PNS, Private Workers, Employees freelancing, and self-employed).

Table 5.6 Types of Work

Pekerjaan	Frekuensi	Presentasi
Pelajar/mahasiswa	2	2%
ASN atau PNS	19	15%
Pekerja Swasta	28	23%
Pekerja Lepas	1	1%
Wiraswasta	9	7%
lainnya	65	52%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.2.7. Respondents Subscription Power

Table 5.7 shows the subscription power owned by respondents, where the majority are more than 3500 VA by 43%. This is highly expected by researchers because respondents in infrastructure have the ability to use induction electric stoves, this is in accordance with the data of respondents who know about induction electric stoves as shown in table 5.8 as much as 96%.

Table 5.7 Respondents' Electrical Power

Daya Langganan	Frekuensi	Presentasi
450 VA	3	2%
900 VA	21	17%
1300 VA	17	14%
2200 VA	28	23%
lebih 3500 VA	53	43%
Tidak mengisi	2	2%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.2.8. Knowledge of induction electric stoves

Table 5.8 shows the respondents' knowledge about induction electric stoves, where the majority of respondents know about 96% of induction electric stoves. This is in accordance with the respondent's subscription power above 3500 VA as shown in table 5.7. Table 5.8 Knowledge of induction electric stoves

Pengetahuan Kompiler Induksi	Frekuensi	Presentasi
Ya	119	96%
Tidak	5	4%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

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### 5.2.9. Willingness Up Power

Table 5.9 shows that many respondents are willing to increase their subscription power to above 3500 VA by 86%. This is in line with the education level of the respondents as shown in table 5.5 which has insight into the benefits of using electricity by increasing electric power.

Table 5.9 Willingness to Power Up

Kesediaan	Frekuensi	Presentasi
Ya	107	86%
Tidak	16	13%
Tidak mengisi	1	1%
<b>Jumlah</b>	<b>124</b>	<b>100%</b>

Source: Primary data processed in 2023

### 5.3. Outer Model Test

#### 5.3.1. validity

The first thing to note is validity. If the validity does not pass, the modeling and calculations must be repeated. Table 5.10 provides an overview of the initial stages of modeling and calculation. The convergent validity criterion used is a minimum loading value of 0.5 and a significant value (p value) below a maximum of 0.05 (Kock, 2020, p. 87). The results show that the X1.7 indicator related to the GSC variable does not pass the convergent validity test because the loading value is less than 0.5, namely 0.098 and the p value is above 0.05, namely 0.134. For other indicators besides X1.7, all of them have a loading value above 0.5 and a p value <0.001.

Table 5.10 Value of Combined loadings and cross-loadings Stage 1

	GSC	CYN	AS	AF	AL	AM	IA	P value
X1.1	<b>0.583</b>	0.210	0.060	0.032	0.604	-0.613	-0.054	<0.001
X1.2	<b>0.595</b>	-0.104	0.403	0.098	0.215	-0.576	0.095	<0.001
X1.3	<b>0.748</b>	-0.029	-0.004	0.003	0.360	-0.242	-0.027	<0.001
X1.4	<b>0.619</b>	0.204	0.107	-0.247	0.397	-0.667	-0.095	<0.001
X1.5	<b>0.789</b>	-0.000	0.044	0.030	-0.063	0.120	-0.002	<0.001
X1.6	<b>0.822</b>	-0.067	-0.172	0.108	-0.102	0.320	-0.061	<0.001
X1.7	<b>0.098</b>	0.015	-0.417	0.257	-0.457	0.678	0.089	<b>0.134</b>
X1.8	<b>0.651</b>	0.010	0.010	-0.091	-0.247	0.195	0.139	<0.001
X1.9	<b>0.830</b>	-0.104	-0.236	-0.078	-0.276	0.336	0.140	<0.001
X1.10	<b>0.862</b>	-0.035	-0.002	0.070	-0.494	0.538	-0.127	<0.001
X2.1	0.254	<b>0.641</b>	-0.037	0.097	-0.258	0.336	-0.296	<0.001
X2.2	-0.108	<b>0.656</b>	0.572	0.099	-0.256	-0.092	-0.095	<0.001
X2.3	-0.119	<b>0.815</b>	-0.129	0.020	-0.131	0.381	0.006	<0.001
X2.4	0.098	<b>0.720</b>	0.181	-0.128	-0.046	-0.120	-0.045	<0.001
X2.5	0.024	<b>0.845</b>	0.117	-0.110	0.141	-0.333	0.103	<0.001
X2.6	-0.085	<b>0.812</b>	-0.263	0.034	0.114	0.012	0.201	<0.001
X2.7	-0.024	<b>0.683</b>	-0.383	0.020	0.384	-0.158	0.043	<0.001
Y1.1	-0.014	-0.005	<b>0.981</b>	-0.013	0.052	-0.024	0.047	<0.001
Y1.2	-0.002	-0.015	<b>0.981</b>	0.053	-0.091	0.065	-0.055	<0.001
Y1.3	0.017	0.020	<b>0.970</b>	-0.040	0.040	-0.042	0.008	<0.001
Y2.1	0.021	0.030	-0.064	<b>0.948</b>	-0.052	0.131	0.020	<0.001
Y2.2	-0.017	0.001	0.043	<b>0.980</b>	-0.082	0.024	0.029	<0.001
Y2.3	-0.003	-0.031	0.020	<b>0.970</b>	0.133	-0.152	-0.049	<0.001
Y3.1	-0.004	-0.012	0.051	0.039	<b>0.945</b>	0.034	-0.065	<0.001
Y3.2	0.026	0.011	-0.000	-0.006	<b>0.970</b>	0.078	0.016	<0.001
Y3.3	-0.022	0.001	-0.050	-0.032	<b>0.962</b>	-0.112	0.048	<0.001
Y4.1	-0.034	-0.007	-0.001	0.069	-0.043	<b>0.932</b>	-0.131	<0.001
Y4.2	-0.006	0.012	-0.053	-0.047	0.069	<b>0.959</b>	-0.012	<0.001
Y4.3	0.040	-0.005	0.054	-0.021	-0.027	<b>0.948</b>	0.141	<0.001
Y5.1	-0.029	0.008	0.097	-0.009	-0.022	-0.204	<b>0.969</b>	<0.001
Y5.2	0.002	0.019	0.095	-0.020	0.012	-0.243	<b>0.970</b>	<0.001
Y5.3	0.031	-0.031	-0.214	0.032	0.011	0.500	<b>0.866</b>	<0.001

Source: Primary data processed in 2023

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From the results of the first stage of calculations, where the X1.7 indicator did not pass convergent validity, a re-calculation was carried out by eliminating the X1.7 indicator, resulting in the calculation as shown in table 5.11. The results of the second stage of the calculation obtained the loading value of all indicators above 0.5 and the p value <0.001. Thus after the calculation of stage II, convergent validity passed.

**Table 5.11 Value of Combined loadings and cross-loadings Stage 2**

	GSC	CYN	AS	AF	AL	AM	IA	P value
X1.1	<b>0.586</b>	0.210	0.039	0.043	0.560	-0.557	-0.054	<0.001
X1.2	<b>0.596</b>	-0.104	0.399	0.100	0.214	-0.573	0.096	<0.001
X1.3	<b>0.746</b>	-0.030	0.007	-0.003	0.396	-0.286	-0.025	<0.001
X1.4	<b>0.618</b>	0.203	0.114	-0.251	0.425	-0.701	-0.093	<0.001
X1.5	<b>0.791</b>	0.000	0.022	0.042	-0.110	0.180	-0.002	<0.001
X1.6	<b>0.823</b>	-0.067	-0.185	0.116	-0.126	0.351	-0.060	<0.001
X1.8	<b>0.650</b>	0.010	0.010	-0.091	-0.240	0.187	0.141	<0.001
X1.9	<b>0.829</b>	-0.104	-0.243	-0.073	-0.284	0.348	0.141	<0.001
X1.10	<b>0.861</b>	-0.035	-0.009	0.074	-0.502	0.550	-0.125	<0.001
X2.1	0.249	<b>0.641</b>	-0.029	0.093	-0.234	0.306	-0.295	<0.001
X2.2	-0.091	<b>0.656</b>	0.541	0.116	-0.335	0.007	-0.097	<0.001
X2.3	-0.130	<b>0.815</b>	-0.109	0.009	-0.081	0.317	0.007	<0.001
X2.4	0.103	<b>0.720</b>	0.171	-0.122	-0.072	-0.088	-0.045	<0.001
X2.5	0.031	<b>0.845</b>	0.103	-0.102	0.107	-0.290	0.103	<0.001
X2.6	-0.092	<b>0.812</b>	-0.250	0.027	0.143	-0.025	0.201	<0.001
X2.7	-0.030	<b>0.683</b>	-0.372	0.014	0.410	-0.190	0.044	<0.001
Y1.1	-0.015	-0.005	<b>0.981</b>	-0.014	0.055	-0.027	0.047	<0.001
Y1.2	-0.003	-0.015	<b>0.981</b>	0.052	-0.089	0.063	-0.055	<0.001
Y1.3	0.018	0.020	<b>0.970</b>	-0.039	0.035	-0.036	0.008	<0.001
Y2.1	0.017	0.030	-0.057	<b>0.948</b>	-0.032	0.106	0.021	<0.001
Y2.2	-0.016	0.001	0.041	<b>0.980</b>	-0.086	0.029	0.029	<0.001
Y2.3	-0.000	-0.030	0.014	<b>0.970</b>	0.118	-0.133	-0.050	<0.001
Y3.1	-0.003	-0.012	0.049	0.041	<b>0.945</b>	0.042	-0.065	<0.001
Y3.2	0.025	0.011	0.000	-0.006	<b>0.970</b>	0.077	0.016	<0.001
Y3.3	-0.023	0.001	-0.048	-0.034	<b>0.962</b>	-0.119	0.048	<0.001
Y4.1	-0.033	-0.007	-0.002	0.070	-0.046	<b>0.932</b>	-0.131	<0.001
Y4.2	-0.006	0.012	-0.053	-0.047	0.068	<b>0.959</b>	-0.012	<0.001
Y4.3	0.039	-0.005	0.055	-0.021	-0.024	<b>0.948</b>	0.141	<0.001
Y5.1	-0.028	0.009	0.095	-0.008	-0.027	-0.197	<b>0.969</b>	<0.001
Y5.2	0.002	0.019	0.095	-0.020	0.012	-0.243	<b>0.970</b>	<0.001
Y5.3	0.030	-0.031	-0.212	0.031	0.016	0.493	<b>0.866</b>	<0.001

Source: Primary data processed in 2023

The next discriminant validity is measured from the average variance extracted (AVE) value. The size used is a value greater than 0.5 (Kock, 2020, p. 94). Table 5.12 shows that all latent variables have a value of more than 0.5. This shows that the model passes the discriminant validity test.

**Table 5.12 Value of Average variances extracted (AVE)**

GSC	CYN	AS	AF	AL	AM	IA
0.532	0.552	0.955	0.934	0.920	0.897	0.877

Source: Primary data processed in 2023

The second discriminant validity is that the AVE root value must be higher than the latent variable correlation. The root value of AVE lies in the diagonal value of 0.730; 0.743; 0.977; 0.966; 0.959; 0.947 and 0.936. Table 5.13 shows that the diagonal value is higher than the correlation value on the latent variable (related column).

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Table 5.13 Correlations among I.vs. with sq. rts. of AVEs

	GSC	CYN	AS	AF	AL	AM	IA
GSC	<b>0.730</b>	-0.054	0.513	-0.098	0.501	0.494	0.352
CYN	-0.054	<b>0.743</b>	-0.044	0.198	-0.009	-0.037	0.033
AS	0.513	-0.044	<b>0.977</b>	-0.203	0.800	0.799	0.611
AF	-0.098	0.198	-0.203	<b>0.966</b>	-0.158	-0.194	0.016
AL	0.501	-0.009	0.800	-0.158	<b>0.959</b>	0.848	0.517
AM	0.494	-0.037	0.799	-0.194	0.848	<b>0.947</b>	0.619
IA	0.352	0.033	0.611	0.016	0.517	0.619	<b>0.936</b>

Source: Primary data processed in 2023

Predictive validity is measured by the value of Q square or blindfolding. The size used is a value greater than 0 (kock, 2020, p. 95). Table 5.14 shows that all endogenous variables have values above 0. The model passes predictive validity.

Table 5.14 Value of Q-squared coefficients

GSC	CYN	AS	AF	AL	AM	IA
		0.345	0.076	0.335	0.808	0.398

Source: Primary data processed in 2023

### 5.3.2. Reliability

The model must pass the composite reliability test and cronbach's alpha. The ideal value for both is at least 0.7 although it is accepted if it is at least 0.6. Table 5.15 shows that the composite reliability value is above 0.7 and table 5.16 also shows that the Cronbach's alpha value is also above 0.7, so the second model passes the reliability test.

Table 5.15 Composite reliability coefficients

GSC	CYN	AS	AF	AL	AM	IA
0.909	0.895	0.985	0.977	0.972	0.963	0.955

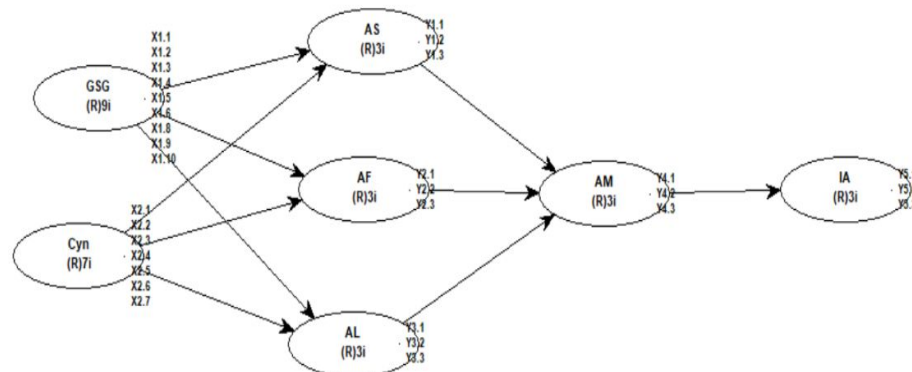
Source: Primary data processed in 2023

Table 5.16 Value of Cronbach's alpha coefficients

GSC	CYN	AS	AF	AL	AM	IA
0.886	0.862	0.977	0.965	0.956	0.942	0.928

Source: Primary data processed in 2023

After testing the validity and reliability, the best model obtained for this study is as shown in Figure 5.1 by eliminating X1.7.



## 5.4. Latent Variable Descriptive Analysis

### 5.4.1. Description of Research variables

The average value is shown in Table 5.17 Mean 7 Research Variables. The highest average is the intention to adopt. The lowest is the variable attitude towards failure and cynicism. The mean value of a scale of 7 indicates a critical point is 4 related to tend to enter disapproval or unhappiness. The five variables above the four biggest critical points are intention of adoption, attitude towards adoption, attitude towards success and attitude towards learning.

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Table 5.17 Average of 7 Research Variables

Variabel	Rata-rata
GSC	5,48
Sinisme	3,91
<i>Attitude towards Success</i>	5,79
<i>Attitude towards Failure</i>	3,44
<i>Attitude towards Learning</i>	5,79
<i>Attitude towards Adoption</i>	5,83
<i>Intention of Adoption</i>	5,86

Source: Primary data processed in 2023

Two variables tend to be experienced low by respondents. This is related to values below 4, namely cynicism and attitude towards failure. This means that these two variables were not experienced by the respondents. People tend not to be cynical about the government and failures do not affect the perceptions of respondents.

### 5.4.2. Description of Indicator Strength

The test looks at the ES and WLS values in the indicator weight table. Table 5.18 displays the results of the calculations. WLS all indicators are positive. ES value above 0.02. This means that all indicators contribute to the ability to explain the model (R Squared). The lowest ES on the X1.1 indicator is 0.072. The indicators that give the biggest contribution are the variable indicators of attitude towards success, attitude towards failure, attitude towards learning, attitude towards adoption and intention to adopt.

Table 5.18 Value of Indicator weights

	GSC	CYN	AS	AF	AL	AM	IA	WLS	ES
X1.1	0.122	0.000	0.000	0.000	0.000	0.000	0.000	1	0.072
X1.2	0.124	0.000	0.000	0.000	0.000	0.000	0.000	1	0.074
X1.3	0.156	0.000	0.000	0.000	0.000	0.000	0.000	1	0.116
X1.4	0.129	0.000	0.000	0.000	0.000	0.000	0.000	1	0.080
X1.5	0.165	0.000	0.000	0.000	0.000	0.000	0.000	1	0.131
X1.6	0.172	0.000	0.000	0.000	0.000	0.000	0.000	1	0.141
X1.8	0.136	0.000	0.000	0.000	0.000	0.000	0.000	1	0.088
X1.9	0.173	0.000	0.000	0.000	0.000	0.000	0.000	1	0.143
X1.10	0.180	0.000	0.000	0.000	0.000	0.000	0.000	1	0.155
X2.1	0.000	0.166	0.000	0.000	0.000	0.000	0.000	1	0.107
X2.2	0.000	0.170	0.000	0.000	0.000	0.000	0.000	1	0.111
X2.3	0.000	0.211	0.000	0.000	0.000	0.000	0.000	1	0.172
X2.4	0.000	0.186	0.000	0.000	0.000	0.000	0.000	1	0.134
X2.5	0.000	0.219	0.000	0.000	0.000	0.000	0.000	1	0.185
X2.6	0.000	0.210	0.000	0.000	0.000	0.000	0.000	1	0.171
X2.7	0.000	0.177	0.000	0.000	0.000	0.000	0.000	1	0.121
Y1.1	0.000	0.000	0.342	0.000	0.000	0.000	0.000	1	0.336
Y1.2	0.000	0.000	0.342	0.000	0.000	0.000	0.000	1	0.336
Y1.3	0.000	0.000	0.338	0.000	0.000	0.000	0.000	1	0.328
Y2.1	0.000	0.000	0.000	0.338	0.000	0.000	0.000	1	0.321
Y2.2	0.000	0.000	0.000	0.350	0.000	0.000	0.000	1	0.343
Y2.3	0.000	0.000	0.000	0.346	0.000	0.000	0.000	1	0.336
Y3.1	0.000	0.000	0.000	0.000	0.343	0.000	0.000	1	0.324
Y3.2	0.000	0.000	0.000	0.000	0.351	0.000	0.000	1	0.341
Y3.3	0.000	0.000	0.000	0.000	0.349	0.000	0.000	1	0.335
Y4.1	0.000	0.000	0.000	0.000	0.000	0.347	0.000	1	0.323
Y4.2	0.000	0.000	0.000	0.000	0.000	0.357	0.000	1	0.342
Y4.3	0.000	0.000	0.000	0.000	0.000	0.353	0.000	1	0.334
Y5.1	0.000	0.000	0.000	0.000	0.000	0.000	0.369	1	0.357
Y5.2	0.000	0.000	0.000	0.000	0.000	0.000	0.369	1	0.357
Y5.3	0.000	0.000	0.000	0.000	0.000	0.000	0.329	1	0.285

Source: Primary data processed in 2023

GSC (general self-confident) variables sequentially contributing to R Square are indicators X1.10, X1.9, X1.6, X1.5, X1.3, X1.8, X1.4, X1.2, and X1.1. The Cyn variable (cynicism) sequentially the indicator contribution is X2.5, X2.3, X2.6, X2.4, X2.7, X2.2, and X2.1. Attitude towards success variables respectively are Y1.1, Y1.2, and Y1.3. Attitudes towards failure are Y2.2, Y2.3, and Y2.1.



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Attitudes towards learning are Y3.2, Y3.3, and Y3.1. Attitudes towards the adoption of electric induction cookers are Y4.2, Y4.3, and Y4.1. The intention to adopt the stove is Y5.1, Y5.2, and Y5.3. This sequence is important in policy priorities. This also applies to the order of other variables.

#### 5.4.3. General Self-Confidence (GSC) Indicator Description

All GSC indicators exceed critical values. Only one under it, namely X1.7, is a matter of dressing. The highest indicator is a positive impression on the people you meet. From Table 5.19 it shows that GSC is indeed experienced by respondents with an average score of 5.48.

Table 5.19 Average GSC Indicators

Indikator GSC	Rata-rata
X1.1	5,99
X1.2	5,41
X1.3	5,61
X1.4	5,60
X1.5	6,02
X1.6	5,57
X1.7	3,57
X1.8	5,56
X1.9	5,81
X1.10	5,66

Source: Primary data processed in 2023

#### 5.4.4. Cynicism Indicator Description (CYN)

CYN generally did not occur in respondents. This can be seen in Table 5.20, where all indicators are still around critical point 4. Only two indicators can be said to have occurred, namely the perception that many people are used by other people and that many people are arrogant or self-assertive.

Table 5.20 Average CYN Indicators

Indikator CYN	Rata-rata
X2.1	3,30
X2.2	4,67
X2.3	3,89
X2.4	4,44
X2.5	4,30
X2.6	3,40
X2.7	3,40

Source: Primary data processed in 2023

#### 5.4.5. Attitude Towards Success (US) Indicator Description

AS did occur in respondents. Table 5.21 shows all the indicators above 4. Success is more related to goodness and happiness.

Table 5.21 Average US Indicators

Indikator AS	Rata-rata
Y1.1	5,81
Y1.2	5,82
Y1.3	5,74

Source: Primary data processed in 2023

#### 5.4.6. Attitude Towards Failure (AF) Indicator Description

Regarding AF, it can be seen in Table 5.22. Value below 4 even though feeling good reaches 3.504. This means that failure will have a negative impact on feelings.

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Table 5.22 Average AF Indicator

Indikator AF	Rata-rata
Y2.1	3,50
Y2.2	3,38
Y2.3	3,44

Source: Primary data processed in 2023

### 5.4.7. Attitude Towards Learning (AL) Indicator Description

The AL indicator shows the average above 4. Table 5.23 shows the average above 5. The feelings that occur are positive towards happiness.

Table 5.23 Average LA Indicator

Indikator AL	Rata-rata
Y3.1	5,78
Y3.2	5,81
Y3.3	5,78

Source: Primary data processed in 2023

### 5.4.8. Description of Attitude Towards Induction Stove Adoption (AM) Indicator

AM indicates a value above 5. Table 5.24 shows this and is almost evenly distributed. Attitudes towards the adoption of induction cookers tend to give positive perceptions.

Table 5.24 Mean AM Indicators

Indikator AM	Rata-rata
Y4.1	5,80
Y4.2	5,82
Y4.3	5,87

Source: Primary data processed in 2023

### 5.4.9. Description of Intention to adopt Induction Stove (IA) Indicator

The IA indicator is also above the critical value of 4. Table 5.25 shows the value above 5. The desire for adoption is also evenly distributed in each indicator on a scale of 6. This means that the desire for adoption is approved by the respondents.

Table 5.25 Average of IA Indicators

Indikator IA	Rata-rata
Y5.1	5,86
Y5.2	5,82
Y5.3	5,90

Source: Primary data processed in 2023

## 5.5. Outlier Test

The outlier test results for each variable show two things. This can be seen in table 5.26. Variables that contain outlier values (minimum or maximum values) are success attitudes and learning attitudes. The minimum score is above 4. However, it is still below 5. Outlier values that have an effect are extreme values. The value 4 is not skipped by only a few digits.

Table 5.26 Latent variable coefficients

	GSC	CYN	AS	AF	AL	AM	IA
Min	-3.140	-2.334	-4.407	-1.578	-4.488	-1.867	-3.158
Max	1.489	2.464	1.078	2.315	1.099	1.165	0.991

Source: Primary data processed in 2023

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### 5.6. Model Conformity and Quality Test

Table 5.27 shows the 10 criteria for model fit and quality indices to produce fit results. This shows that all criteria are still within the allowable value limits. This shows that the model is good and all endogenous variables can be explained by exogenous variables.

**Table 5.27 Results of Fit & Quality Indices Models**

No	Indikasi Model fit & Kualitas	Kriteria Fit	Hasil
1	Average path coefficient (APC)=0.329	$p < 0.05$	$P < 0.001$
2	Average R-squared (ARS)=0.372	$p < 0.05$	$P < 0.001$
3	Average adjusted R-squared (AARS)=0.362	$p < 0.05$	$P < 0.001$
4	Average block VIF (AVIF)	diterima jika $\leq 5$ , idealnya $\leq 3.3$	1.498
5	Average full collinearity VIF (AFVIF)	diterima jika $\leq 5$ , idealnya $\leq 3.3$	2.591
6	Tenenhaus GoF (GoF)	Kecil $\geq 0.1$ Medium $\geq 0.25$ Besar $\geq 0.36$	0.549
7	Sympson's paradox ratio (SPR)	Diterima jika $\geq 0.7$ , idealnya = 1	0.800
8	R-squared contribution ratio (RSCR)	Diterima jika $\geq 0.9$ , idealnya = 1	0.969
9	Statistical suppression ratio (SSR)	Diterima jika $\geq 0.7$	1.000
10	Nonlinear bivariate causality direction ratio (NLBCDR)	Diterima jika $\geq 0.7$	0.900

Source: Primary data processed in 2023

### 5.7. Inner Model Test (Hypothesis Test and Effect Size)

Direction of influence and significant value (p value) can be seen in Table 5.28 and table 5.29. Directions and significant details per hypothesis are as follows:

**Table 5.28 Path coefficients**

	GSC	CYN	AS	AF	AL	AM	IA
AS	0.528	-0.133					
AF	-0.147	0.186					
AL	0.517	0.143					
AM			0.370	0.034	0.600		
IA						0.628	

Source: Primary data processed in 2023

**Table 5.29 P Value**

	GSC	CYN	AS	AF	AL	AM	IA
AS	<0.001	0.064					
AF	0.046	0.016					
AL	<0.001	0.051					
AM			<0.001	0.353	<0.001		
IA						<0.001	

Source: Primary data processed in 2023

#### H1: Attitudes toward success have a positive impact on attitudes toward induction hob adoption

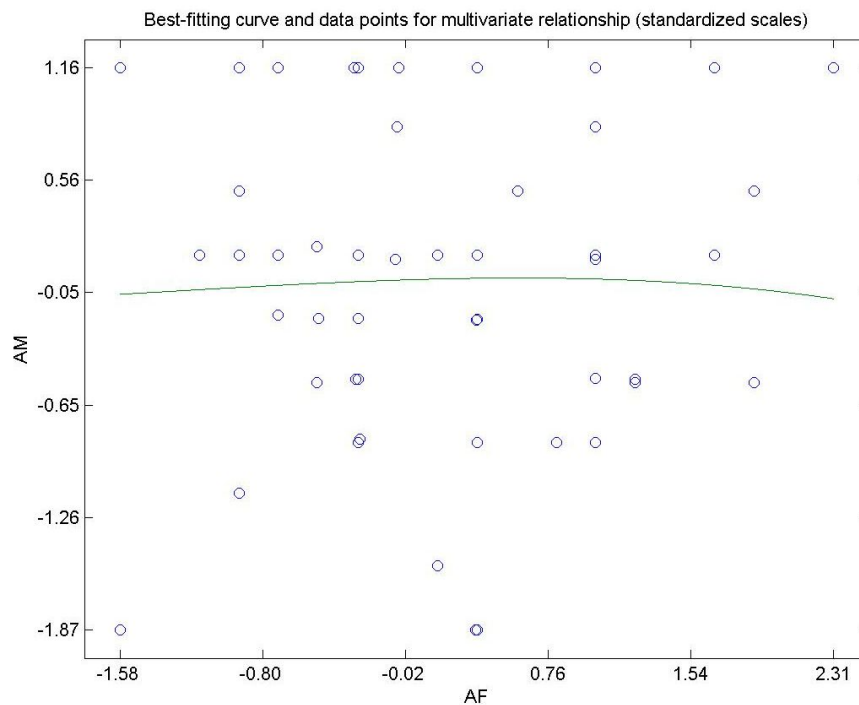
Hypothesis 1 proved positive with a coefficient value of 0.370 and a significant value below 0.05.

#### H2: Attitudes toward failure have a negative impact on attitudes toward induction hob adoption

Hypothesis 2 was not proven negative and not significant. This can be seen from the positive coefficient value of 0.034 and a significant value above 0.05, namely 0.353.

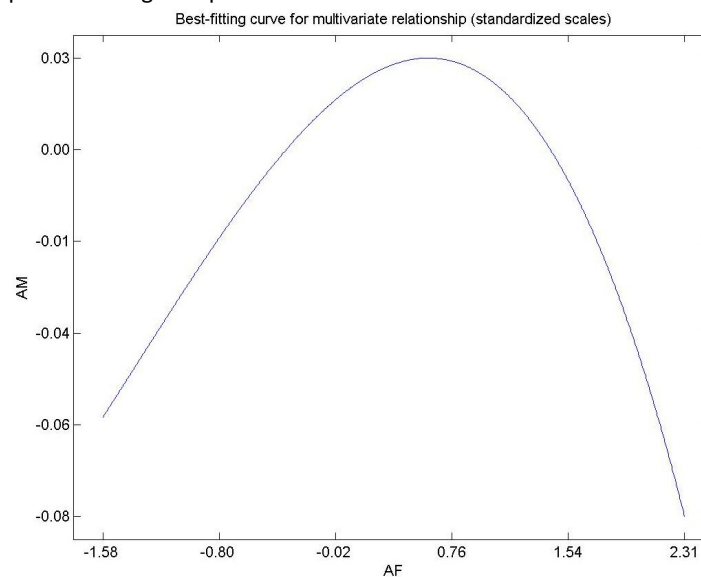
The outlier test shows that the data reveals no outliers. The data pattern shows that the data is spread very far. Figure 5.2 Scatter Diagram and Data Pattern Line shows these two things. None of the data ranges exceed 4 standard deviations. The pattern side shows that there is no good data collection pattern.

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**Figure 5.2 Scatter Diagram and Pattern Lines of AF and AM Data**  
Source: Primary data processed in 2023

The slightly curved pattern of the data pattern lines indicates that there are two patterns. Figure 5.3 Focus The AF and AM patterns show one positive relationship and one negative pattern.



**Figure 5.3 AF and AM Focus Patterns**

The researcher found the fact that there were variables that changed direction and weakened the effect of failure attitudes and adoption attitudes, influenced by the attitude of indifference or indifference of respondents about the attitude towards failure variable (AF) as shown in table 5.20. While the response of respondents to the adoption variable (AM) was quite enthusiastic as shown in table 5.22.

Online questionnaires are very different from offline, where researchers can interact directly with respondents. Online questionnaires also require clear explanations or descriptions so that respondents who do not meet face to face with researchers can understand the questions in the questionnaire so that they can provide clearer responses to these variables. There are three reasons why the respondent answered neutral or doubtful, namely; (1) the respondent has no attitude or opinion, (2) the

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respondent gives a balanced score, and (3) the respondent does not yet have a clear attitude or opinion (Shaw & Wright, 1967). In addition, there are other factors that influence respondents, such as doubt or not understanding the intent of the questions in the questionnaire (Kulas & Stachowski, 2009).

**H3: Attitudes towards learning to use an induction electric stove have a positive effect on attitudes towards the adoption of an induction electric stove.**

Hypothesis 3 is proven positive and significant. This can be seen from the coefficient value of 0.600 and significantly below 0.05.

**H4: Attitudes towards the adoption of induction hobs have a positive impact on the intention to adopt induction hobs**

Hypothesis 4 proved positive and significant. This can be seen from the coefficient value of 0.628 and a significant value below 0.05.

**H5: Confidence in general has a positive impact on attitudes towards success.**

Hypothesis 5 on self-esteem in general is positive and significant. This can be seen from the coefficient value of 0.528 and a significant value of less than 0.05

**H6: Confidence in general has a negative impact on attitudes toward failure**

Hypothesis 6 proved to be negative and significant. This can be seen from the coefficient value -0.147 and the significant value is at 0.046.

**H7: Confidence in general has a positive impact on attitudes towards learning to use an induction electric stove**

Hypothesis 7 proved to be significant and positive. This corresponds to a coefficient value of 0.517 and a significant value below 0.05.

**H8: Cynicism has a negative impact on attitudes towards success**

Hypothesis 8 proved to be significant and negative. The coefficient value is -0.133 and the significant value is at 0.064.

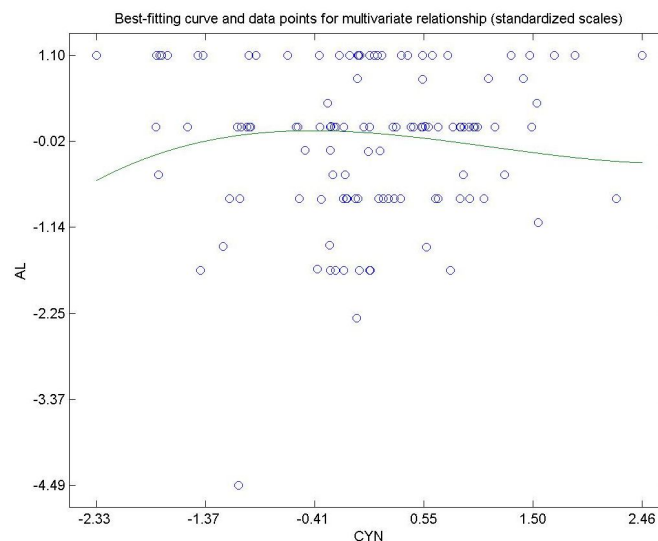
**H9: Cynicism has a positive effect on attitudes towards failure**

Hypothesis 9 proved to be significant and positive. The coefficient value is 0.186 and it is significant at 0.016.

**H10: Cynicism has a negative impact on attitudes toward learning to use an induction hob**

Hypothesis 10 does not prove negative but is significant. This shows a coefficient of 0.143 and a significant value of 0.051.

Checks were also carried out regarding outliers and data patterns related to differences in results with theory. There were indeed outliers at one point because the standard value exceeded 4. However, judging from the significant value, this was not a problem. It can be seen from the distribution of the data that the distribution is not a problem. The problem lies in the data pattern line.



**Figure 5.4 Scatter Diagram and Lines of Cyn and AL Data Patterns**

The focus on influence shows similarities to the previous problem. Figure 5.5 Focus on the relationship between CYN and AL shows two patterns. This describes the symptoms of differences in the characteristics of the respondents. But this is more to other variables that change the direction of influence.

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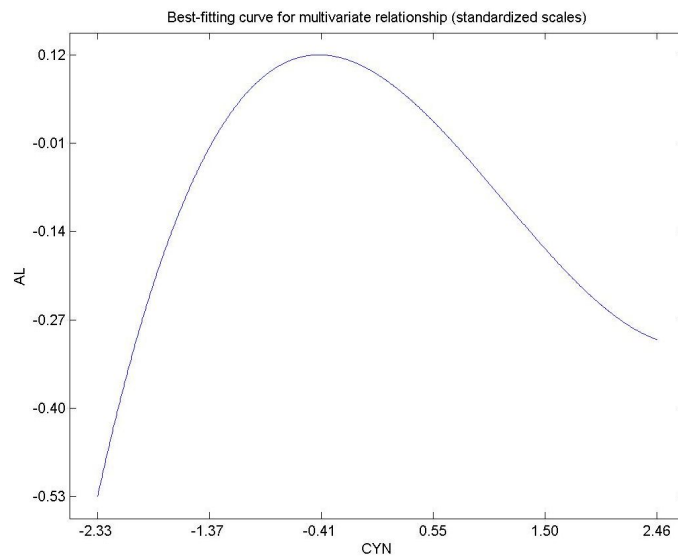


Figure 5.5 Focus on CYN and AL Relations

Researchers found the fact that there were variables that changed direction and weakened the effect of cynicism and attitudes towards learning, influenced by the attitude of indifference or indifference of respondents about the variable cynicism (CYN) as shown in table 5.18. While the response of respondents to the learning variable (AL) was quite enthusiastic as shown in table 5.21.

The explanation is the same as the unproven Hypothesis 2 (H2) above that online questionnaires also require clear explanations or descriptions so that respondents who do not meet face to face with researchers can understand the questions in the questionnaire so that they can provide clearer responses to variables. the.

### 5.8. Determination Coefficient Test

The coefficient test illustrates that the model in the best research is the ability to explain changes in attitudes towards adopting an induction electric stove, namely 80.8%. This means that success attitude, failure attitude and learning attitude are strong in explaining the attitude of induction cooker adoption.

The ability to explain traits, namely GSG and CYN, is more in two respects. These two things are the attitude of success and the attitude of learning. The smallest ability of the model to explain change is in the failure attitude variable, which is only 6.4%.

Table 5.30 Value of R-squared coefficients

GSC	CYN	AS	AF	AL	AM	IA
		0.345	0.064	0.247	0.808	0.395

As the main objective variable, namely the intention to adopt an induction electric stove, only 39.5% could be explained. This means that the attitude of adopting an induction electric stove is less able to explain broadly the intention. This was concluded because 60.5% explained other variables not examined.

### 5.9. Discussion of Research Results

UseInduction electric stove which is a new technology in developing countries like Indonesia is a problematic behavior due to internal and external factors that hinder behavior in using it. In a developing country like Indonesia, when faced with a choice in the face of a new technology such as an induction electric stove, whether to accept or refuse to use the new technology by considering the failures and successes in its use. (Xie et al., 2008). New technologies such as induction electric stoves because they are still not widely used in society, require a learning process in their use, where this can also be a barrier for the community. (Bagozzi, 1992).

#### 5.9.1. The Effect of Traits (GSC and Cynicism) on Attitude

The influence of traits (GCG and cynicism) on attitude is represented by 6 hypotheses. The representative hypotheses are hypotheses 5 to 10. In general, traits affect attitudes related to the theory of trying. This influence with few exceptions in different directions of influence is generally cynicism and a learning attitude.

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Confidence in general has a positive impact on attitudes towards success. Positive influence means the movement is in the same direction. When self-confidence increases, the attitude of success also increases. Confidence in general has a negative impact on attitudes toward failure. Negative influence means movement in the opposite direction. When general self-confidence increases, attitudes towards failure decrease. Confidence in general has a positive impact on attitudes towards learning to use an induction electric stove. A positive relationship indicates a unidirectional movement. When self-confidence decreases, learning attitudes also decrease, and vice versa.

Cynicism has a negative impact on attitudes towards success. Negative indicates the opposite direction of the two variables. When cynicism increases, the attitude of success decreases. Cynicism has a positive effect on attitudes towards failure. When cynicism increases, attitudes towards failure also increase.

The previous effect description is in agreement with several studies. The presentation of suitability is unified because generally researchers examine all the variables described in different contexts. This research is consistent with research (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013).

Cynicism has a positive impact on attitudes toward learning to use an induction hob. This is contrary to research (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013). The pattern of influence shows that there are variables that change the direction of influence to be positive. This other side is important for further research.

### **5.9.2. The Effect of Attitude in Theory of Trying on the Attitude of Adopting an Induction Electric Stove**

The research also produced that the attitude variable towards using/adopting an induction electric stove was positively and significantly influenced by the attitude variable towards success and the attitude variable towards learning, but not so towards the attitude towards failure which produced a positive and insignificant result. This is slightly different from the research results of Walid Chaouali and friends (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013). The attitude variable towards using/adopting an induction electric stove shows a result of 80.8% which can be explained by the three attitudes, namely attitudes towards success, attitudes towards failure and attitudes towards learning.

The influence of attitude towards the adoption of induction electric stoves is the main influence of the study. This influence study includes three hypotheses, namely hypotheses 1 to 3. The results show that all have a positive effect. But the second hypothesis that has no significant effect is hypothesis two. In addition, the second hypothesis has a different direction from the general view of theory and research.

The two hypotheses are in line with theory and research (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013). In general, attitudes towards success have a positive impact on attitudes towards the adoption of induction cookers. If the attitude of success increases, the adoption of induction cookers also increases. Attitudes towards learning to use an induction electric stove have a positive effect on attitudes towards the adoption of an induction electric stove. The increase in attitudes towards learning increases the attitude towards the adoption of induction electric stoves also increases.

In general, attitudes toward failure have a negative impact on attitudes toward adopting an induction hob (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013). This study shows that the effect is not significant and the effect is different, namely positive.

The data pattern indicates the need for attention of other variables for its application. There comes a point where the relationship reverses. From positive to negative, and vice versa.

### **5.9.3. The Effect of Adoption Attitudes on Adoption Intentions**

The research results confirm the conceptual model and the hypothesis that there is a slight difference. Research shows that the variable of intention to use/adopt an induction electric stove is positively and significantly influenced by the variable of attitude towards using/adopting an induction electric stove. This is in line with the research results of Walid Chaouali and friends (Chaouali et al., 2017), (Malik et al., 2019), (Barber et al., 2006) and (Chuang et al., 2013).

This research provides reliable evidence that the multidimensional concept of attitude is compatible with the Theory of Trying. This multidimensional concept of attitude can describe the concept of attitude more completely than other attitude concepts which tend to only have one dimension (Curran & Meuter, 2005), (Jones et al., 2015) and (Kaushik & Rahman, 2015). The concept of a one-dimensional or monolithic attitude, which was previously used as literacy, is considered inappropriate when an attitude is faced with internal and external obstacles (Xie, 2008). The results of the analysis also show that attitudes towards failure have a weaker impact (6.4%) than attitudes towards success (34.5%) and attitudes towards learning (23.5%) on the variable of using/adopting an induction electric stove. This can be justified because the education level of respondents with an undergraduate degree or equivalent is 62% and ages 27 to 44 years are also dominant, so attitudes towards success and attitudes towards learning new technologies such as induction electric stoves are very easy for respondents. With typical respondents who

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are highly educated and relatively young in age, they tend to be able to accept new technologies that are developing in today's society.

### **5.10. Research Implications**

#### **5.10.1. Theoretical Implications**

Theoretical implications provide reinforcement to the theory of traits that influence attitudes to the theory of trying. All variables related to traits influence the elements of the theory of trying. However, the influence of cynicism on learning attitudes has a different pattern, namely being positive.

Previous checks proved a new pattern. There is a turning point from the influence from positive to negative, and vice versa. This indicates the need for further study of variables that change the direction of this influence.

Related to the theory of trying itself with one exception is also strengthened. The exception is the effect of failure attitudes on adoption attitudes. The previous check gave a new direction for a turning point from positive to negative influence and vice versa. This shows the need to study variables that change the direction of the effect.

#### **5.10.2. Managerial Implications**

The adoption of induction electric stoves by the community requires control or management of traits, namely self-confidence and management of cynicism. Good self-confidence will increase the attitude of success and learning and decrease the attitude of failure. Increased cynicism can decrease success and increase failure. But the other side of cynicism has two patterns. The essence of the pattern is that there is a turning point that needs attention from the symptoms of society. What factors tend to change people's interest despite high cynicism.

The side of the theory of trying provides a downward direction so that the attitude of supporting the adoption of induction electric stoves increases, namely the need for an increase in the attitude of learning and attitude of success. Meanwhile, the attitude of failure can still increase a good attitude towards adoption if it is sensitive to factors that change direction or neutralize the attitude of failure.

### **5.11. Research Limitations**

Researchers convey the limitations of this study, namely:

1. The sample is still too small to represent Indonesia
2. Requires follow-up qualitatively to understand different patterns to discover new knowledge.

## **CLOSING**

### **6.1. Conclusion**

1. Attitude towards success has a significant positive effect on the attitude of induction electric cooker adoption.
2. Attitude towards failure has no negative and insignificant effect on attitude towards induction cooker adoption.
3. Attitudes towards learning to use an induction electric stove have a significant positive effect on attitudes towards the adoption of an induction electric stove.
4. Attitudes towards the adoption of induction hobs have a positive impact on the intention to adopt induction hobs.
5. Confidence in general has a significant positive effect on attitudes towards success.
6. Confidence in general has a significant negative effect on attitudes towards failure.
7. Confidence in general has a significant positive effect on attitudes towards learning to use an induction electric stove.
8. Cynicism has a significant negative effect on attitudes towards success.
9. Cynicism has a significant positive effect on attitudes towards failure.
10. Cynicism has a significant positive effect on attitudes toward learning to use an induction hob.
11. *Traits* influences the difficulties described by the theory of trying

### **6.2. Suggestion**

1. This research can still be developed by other researchers at the undergraduate and postgraduate levels in Indonesia because there is still a lack of research using the Theory of Trying behavior theory in Indonesia.
2. The adoption of induction cookers requires control over the traits of society, namely general self-confidence and cynicism. But cynicism needs to be carefully controlled because there are two patterns and it really depends on the sensitivity of identifying the factors that influence it. This can be a concern for policy makers such as the government to take strategic steps to popularize induction electric stoves towards Indonesia's Net Zero Emissions (NZE) in 2060 by taking into account the condition of society in terms of general self-confidence and growing cynicism in society. Likewise for induction electric stove manufacturers also need to pay attention to these two factors. Both the Government and induction cooker manufacturers



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can take advantage of social media such as Instagram, Tik Tok, Twitter and other social media to build self-confidence and control public cynicism in providing insights about induction electric stoves so that they can be accepted in society at large. In the present era, you can also take advantage of influencers who can enter broad layers of society so that they can influence or strengthen self-confidence and control people's cynicism in their acceptance of induction electric stoves.

3. The adoption of electric induction cookers for the community requires control of three attitudes from the community. However, attitudes toward failure have two patterns and need to be sensitive to ongoing factor identification. In order to popularize this induction electric stove, the community needs to be invited or brought to these three attitudes so as to form a good experience in the community to have the intention to use an induction electric stove.

## REFERENCES

- 1) Aaker, DA, & Bagozzi, RP (1979). Unobservable Variables in Structural Equation Models with an Application in Industrial Selling. *Journal of Marketing Research*, 16(2), 147. <https://doi.org/10.2307/3150680>
- 2) Abou-Shouk, MA, Lim, WM, & Megicks, P. (2016). Using competing models to evaluate the role of environmental pressures in e-commerce adoption by small and medium sized travel agents in a developing country.
- 3) Agarwal, NA and M. (2003). Theory of Trying – Implications for Marketing New-concept. *IIMB Management Review*, December, 15–23.
- 4) Agarwal, Reeti, Rastogi, S., & Mehrotra, A. (2009). Customers' perspectives regarding e-banking in an emerging economy. *Journal of Retailing and Consumer Services*, 16(5), 340–351. <https://doi.org/10.1016/j.jretconser.2009.03.002>
- 5) Agarwal, Ritu, Sambamurthy, V., & Stair, RM (2000). Research Report: The Evolving Relationship between General and Specific Computer Self-Efficacy - An Empirical Assessment. *Information Systems Research*, 11(4), 418–430. <https://doi.org/10.1287/isre.11.4.418.11876>
- 6) Ahuja, MK, & Thatcher, JB (2005). Moving beyond intentions and toward the theory of trying: Effects of work environment and gender on post-adoption of information technology use. *MIS Quarterly: Management Information Systems*, 29(3), 427–459. <https://doi.org/10.2307/25148691>
- 7) Ajzen, I. (1988). *Attitudes, personality and behavior*. Milton Keynes: Open University Press.
- 8) Akhlaq, A., & Ahmed, E. (2013). The effect of motivation on trust in the acceptance of internet banking in a low income country. *International Journal of Bank Marketing*, 31(2), 115–125. <https://doi.org/10.1108/02652321311298690>
- 9) Al-Somali, SA, Gholami, R., & Clegg, B. (2009). An investigation into the acceptance of online banking in Saudi Arabia. *Technovation*, 29(2), 130–141. <https://doi.org/10.1016/j.technovation.2008.07.004>
- 10) Azzahra, S., Azis, H., Sitorus, MTB, & Pawenary, P. (2020). Performance Test of Induction Stoves and Gas Stoves on Energy Consumption and Their Economical Aspects. *Energy & Electricity*, 12(2), 149–155.  
a. <https://doi.org/10.33322/energi.v12i2.1009>
- 11) Badrinarayanan, V., Becerra, EP, & Madhavaram, S. (2014). Influence of congruity in store-attribute dimensions and self-image on purchase intentions in online stores of multichannel retailers. *Journal of Retailing and Consumer Services*, 21(6), 1013–1020. <https://doi.org/10.1016/j.jretconser.2014.01.002>
- 12) Bagozzi, RP (1981). An examination of the validity of two models of attitude. *Multivariate Behavioral Research*, 16(3), 323–359. [https://doi.org/10.1207/s15327906mbr1603\\_4](https://doi.org/10.1207/s15327906mbr1603_4)
- 13) Bagozzi, RP (1992). The Self-Regulation of Attitudes, Intentions, and Behavior. *Social Psychology Quarterly*, 55(2), 178. <https://doi.org/10.2307/2786945>
- 14) Bagozzi, RP (1993). On the neglect of volition in consumer research: A critique and proposal. *Psychology & Marketing*, 10(3), 215–237. <https://doi.org/10.1002/mar.4220100305>
- 15) Bagozzi, RP (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems*, 8(4), 244–254. <https://doi.org/10.17705/1jais.00122>
- 16) Bagozzi, RP, & Kimmel, SK (1995). A comparison of leading theories for the prediction of goal-directed behaviour. *British Journal of Social Psychology*, 34(4), 437–461. <https://doi.org/10.1111/j.2044-8309.1995.tb01076.x>
- 17) Bagozzi, RP, Moore, DJ, & Leone, L. (2004). Self-Control and the Self-Regulation of Dieting Decisions: The Role of Prefactual Attitudes, Subjective Norms, and Resistance to Temptation. *Basic and Applied Social Psychology*, 26(2–3), 199–213. <https://doi.org/10.1080/01973533.2004.9646405>
- 18) Bagozzi, RP, & Warshaw, PR (1990). Trying to Consume. *Journal of Consumer Research*, 17(2), 127. <https://doi.org/10.1086/208543>
- 19) Barber, N., Almanza, BA, & Donovan, JR (2006). Motivational factors of gender, income and age on selecting a bottle of wine. *International Journal of Wine Marketing*, 18(3), 218–232. <https://doi.org/10.1108/09547540610704774>

## Intention to Use Induction Electric Stove According to Theory of Trying

- 20) Bay, D., & Daniel, H. (2003). The Theory of Trying and Goal-Directed Behavior: The Effect of Moving Up the Hierarchy of Goals. *Psychology and Marketing*, 20(8), 669–684. <https://doi.org/10.1002/mar.10091>
- 21) Bearden, WO, Hardesty, DM, & Rose, RL (2001). Consumer self-confidence: Refinements in conceptualization and measurement. *Journal of Consumer Research*, 28(1), 121–134. <https://doi.org/10.1086/321951>
- 22) Beheshti, A., Cekanaviciute, E., Smith, DJ, & Costes, SV (2018). Global transcriptomic analysis suggests carbon dioxide as an environmental stressor in spaceflight: A systems biology GeneLab case study. *Scientific Reports*, 8(1), 1–10. <https://doi.org/10.1038/s41598-018-22613-1>
- 23) Bell, GD (1967). Self-Confidence and Persuasion in Car Buying. *Journal of Marketing Research*, 4(1), 46. <https://doi.org/10.2307/3150163>
- 24) Benabou, R., & Tirole, J. (2020). Self-Confidence and Personal Motivation. August, 1–19.
- 25) Bentler PM, & Chou Chih-Ping. (1987). Practical Issues in Structural Modeling. In *Sociological methods & research* (Vol. 16, Issue 1, pp. 78–117).
- 26) Bollen, KA (1989). A New Incremental Fit Index for General Structural Equation Models. *Sociological Methods & Research*, 17(3), 303–316. <https://doi.org/10.1177/0049124189017003004>
- 27) Carsrud, A., Brännback, M., Elfving, J., & Brandt, K. (2017). Motivations: The Entrepreneurial Mind and Behavior. 185–209. [https://doi.org/10.1007/978-3-319-45544-0\\_13](https://doi.org/10.1007/978-3-319-45544-0_13)
- 28) Chaouali, W., Souiden, N., & Ladhari, R. (2017). Explaining the adoption of mobile banking with the theory of trying, general self-confidence, and cynicism. *Journal of Retailing and Consumer Services*, 35(November 2016), 57–67. <https://doi.org/10.1016/j.jretconser.2016.11.009>
- 29) Chemingui, H., & Lallouna, H. Ben. (2013). Resistance, motivations, trust and intention to use mobile financial services. *International Journal of Bank Marketing*, 31(7), 574–592. <https://doi.org/10.1108/IJBM-12-2012-0124>
- 30) Chuang, SC, Cheng, YH, Chang, CJ, & Chiang, YT (2013). The impact of self-confidence on the compromise effect. *International Journal of Psychology*, 48(4), 660–675. <https://doi.org/10.1080/00207594.2012.666553>
- 31) Chylinski, M., & Chu, A. (2010). Consumer cynicism: Antecedents and consequences. In *European Journal of Marketing* (Vol. 44, Issue 6). <https://doi.org/10.1108/03090561011032720>
- 32) Cruz, P., Neto, LBF, Muñoz-Gallego, P., & Laukkanen, T. (2010). Mobile banking rollout in emerging markets: Evidence from Brazil. *International Journal of Bank Marketing*, 28(5), 342–371. <https://doi.org/10.1108/02652321011064881>
- 33) Cruz, P., Salo, J., Munoz-Gallego, P., & Laukkanen, T. (2010). Heavy users of e-banking and Customer Experience Management : evidence on intrinsic motivation Pedro Cruz \* Jari Salo Pablo Muñoz-Gallego Tommi Laukkanen. *International Journal Electronic Business*, 8(2).
- 34) Curran, JM, & Meuter, ML (2005). Self-service technology adoption: Comparing three technologies. *Journal of Services Marketing*, 19(2), 103–113. <https://doi.org/10.1108/08876040510591411>
- 35) Darke, PR, & Ritchie, RJ (2007). The Defensive Consumer: Advertising Deception, Defensive Processing, and Distrust. 44(1). <https://journals.sagepub.com/doi/abs/10.1509/jmkr.44.1.114>
- 36) Davis, FD, Bagozzi, RP, & Warshaw, PR (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- 37) Day, RC, & Hamblin, RL (1964). Some Effects of Close and Punitive Styles of Supervision. *American Journal of Sociology*, 69(5), 499–510. <https://doi.org/10.1086/223653>
- 38) Dean, JW, Brandes, P., & Dharwadkar, R. (1998). Organizational cynicism. *Academy of Management Review*, 23(2), 341–352. <https://doi.org/10.5465/AMR.1998.533230>
- 39) Dey, BL, Pandit, A., Saren, M., Bhowmick, S., & Woodruffe-Burton, H. (2016). Co-creation of value at the bottom of the pyramid: Analysing Bangladeshi farmers' use of mobile telephony. *Journal of Retailing and Consumer Services*, 29, 40–48. <https://doi.org/10.1016/j.jretconser.2015.10.009>
- 40) Dodd, TH, Laverie, DA, Wilcox, JF, & Duhan, DF (2005). Differential Effects of Experience, Subjective Knowledge, and Objective Knowledge on Sources of Information used in Consumer Wine Purchasing. *Journal of Hospitality and Tourism Research*, 29(1), 3–19. <https://doi.org/10.1177/1096348004267518>
- 41) Eagly, AH, & Chaiken, S. (1993). No Title. In *The psychology of attitudes*. Harcourt brace Jovanovich college publishers.
- 42) Faqih, KMS (2016). An empirical analysis of factors predicting the behavioral intention to adopt Internet shopping technology among non-shoppers in a developing country context: Does gender matter? In *Journal of Retailing and Consumer Services* (Vol. 30, pp. 140–164). <https://doi.org/10.1016/j.jretconser.2016.01.016>
- 43) Faqih, KMS, & Jaradat, M.-IRM (2015). Assessing the moderating effect of gender differences and individualism-collectivism at individual-level on the adoption of mobile commerce technology TAM3 perspective.pdf. *Journal of*

## Intention to Use Induction Electric Stove According to Theory of Trying

- Retailing and Consumer Services 22 (2015) 37–52.
- 44) Faustman, EM, Silbernagel, SM, Fenske, RA, Burbacher, TM, & Ponce, RA (2000). Mechanisms underlying children's susceptibility to environmental toxicants. *Environmental Health Perspectives*, 108(SUPPL. 1), 13–21. <https://doi.org/10.1289/ehp.00108s113>
  - 45) Ferdinand, A. (2006). *Management Research Methods: research guidelines for thesis research, theses and dissertations in management science* (5th Edition). Diponegoro Press University.
  - 46) Fidell, S., Silvati, L., Howe, R., Pearsons, KS, Tabachnick, B., Knopf, RC, Gramann, J., & Buchanan, T. (1996). Effects of aircraft overflights on wilderness recreationists. *The Journal of the Acoustical Society of America*, 100(5), 2909–2918. <https://doi.org/10.1121/1.417102>
  - 47) Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An introduction to Theory and Research*. Addison-Wesley.
  - 48) Ghozali, I. (2008). *Structural Equation Modelling*.
  - 49) Ghozali, I., & Latan, H. (2015). *Partial Least Squares: Concepts, Techniques and Applications of SmartPLS 2.0 M3 for Empirical Research* (2nd Edition). Diponegoro University publishing body.
  - 50) Hair, A., Duffy, K., McLean, J., Taylor, S., Smith, H., Walker, A., Macintyre, IMC, & O'Dwyer, PJ (2000). Groin hernia repair in Scotland. *British Journal of Surgery*, 87(12), 1722–1726. <https://doi.org/10.1046/j.1365-2168.2000.01598.x>
  - 51) Hair, JF, Anderson, RE, Tatham, RL, & Black, WC (1995). *Multivariate data analysis with readings*. NY Prentice Hall.
  - 52) Hair, JF, Black, WC, Babin, BJ, & Anderson, RE (2010). *Multivariate Data Analysis*.
  - 53) Hair, Joe F., Sarstedt, M., Hopkins, L., & Kuppelwieser, VG (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
  - 54) Hasanah, AW, & Handayani, O. (2016). Comparison of Energy Efficiency and Cost of Induction Cookers Against Electric Stoves and Gas Stoves. In *Sutet Scientific Journal* (Vol. 6, Issue 2, pp. 22–29). <https://stt-pln.e-journal.id/sutet/article/view/565>
  - 55) Hinsz, VB, & Ployhart, RE (1998). Trying, intentions, and the processes by which goals influence performance: An empirical test of the theory of goal pursuit. *Journal of Applied Social Psychology*, 28(12), 1051–1066. <https://doi.org/10.1111/j.1559-1816.1998.tb01667.x>
  - 56) Hoyle, RH, & Panter, AT (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*.
  - 57) Hulland, J., Chow, YH, & Lam, S. (1996). Use of causal models in marketing research: A review. *International Journal of Research in Marketing*, 13(2), 181–197. [https://doi.org/10.1016/0167-8116\(96\)00002-X](https://doi.org/10.1016/0167-8116(96)00002-X)
  - 58) Indikator. (2021). COP26, Indonesia Affirms Its Commitment to Overcome Climate Change Indika Energy's commitment is also committed to climate change. 2021. <https://indikator.indikaenergy.co.id/serba-serbi/cop26-indonesia-tegaskan-komitmennya-atasi-dinding-changing-iklim/#:~:text=COP26 is the United Nations%28KTT%29 Summit, ratified it in 2016 in New York.>
  - 59) Jacobson, TA, Kler, JS, Hernke, MT, Braun, RK, Meyer, KC, & Funk, WE (2019). Direct human health risks of increased atmospheric carbon dioxide. *Nature Sustainability*, 2(8), 691–701. <https://doi.org/10.1038/s41893-019-0323-1>
  - 60) Jones, MA, Reynolds, KE, Arnold, MJ, Gabler, CB, Gillison, ST, & Landers, VM (2015). Exploring consumers' attitude towards relationship marketing. *Journal of Services Marketing*, 29(3), 1–40. <https://www.emerald.com/insight/content/doi/10.1108/JSM-04-2014-0134/full/html>
  - 61) Kaushik, AK, & Rahman, Z. (2015). An alternative model of self-service retail technology adoption. *Journal of Services Marketing*, 29(5), 406–420. <https://doi.org/10.1108/JSM-08-2014-0276>
  - 62) Kulas, JT, & Stachowski, AA (2009). Middle category endorsement in odd-numbered Likert response scales: Associated item characteristics, cognitive demands, and preferred meanings. *Journal of Research in Personality*, 43(3), 489–493. <https://doi.org/10.1016/j.jrp.2008.12.005>
  - 63) Laukkanen, T., & Cruz, P. (2009). Comparing consumer resistance to mobile banking in Finland and Portugal. *Communications in Computer and Information Science*, 48, 89–98. [https://doi.org/10.1007/978-3-642-05197-5\\_6](https://doi.org/10.1007/978-3-642-05197-5_6)
  - 64) Laukkanen, T., & Kiviniemi, V. (2010). The role of information in mobile banking resistance. *International Journal of Bank Marketing*, 28(5), 372–388. <https://doi.org/10.1108/02652321011064890>
  - 65) Lee, CBP, & Wan, G. (2010). Including Subjective Norm and Technology Trust in the Technology Acceptance Model: A Case of E-Ticketing in China. *Data Base for Advances in Information Systems*, 41(4), 40–51. <https://doi.org/10.1145/1899639.1899642>
  - 66) Lu, J., Liu, C., Yu, CS, & Wang, K. (2008). Determinants of accepted wireless mobile data services in China. *Information*

## Intention to Use Induction Electric Stove According to Theory of Trying

- and Management, 45(1), 52–64. <https://doi.org/10.1016/j.im.2007.11.002>
- 67) MacKenzie, SB (2001). Opportunities for improving consumer research through latent variable structural equation modeling. *Journal of Consumer Research*, 28(1), 159–166. <https://doi.org/10.1086/321954>
  - 68) Mada, G. (2018). Trying To Buy a New Product: What Does Advertising Do Nowadays? *Asia Pacific Journal of Advanced Business and Social Studies*, 4(1), 352–262. <https://doi.org/10.25275/apjabssv4i1ss10>
  - 69) Malik, S., Nawaz, F., Shujahat, M., Kianto, A., Hussain, S., & Ali, M. (2019). The determinants of the online banking adoption behavior by the theory of trying in developing countries: The case of Pakistani banks. *Knowledge Management and E-Learning*, 11(2), 247–261. <https://doi.org/10.34105/j.kmel.2019.11.013>
  - 70) ESDM Energy and Mineral Resources Data and Information Center. (2020). Inventory of GHG Emissions in the Energy Sector.
  - 71) Regoli, RM (1976). No Title. The Effects of College Education on Maintenance of Police Cynicism.
  - 72) Riduwan, Buchari Alma, H., & Akdon. (2006). Formulas and data in statistical applications: for research (Educational-Business-Government-Social-Policy-Economic-Law-Management-Health). Alfabeta.
  - 73) Rosenberg, M. (2015). Society and the Adolescent Self-Image. Princeton University Press. <https://doi.org/doi:10.1515/9781400876136>
  - 74) Ruangenergi.com. (2020). Government encouragement.pdf. <https://www.ruangenergi.com/Government-push-pengguna-kompor-induction/>
  - 75) Sandve, A., & Øgaard, T. (2013). Understanding Corporate Social Responsibility Decisions: Testing a Modified Version of the Theory of Trying. *Scandinavian Journal of Hospitality and Tourism*, 13(3), 242–256. <https://doi.org/10.1080/15022250.2013.818188>
  - 76) Santoso, S. (2014). Non Parametric Statistics: Concepts and Applications with SPSS (Revi Edition). Elex Media Komputindo.
  - 77) Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norms and moderating effects. *Information and Management*, 44(1), 90–103. <https://doi.org/10.1016/j.im.2006.10.007>
  - 78) Shaw, ME, & Wright, JM (1967). Scales for the measurement of attitudes. McGraw-Hill.
  - 79) Sihombing, SO (2004). DISSERTATION ON RELATIONSHIP ATTITUDE AND BEHAVIOR OF SELECTING A BRAND : COMPARISON BETWEEN THEORY OF PLANNED BEHAVIOR AND By : Sabrina Oktoria Sihombing.
  - 80) Steenkamp, J.-BEM, & Baumgartner, H. (1998). Assessing Measurement Invariance in. *Journal of Consumer Research*, 25(1), 78–107.
  - 81) Subekti, L. (2012). Effect of power factor improvement on induction cooker performance. 2012(semnasIF), 59–66.
  - 82) Sugiyono. (2013). Educational Research Methods Quantitative, Qualitative and R&D Approaches.
  - 83) Suroso, A. (2009). Testing Theory of Trying in the Context of Higher Level Goals and Lower Level Goals.pdf. *Management Application Journal* 7.
  - 84) Tan, SJ, & Tan, KL (2007). Antecedents and consequences of skepticism toward health claims: An empirical investigation of Singaporean consumers. *Journal of Marketing Communications*, 13(1), 59–82.
  - 85) <https://doi.org/10.1080/13527260600963711>
  - 86) Taylor, SD, Bagozzi, RP, & Gaither, CA (2001). Gender Differences in the Self-Regulation of Hypertension. *Journal of Behavioral Medicine*, 24(5), 469–487. <https://doi.org/10.1023/A:1012223627324>
  - 87) Wagner, G., Schramm-Klein, H., & Steinmann, S. (2016). Consumers' attitudes and intentions toward Internet-enabled TV shopping. *Journal of Retailing and Consumer Services*, 34, 278–286. <https://doi.org/10.1016/j.jretconser.2016.01.010>
  - 88) Xie, C. (2008). Trying to prosume: *Journal of the Academy of Marketing Science*, 1, 109–122.
  - 89) Xie, C., Bagozzi, RP, & Troye, SV (2008). Trying to prosume: Toward a theory of consumers as co-creators of value. *Journal of the Academy of Marketing Science*, 36(1), 109–122. <https://doi.org/10.1007/s11747-007-0060-2>
  - 90) Yousafzai, SY, Foxall, GR, & Pallister, JG (2007a). Technology acceptance: a meta-analysis of the TAM: Part 1. In *Journal of Modeling in Management* (Vol. 2, Issue 3). <https://doi.org/10.1108/17465660710834453>
  - 91) Yousafzai, SY, Foxall, GR, & Pallister, JG (2007b). Technology acceptance: a meta-analysis of the TAM: Part 2. *Journal of Modeling in Management*, 2(3), 281–304. <https://doi.org/10.1108/17465660710834462>
  - 92) Zaza, I., & Junglas, I. (2016). IT self-service engagement: A theory of trying perspective. 2016 International Conference on Information Systems, ICIS 2016, 1–21.
  - 93) Zhang, L., Zhu, J., & Liu, Q. (2012). A meta-analysis of mobile commerce adoption and the moderating effect of culture. *Computers in Human Behavior*, 28(5), 1902–1911. <https://doi.org/10.1016/j.chb.2012.05.008>

**Intention to Use Induction Electric Stove According to Theory of Trying**

**ATTACHMENT**

**Attachment1**

**QUESTIONNAIRE**

**INTENTION TO USE INDUCTION ELECTRIC STOVE ACCORDING TO THEORY OF TRYING**

**Respondent Data**

Gender :	domicile	Age :	Status	Education	Work :	PLN subscription power:
<input type="checkbox"/> Man <input type="checkbox"/> Woman	<input type="checkbox"/> Nanggroe Aceh Darussalam <input type="checkbox"/> North Sumatra <input type="checkbox"/> etc	<input type="checkbox"/> 18 – 26 years <input type="checkbox"/> 27 – 35 years <input type="checkbox"/> 36 – 44 years <input type="checkbox"/> 45 – 53 years <input type="checkbox"/> > 54 years	<input type="checkbox"/> Marry <input type="checkbox"/> Not married	<input type="checkbox"/> SD / equivalent <input type="checkbox"/> Junior High School/equivalent <input type="checkbox"/> SMA / equivalent <input type="checkbox"/> S1/ Equivalent <input type="checkbox"/> S2/ equivalent <input type="checkbox"/> S3/ equivalent <input type="checkbox"/> other	<input type="checkbox"/> students <input type="checkbox"/> ASN/PNS <input type="checkbox"/> private employees <input type="checkbox"/> freelancer <input type="checkbox"/> self-employed <input type="checkbox"/> other	<input type="checkbox"/> 450 VA <input type="checkbox"/> 900VA <input type="checkbox"/> 1300 VA <input type="checkbox"/> 2200 VA <input type="checkbox"/> above 3500 VA

- Do you know about Induction Electric Stoves? (Yes No)
- PLN Subscription Power Requirements To try or use a minimum 3500 VA induction electric stove, do you plan to increase the PLN subscription power to a minimum of 3500 VA someday? (Yes No)
- If you are NOT willing to increase PLN's subscription power, please provide information on the reason?  
 .....  
 .....
- If you are not willing to add to your PLN subscription power of at least 3500 VA, there is no need to continue this questionnaire.

**Description of how to fill:**

Give a signVfor each of these statements according to the facts that you know or feel in the ASSESSMENT column:

**A. General self-confidence**

No	STATEMENT	EVALUATION						
(1) Strongly Disagree (4) Undecided (7) Strongly Agree (2) Disagree (5) Somewhat Agree (3) Somewhat Disagree (6) Agree								
1	I feel able to handle myself in most social situations							
2	I am seldom afraid that my actions will cause others to have a low opinion of me							

**Intention to Use Induction Electric Stove According to Theory of Trying**

3	I am confident to enter a room where others have gathered to strike up a conversation.								
4	In group discussions, I usually feel that my opinion is well received								
5	I make a good first impression on others								
6	When dealing with a group of strangers, my first reaction is always embarrassment								
7	I feel normal when I accidentally go to a formal event with inappropriate clothes								
8	I don't spend a lot of time worrying about what people think of me								
9	When in a group, I am very confident in expressing opinions								
10	I am never at a loss for words when I am introduced to someone								

**B. Cynicism**

No	STATEMENT	EVALUATION						
<p><b>(1) Strongly Disagree (4) Undecided (7) Strongly Agree</b>  <b>(2) Disagree (5) Somewhat Agree</b>  <b>(3) Somewhat Disagree (6) Agree</b></p>								
1	I think other people will usually lie about the recognition of other people's success							
2	People claim to have ethical standards of honesty/morality, but few adhere to those ethical standards when it comes to money							
3	People only pretend to care more about each other when in reality it's the other way around							
4	It's sad to see selfless people in today's world when so many people are just taking advantage of it							

**Intention to Use Induction Electric Stove According to Theory of Trying**

5	Most people only stick out for themselves							
6	Most people at heart do not like to put themselves in the shoes of helping others							
7	Most people are dishonest by nature							

**C. Attitude towards success**

No	PERNYATAAN	PENILAIAN		
	<b>(1) Sangat Tidak Menyenangkan</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Menyenangkan</b> <b>(2) Tidak Menyenangkan</b> <b>(5) Agak Menyenangkan</b> <b>(3) Agak Tidak Menyenangkan</b> <b>(6) Menyenangkan</b>			
1	Saya akan mencoba dan bila berhasil menggunakan kompor listrik induksi akan membuat perasaan saya			

No	PERNYATAAN	PENILAIAN		
	<b>(1) Sangat Tidak Baik</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Baik</b> <b>(2) Tidak Baik</b> <b>(5) Agak Baik</b> <b>(3) Agak Tidak Baik</b> <b>(6) Baik</b>			
2	Saya akan mencoba dan bila berhasil menggunakan kompor listrik induksi akan membuat perasaan saya			

No	PERNYATAAN	PENILAIAN		
	<b>(1) Sangat Tidak Bahagia</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Bahagia</b> <b>(2) Tidak Bahagia</b> <b>(5) Agak Bahagia</b> <b>(3) Agak Tidak Bahagia</b> <b>(6) Bahagia</b>			
3	Saya akan mencoba dan bila berhasil menggunakan kompor listrik induksi akan membuat perasaan saya			

**Intention to Use Induction Electric Stove According to Theory of Trying**

**D. Attitude to failure**

No	PERNYATAAN	PENILAIAN					
	<b>(1) Sangat Tidak Menyenangkan</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Menyenangkan</b> <b>(2) Tidak Menyenangkan</b> <b>(5) Agak Menyenangkan</b> <b>(3) Agak Tidak Menyenangkan</b> <b>(6) Menyenangkan</b>						
1	Saya akan mencoba dan bila gagal menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	<b>(1) Sangat Tidak Baik</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Baik</b> <b>(2) Tidak Baik</b> <b>(5) Agak Baik</b> <b>(3) Agak Tidak Baik</b> <b>(6) Baik</b>						
2	Saya akan mencoba dan bila gagal menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	<b>(1) Sangat Tidak Bahagia</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Bahagia</b> <b>(2) Tidak Bahagia</b> <b>(5) Agak Bahagia</b> <b>(3) Agak Tidak Bahagia</b> <b>(6) Bahagia</b>						
3	Saya akan mencoba dan bila gagal menggunakan kompor listrik induksi akan membuat perasaan saya						



**Intention to Use Induction Electric Stove According to Theory of Trying**

**E. Attitude towards learning**

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Menyenangkan    (4) Ragu-ragu    (7) Sangat Menyenangkan (2) Tidak Menyenangkan    (5) Agak Menyenangkan (3) Agak Tidak Menyenangkan    (6) Menyenangkan						
1	Belajar untuk menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Baik    (4) Ragu-ragu    (7) Sangat Baik (2) Tidak Baik    (5) Agak Baik (3) Agak Tidak Baik    (6) Baik						
2	Belajar untuk menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Bahagia    (4) Ragu-ragu    (7) Sangat Bahagia (2) Tidak Bahagia    (5) Agak Bahagia (3) Agak Tidak Bahagia    (6) Bahagia						
3	Belajar untuk menggunakan kompor listrik induksi akan membuat perasaan saya						

**Intention to Use Induction Electric Stove According to Theory of Trying**

**F. Attitudes towards the adoption of induction electric cookers**

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Menyenangkan    (4) Ragu-ragu    (7) Sangat Menyenangkan (2) Tidak Menyenangkan    (5) Agak Menyenangkan (3) Agak Tidak Menyenangkan    (6) Menyenangkan						
1	Seandainya saya menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Baik    (4) Ragu-ragu    (7) Sangat Baik (2) Tidak Baik    (5) Agak Baik (3) Agak Tidak Baik    (6) Baik						
2	Seandainya saya menggunakan kompor listrik induksi akan membuat perasaan saya						

No	PERNYATAAN	PENILAIAN					
	(1) Sangat Tidak Bahagia    (4) Ragu-ragu    (7) Sangat Bahagia (2) Tidak Bahagia    (5) Agak Bahagia (3) Agak Tidak Bahagia    (6) Bahagia						
3	Seandainya saya menggunakan kompor listrik induksi akan membuat perasaan saya						

**Intention to Use Induction Electric Stove According to Theory of Trying**

**G. The intention to adopt an induction electric stove**

No	PERNYATAAN	PENILAIAN					
	<b>(1) Sangat Tidak Setuju</b> <b>(4) Ragu-ragu</b> <b>(7) Sangat Setuju</b> <b>(2) Tidak Setuju</b> <b>(5) Agak Setuju</b> <b>(3) Agak Tidak Setuju</b> <b>(6) Setuju</b>						
1	Saya berencana untuk menggunakan kompor listrik induksi di masa depan.						
2	Kemungkinan besar saya akan menggunakan kompor listrik induksi di masa depan.						
3	Saya pikir lebih baik bagi saya untuk menggunakan kompor listrik induksi.						

## Intention to Use Induction Electric Stove According to Theory of Trying

### Appendix 2 Calculation Results of Phase I

\*\*\*\*\*  
 \* Combined loadings and cross-loadings \*  
 \*\*\*\*\*

	GSC	CYN	AS	AF	AL	AM	IA	Type (a	SE	P value
X1.1	0.583	0.210	0.060	0.032	0.604	-0.613	-0.054	Reflect	0.078	<0.001
X1.2	0.595	-0.104	0.403	0.098	0.215	-0.576	0.095	Reflect	0.078	<0.001
X1.3	0.748	-0.029	-0.004	0.003	0.360	-0.242	-0.027	Reflect	0.075	<0.001
X1.4	0.619	0.204	0.107	-0.247	0.397	-0.667	-0.095	Reflect	0.077	<0.001
X1.5	0.789	-0.000	0.044	0.030	-0.063	0.120	-0.002	Reflect	0.074	<0.001
X1.6	0.822	-0.067	-0.172	0.108	-0.102	0.320	-0.061	Reflect	0.073	<0.001
X1.7	0.098	0.015	-0.417	0.257	-0.457	0.678	0.089	Reflect	0.088	0.134
X1.8	0.651	0.010	0.010	-0.091	-0.247	0.195	0.139	Reflect	0.077	<0.001
X1.9	0.830	-0.104	-0.236	-0.078	-0.276	0.336	0.140	Reflect	0.073	<0.001
X1.10	0.862	-0.035	-0.002	0.070	-0.494	0.538	-0.127	Reflect	0.073	<0.001
X2.1	0.254	0.641	-0.037	0.097	-0.258	0.336	-0.296	Reflect	0.077	<0.001
X2.2	-0.108	0.656	0.572	0.099	-0.256	-0.092	-0.095	Reflect	0.077	<0.001
X2.3	-0.119	0.815	-0.129	0.020	-0.131	0.381	0.006	Reflect	0.074	<0.001
X2.4	0.098	0.720	0.181	-0.128	-0.046	-0.120	-0.045	Reflect	0.075	<0.001
X2.5	0.024	0.845	0.117	-0.110	0.141	-0.333	0.103	Reflect	0.073	<0.001
X2.6	-0.085	0.812	-0.263	0.034	0.114	0.012	0.201	Reflect	0.074	<0.001
X2.7	-0.024	0.683	-0.383	0.020	0.384	-0.158	0.043	Reflect	0.076	<0.001
Y1.1	-0.014	-0.005	0.981	-0.013	0.052	-0.024	0.047	Reflect	0.071	<0.001
Y1.2	-0.002	-0.015	0.981	0.053	-0.091	0.065	-0.055	Reflect	0.071	<0.001
Y1.3	0.017	0.020	0.970	-0.040	0.040	-0.042	0.008	Reflect	0.071	<0.001
Y2.1	0.021	0.030	-0.064	0.948	-0.052	0.131	0.020	Reflect	0.071	<0.001
Y2.2	-0.017	0.001	0.043	0.980	-0.082	0.024	0.029	Reflect	0.071	<0.001
Y2.3	-0.003	-0.031	0.020	0.970	0.133	-0.152	-0.049	Reflect	0.071	<0.001
Y3.1	-0.004	-0.012	0.051	0.039	0.945	0.034	-0.065	Reflect	0.071	<0.001
Y3.2	0.026	0.011	-0.000	-0.006	0.970	0.078	0.016	Reflect	0.071	<0.001
Y3.3	-0.022	0.001	-0.050	-0.032	0.962	-0.112	0.048	Reflect	0.071	<0.001
Y4.1	-0.034	-0.007	-0.001	0.069	-0.043	0.932	-0.131	Reflect	0.072	<0.001
Y4.2	-0.006	0.012	-0.053	-0.047	0.069	0.959	-0.012	Reflect	0.071	<0.001
Y4.3	0.040	-0.005	0.054	-0.021	-0.027	0.948	0.141	Reflect	0.071	<0.001
Y5.1	-0.029	0.008	0.097	-0.009	-0.022	-0.204	0.969	Reflect	0.071	<0.001
Y5.2	0.002	0.019	0.095	-0.020	0.012	-0.243	0.970	Reflect	0.071	<0.001
Y5.3	0.031	-0.031	-0.214	0.032	0.011	0.500	0.866	Reflect	0.073	<0.001

Notes: Loadings are unrotated and cross-loadings are oblique-rotated. SEs and P values are for loadings. P values < 0.05 are desirable for reflective indicators.

## Intention to Use Induction Electric Stove According to Theory of Trying

### Appendix 3 Calculation Results of Phase II

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*****
* Combined loadings and cross-loadings *
*****
```

	GSC	CYN	AS	AF	AL	AM	IA	Type (a	SE	P value
X1.1	0.586	0.210	0.039	0.043	0.560	-0.557	-0.054	Reflect	0.078	<0.001
X1.2	0.596	-0.104	0.399	0.100	0.214	-0.573	0.096	Reflect	0.078	<0.001
X1.3	0.746	-0.030	0.007	-0.003	0.396	-0.286	-0.025	Reflect	0.075	<0.001
X1.4	0.618	0.203	0.114	-0.251	0.425	-0.701	-0.093	Reflect	0.077	<0.001
X1.5	0.791	0.000	0.022	0.042	-0.110	0.180	-0.002	Reflect	0.074	<0.001
X1.6	0.823	-0.067	-0.185	0.116	-0.126	0.351	-0.060	Reflect	0.073	<0.001
X1.8	0.650	0.010	0.010	-0.091	-0.240	0.187	0.141	Reflect	0.077	<0.001
X1.9	0.829	-0.104	-0.243	-0.073	-0.284	0.348	0.141	Reflect	0.073	<0.001
X1.10	0.861	-0.035	-0.009	0.074	-0.502	0.550	-0.125	Reflect	0.073	<0.001
X2.1	0.249	0.641	-0.029	0.093	-0.234	0.306	-0.295	Reflect	0.077	<0.001
X2.2	-0.091	0.656	0.541	0.116	-0.335	0.007	-0.097	Reflect	0.077	<0.001
X2.3	-0.130	0.815	-0.109	0.009	-0.081	0.317	0.007	Reflect	0.074	<0.001
X2.4	0.103	0.720	0.171	-0.122	-0.072	-0.088	-0.045	Reflect	0.075	<0.001
X2.5	0.031	0.845	0.103	-0.102	0.107	-0.290	0.103	Reflect	0.073	<0.001
X2.6	-0.092	0.812	-0.250	0.027	0.143	-0.025	0.201	Reflect	0.074	<0.001
X2.7	-0.030	0.683	-0.372	0.014	0.410	-0.190	0.044	Reflect	0.076	<0.001
Y1.1	-0.015	-0.005	0.981	-0.014	0.055	-0.027	0.047	Reflect	0.071	<0.001
Y1.2	-0.003	-0.015	0.981	0.052	-0.089	0.063	-0.055	Reflect	0.071	<0.001
Y1.3	0.018	0.020	0.970	-0.039	0.035	-0.036	0.008	Reflect	0.071	<0.001
Y2.1	0.017	0.030	-0.057	0.948	-0.032	0.106	0.021	Reflect	0.071	<0.001
Y2.2	-0.016	0.001	0.041	0.980	-0.086	0.029	0.029	Reflect	0.071	<0.001
Y2.3	-0.000	-0.030	0.014	0.970	0.118	-0.133	-0.050	Reflect	0.071	<0.001
Y3.1	-0.003	-0.012	0.049	0.041	0.945	0.042	-0.065	Reflect	0.071	<0.001
Y3.2	0.025	0.011	0.000	-0.006	0.970	0.077	0.016	Reflect	0.071	<0.001
Y3.3	-0.023	0.001	-0.048	-0.034	0.962	-0.119	0.048	Reflect	0.071	<0.001
Y4.1	-0.033	-0.007	-0.002	0.070	-0.046	0.932	-0.131	Reflect	0.072	<0.001
Y4.2	-0.006	0.012	-0.053	-0.047	0.068	0.959	-0.012	Reflect	0.071	<0.001
Y4.3	0.039	-0.005	0.055	-0.021	-0.024	0.948	0.141	Reflect	0.071	<0.001
Y5.1	-0.028	0.009	0.095	-0.008	-0.027	-0.197	0.969	Reflect	0.071	<0.001
Y5.2	0.002	0.019	0.095	-0.020	0.012	-0.243	0.970	Reflect	0.071	<0.001
Y5.3	0.030	-0.031	-0.212	0.031	0.016	0.493	0.866	Reflect	0.073	<0.001

Notes: Loadings are unrotated and cross-loadings are oblique-rotated. SEs and P values are for loadings. P values < 0.05 are desirable for reflective indicators.

#### Average variances extracted

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GSC	CYN	AS	AF	AL	AM	IA
0.532	0.552	0.955	0.934	0.920	0.897	0.877

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Correlations among l.vs. with sq. rts. of AVEs

-----

	GSC	CYN	AS	AF	AL	AM	IA
GSC	0.730	-0.054	0.513	-0.098	0.501	0.494	0.352
CYN	-0.054	0.743	-0.044	0.198	-0.009	-0.037	0.033
AS	0.513	-0.044	0.977	-0.203	0.800	0.799	0.611
AF	-0.098	0.198	-0.203	0.966	-0.158	-0.194	0.016
AL	0.501	-0.009	0.800	-0.158	0.959	0.848	0.517
AM	0.494	-0.037	0.799	-0.194	0.848	0.947	0.619
IA	0.352	0.033	0.611	0.016	0.517	0.619	0.936

Note: Square roots of average variances extracted (AVEs) shown on diagonal.

Q-squared coefficients

-----

GSC	CYN	AS	AF	AL	AM	IA
		0.345	0.076	0.335	0.808	0.398

Composite reliability coefficients

-----

GSC	CYN	AS	AF	AL	AM	IA
0.909	0.895	0.985	0.977	0.972	0.963	0.955

Cronbach's alpha coefficients

-----

GSC	CYN	AS	AF	AL	AM	IA
0.886	0.862	0.977	0.965	0.956	0.942	0.928

### Intention to Use Induction Electric Stove According to Theory of Trying

\*\*\*\*\*  
 \* Indicator weights \*  
 \*\*\*\*\*

	GSC	CYN	AS	AF	AL	AM	IA	Type (a	SE	P value	VIF	WLS	ES
X1.1	0.122	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.087	0.081	1.852	1	0.072
X1.2	0.124	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.087	0.078	1.642	1	0.074
X1.3	0.156	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.037	1.818	1	0.116
X1.4	0.129	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.087	0.070	1.643	1	0.080
X1.5	0.165	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.029	2.519	1	0.131
X1.6	0.172	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.024	2.729	1	0.141
X1.8	0.136	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.087	0.061	1.819	1	0.088
X1.9	0.173	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.023	3.077	1	0.143
X1.10	0.180	0.000	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.019	3.761	1	0.155
X2.1	0.000	0.166	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.028	1.440	1	0.107
X2.2	0.000	0.170	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.026	1.684	1	0.111
X2.3	0.000	0.211	0.000	0.000	0.000	0.000	0.000	Reflect	0.085	0.007	2.295	1	0.172
X2.4	0.000	0.186	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.016	1.958	1	0.134
X2.5	0.000	0.219	0.000	0.000	0.000	0.000	0.000	Reflect	0.085	0.006	2.738	1	0.185
X2.6	0.000	0.210	0.000	0.000	0.000	0.000	0.000	Reflect	0.085	0.008	2.731	1	0.171
X2.7	0.000	0.177	0.000	0.000	0.000	0.000	0.000	Reflect	0.086	0.021	2.037	1	0.121
Y1.1	0.000	0.000	0.342	0.000	0.000	0.000	0.000	Reflect	0.083	<0.001	12.720	1	0.336
Y1.2	0.000	0.000	0.342	0.000	0.000	0.000	0.000	Reflect	0.083	<0.001	12.900	1	0.336
Y1.3	0.000	0.000	0.338	0.000	0.000	0.000	0.000	Reflect	0.083	<0.001	7.785	1	0.328
Y2.1	0.000	0.000	0.000	0.338	0.000	0.000	0.000	Reflect	0.083	<0.001	4.881	1	0.321
Y2.2	0.000	0.000	0.000	0.350	0.000	0.000	0.000	Reflect	0.082	<0.001	12.899	1	0.343
Y2.3	0.000	0.000	0.000	0.346	0.000	0.000	0.000	Reflect	0.083	<0.001	10.399	1	0.336
Y3.1	0.000	0.000	0.000	0.000	0.343	0.000	0.000	Reflect	0.083	<0.001	4.467	1	0.324
Y3.2	0.000	0.000	0.000	0.000	0.351	0.000	0.000	Reflect	0.082	<0.001	7.785	1	0.341
Y3.3	0.000	0.000	0.000	0.000	0.349	0.000	0.000	Reflect	0.082	<0.001	6.726	1	0.335
Y4.1	0.000	0.000	0.000	0.000	0.000	0.347	0.000	Reflect	0.083	<0.001	3.679	1	0.323
Y4.2	0.000	0.000	0.000	0.000	0.000	0.357	0.000	Reflect	0.082	<0.001	5.707	1	0.342
Y4.3	0.000	0.000	0.000	0.000	0.000	0.353	0.000	Reflect	0.082	<0.001	4.872	1	0.334
Y5.1	0.000	0.000	0.000	0.000	0.000	0.000	0.369	Reflect	0.082	<0.001	25.376	1	0.357
Y5.2	0.000	0.000	0.000	0.000	0.000	0.000	0.369	Reflect	0.082	<0.001	25.435	1	0.357
Y5.3	0.000	0.000	0.000	0.000	0.000	0.000	0.329	Reflect	0.083	<0.001	2.156	1	0.285

Notes: P values < 0.05 and VIFs < 2.5 are desirable for formative indicators; VIF = indicator variance inflation factor;  
 WLS = indicator weight-loading sign (-1 = Simpson's paradox in l.v.); ES = indicator effect size.

## Intention to Use Induction Electric Stove According to Theory of Trying

	GSC	CYN	AS	AF	AL	AM	IA
R-squared			0.345	0.064	0.247	0.808	0.395
Adj. R-squared			0.334	0.048	0.235	0.803	0.390
Composite reliab.	0.909	0.895	0.985	0.977	0.972	0.963	0.955
Cronbach's alpha	0.886	0.862	0.977	0.965	0.956	0.942	0.928
Avg. var. extrac.	0.532	0.552	0.955	0.934	0.920	0.897	0.877
Full collin. VIF	1.413	1.048	3.691	1.133	4.339	4.666	1.842
Q-squared			0.345	0.076	0.335	0.808	0.398
Min	-3.140	-2.334	-4.407	-1.578	-4.488	-1.867	-3.158
Max	1.489	2.464	1.078	2.315	1.099	1.165	0.991
Median	0.163	0.035	0.164	0.257	0.168	0.154	0.100
Mode	1.489	0.065	0.164	0.368	0.168	1.165	0.991
Skewness	-0.307	-0.183	-1.051	0.164	-1.029	-0.460	-0.878
Exc. kurtosis	-0.369	0.088	1.754	-0.384	1.895	-0.812	-0.032
Unimodal-RS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unimodal-KMV	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Normal-JB	Yes	Yes	No	Yes	No	No	No
Normal-RJB	Yes	Yes	No	Yes	No	Yes	No
Histogram	View	View	View	View	View	View	View

Notes: Unimodal-RS = Rohatgi-Székely test of unimodality; Unimodal-KMV = Klaassen-Mokveld-van Es test of unimodality; Normal-JB = Jarque-Bera test of normality; Normal-RJB = robust Jarque-Bera test of normality; click on "View" cell to see corresponding histogram.



## Intention to Use Induction Electric Stove According to Theory of Trying

### Model fit and quality indices

-----

Average path coefficient (APC)=0.329,  $P<0.001$

Average R-squared (ARS)=0.372,  $P<0.001$

Average adjusted R-squared (AARS)=0.362,  $P<0.001$

Average block VIF (AVIF)=1.498, acceptable if  $\leq 5$ , ideally  $\leq 3.3$

Average full collinearity VIF (AFVIF)=2.591, acceptable if  $\leq 5$ , ideally  $\leq 3.3$

Tenenhaus GoF (GoF)=0.549, small  $\geq 0.1$ , medium  $\geq 0.25$ , large  $\geq 0.36$

Sympson's paradox ratio (SPR)=0.800, acceptable if  $\geq 0.7$ , ideally = 1

R-squared contribution ratio (RSCR)=0.969, acceptable if  $\geq 0.9$ , ideally = 1

Statistical suppression ratio (SSR)=1.000, acceptable if  $\geq 0.7$

Nonlinear bivariate causality direction ratio (NLBCDR)=0.900, acceptable if  $\geq 0.7$

### Intention to Use Induction Electric Stove According to Theory of Trying

```

*****
* Path coefficients and P values *
*****

Path coefficients
-----

      GSC   CYN   AS    AF    AL    AM    IA

AS    0.528 -0.133
AF    -0.147 0.186
AL    0.517 0.143
AM                0.370 0.034 0.600
IA                                0.628

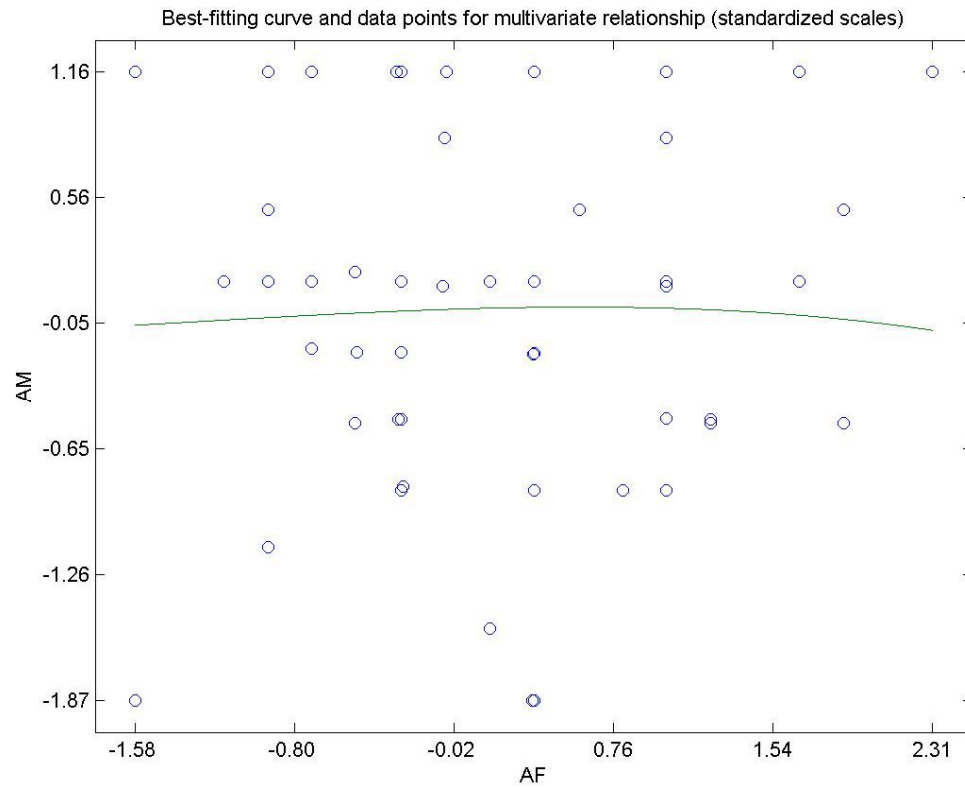
P values
-----

      GSC   CYN   AS    AF    AL    AM    IA

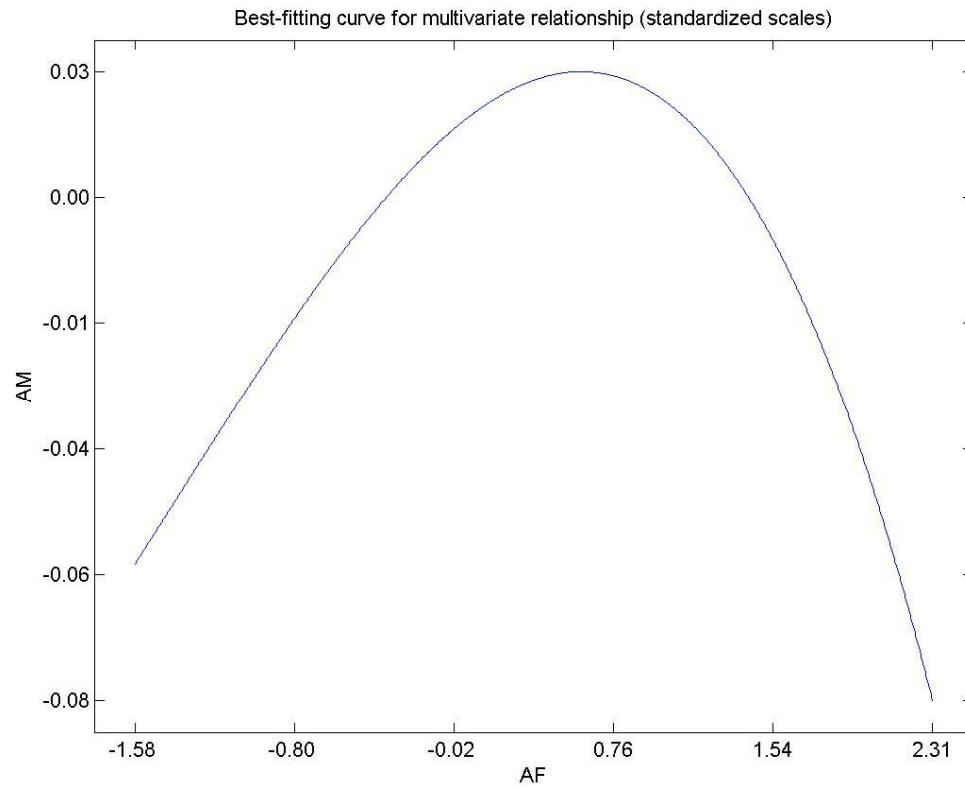
AS    <0.001 0.064
AF    0.046 0.016
AL    <0.001 0.051
AM                <0.001 0.353 <0.001
IA                                <0.001

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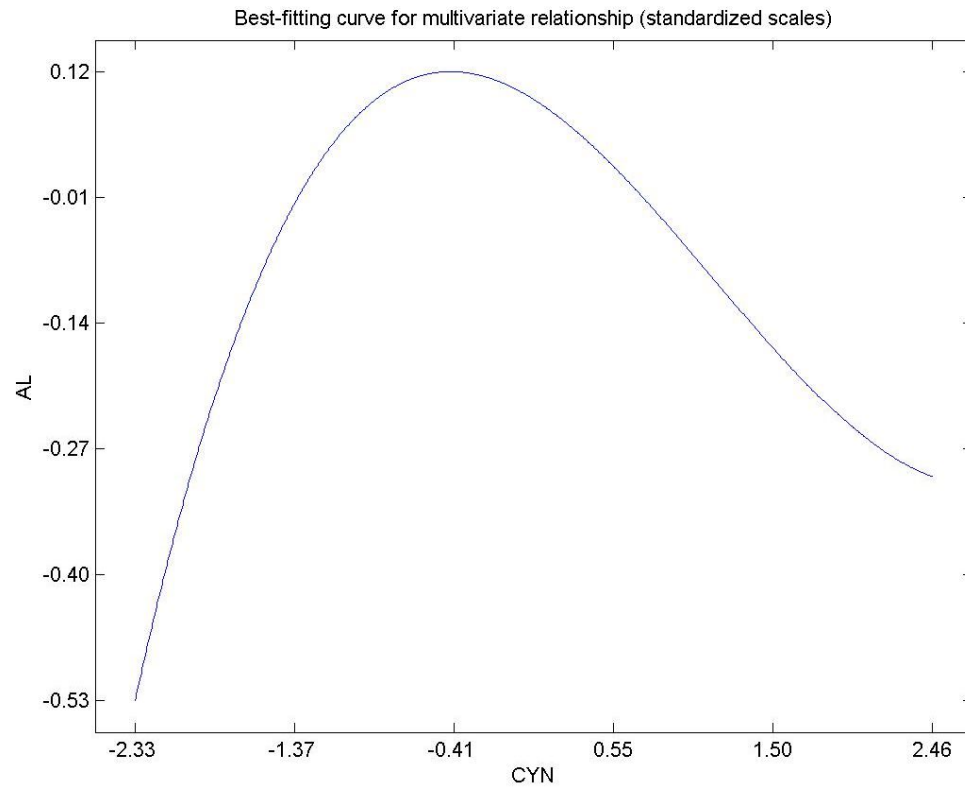
## Intention to Use Induction Electric Stove According to Theory of Trying



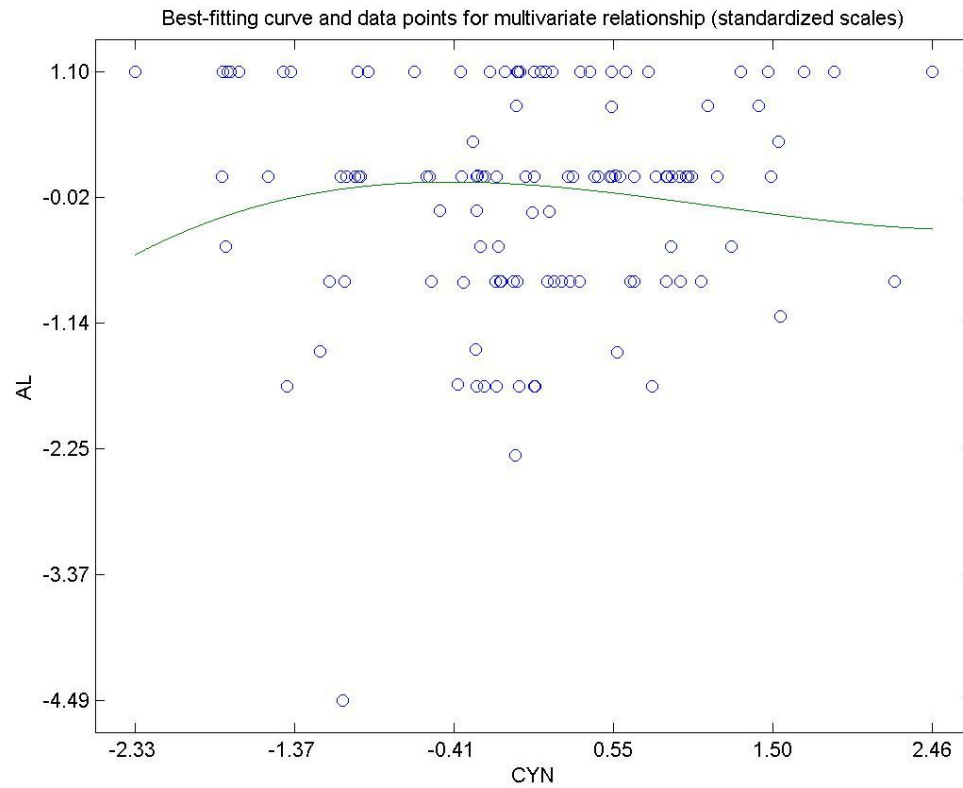
## Intention to Use Induction Electric Stove According to Theory of Trying



### Intention to Use Induction Electric Stove According to Theory of Trying



## Intention to Use Induction Electric Stove According to Theory of Trying



### R-squared coefficients

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GSC	CYN	AS	AF	AL	AM	IA
		0.345	0.064	0.247	0.808	0.395

## The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan



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**ABSTRACT:** Everyone should prioritize their education extremely highly. A person's mindset can shift for the better due to it. E-learning makes it easier for teachers to provide learning materials and for students to access learning materials. The research objective revealed in this study was to develop e-learning with Moodle as a learning medium that can be done and accessed whenever and wherever. E-learning can be done and accessed whenever and wherever. Several kinds of studies on development. The end goal of development research is either the creation of brand-new items or the improvement of current ones. Developing, designing, and evaluating research are all part of the research process. This particular research utilized a total population of 65 students, of which only 30 were randomly selected to participate in the sample. According to the research findings, the validity of the moodle-based E-Learning Platform Validity Test based on material expert validation was determined to be 0.78 percent, while the validity of the test based on media validation was found to be 0.96 percent. Based on these findings, it is possible to conclude that the e-Learning platform might be implemented in vocational high schools.

**KEYWORDS:** Development, E-learning Platform, Vocational High Schools

### INTRODUCTION

Everyone should make getting an education a very high priority in their lives. Because of it, a person's frame of mind could improve positively. To phrase this another way, both the Constitution of 1945 and the National Education Law state that is acquiring an education is necessary for the growth of a person who possesses a noble and dignified character. This is the case because education is fundamental to the development of a human being. Because of this, the education problem is a local concern whose repercussions are experienced nationally and, in the long run, define the course our nation's future will take (Suswanto:2017). To facilitate the education and learning process, computer technology and the internet provide opportunities and choices for those involved in the field. This is a natural consequence of the proliferation of ever-more sophisticated technological capabilities. One of the applications that the learning management system can support is known more popularly as "E-Learning," which stands for electronic learning. (Hidayatulah:2015). It is anticipated that using e-learning in the learning process will be an alternative to learning independence learning as it enables teaching students to seek and learn broad knowledge in the internet world. This is because using E-learning allows teaching students to seek and learn broad knowledge in the internet world. Students can express their originality while expanding their knowledge through e-learning (Irfan & Apriani:2017).

In preparation for the imminent transition of the educational system to digital universities in Indonesia, several of the country's institutions have begun implementing the mobile learning management system, commonly known as M-LMS. The utilization of various learning gadgets as extra tools to improve students' academic performance is feasible thanks to the advent of mobile learning management systems in educational environments. There is an almost unanimous consensus that M-LMS has a favorable impact on the instruction that takes place in the classroom. Establishing a centralized mobile learning platform based on a web browser will hasten the availability of information storage, the dissemination of information via peer collaboration, and the participation in online courses throughout the entire learning community (Rini:2020). However, the teaching and learning process has only occurred between teachers and pupils during regular school hours; there has been no further connection outside those hours. Up until this moment, there has been no other link. Students who are unable to attend class will surely find that they are unable to keep up with the information that is offered in class as well as the subject that is covered

## **The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan**

in class. Sometimes the information is communicated regarding the schedule of quizzes, daily assessments, or assignments, which can cause inefficiency in teaching and learning because it prevents proper effectiveness from being established.

Other times, the information that is communicated is about something completely different. As a direct consequence of the inquiry, resources such as the Internet are now available, although they have not been utilized to the extent they could have. Researchers are working to provide an alternative by producing E-Learning media that can deliver education to students in a manner that is more engaging and straightforward for them to access. This is done with the expectation that pupils would be inspired to study and perform admirably in terms of their ability to absorb what they are being taught. This way of instructing students is becoming increasingly popular in today's society. In the modern world, it is anticipated that instructors will be able to use various technological tools to improve their pupils' educational experiences (Rini:2018).

Instructing and being instructed do not call for a particular setting or period but rather for adaptability and the ability to take place anywhere and at any time. Rather than requiring a specific setting or period, instructing and being instructed calls for the ability to take place. Mobile technology is being integrated into educational institutions' classrooms and other learning settings worldwide because it is both evident and unavoidable (Kumar & Chand: 2019). The teaching and learning process does not require a particular time or place; rather, it requires flexibility and the capacity to take place at any location and at any time. The incorporation of mobile technology into the instructional practices of educational institutions worldwide is something that should come as no surprise and cannot be avoided. This has been made possible through the creation of a system that will digitize daily school activities such as the distribution of announcements, the management of subjects taken by students, the posting of upcoming events and reminders such as announced quizzes, tests, and assignments, all while maintaining output efficiencies that positively impact all of the system's users (Vincent:2019)

Learning management systems (LMS), which have become an integral component of the e-learning landscape, have played an increasingly important part in the expanding function of e-learning technologies in higher education. This is especially true of the LMS. Understanding the elements that influence the behavioral intents of students regarding the utilization of LMS is of the utmost relevance, as it is of the utmost need to get a knowledge of those factors. This study aims to analyze the criteria that students at vocational high schools use to predict whether they would enroll in the Portal Course. The findings of this research will be applied to vocational high schools. As a result of the rapid advancements in information and communication technology as well as the results of investments in technological infrastructure in schools, electronic learning, also known as e-learning, is becoming an increasingly important part of the teaching, and learning process across all educational levels, from primary education to higher and post-graduate education. This occurs across all educational levels, from primary to higher and post-graduate. The educational system in Turkey, like the educational systems in all developing nations, has received significant financial investment from a diverse range of institutions and organizations. In Turkey, this is the case. Increasing the overall quality of the online teaching and learning process by utilizing e-learning to increase its overall standard Learning management systems, also abbreviated as LMS, are one type of e-learning technologies that have been implemented in a variety of public and private universities to support either traditional classroom instruction or online instruction. These universities can teach students in traditional classrooms or online (Ozkan:2020). A learning management system called an LMS is a resource management system used in web-based learning media, also known as e-learning. Another name for a learning management system is an LMS. An example of a Web 2.0 application is a learning management system (LMS) such as Moodle or Blackboard. It combines many multimedia resources that may be utilized in various educational activities. Also, it serves as an online platform for group discussions, uploading content, and grading assignments (Cahyana:2021).

Students at SMK Negeri 1 Painan currently utilize several online services, such as Google Classroom, WhatsApp, and Zoom. Using so many different platforms makes it difficult for educational institutions to maintain accurate records of the activities linked with the learning process because there is neither an integrated, computerized, or medium to perform these functions. Therefore, E-Learning is highly suggested as a platform that may assist teachers and students in online and online learning. As a consequence of this, E-Learning comes highly recommended. Pupils have a low level of interest in learning due to the less attractive methods and media employed in the teaching and learning process at school and the restricted amount of face-to-face time between teachers and students throughout this process. The TKJ instructors teaching class X students at SMK Negeri 1 Painan have not utilized integrated e-learning in either online or online learning. Also, there is a limited face-to-face interaction between teachers and students during school teaching and learning. Because of this, implementing an e-learning platform in state vocational high schools is necessary to tap into the full extent of the potential offered by the educational experience.



## The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan

### RESEARCH METHODS

This study was carried out by students in the TKJ class X basic computer and network topics in the school year 2022/2023. The research location, which took place at SMK Negeri 1 Painan, can be found on Jln. Moh. Hatta in Painan, is described here. The time devoted to research was spent during the off semester of 2022–2023. An "informant," which refers to a person who is part of the research backdrop and is utilized to provide information on the circumstances and situations that are part of the research background, is the focus of the investigation.

The kind of research that was carried out fell under the category of development research. Development research aims to create new products or improve ones already on the market. This study's data collection and analysis processes utilized research and development methods. Research and development abbreviated as R&D and more commonly called "development," is a research approach or process robust enough to enhance teaching and learning practices. More specifically, it is necessary to do development research to find solutions to learning challenges associated with certain goods (Tegeh & Kirna:2013) The ADDIE model is the one that was employed for the research. The ADDIE Model, which is one of the systematic learning design models, was the development paradigm that was utilized in the process of developing this instructional content. The decision to go with this model was made after considering that it follows a systematic development process and is founded on the theoretical underpinnings of learning design. This model is set up programmatically, with a systematic sequence of activities, to solve learning problems related to learning resources that follow the learner's requirements and characteristics. This model is arranged programmatically with a systematic sequence of activities. This model consists of five steps, namely: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. This model consists of these five steps: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation (Tegeh & Kirna, 2013: 16). The following image provides a visual representation of each level of the ADDIE Model:

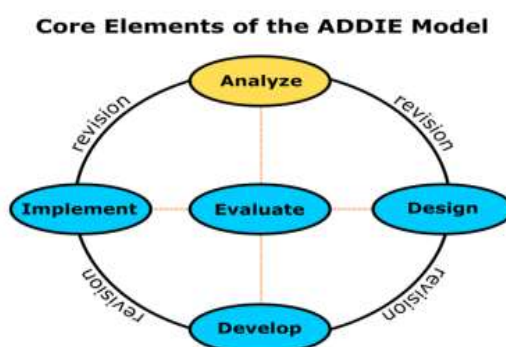


Figure 1. ADDIE Development Model

- a. Analyze Find out what's causing the issues with the learning and the pre-planning that decides or thinks about the topic or course that will be taught.
- b. Design Verification of the intended results or achievements (learning objectives), as well as the determination of the approach or strategy that will be used.
- c. Develop, Create, and verify learning resources, as well as the development of necessary materials and supporting techniques.
- d. Prepare the learning environment and implement learning by involving students Preparation of the learning environment and implementation of learning
- e. Evaluate the overall quality of the product and the teaching process. (Hidayat, 2021:31)

In the course of this investigation, questionnaires were the instrument of choice for carrying out the various data collection procedures. A questionnaire featuring a group of questions. Data collection techniques known as questionnaires consist of posing questions to be answered by respondents and collecting their responses. For this study, it is required to obtain the data set by utilizing appropriate procedures and data sources that can be trusted. A questionnaire is a method for collecting data that provides respondents with either a list of questions or responses. The researchers produced and sent this questionnaire since they are interested in gathering information regarding the new kinds of media currently being developed. This questionnaire is presented directly to respondents to analyze the validity of learning materials, the practicality of the intended learning media for teachers, and the practicality of the developed learning media for students. This investigation was carried out to evaluate the validity of the E-Learning learning media developed using Moodle. This evaluation aimed to determine whether or not the proposed learning media was valid. The Likert scale will be evaluated during this study to determine how effectively

## The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan

it functions. The Likert scale is the scale that is used the most commonly in questionnaires, and it is also the scale that is used the most frequently in research that is carried out in the form of surveys.

### FINDING AND DISCUSSION

The Elearning Platform is the product produced as a result of this research. Researchers built it to be a tool that can be used in the learning process and an independent learning resource that students can use. This research resulted in the production of this product. Elearning Platform. The Research and Development (R&D) Process, founded on the ADDIE Development Model, is being applied to this Research and Development to facilitate its completion. The ADDIE model of product development is comprised of five major stages, which are as follows: First comes the analysis, then the design, then the development, then the implementation, and finally, the evaluation. At this stage of the analysis, it will analyze the needs and problems in materials, learning media, student learning conditions, and basic competencies used when designing learning media using a moodle-based e-learning platform, student learning conditions in class X. In addition, it will analyze the basic competencies used when designing learning media. In particular, it will concentrate on the teaching methods utilized in class X. Learning media is essential to assist teachers in presenting students with the necessary material. This is because students in TKJ are less focused on following the learning process. The first step in the process of developing a learning media product that is based on Moodle is called the Design Stage. The goal of this stage is to produce learning media customized to meet the needs of the students. This stage also serves as the initial design for producing a learning media product.

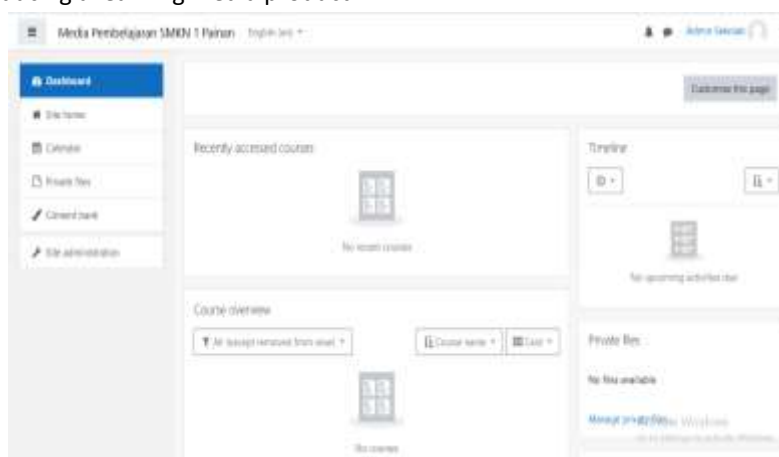


Figure 2. E-learning Dashboard Page

The home site page is a page that displays classes and subjects in E-learning. It can be seen in the following figures:



Figure 3. E-learning home site view

Following that, the process of developing the system was carried out. So, this very first glance develops into an intriguing very first perspective. Figure 1 shows the landing screen that users see when they access eLearning by putting in <https://elearningsmkn1painan.com/moodle>. After checking in to eLearning, users are taken to the dashboard page. This page may be viewed by clicking on the following link.

## The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan

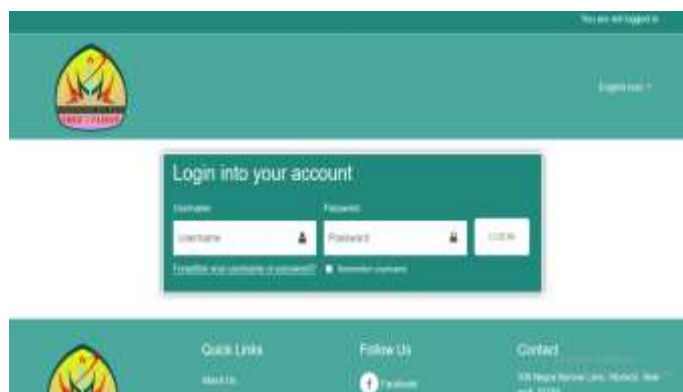


Figure 4. Initial View

This media aims to inquire about the perspectives of knowledgeable media professionals concerning the practicability of educational media. Evaluating e-learning is accomplished by first reviewing the moodle-based e-learning learning media, then delivering a validation questionnaire to the media. However, the questionnaire has many statements comprising three different indicators, namely Display, Interactivity Aspect, and Expediency Aspect. Two different media experts each carry out their independent validation of the learning media experts. The following is a list of the findings about the media's credibility, which may be found in the table below:

Table 1. Media Validity Results

No	Aspek Penilaian	Validator			Jumlah	Hasil Validitas	Kategori
		V1	V2	V3			
1.	Tampilan Media	3,71	3,85	3,14	10,71	0,714	Valid
2.	Kemudahan Penggunaan	3,5	4	4	11,5	0,766	Valid
Total						1,48	
Rata-rata						0,74	Valid

Source: Research Results, 2022 (Data processed)

According to the findings of the research on E-Learning learning media data, Media Display, and Ease of Use conducted by media expert validators, it was declared "valid" because the validity category on learning media 0.667 was declared "valid." In contrast, 0 – 0.666 was declared "invalid." This was based on the table presented earlier, which stated that the findings of media validation values of 0.704 were declared "valid" and suitable for use as learning media. This validation is carried out by looking at the content on the E-Learning learning media and then submitting a validation questionnaire to the content included on the learning media. This validation is being done to elicit subject matter specialists' feedback concerning the practicability of utilizing E-Learning pedagogical tools. Whereas the questionnaire contains several statements, each comprising two indicators, content (material) and instructive.

Table 2. Material Validity Results

No	Aspek Penilaian	Validator			Jumlah	Hasil Validitas	Kategori
		V1	V2	V3			
1.	Isi (Materi)	3,5	4	4	11,5	0,766	Valid
2.	Instruksional	3	3,5	3,25	9,75	0,628	Valid
Jumlah						1,394	
Rata-rata						0,697	Valid

Source: Research results, 2022 (Data processed)

## The Discourse of Development of E-Learning Platform in Vocational High Schools Case Study: SMK Negeri 1 Painan

The results of the material validation values of 0.697 are declared "valid," They are eligible for use as learning media. This is because the validity category of 0.667 is proclaimed "valid," while 0-0.666 is declared "invalid." These conclusions are based on the findings of an analysis of E-Learning learning media on the content (material), as well as the instructional features reviewed by material expert validators. The material expert validators carried out this analysis. Teachers of the Fundamentals of TKJ Expertise and students of Class X TKJ participate in this Practicality Test to determine whether this E-Learning learning medium is utilized in schools. This group is responsible for carrying out the Practicality Test since the objective is to establish whether or not the E-Learning learning medium is practical. Both the questionnaire for teachers and the questionnaire for students have several statements that are composed of a variety of various indicators. Also, both questionnaires contain several statements that are composed of a variety of different indicators. The consequences of the efforts made by the instructors and the students to be as realistic and applicable as possible are presented in the table that can be found below:

**Table 3. Teacher Practicality**

No	Practicality Aspects	(%)	Category
1.	Ease of Use	90	Very Practical
2.	Learning Time Efficiency	80	Very Practical
3.	Attraction	90	Very Practical
4.	Benefit	86,66	Very Practical
<b>Average</b>		86,66	Very Practical

**Source:** Research Results, 2022 (Data processed)

Therefore, the value obtained by the teacher is "Very Practical" because the Practicality category of 81-100% is stated to be "Very Practical". After all, in the table of practicality results, the teacher's response above has a percentage of 86.66% with the category "Very Practical" and is suitable for use as a learning medium. In addition, the value obtained by the teacher is "Very Practical" because the Practicality category of 81-100% is stated to be "Very Practical." In addition, the value that the instructor achieved is "Very Practical" because the Practicality category that was scored between 81 and 100% was claimed to be "Very Practical." To conduct an accurate analysis of how valuable the content of an e-learning course is, it is necessary to collect feedback from students in the form of their responses. After students have received information from absorbing various media, they are given questionnaires to fill out and asked to reflect on their experiences. The compiled findings are presented in the following table, which can be seen down below:

**Table 4. Student Practicality**

No	Practicality Aspects	(%)	Category
1.	Ease of Use	84,147	Very Practical
2.	Learning Time Efficiency	86,89	Very Practical
3.	Attraction	90,57	Very Practical
4.	Benefit	86,72	Very Practical
<b>Average</b>		87,08	Sangat Praktis

**Source:** Research Results, 2022 (Data processed)

It is conceivable to conclude that the E-Learning learning media that has been generated has an average student answer practicality score of 87.08%, which places it in the Very Practical category. This result is reachable because it is possible to draw this conclusion. This conclusion can be reached by examining the table of student replies about their practicality. The goal of this study is to develop an e-learning platform on the subject of fundamental expertise in TKJ for usage at SMKN 1 Painan, which is the intended audience for the findings of this study. The validation findings of the assessment of the entire e-module indicated that the average score with a valid category achieved 0.696 out of a possible 1.000 points by media experts. It is common knowledge that the findings of the validation of the material used for e-learning obtained an average score of 0.697 with a valid category. This information was gathered from the materials.

## CONCLUSION

The information being provided pertains to a subject wholly unrelated to the topic at hand. As a direct result of the investigation, previously unavailable resources such as the Internet are now at the user's disposal; nevertheless, these resources have not

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been utilized to the extent that they potentially could have been. Researchers are working to produce E-Learning material that can educate students in a manner that is more interesting to them and uncomplicated for them to access as a means of providing an alternative that researchers are currently working on. This is done with the hope that students will be encouraged to study and excel academically in terms of their capacity to retain the information they are being taught. This method of teaching students is gaining popularity in today's culture and is expected to continue doing so. It is reasonable to expect that in today's modern world, teachers will be able to make full use of a wide array of technical tools to enhance their students' educational experiences. According to the research findings, the E-learning Platform produced was deemed genuine by material experts 0.708% of the time and by media specialists 0.740% of the time. On the practicality test, 86.66 percent of teachers said that the established e-learning platform was extremely practical, while 87.08 percent of students said it was very practical. The findings of the validity and practicality tests indicate that the E-learning Platform at SMK Negeri 1 Painan should be developed.

### REFERENCES

- 1) Añonuevo, X. R., Nocum, V., Ramiro, C., Baricanosa, R. V., & Prospero, M. R. (2019). Online Learning Management System in Multi-platform Devices. *LPU-Lagura Journal of Engineering and Computer Studies*, 4(2), 47–53.
- 2) Cahyana, U., Janah, F., & Budi, S. (2021). Development of Mobile Learning integrated with Learning Management System (LMS) on Buffer Solutions Topic. *JTK (Jurnal Tadris Kimiya)*, 6(2), 156–166. <https://doi.org/10.15575/jtk.v6i2.13936>
- 3) Hidayat, F., & Muhamad, N. (2021). Model Addie (Analysis, Design, Development, Implementation and Evaluation) dalam Pembelajaran Pendidikan Agama Islam. *JIPAI; Jurnal Inovasi Pendidikan Agama Islam*, 1(1), 28–37. <https://journal.uinsgd.ac.id/index.php/jipai>
- 4) Hidayatulah, A., yushardi, Y., & Wahyuni, S. (2015). Pengembangan Bahan Ajar Berbasis Web Interaktif Dengan Aplikasi E-Learning Moodle Pada Pokok Bahasan Besaran Dan Satuan Di Sma. *Jurnal Pembelajaran Fisika Universitas Jember*, 4(2), 139047.
- 5) Irfan, P., & Apriani. (2017). Implementasi E-Learning Berbasis Website SMA Negeri di Kabupaten Lombok Utara. *Konferensi Nasional Sistem & Informatika*, 6.
- 6) Kumar, B. A., & Chand, S. S. (2019). Mobile learning adoption: A systematic review. *Education and Information Technologies*, 24(1), 471–487. <https://doi.org/10.1007/s10639-018-9783-6>
- 7) Ozkan, U. B., Cigdem, H., & Erdogan, T. (2020). Artificial neural network approach to predict LMS acceptance of vocational school students. *Turkish Online Journal of Distance Education*, 21(3), 156–169. <https://doi.org/10.17718/TOJDE.762045>
- 8) Rini, F., Julinus, N., Rizal, F., & Weay, A. L. (2018). Implementation of mobile learning management system (M-Lms) to improve the effectiveness of student's learning engagement. *Journal of Advanced Research in Dynamical and Control Systems*, 10(13 Special Issue), 857–865.
- 9) Rini, F., Mulyadi, R., Surya, J., & Louis, A. (2020). The Validity of Mobile Learning Management System (M-LMS) at University. *Journal of Computational and Theoretical Nanoscience*, 17(6), 2836–2842. <https://doi.org/10.1166/jctn.2020.8948>
- 10) Suswanto, H., Nidhom, A. M., Nur, A. B., Putra, R., & Hammad, J. A. H. (2017). Developing An LMS-Based Cross-Platform Web Application For Improving Vocational High School Students' Competitiveness In ASEAN Economic Community. *Jurnal Pendidikan Sains*, 5(3), 72–79. <http://journal.um.ac.id/index.php/jps/>
- 11) Tegeh, I. M., & Kirna, I. M. (2013). Pengembangan Bahan Ajar Metode Penelitian Pendidikan dengan ADDIE Model. *Jurnal IKA*, 11(1), 16. <https://ejournal.undiksha.ac.id/index.php/IKA/article/view/1145>



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## The Effect of Outsourcing on Product Quality Dimensions



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**ABSTRACT:** This study aims mainly to show whether outsourcing (manufacturing by others) affects the quality of products. It also shows the most important advantages and disadvantages of outsourcing (manufacturing by others). For this reason, the study was conducted in a number of Iraqi industrial companies. Where the study followed the descriptive analytical approach, the data related to the study was collected through a questionnaire distributed to a sample of department and division managers in those companies, in addition to the work data recorded in the records of the researched companies. For the purpose of obtaining the results, the data obtained through the SPSS program were analyzed and the results were used to determine the quality of the relationship between outsourcing (Manufacturing by others) and the dimensions of product quality in the study sample companies.

**KEYWORDS:** production, outsourcing, quality, product quality.

### INTRODUCTION

Companies are constantly looking for new methods that help them reduce the costs of their products and quickly respond to changes, whether in the manufacturing environment or in the customers' tastes. Cooperation strategies, alliances, contracting, obtaining franchises and other strategies are among the methods used by companies to achieve this, as companies seek through It adopts these strategies to maintain its position in the market or increase the demand for its products.

Outsourcing or manufacturing by others, whether for complete products or parts of them, is an important issue that directly contributes to reducing pressure on companies by eliminating some of the expenses related to the production of products or parts agreed upon to be manufactured by others, and employing these expenses in other products. The company can also benefit from the experience, ability, skills, knowledge, and administrative systems of other companies, which may positively affect its performance. The company may also benefit from the speed provided by manufacturing by others in response to customer demand. On the other hand, there are a number of negatives that accompany the use of manufacturing by others, whether related to quality or delay in receipt.

This study attempts to determine the nature of the relationship between manufacturing by others as an independent variable and the dimensions of quality as a dependent variable through two basic hypotheses and several sub-hypotheses. To test the hypotheses of the study, the data and information necessary to test the hypotheses were collected by referring to the company's records and the field experience of working in the company to cover all aspects of the study.

### THE METHODOLOGICAL FRAMEWORK OF THE STUDY

**1. Study problem:** Iraqi companies seek to compete in the local markets and markets of neighboring countries. Therefore, it is constantly working to build capabilities that differentiate it from its competitors by diversifying its products or quickly switching from one product to another. Hence, the study problem revolves around the following:

**A-** Does the company use the manufacturing method by others in manufacturing its products?

**B-** Is it possible for a company to be used for manufacturing by others to face changes in its industrial environment?

**C-** What is the level of the impact of dependence on manufacturing by others on the dimensions of the quality of the company's products?

**2. Objective of the study:** This study aims, in its theoretical and field aspects, to study the effect of outsourcing in manufacturing on the dimensions of product quality, with the aim of:

**A-** Studying the importance of manufacturing by others in general and the company under study in particular.

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B- The relationship and impact of outsourcing manufacturing resources on the dimensions of the quality of the company's products.

3. **Hypothesis of the study:** The hypothesis of the study reflects the nature of the problem that the research intends to address by clarifying the relationship between the research variables and their impact on each other.

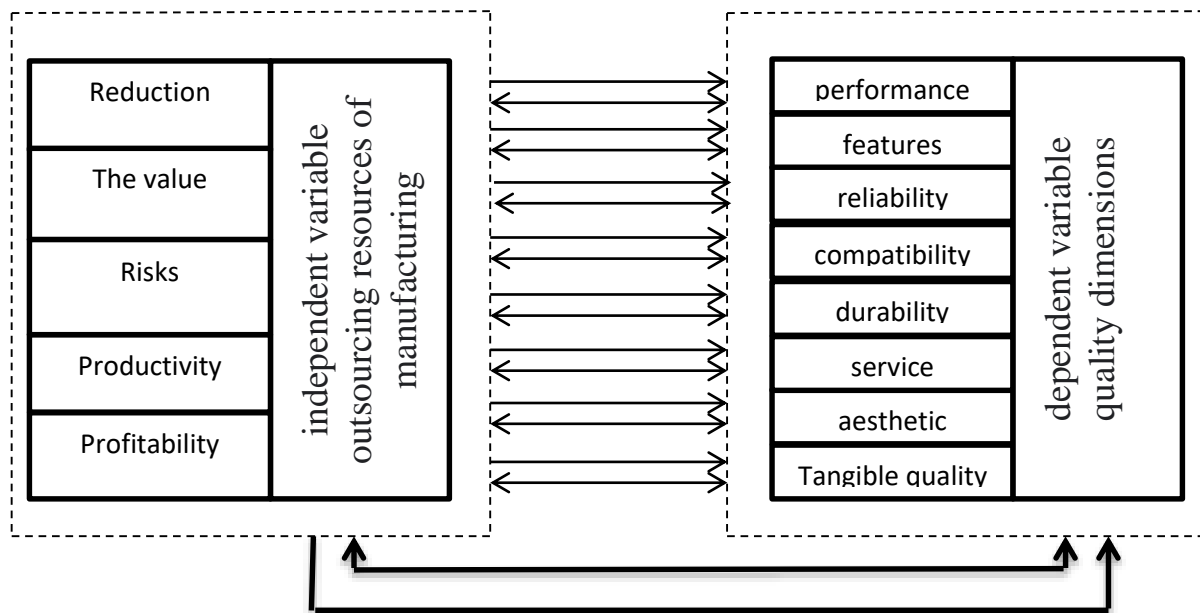


Figure No. 1. Study model

### 4. Study hypotheses

The study hypotheses were formulated as follows:

First: there is a significant correlation between manufacturing using the outsourcing method or manufacturing by others, and the dimensions of product quality.

Second: The second Hypothesis: There is a significant effect between manufacturing using outsourcing or manufacturing by others and the dimensions of product quality.

### 5. Study Methodology

This study adopted a descriptive analytical approach to study the study variables using the applied method and a field study that included the use of many statistical methods and treatments related to the subject of the study.

## THE THEORETICAL SIDE

### The manufacturing by others

The concept of manufacturing by others: The term outsourcing comes from the American term outsourcing, which refers to the acquisition of resources from abroad. It is also defined as an agreement whereby a company contracts a portion of its internal operations with another company. Outsourcing also refers to reliance on the outsourcing of manufacturing components and other value-added activities (Paek et al., 2019:3). (Kalia et al., 2017) also describe the transfer of enterprise operations to external service providers regardless of the service provider's location within the home country or in a foreign country. Conducted internally may be handed over to a third party or as a handover of all or part of an organizational activity to an outside supplier (Palcic, 2018:2). Outsourcing strategy is an organizational arrangement that arises when companies rely on intermediate markets to provide specialized capabilities that complement their existing capabilities and are deployed along the corporate value chain (Dani, 2017:12). Therefore, outsourcing (manufacturing by others) is seen as the act of transferring some local activities and the right to decide their activities through a contract with external suppliers, and outsourcing (manufacturing by others) is one of the modern methods of managing dealing with shortcomings and limitations in which organizations participate. (Abbasi, and other., 2018:17), Outsourcing goes beyond the use of consultants in practice, only to activities, production factors, related assets (including people, facilities, equipment, technology, and other assets), and the right to delegate decisions (Abbasi, et al., 2018:18). Outsourcing has expanded over the past two decades by purchasing only non-core components and services in which manufacturing can be outsourced to every possible activity within the value chain. ) In manufacturing services, manufacturing establishments buy from the market or contract with specialized establishments for production services instead of being provided by their production

## **The Effect of Outsourcing on Product Quality Dimensions**

departments in the first place. Therefore, it is a form of service outsourcing in the manufacturing industry (Cao, 2019:2068). Contract manufacturers provide this service to many (or even competing) companies, based on their own or customer designs, formulas, and/or specifications. (Brehm,2020:10).

### **Reasons for outsourcing (manufacturing by others)**

The tendency to manufacture using the outsourcing method is the act of acquiring semi-finished products, finished products, or services from an external company. The for outsourcing manufacturing include the following:

Ability to focus on core competencies and eliminate peripheral competencies. To accomplish work more efficiently, and increase the ability to face changing circumstances and demands. Lack of internal resources, and low ongoing investment in internal infrastructure. (Manjunath,2019:13),The company can focus on its core competencies and improve the quality of its products. Eliminate routine tasks that are too time-consuming, facilitate access to technology, and reduce the risk of obsolescence. Saving personnel costs, by providing an alternative to internal employees and reducing the costs of modern technology (Dani, 2017: 12). Cost reduction owing to lower manufacturing costs, lower investment, lower fixed capital, or by taking advantage of economies of scale (Kinkel, et al., 2016:4).Maintaining infrastructure and technology, reduces the need for investment in infrastructure. This reduces operational costs to a large extent. (Manjunath, 2019:13) It is also a successful policy that involves balancing the risks and benefits of obtaining external expertise in support of a set of tasks that are beyond the capabilities of internal employees or cannot be carried out cost-effectively within the organization, and through improving capabilities To meet demand and take advantage of opportunities in a competitive environment. (Dani,2017:14) ,The expected benefits of outsourcing are defined in five categories: reduced costs, increased productivity, increased profitability, improved company value, and control of risk (Festel, 2014:120).

### **Reasons for outsourcing (manufacturing by others)**

The tendency to manufacture using the outsourcing method is the act of acquiring semi-finished products, finished products, or services from an external company. The business case for outsourcing (manufacturing by third parties) varies, but the reasons for outsourcing manufacturing often include one or more of the following:

1. Lack of internal resources.
2. Accomplishing work more effectively or efficiently and increasing flexibility to meet changing circumstances and demands.
3. Low ongoing investment in internal infrastructure impedes, access to innovation and thought leadership. (Manjunath,2019:13).
4. A company can focus on its core competencies and improve its product quality.
5. Eliminate routine tasks that are too time-consuming, facilitate access to technology, and reduce the risk of obsolescence. (Dani,2017:12).
6. Cost reduction owing to lower manufacturing costs, lower investment, lower fixed capital, or by taking advantage of economies of scale (Kinkel, et al., 2016:4).
7. Improving the quality of products or services by outsourcing to specialized vendors wish better equipment and technical expertise than the company .
8. Maintaining infrastructure and technology (Manjunath, 2019:13).
9. The expected benefits can be identified and grouped into five categories: reduced costs, increased productivity, and profitability, improved companyvalue, and risk control (Festel, 2014:120).

Outsourcing (manufacturing by third parties) is a successful policy that involves balancing the risks and benefits of obtaining external expertise in support of a set of tasks that are beyond the capabilities of internal employees or cannot be carried out cost-effectively within the organization. Organizations develop flexibility through outsourcing strategies by improving their capabilities to meet demand and taking advantage of opportunities in a competitive environment. (Dani,2017:14).

### **The risks of outsourcing**

However, outsourcing manufacturing is not an ideal solution in all cases, This trade-off has some disadvantages such as: loss of control over product quality, difficulty in coordinating and managing external cooperation and contracts, supplier evaluation and control problems, and delivery speed problems, (Festel, 2014:120).Firms' capacity for organizational learning and the development of new technologies is impaired, and the cost savings associated with outsourcing (manufacturing by third parties) may be exaggerated. There is no indication that outsourcing (manufacturing by third parties) improves the productivity and profitability of the company (Kinkel, et al., 2016:4). In addition, the outsourcing of manufacturing involves relying on external skills and capabilities. This leads to the weakness of the company's potential in organizational learning and the development of new technologies, particularly the skills needed to develop new business and core capabilities. The trend of mass customization is forcing many companies to focus on their core competencies. Non-essential activities and functions are outsourced to



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manufacturing (Dani, 2017:13), Security risks: If the product to be manufactured by others contains confidential information, the company may compromise the security of its business at risk because confidential information may leak from the seller (Manjunath,2019:14) ,The outsourcing process is seen as a reason for poor product quality or delaying delivery of the entire process (Kim., and other, 2018:1).

### THE QUALITY

#### Definition of quality

The definition of quality varies according to the customer's view and need for the product. Quality is defined as a product's ability to meet consumer expectations. Quality is the sum of the features and characteristics of a product or service that affect its ability to meet explicit or implicit needs. Product quality has a significant impact on performance, and a higher level of product quality leads to a higher level of customer satisfaction (Chowdhury, 2017, p. 1031). Product quality is a feature that is compatible with eight basic dimensions, performance, features, compatibility, reliability, durability, serviceability, aesthetics, and quality that the consumer imagines (Jakpar, 2012, p. 223). "Improvement" in one does not mean "improvement" in the other. Quality is therefore complex and multifaceted concept. Product quality is the ability of a product to meet or exceed consumer expectations, and quality is the key to an organization's success and survival. High quality no longer distinguishes competitors. Rather, it validates a firm's competency (Hoe, et al.,2018, p. 23).

#### Dimensions of quality

- 1. Performance:** Product performance is an essential operating characteristic. That is, performance should be in accordance with what is required of the product and what the customer expects, based on what is fixed on the product by the producer (Phong, 2017, p. 25). This allows the customer to judge a product's quality level based on the information expected in the product at different levels of evaluation, from simple product features to complex personal values (Jaskelska, 2013, p. 33).
- 2. Features:** They are the additional characteristics that enhance the attractiveness of a product or service to the user (Garivn, 1984), and sometimes are those essential characteristics that go beyond the requirements and expectations of customers (Phong, 2017, p. 25), and are verified as features with their ability to change Product perception (de silva, 2020, p: 12).
- 3. Reliability:** It is the chance of a product to malfunction or fail at a specific time (Garivn, 1984), and it is difficult to evaluate the reliability dimension of a product that is used immediately, For most customers, the reliability dimension can be the main factor that determines the quality of the product (Phong, 2017 ,p.25).
- 4. Compatibility:** This dimension indicates the extent to which the characteristics of the product and its operation meet the established standards, so it indicates defects in the product, and the number of product units that do not meet the specifications and therefore require repair (Phong, 2017, p. 25).
- 5. Durability:** Durability measures the longevity of a product (Garivn, 1984).,Durability expresses the amount of use that the consumer obtains from the product before it becomes a consumer and prefers to replace it (Phong, 2017, p. 26).
- 6. Service:** This includes the speed of access to after-sales service centers, the speed and ease of repair of the product, the services provided in after-sales service centers, and its reliability (Phong, 2017, p. 26).
- 7. Aesthetics:** refers to the external appearance of a product (Garivn, 1984). The evaluation of a product's aesthetics is based on personal opinion and customer preferences, therefore, the view of the product's aesthetics varies from one consumer to another depending on the culture, personality, and need for the product (Phong, 2017, p. 26).
- 8. Tangible quality:** Consumers usually do not have complete information about the characteristics of the product, so it depends on the brand to compare it,thus, the reputation of the brand of the product is the most popular factor that affects the customer's decision and checks the consumer's satisfaction with the product (Phong, 2017, p.26). This dimension is, therefore, related to the brand's reputation (de Silva, 2020, p. 12).

### FIELD FRAME

#### Study population and sample

**1-** General Company for the manufacture of cars and equipment : The company was established in 2016 after merging three companies (the General Company for the Automotive Industry, the General Company for Mechanical Industries, the General Company for the manufacture of batteries) And The battery factory / Babel-1 was selected from this company as a first sample for the study, which produces different types of liquid lead-acid batteries.

**2-** The General Company for Construction Industry: The company was established in 1988 after merging seven facilities belonging to more than one abolished establishment. The company includes a group of brick factories distributed in central and southern

## The Effect of Outsourcing on Product Quality Dimensions

Iraq. In addition to the plastic factories, Baghdad and Maysan. The Al-Numan factory, which produces plastic pieces and tubes using injection and extrusion methods was selected from this company as a second sample for the study.

3- Al-Zawraa State Company was established in 2015 from the merger of three companies, namely (Al-Zawraa State Company, Al-Tahadi General Company, and Al-Mansour Factory), and the company specializes in engineering industries (mechanical and electrical). It produces air filters, electrical panels, generators and transformers, electromechanical equipment, medical and industrial gases, drinking water, distilled water and solar panels. The electrical panel factory was selected as the third sample for this study.

### Measuring tool

A questionnaire was used to measure the study variables. The questionnaire consisted of 60 questions based on the literature review distributed over the study variables, which were applied to three factories, and the questionnaire was distributed to department managers and people officials in the three factories. As 120 questionnaires were distributed, 111 were analyzed, and nine were neglected due to deficiencies.

### Description and diagnosis of the study variables

Presentation of the data obtained from the study sample regarding the study variables. These data will be processed using descriptive measures, the arithmetic mean, which is one of the measures of central tendency, the standard deviation, which is a measure of dispersion, and the coefficient of variation.

The results of descriptive statistics for the variables and dimensions of the current study are as follows:

First: the results of manufacturing by others:

**1. Cost reduction:** This dimension consists of five field indicators. The total weighted arithmetic mean for this dimension was (3.959), while the standard deviation was (0.841) and the coefficient of variation (21.25%), and this reflects the high agreement of the study sample on this dimension, as well as the interest of companies. The study sample reduced costs in order to increase profits. Paragraph (X3) obtained the highest weighted arithmetic mean (4.342), while the coefficient of variation was (14.06%), reflecting the least dispersion in the answers. Paragraph (X2) obtained the lowest weighted arithmetic mean (3.505), which is higher than the hypothetical mean (3), while the coefficient of variation was (25.49%), which indicates dispersion in the answers.

**Table 1. mean, standard division and coefficient of variation for the Reducing costs dimension**

	1- Reducing costs:	average	Standard deviation	coefficient of variation	rank
<b>X1</b>	The company constantly monitors costs related to production in order to reduce unnecessary expenses	4.414	0.653	14.80	2nd
<b>X2</b>	Outsourcing reduces operating costs	3.505	0.893	25.49	5th
<b>X3</b>	Cost is taken into account when calculating the total contract cost	4.342	0.610	14.06	1st
<b>X4</b>	The company is aware of the true direct and indirect costs of outsourcing	3.901	0.762	19.54	3rd
<b>X5</b>	Decisions to outsource whether or not start from a cost perspective	3.631	0.841	23.17	4th
	Total	3.959	0.841	21.25%	

**2. Company value:** This dimension consists of five field indicators (X6-X10), where the total weighted arithmetic mean for this dimension was (3.222), the standard deviation was (0.911) and the coefficient of variation (28.28%), which reflects the high agreement of the study sample on this dimension, as it reflects the interest of the study sample companies in improving production and working to increase performance. Paragraph (X8) obtained the highest weighted arithmetic mean (3.477), which was higher than the hypothetical mean (3), while the coefficient of variation was (21.18%), which reflects the least dispersion in the answers to this paragraph. Paragraph (X10) obtained the lowest weighted arithmetic average (2.892), which is less than the hypothetical mean (3), which indicates that the answers to this paragraph were low, while the coefficient of variation was (33.41%), which indicates a high dispersion in the answers.

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**Table 2. mean, standard division and coefficient of variation for value of the company dimension**

	value of the company	average	Standard deviation	coefficient of variation	rank
X6	Outsourcing is used to raise the level of performance	3.261	0.979	30.02	4th
X7	Outsourcing contributes to focusing on the core activities of the company	3.225	0.849	26.34	2nd
X8	The company's use of manufacturing from others leads to the company's fulfillment of its social responsibilities	3.477	0.737	21.18	1st
X9	Outsourcing is done in order to increase the company's distinction from other companies by providing high quality products	3.252	0.919	28.26	3rd
X10	Outsourcing resources of manufacturing is the best option to improve company value	2.892	0.966	33.41	5th
	Total	3.222	0.911	28.28%	

**3. Risks:** This dimension consists of five field indicators (X11-X15), where the total weighted arithmetic mean for this dimension was (3.155), the standard deviation was (1.017) and the coefficient of variation (32.23%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies in avoiding risks. Paragraph (X13) obtained the highest weighted arithmetic average (3.649), which was higher than the hypothetical mean (3), while the coefficient of variation was (21.44%), reflecting the least dispersion in the answers.

Paragraph (X14) obtained the lowest weighted arithmetic average (2.676), which is less than the hypothetical mean (3), which indicates that the answers to this paragraph were low, while the coefficient of variation was (36.40%), which indicates a dispersion in the answers.

**Table 3. mean, standard division and coefficient of variation for risks dimension**

	3 - Risks	average	Standard deviation	coefficient of variation	rank
X11	Outsourcing led to the timely delivery of the product to the customers	3.027	0.948	31.33	3rd
X12	Outsourcing leads to less damage to goods due to less storage	2.928	0.817	27.90	2nd
X13	Outsourcing allows others to know the company's secrets	3.649	0.782	21.44	1st
X14	Outsourcing eliminates the risks of changes in the environment	2.676	0.974	36.40	5th
X15	Outsourcing leads to the risk of losing the company's core competencies	3.495	1.190	34.04	4th
	Total	3.155	1.017	32.23%	

**4.Productivity:** This dimension consists of five field indicators (X16-X20), where the total weighted arithmetic mean for this dimension was (3.092), the standard deviation was (0.912) and the coefficient of variation (29.48%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies in increasing productivity in order to increase profits. Paragraph (X17) obtained the highest weighted arithmetic mean (3.180), which was higher than the hypothetical mean (3), while the coefficient of variation was (27.87%), which reflects the least dispersion in the answers.

Paragraph (X16) obtained the lowest weighted arithmetic average (3.054), which is higher than the hypothetical mean (3), while the coefficient of difference was (32.70%), which indicates the presence of dispersion in the answers.

## The Effect of Outsourcing on Product Quality Dimensions

**Table 4. mean, standard division and coefficient of variation for Productivity dimension**

	<b>4- Productivity</b>	average	Standard deviation	coefficient of variation	rank
<b>X16</b>	Outsourcing increases productivity	3.054	0.999	32.70	5th
<b>X17</b>	Check outsourcing in the manufacture of products to the use of modern technology in production	3.180	0.886	27.87	1st
<b>X18</b>	Outsourcing enables the company to focus on improving internal organizational activities	3.108	0.878	28.23	2nd
<b>X19</b>	Outsourcing practices lead to continuous improvement (services provided and innovations implemented during the service production process)	3.045	0.888	29.17	3rd
<b>X20</b>	This practice enabled the organization to focus on its core business and thus achieve improved customer satisfaction, and to respond faster to their demands	3.072	0.912	29.68	4th
	Total	3.092	0.912	29.48%	

**5.Profitability:** This dimension consists of five field indicators (X21-X25), where the total weighted arithmetic mean for this dimension was (2.822), the standard deviation was (1.079) and the coefficient of variation (38.25%), which reflects the high agreement of the study sample on this dimension. This also reflects the interest of the sample companies in increasing profits. Paragraph (X22) obtained the highest weighted arithmetic average (3.072), which was higher than the hypothetical mean (3), while the coefficient of variation was (33.63%), reflecting the least dispersion in the answers.

Paragraph (X24) obtained the lowest weighted arithmetic average (2.928), which is less than the hypothetical mean (3), while the coefficient of variation was (40.86%), which indicates a dispersion in the answers.

**Table 5. mean, standard division and coefficient of variation for Profitability dimension**

	<b>5- Profitability</b>	average	Standard deviation	coefficient of variation	rank
<b>X21</b>	The organization's profits have increased as a result of outsourcing practices	2.820	1.146	40.63	4th
<b>X22</b>	Quality of working life (employee motivation level) is affected by outsourcing practices	3.072	1.033	33.63	1st
<b>X23</b>	Employee welfare is achieved due to the implementation of health and safety programs due to increased profits after outsourcing	2.829	0.999	35.31	2nd
<b>X24</b>	led sourcing Foreign Ministry to reduce wages to stop work on some production lines	2.928	1.196	40.86	5th
<b>X25</b>	Profits distributed to employees increased after outsourcing	2.459	0.922	37.50	3rd
	Total	2.822	1.079	38.25%	

### Second: the results of product quality dimensions:

**1. Performance:** This dimension consists of five field indicators (Z1-Z5), where the total weighted arithmetic mean for this dimension was (4.056), the standard deviation was (0.705) and the coefficient of variation (17.38%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies in raising their level of performance. Paragraph (Z2) obtained the highest weighted arithmetic mean (4.180), which was higher than the hypothetical mean (3), while the coefficient of variation was (14.13%), which reflects the least dispersion in the answers.

Paragraph (Z4) had the lowest weighted arithmetic mean (3.739), which was higher than the hypothetical mean (3), while the coefficient of variation was (22.15%), indicating a dispersion in the answers.

## The Effect of Outsourcing on Product Quality Dimensions

**Table 6. mean, standard division and coefficient of variation for Performance dimension**

1.Performance:		average	Standard deviation	coefficient of variation	rank
<b>Z1</b>	The company can establish a system through which performance is measured and monitored.	4.153	0.621	14.95%	second
<b>Z2</b>	The company seeks to provide high performance products.	4.180	0.591	14.13%	first
<b>Z3</b>	The company checks its products before introducing them to the market.	4.126	0.689	16.70%	third
<b>Z4</b>	The company's products always meet the approval of customers.	3.739	0.828	22.15%	Fifth
<b>Z5</b>	The company believes that the quality of product performance is achieved by keeping pace with the product developments.	4.081	0.689	16.89%	fourth
Total		4.056	0.705	17.38%	

**2. Robustness:** This dimension consists of five field indicators (Z6-Z10), where the total weighted arithmetic mean for this dimension was (4.056), the standard deviation was (0.710) and the coefficient of variation (17.48%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies in terms of the durability of their products. Paragraph (Z6) obtained the highest weighted arithmetic mean (4,351), which was higher than the hypothetical mean (3), while the coefficient of variation was (14.42%), which reflects the least dispersion in the answers.

Paragraph (Z8) obtained the lowest weighted arithmetic mean (3.937), which was higher than the hypothetical mean (3), while the coefficient of variation was (20.5%), indicating a dispersion in the answers.

**Table 7. mean, standard division and coefficient of variation for The bladder dimension**

2 - The bladder		average	Standard deviation	coefficient of variation	rank
<b>Z6</b>	The company uses quality raw materials to ensure a product with high durability.	4.351	0.627	14.42%	first
<b>Z7</b>	The company offers products that have the ability to withstand external conditions (such as transportation).	4.180	0.663	15.87%	second
<b>Z8</b>	The company's products have a long life before being replaced.	3.937	0.789	20.05%	Fifth
<b>Z9</b>	The parts of the product are assembled in such a way as to give it high durability.	3.946	0.672	17.03%	third
<b>Z10</b>	The company's products withstand tensile and wear tests.	3.910	0.695	17.77%	fourth
Total					

**3. Reliability:** This dimension consists of five field indicators (Z11-Z15), where the total weighted arithmetic mean for this dimension was (4.020), the standard deviation was (0.719) and the coefficient of variation (17.90%), which reflects the high agreement of the study sample on this dimension. The study sample companies' interests also reflect the high reliability of their products. Paragraph (Z14) obtained the highest weighted arithmetic mean (4.117), which was higher than the hypothetical mean (3), while the coefficient of variation was (15.62%), which reflects the least dispersion in the answers.

Paragraph (Z15) obtained the lowest weighted arithmetic mean (3.775), which was higher than the hypothetical mean (3), while the coefficient of variation was (22.22%), which indicates a dispersion in the answers.

## The Effect of Outsourcing on Product Quality Dimensions

**Table 8. mean, standard division and coefficient of variation for Reliability dimension**

	<b>3- Reliability</b>	average	Standard deviation	coefficient of variation	rank
<b>Z11</b>	The company offers customers safe and reliable products.	4.171	0.672	16.12%	second
<b>Z12</b>	The company's products are distinguished by a high degree of reliability in use.	4.036	0.660	16.34%	third
<b>Z13</b>	The company is interested in presenting the products correctly the first time.	4.000	0.714	17.84%	fourth
<b>Z14</b>	The company believes in the principle that the unreliable product will be less demanded.	4.117	0.643	15.62%	first
<b>Z15</b>	The company's management develops its product designs based on the results of research and development.	3.775	0.839	22.22%	Fifth
	Total	4.020	0.719	17.90%	

**4. Perceived quality:** This dimension consists of five field indicators (Z16-Z20), where the total weighted arithmetic mean for this dimension was (3.917), the standard deviation was (0.709) and the coefficient of variation (18.09%), which reflects the high agreement of the study sample on this dimension, as it reflects the interest of the study sample companies in the aesthetics of their products. Paragraph (Z18) obtained the highest weighted arithmetic mean (4.072), which was higher than the hypothetical mean (3), while the coefficient of variation was (13.94%), which reflects the least dispersion in the answers.

Paragraph (Z19) obtained the lowest weighted arithmetic mean (3.838), which was higher than the hypothetical mean (3), while the coefficient of variation was (19.42%), which indicates a dispersion in the answers.

**Table 9. mean, standard division and coefficient of variation for Perceived quality dimension**

	<b>4- Perceived quality</b>	average	Standard deviation	coefficient of variation	rank
<b>Z16</b>	The company seeks through its products to raise its reputation among companies.	4.279	0.677	15.81%	second
<b>Z17</b>	The company has a distinctive brand that customers prefer.	3.901	0.674	17.27%	third
<b>Z18</b>	The company raises the slogan of improving product quality, everyone's responsibility.	4.072	0.567	13.94%	first
<b>Z19</b>	The company is characterized by credibility in dealing with suppliers and customers.	3.838	0.745	19.42%	Fifth
<b>Z20</b>	The company adopts a policy of informing the customer of the characteristics of its products and formulations before marketing them to him.	3.964	0.738	18.61%	fourth
	Total	3.917	0.709	18.09%	

**5. Aesthetic:** This dimension consists of five field indicators (Z21-Z25), where the total weighted arithmetic mean for this dimension was (3.917), the standard deviation was (0.709) and the coefficient of variation (18.09%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies in the aesthetics of their products. Paragraph (Z22) obtained the highest weighted arithmetic mean (4.009), which was higher than the hypothetical mean (3), while the coefficient of variation was (14.85%), which reflects the least dispersion in the answers.

Paragraph (Z24) obtained the lowest weighted arithmetic average (3.775), which is higher than the hypothetical mean (3), while the coefficient of variation was (19.46%), which indicates the presence of dispersion in the answers.

## The Effect of Outsourcing on Product Quality Dimensions

**Table 10. mean, standard division and coefficient of variation for Aesthetic dimension**

	5- Aesthetic	average	Standard deviation	coefficient of variation	rank
Z21	The company relies on the product's aesthetic and tangible characteristics to meet the customer's needs and desires.	4.081	0.715	17.53%	second
Z22	The company's management is convinced that the shape and appearance of the product indicate the basic function that the product performs.	4.009	0.595	14.85%	first
Z23	The company's management seeks continuous development in the external appearance of the product, keeps pace with the aspirations of the customer, and competes with international designs.	3.901	0.726	18.60%	third
Z24	The company's product is able to capture the attention of customers and attract them.	3.775	0.735	19.46%	Fifth
Z25	The quality of raw and raw materials is evident in the appearance and quality of the product.	3.820	0.729	19.07%	fourth
	Total	3.917	0.709	18.09%	

**6. Conformity:** This dimension consists of five field indicators (Z26-Z30), where the total weighted arithmetic mean for this dimension was (4.083), the standard deviation was (0.685) and the coefficient of variation (16.78%) and, reflecting the high agreement of the study sample on this dimension, which also reflects the interest of the study sample companies that their products conform to the specifications specified for them. Paragraph (Z28) obtained the highest weighted arithmetic average (4.117), which is higher than the hypothetical mean (3), while the coefficient of variation was (15.62%), which reflects the least dispersion in the answers.

Paragraph (Z27) obtained a weighted arithmetic mean of (4.009), which was higher than the hypothetical mean (3), while the coefficient of variation was (18.57%), which indicates a dispersion in the answers.

**Table 11. mean, standard division and coefficient of variation for Matching dimension**

	6- Matching	average	Standard deviation	coefficient of variation	rank
Z26	The company seeks to produce quality products conforming to the specifications specified in advance.	4.216	0.680	16.12%	third
Z27	The company takes the necessary measures to remove the causes of non-conformity of the products with the specified specifications and to prevent its recurrence.	4.009	0.745	18.57%	Fifth
Z28	The company constantly conducts appropriate checks to verify the quality of its products.	4.117	0.643	15.62%	first
Z29	The company adopts clear policies to make the product conform to international standards, the ISO system and other quality systems.	4.117	0.657	15.96%	second
Z30	The company resorts to matching the quality of its products by comparing with other competing products.	3.955	0.679	17.18%	fourth
	Total	4.083	0.685	16.78%	

**7. Safety:** This dimension consists of five field indicators (Z31-Z35), where the total weighted arithmetic mean for this dimension was (4.059), the standard deviation was (0.651) and the coefficient of variation (16.05%), which reflects the high agreement of the study sample on this dimension. It also reflects the interest of the sample companies that their products enjoy safety and security. Paragraph (Z33) obtained a weighted arithmetic mean (4.090), which was higher than the hypothetical mean (3), while the coefficient of variation was (15.30%), which reflects the least dispersion in the answers.

## The Effect of Outsourcing on Product Quality Dimensions

Paragraph (Z34) obtained a weighted arithmetic mean of (3.982), which was higher than the hypothetical mean (3), while the coefficient of variation was (17.26%), indicating a dispersion in the answers.

**Table 12. mean, standard division and coefficient of variation for Safety or security dimension**

	<b>7 - Safety or security</b>	average	Standard deviation	coefficient of variation	rank
<b>Z31</b>	The company's products do not do any harm when used.	4.162	0.668	16.05%	fourth
<b>Z32</b>	The company's raw materials are treated in a way that gives the final product high specifications and safety.	4.063	0.636	15.66%	second
<b>Z33</b>	The product is safe and secure for the price paid.	4.090	0.626	15.30%	first
<b>Z34</b>	The company seeks to design its products with high levels of safety.	3.982	0.687	17.26%	Fifth
<b>Z35</b>	The company's products make the customer feel reassured that he will not suffer any injury.	4.000	0.632	15.81%	third
	Total	4.059	0.651	16.05%	

### Third: Testing the hypotheses of correlation

1. The results in Table (13 ) indicate that there is a strong positive correlation with a significant difference between manufacturing by others and the dimensions of product quality, where the correlation coefficient (0.725) reached a significant level (0.01)., There is also a positive correlation between manufacturing by others and all dimensions of product quality, so the first main hypothesis that states (there is a correlation between outsourcing resources of manufacturing and the dimensions of product quality) is accepted, as well as the first, second, third, fourth, and fifth sub-hypotheses. Table (13) shows the relationships between the study variables and their dimensions,

**Table 13. The correlation between outsourcing resources of manufacturing and its dimensions, and the quality of the product and its dimensions.**

Outsourcing	The performance	durability	Reliability	Perceived Quality	Aesthetic	Matching	Safety	Dimensions of product quality
Reduction	0.704**	0.756**	0.756**	0.812**	0.739**	0.776**	0.759**	0.704**
The value	0.704**	0.789**	0.819**	0.808**	0.809**	0.797**	0.793**	0.771**
Risks	0.771**	0.698**	0.724**	0.794**	0.744**	0.748**	0.757**	0.771**
Productivity	0.804**	0.816**	0.820**	0.818**	0.808**	0.808**	0.796**	0.804**
Profitability	0.777**	0.787**	0.809**	0.772**	0.783**	0.799**	0.791**	0.777**
Outsourcing	0.704**	0.756**	0.756**	0.812**	0.739**	0.776**	0.759**	0.725**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

This paragraph focuses on validating the second hypothesis, which states that outsourcing of manufacturing sources has a significant impact on product quality.

The results of the analysis in Table (14) indicate that manufacturing by others has a significant effect on the dimensions of product quality, and this is supported by the value of (F), which, respectively (543.521, 739.913, 737.147, 1072.630, 665.889, 838.165, 751.019) is greater than its tabular value. of (3.17) at a large (0.01) level and from the value of the coefficient of determination (R<sup>2</sup>) of 0.496 for each of the product dimensions. quality), 0.572, 0.571, 0.66, 0.546, 0.602, 0.576), and follow-up coefficients (B) and (t), we find that there is a significant effect of manufacturing by others in the dimensions of product quality.

Overall, the regression model of outsourcing manufacturing resources with product quality was significant at a level of 0.01 (in terms of the value of F) computed (3067.974), which is greater than its tabular value of (3.17), which allows us to accept the second hypothesis. The value of the coefficient of determination was ( R<sup>2</sup>) (0.53%), which means that the change in manufacturing by others explains the value (53%) of the change in product quality. Accordingly, the second hypothesis is accepted, which states that



## The Effect of Outsourcing on Product Quality Dimensions

there is a significant effect of manufacturing by others, a significant effect on the dimensions of product quality. Table (14) shows the results of outsourcing manufacturing resources with product quality dimensions.

**Table 14 the results of outsourcing resources of manufacturing with the dimensions of product quality**

Independent	Dependent	R	R Square	B	F	t	Sig.
Outsourcing	Performance	0.704**	0.496	0.590	543.521	23.314	0.000
	Durability	0.756**	0.572	0.639	739.913	27.201	0.000
	Dependency	0.756**	0.571	0.646	737.147	27.150	0.000
	Quality Perceived	0.812**	0.660	0.674	1072.630	32.751	0.000
	Aesthetic	0.739**	0.546	0.632	665.889	25.805	0.000
	Matching	0.776**	0.602	0.588	838.165	28.951	0.000
	Safety	0.759**	0.576	0.425	751.019	27.504	0.000
	Quality dimensions	0.725**	0.525	0.501	3067.974	55.389	0.000

## CONCLUSION

The use of resources from outside the company or factory is one of the methods that industrial institutions resort to in order to benefit from the experiences of others in the industry, as well as to direct their internal resources (machines and , human resources) to produce other products: it is also one of the methods followed by industrial companies in order to reduce production costs and improve quality, especially if the companies that are hired are among the leading companies in their field of work.

This study attempts to highlight the relationship between outsourcing and product quality, as the results of analyzing the data obtained from the sample companies show the existence of a relationship and influence between outsourcing and the dimensions of product quality.

All the observations presented in the data analysis in this study aim to clarify the possibility of outsourcing's impact on improving product quality. The study consisted of several parts: in the first part, some aspects of knowledge related to the subject were shown, while in the second part, the data obtained from the reality of the companies' work was presented, and the relationships and influence were presented in a quantitative manner to evaluate the final results. This study provides a full explanation that can be used to make decisions related to outsourcing.

## REFERENCES

- 1) Calia , Pinuccia ., and Pacei, Silvia., " Outsourcing and Firm Performance: Evidence from the Italian Manufacturing Industry', International Journal of Business and Management, Vol. 12, No. 11: 2017.
- 2) Brehm, Kathryn M., "Inventory management and contract manufacturing", Master's thesis of science in integrated supply gain management, University of Wisconsin- Platteville,2020.
- 3) Palcic, Iztok., Ojstersek, Robert., & Buchmeister, Borut., " Creating Value in Manufacturing Companies", Proceedings of the 29th DAAAM International Symposium, pp. 70-75, Vienna, Austria, January 2018.
- 4) Dani, Mahesh Haribhau., "Study of supply selection process under strategic outsourcing conditions",thesis Doctor of in Management, Goa University ,2017.
- 5) Manjunath,Vishnu ., and Joshi,Vyshak., " Manufacturing cost modelling and analysis for a Startup The case of 10MD", Master thesis in Production Engineering Department of Technology Management and Economics, Chalmers University of Technology ,Gothenburg, Sweden 2019.
- 6) Kinkel , Steffen., Jäger, Angela., Horvath, and Djerdj ., and Rieder and Bernhard ., " The effects of in-house manufacturing and outsourcing on companies' profits and productivity",23rd International Annual EurOMA Conference At: Trondheim Volume: june 23, 2016.
- 7) Cao, Jiqing., "Research on Talents Training of Productive Service Outsourcing under Intelligent Manufacturing",2019 3rd International Conference on Economics, Management Engineering and Education Technology (ICEMEET 2019).
- 8) Kim, Youn Sook., Murata,Tomohiro., and Ki, Jaesug., "A Study on Project Risk Analysis Model for Outsourcing Based on Bayesian Networks: Application to Small Company OEM Project of Mold Industry",Proceedings of the International MultiConference of Engineers and Computer Scientists 2018 Vol II, March 14-16, 2018, Hong Kong.
- 9) Festel , Gunter ., Nardo, Mikko De., and Simmen, Timo., "Outsourcing of Pharmaceutical Manufacturing – A Strategic Partner Selection Process", Journal of Business Chemistry , 11 (3), 2014 .

## The Effect of Outsourcing on Product Quality Dimensions

- 10) Singla, Babita., Singh, Amandeep., "Contract Manufacturing: The Boon for Developing Economies", International Journal of Innovative Technology and Exploring Engineering, Volume-8 Issue-12, October 2019.
- 11) Abbasi, Alireza., and Nikbakht, Mehrdad., "Identification and Clustering Outsourcing Risks of Aviation Part-Manufacturing Projects in Aviation Industries Organization Using K- means Method", Journal of Modern Processes in Manufacturing and Production, Volume 7, No. 4, Autumn 2018.
- 12) Phong, Le Thai., 2017. "Quality dimensions between foreign and domestic Vietnamese mechanical firms: A comparative study", Business & Entrepreneurship Journal, SCIENPRESS Ltd, vol. 6(2), 2017, 21-33.
- 13) Garvin, D. A., "What does product quality really mean?", Sloan Management Review, 26(1), 1984, 25-41.
- 14) Garvin, David A. "Competing on Eight Dimensions of Quality." Harvard Business Review 65, no. 6 (November–December 1987).
- 15) da Silva, Cláudia Alexandra Mendes ., "Comparison of Adjustment Quality Tests for Statistical Process Control in an Industrial Unit of the Automotive Industry", Dissertation to obtain the Master's Degree in Industrial Engineering and Management Graduated in Engineering Sciences and Industrial Management, Faculty of Sciences and Technology, Universidade Nova de Lisboa. 2020
- 16) Chowdhury, Sultana Razia., "Measuring the Relationship Between Product Quality Dimensions & Repurchase Intention of Smart Phone: A Case study On Chittagong City", International Journal of Scientific & Engineering Research, Volume 8, Issue 2, February-2017.
- 17) Jaskulska, Justyna ., "Quality of service and product as the main factors influencing customers' satisfaction in the clothing retailing industry in Ireland - case study of Zara Plc", MBA in Business Management, Dublin Business School, 2013.
- 18) Jakpar, Shaharudin., Sze Na, Angelyn Goh ., Johari, Anita., Myint, Khin Than., "Examining the Product Quality Attributes That Influences Customer Satisfaction Most When the Price Was Discounted: A Case Study in Kuching Sarawak", International Journal of Business and Social Science, Vol. 3 No. 23; December 2012, 221-236.
- 19) 19. Hoe, Ling Chen., Mansori, Shaheen., " The Effects of Product Quality on Customer Satisfaction and Loyalty: Evidence from Malaysian Engineering Industry", International Journal of Industrial Marketing, Vol. 3, No. 1, 2018. 20-35.



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## Rescue, Rehabilitation and Reintegration of female survivors of human trafficking in Northern Tanzania



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**ABSTRACT:** The victims of human trafficking experience a very traumatic experience from the time they are recruited up to the time of rescue. It is without doubt that they require rehabilitation process in order for them to recover to their normal being before being given other opportunities or reintegrated back into their communities. However, many countries have limited services to the victims of human trafficking and as a result, the victims return to the trafficking cycle. In many it is not clearly stipulated who is responsible for rescue, rehabilitation and reintegration of the victims. It is from this concern the current study sought the importance of establishing and documenting information on the rescue, rehabilitation and reintegration of victims of human trafficking in Northern Tanzania. The study applied a mixed approach technique where qualitative and quantitative methods were used to get data from the study area. Seven district councils of Arusha region were involved in the study. Data collection tools included a questionnaire, focus group discussion and interview. A total of 400 girls and young women were sampled for the study. The findings revealed that only 30.2% of the respondents reported to have received some sort of assistance and service from different stakeholders. Further it was found that study few respondents (34.5%) were willing to go back to their communities while a good number (65.5%) disagreed with the idea of going back to their communities due to different reasons. Much as these services seem to be crucial for the recovery of the victims, in the current study it was reported that they victims could not receive the said services due to lack of funds for implementing this services.

**KEYWORDS:** Rescue, Rehabilitation, Reintegration, Survivors, Human trafficking

### BACKGROUND

Human trafficking violates human rights, increases sense of insecurity among individuals, increases gender inequality, contravenes rule of law and affects the economy of many countries globally (USDS, 2022). The Sustainable Development Goals (5, 8 and 16) have precisely mentioned human trafficking as a global problem and that more efforts should be taken to alleviate it. Men, women and children have become victims of this heinous act for several decades now. Though men are also victims of human trafficking, women and children are said to account to about 70% of the victims (IOM, 2008; Kamazima, 2009 and, UNODC, 2014). In Africa alone it is estimated that 9.2 Million men, women and children are living in modern slavery. The region also in 2016 was estimated to have the highest prevalence of Modern slavery in the world with 7.6 per 1,000 people in the region (Global Slavery Report, 2018). The victims of trafficking are exploited in different ways including in forced labour in different agricultural, mining and horticulture activities, commercial sex, begging and organ mutilation.

In Tanzania, human trafficking is feared to be increasing (UNDP, 2011). The Global Slavery Index Report states that human trafficking in Tanzania is a problem as it is estimated that more than 336,000 people have been trafficked within and outside the country in 2018 only. The report continues to report that Tanzania is a leading country among the East African countries in human trafficking (Global Slavery Index, 2018). This information goes hand in hand with the United States Department Trafficking in Person Report of 2018 mentions Tanzania as a source, transit and also destination of trafficked human beings (Kamazima, 2009). Both adults and children fall victims to traffickers but in this study the focus will be with girls and young women.

Girls and Young women in Tanzania are said to be trafficked both internally (within the country) and sometimes internationally (outside the borders). The magnitude and extent of trafficking is yet to be established but it is believed that the movement internally (rural – urban) is high as compared to international trafficking. The victims trafficked internally are reported to work as domestic helpers, bar maids, street vendors and sometimes work as prostitutes (Magesa, 2021; Shimba *et al*, 2013; and Kamazima, 2009).

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So far much is not known about this act, since the recruitment statistics, the magnitude and the extent are still elusive. However it is believed that, a lot of girls and young women are trafficked not only within the country but also beyond borders (Mtewele, 2012; IOM, 2008). The government have taken several measures including enacting the anti trafficking Act of 2008 and ratifying the United Nations (2000) protocol and other international instruments such as the United Nations Conventions on the Rights of Children (1989), The African Charter on the Rights and Welfare of the Children (1999). In addition to these measures in 2011, the government established the National Anti Trafficking in person Committee and its Secretariat which has the responsibility to oversee the implementation of the Anti Trafficking act of 2008. Thereafter the establishment of the Committee, in 2012 the Government formulated the Anti Trafficking in Person Action Plans for the years 2012 to 2014 and 2015 to 2017 respectively. The action plans were developed to guide responses of relevant actors to combat human trafficking in person, and they were established to prevent, protect and assist victims of human trafficking (IOM, 2016). Specifically the implementation strategies involved providing quality services to victims of human trafficking, to mobilize and coordinate state and non state actors to combat trafficking in person and also to develop standard operation procedures for identification of victims and perpetrators of human trafficking. Regardless of these efforts, it is still reported that girls and young women are trafficked at twice the rate of adult women, and UNICEF (2006) reported that, domestic workers in Tanzania are mainly less than 18 years, out of which 85% of these are girls (Mathias, 2011). Further it is reported by Mathias (2011) that in Tanzania 97% of cases of trafficking is internal involving youth between 12 and 17 years old; in terms of sex, 74% of the victims are female. The victims are trafficked mainly from Iringa, Morogoro, Singida, Dodoma and Kilimanjaro to Dar es Salaam, Arusha and to the island of Zanzibar for domestic servitude and other purposes like commercial sex trade and organ donation (Magesa, 2021).

The victims of human trafficking experience a very traumatic experience from the time they are recruited up to the time of rescue. It is without doubt that they require rehabilitation process in order for them to recover to their normal being before being given other opportunities or reintegrated back into their communities. According to USAID (2007) the Critical factors in rehabilitation, recovery, and reintegration include the victims' age, physical and psychological health, background, family life, culture, duration of exploitation, and perceptions of the damage done to their person and their future as a result of having been trafficked, especially if they have been victims of commercial sexual exploitation. The long-term recovery, rehabilitation, and reintegration of trafficking victims can involve educational and economic opportunities, as well as extended psycho-social care. With these services it is believed that the victims will be able to proceed with the normal life without becoming vulnerable to the traffickers once more.

Due to different reasons many countries have limited kind of services to the victims of human trafficking and as a result, the victims return to the trafficking cycle. In many it is not clearly stipulated who is responsible for rescue, rehabilitation and reintegration of the victims. In some cases, though stipulated many reasons including lack of funds deter the process. In Tanzania, the government have clearly stipulated these responsibilities, however lack of data of the process have made it impossible to know what is taking place when the victims of trafficking are rescued from the hands of traffickers. It is from this concern the current study sought the importance of establishing and documenting information on the rescue, rehabilitation and reintegration of victims of human trafficking in Northern Tanzania.

## **METHODOLOGY**

### **Study Area**

Arusha region was selected for this study based on two reasons; the first reason was the presence of human trafficking activities as Arusha region is predicted to be the second region in Tanzania, after Dar es Salaam, with high incidences of human trafficking. The presence of human trafficking activities in Arusha has been mentioned in different studies done in Tanzania. Some of the studies indicated Arusha to be the second region in Tanzania where men, women and children are trafficked for labour and sex trade. The second reason for selecting Arusha region was the lack of adequate data on the defined problem (Kamazima, 2009, IOM, 2008) as many documented researches and data have been for other regions such as Dar es Salaam and Zanzibar and none of the studies have been on the impacts of human trafficking. It is for these reasons that Arusha region was picked for this study.

### **Sampling procedure**

The study applied both probability and non probability sampling techniques to select the respondents. Simple random sampling technique was the only technique used for probability sampling. The technique was applied in obtaining girls and young women who, in a way, have been affected by human trafficking. For the case of Non probability sampling convenience and snow ball techniques were applied to get respondents for the qualitative data collection tools.

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A total of 400 girls and young women were selected for this study. The age ranged from 15 to 24 years since UN (2004) consider them as youth. For the case of qualitative tools the study had 4 focus group discussions, 14 face to face interviews and 19 key informant interviews making a total of 37 respondents.

### Data collection tools

The questionnaire was a quantitative data collection tool for this objective while focus group discussions, face to face and in depth interviews were the tools used to collect qualitative information from the respondents. In acquiring different roles as performed by the government and different stakeholders a number of questions were asked to the respondents. Among others, the respondents were inquired if they were still under captive or not; and if they were no longer under captive the study wanted to know how they were rescued or escaped from the trafficking network. Apart from their status, the study went on to probe on the rehabilitation services they were provided after being rescued. After knowing the type of services the respondents were provided with, the study inquired also if the respondents wished to be reintegrated back to their communities and the kind of job they would prefer doing once they are back in their communities.

### Data analysis

Quantitative data obtained from the questionnaire, was analysed by the use of descriptive analysis methods including frequency and percentage while data from qualitative tools i.e. face to face interviews and focus group discussions were analysed through content analysis. The following sections will discuss in detail the actions taken by different actors in rescuing, rehabilitation and reintegration of the victims of human trafficking in Arusha region.

## RESULTS AND DISCUSSION

### Characteristics of Respondents

The age, education level and marital status of respondents were sought by the research. From the research findings it was established that, the majority (71.2%) of the respondents were at the age group of 20 to 24 years of age, while 43.8% of them reported to have been married before being trafficked. In case of their education level, a good number of them (74%) revealed that they at least have completed primary education while very few of them (1.5%) have achieved tertiary education.

### Characteristics of Respondents (n=400)

Category	Frequency	Percent
<b>Age</b>		
15-19	115	28.5
20-24	285	71.5
<b>Education level</b>		
No formal Education	39	13
Primary	210	70
Secondary	33	11
Tertiary	18	6
<b>Marital status</b>		
Have been married before	175	43.8
Have never been married	225	56.2

### The role of the Government on combating human trafficking

The Government of Tanzania fights to suppress and combat human trafficking through different Ministries and Departments; and Non Governmental stakeholders. The Governmental bodies include the Anti-Trafficking Committee through the Anti-Trafficking Secretariat in collaboration with Government departments like Police, Immigration, The National Prosecution Services Office, Judiciary, Social welfare and the local government authorities. These organizations work in collaboration with the Non-Governmental Organizations, and development partners on the daily to daily activities aiming at suppression of cases of human trafficking in the country. Specifically each organization plays a different role or a role in collaboration with other departments in rescuing, rehabilitation and reintegration of the victims of trafficking. Further they collaborate to make sure the perpetrators of this act have been punished as per crime committed as instructed in the Anti Trafficking Act of 2008. Much as the departments work together, specific functions for each department are presented below:

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### **The Ministry of Home Affairs**

The Ministry of Home Affairs is the core ministry in making sure Trafficking in Person is suppressed and ultimately stopped. It works in collaboration with other ministries and department in this task of making this heinous act is suppressed and eventually stopped. The Ministries working with the Ministry of Home affairs include; The Ministry of Health, Community Development, Gender, Seniors and Children, Ministry of Finance and Planning, Ministry of Foreign Affairs and the Ministry of Education. The Organs working with the ministry on this matter include the Anti-Trafficking Committee through the Anti-Trafficking Secretariat in collaboration with Government departments like Police, Immigration, The National Prosecution Services Office, Judiciary, Social welfare and the local government authorities. The main roles of the Ministry as stipulated in the Anti Trafficking Act (2008) are; Implement rehabilitative and protective programs for trafficked persons; provide counseling and temporary shelter to trafficked person and develop a system of accreditation among Non Governmental Organization for purposes of establishing centres and programs for intervention in various level of the community.

### **The Anti Trafficking Secretariat**

According to the Anti Trafficking Act of 2008, The National Anti Trafficking Secretariat is the major player in the fight against human trafficking in Tanzania. It works closely with the Ministry of Home affairs in all matters related to prevention and combating human trafficking. Specifically the secretariat's roles involve; Coordination of all activities aimed for Government Departments and law enforcement organs charged with matters related to trafficking in person; Make recommendations for a national plan of action against trafficking in person; Advise the Minister of Home Affairs on policy matters connected to trafficking in person; Provide advice on investigation and prosecution of offences on trafficking in person and liaise with Government Agencies and Non Governmental Organizations to promote the rehabilitation and reintegration of victims of human trafficking. From these roles, it is clear that the secretariat functions as the main advisory and implementer of different strategies put forward in prevention and combating human trafficking.

### **The Police**

Traditionally the role of police officer is law enforcement within communities. They are responsible for maintaining public order and safety, enforcing the law, and preventing, detecting, and investigating criminal activities. These functions are known as policing. In case of human trafficking, these functions are further expounded as the police work in collaboration with different stakeholders in rescue, rehabilitation and reintegration of the victims of human trafficking. At the local government level (district level) the police at the gender desk are the ones responsible with all matters related to human trafficking as well as gender violence. They work with the district social welfare officer, the immigration officer and the ward officers in curbing this problem. Specifically, Section 11 (2) of the Anti Trafficking Act (2008) requires the police to assist the victim of trafficking to obtain medical and psychological treatment where it is necessary; and to take the victim to a place of safety if the victim expresses a safety concern. Also they are responsible to inform the victim of their rights and any basic support which may be able to assist them. On another hand, the police officer has power to arrest the perpetrator of trafficking act as stipulated in the act. This was also stated by the police officer in charge of the Gender Desk interviewed during data collection. The Officer clearly stated that;

*" We only have few reported cases of Human trafficking per year, as our role once we have a tip of certain human trafficking movement we investigate the case and if it has truth in it then we arrest the culprits and rescue the victim in the process".*

### **Social Welfare Department**

In the local government structures in Tanzania, the social welfare officers work hand in hand with the community development officers of the district. They are actually allocated in the same department. The Social Welfare Services are integrated services that promote social development, social justice and social functioning of people. They are developed to help people function more satisfactory in their interaction with others and thus lead more fulfilling lives. They are designed to help and improve the wellbeing of individuals, families and communities and create a caring just society which respects human rights. In the case of human trafficking the role of social welfare officer is to work with other stakeholders to make sure they rescue the victim from the hands of the trafficker and afterwards make sure the victim obtain psychological and material help while waiting to be reunited with their families. This is clearly stated in the Anti Trafficking Act (2008) as;

*"The social welfare officer is responsible to provide counseling service to the victims of trafficking in person with view of assisting in rehabilitation and reintegration of victims".*

### **The Judicial process**

The judicial process starts once the case is presented by the police to the court. As a law enforcement organ the court makes sure to investigate and sentence the culprits associated with that particular offence. The Penalties given to the culprits goes from a fine

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of not less than 5 Million Tanzanian Shillings but not more than 100 Million Tanzanian Shillings or 2 to 10 years imprisonment or both punishments.

### Local Government, Communities and Individuals

Since the fight against human trafficking is a war declared against human kind, then every individual has a role in it. In Tanzania the local government includes the regional office, the district office, downwards to the wards and village office. All these authorities work together with communities and individuals in their localities in curbing human trafficking. According to the National Anti Trafficking in Person Action Plan (2018), human trafficking is addressed through 4Ps that is prevention, protection, prosecution and partnership. Different stakeholders play their part in the P's. The local Governments and communities however have a big role when it comes to prevention of the act and protection of the vulnerable victims though this is not clearly stipulated in the National Anti Trafficking in Person Act of 2008 and The National Anti Trafficking in Person Action Plan (2018). Much as the above plans are silent on what should be done by communities and local governments, IOM has provided guidelines which emphasize that local government and CSO's should work together with the Government and community members in identification, rescue, protection and re integration of the victim. This should be done when the stakeholders have been acquired knowledge on how to differentiate victims of human trafficking from other victims.

From the current study it was learnt that different stakeholders including the Government, Non Governmental Organization and community members played a big role in the rescue, rehabilitation and reintegration of the victims of human trafficking. The following section will discuss their involvement in these three actions against the heinous act.

### Rescue of Human trafficking victims

Due to the nature of this atrocious act, neighbours and other community members become very afraid of intervening in issues happening concerning human trafficking. They tend to give a blind eye to the abuse of the victims even when they witness. This was reported during focus group discussions in different places. The respondents reported to be afraid of reporting to the authorities due to the nature of the people involved. They explained that, the people involved in human trafficking most of the time are very powerful people so if they know who reported them they might harm you or your family. The following case from a focus group discussion illustrates this situation;

*"Here in Kaloleni there is a house where the girls are hidden after being taken from the village, the pedophile is known but she continues to traffic girls from Kondoa, Singida to Dar Es Salaam and sometimes to Nairobi. The girls are young from age 7 to 15. The girls are locked in the house, not allowed to move or walk outside the gate. There was a time the locked girls crawled to the gate and screamed for help, the gate was opened by neighbour and six girls were saved from that house. The girls were in a very bad situation, it seems they were not given food to eat, neither were they provided with clothes. They were taken to the hospital and later returned to their parents. Despite this situation, the pedophile seems to continue with her trafficking ways since she is protected by powerful people".*

Lack of confidentiality among leaders in different organizations was also blamed as the cause of the silence. In Meru district participants from a focus group discussion reported;

*"In our street there is a brothel which harbours more than ten girls, we always report to the village leaders but nothing is done. In the beginning I used to report, then one day I received a warning from an unknown person telling me to stop reporting. Since then I knew I had to keep quiet for the sake of protecting my family".*

For the case of domestic helpers, the participants reported that, it was very difficult to rescue the girls since most of the time they work in relatives and neighbour's home. The relatives are the ones who abuse the girls. So it becomes complicated and their hands are tied. They only tend to advise the relatives or neighbours to treat the helper in humanly ways. A case from a focus group in Monduli exemplifies this;

*"My neighbor lives with her niece, in the beginning she told me she will take her to school. But I have never seen the niece go to school; she is always working at home. Her aunty always abuses her physically by whipping, scolding and even burning her. The village officials know the situation but no action have been taken".*

Another case was recalled by FARAJA center when they rescued a young girl from the hands of an abusive aunty;

*"In another case an aunty who was a public servant had taken a girl of 13 years as her niece and domestic helper. She abused the girl, beating her continuously, denying her food. She even locked the girl inside not to meet anyone. The girl escaped through climbing the wall, since at the gate they was a security guard, we rescued the girl, though the lady is free".*

Much as a number of the community members were afraid in rescuing the victims of human trafficking, a number of them were able to help. The respondents reported that they were rescued by friends (10.8%), neighbours (16.8%), and staff from NGO, CSO or Government (2%) and also from faith based organization (3%). A good number of the respondents reported to still be working under the hands of the traffickers (67.8%). This is further shown in table 2.

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**Table 2: Person responsible for rescue of human trafficking victim (n = 400)**

Person who assisted in rescue	Frequency	Percent
A friend	43	10.8
A neighbor or community member	66	16.5
A staff from NGO, CSO or Government	8	2.0
A religious person	12	3.0
Not applicable	271	67.8
Total	400	100.0

Only a few victims (2%), reported to be rescued by officials from government, CSO and non government organizations. When interviewed officials from the social work and police gender desk reported to have rescued only few victims. However, they revealed that whenever they encounter such a case it was always termed as a gender violence case and in very rare occasions it was treated as human trafficking case. Another reason why the authorities have rescued only few victims was the victims running away from the authorities, unless they are badly injured by their bosses. The social worker from Arusha city council reports; *“Many cases of human trafficking are treated as child Labour or gender violence cases, and hence the punishment is given for a child labour or violence case. In 2018 only three cases were reported as Human trafficking cases. Even at the gender desk at the police station the cases are treated as gender violence cases and not human trafficking cases. So it is difficult to identify the cases of human trafficking as it is. Also the victims of human trafficking tend to report that they were not forced to come to work in Arusha but rather they agreed, in this case it becomes gender violence or child labour case”.*

### Rehabilitation of Human trafficking victims

According to Oxford dictionary (2011) the term rehabilitation is defined as the action of restoring someone to health or normal life through training and therapy after imprisonment, abusive condition, addiction, or illness. In case of the current study it is obvious that the victims of human trafficking have passed through a very abusive situation, so before they go back to their normal life they need rehabilitation services in order for them to be in good health condition. As earlier discussed in the above section, the victims have different psychological and physical problems due to different forms of abuse they have encountered. So before anything, they need to be rehabilitated. Table 3 shows some of the services provided to the victims as rehabilitation procedure.

**Table 3: Rehabilitation service provided to victims of human trafficking (n = 400)**

Rehabilitation service	Frequency	Percent
Care and support	38	9.5
Shelter	38	9.5
Counseling services	8	2.0
Legal services	7	1.8
Entrepreneurship skills	30	7.5
Not applicable	279	69.8
Total	400	100.0

From table 3, it is clear that not much is done in case of rehabilitation of the victims of human trafficking. Only 30.2% of the respondents reported to have received some sort of assistance and service from different stakeholders. Nine percent of the respondents reported to receive care and shelter from friends and neighbours while only 2% of the victims reported that they had received counseling services from different non-governmental organization and government organization. Among the non-governmental mentioned to provide counseling and shelter services to the victims included FARAJA and AMANI centre. The rescued victims from different parts of Arusha region were taken to the centres for rehabilitation. However, when the centres were visited they reported that the project of rehabilitating victims of human trafficking have sadly phased out. They are currently engaged into training of the victims different life skills. However the training is not free since the trainee has to pay Tshs. 90,000/= as course and accommodation fee. A case from FARAJA center illustrates this;

*“FARAJA Center was started in 2006 and since then we have rescued and rehabilitated more than 420 young females who were initially victims of human trafficking and other forms of abuse. However since 2015 we are no longer getting funds for these activities (rescue and counseling). As a result we are focused in giving shelter and entrepreneurship skills to the victims of human trafficking and abuse. Shelter is given only when the social worker from the city office provides us with allowances to enable us buy food and some clothes for the victim. The shelter is for a short time; normally it does not proceed two weeks”.*



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When interviewed, social workers from district and ward offices concerning where they take the victims of human trafficking for rehabilitation, they responded that due to shortage of funds they rarely provide rehabilitation services, but they still provide medical care for physical injuries and afterwards the victim is reunited with their family. The social worker from the city council stated this;

*“If a victim from domestic abuse or human trafficking is rescued, The Gender Desk (Police Office OCD) always works with the social welfare office to send the victims to the hospital for medical checkup and thereafter the social welfare find the custody for the victims until the end of the court proceeding. After there the girl or the victim is reunited with the family back home, but sometimes the victims do not want to go home, hence they are taken to centers such as FARAJA for vocational skills”.*

In Monduli district, (Mto wa Mbu ward) it was reported that the organization helping after rescuing the victims of human trafficking and other forms of abuse is DSW. The ward community development officer states;

*“DSW, have been working with Mto wa Mbu ward office in empowering the youth especially young females trafficked to Mto wa Mbu in issues related to their development. It has facilitated different workshops aiming at empowering the victims so that they can have their confidence back before going back to the community. They also provide financial assistance to the victims that enable them to open their small business”.*

### **Reintegration of Human trafficking victims**

Reintegration in simple words means reentry of an individual to the society which was once his or her society. An individual re-enters a society after confinement into jail or a place where he or she was isolated for sometimes. In case of human trafficking; the victims is reintegrated back into their community after being confined by the trafficker or pedophile for some time. According to IOM (2011) Reintegration is described as the process of facilitating the Victim of Trafficking (VoT) safe, dignified and sustainable return back to his or her family, community, or country of origin, and to live a normal life thereafter. It also includes the process of facilitating the VoTs stay in the host country or an alternative country when return is not possible. The aim of reintegration is to foster, nurture and strengthen the rehabilitation process of the victim into his or her community or host community to live a normal life. Accordingly, reintegration assistance may include a full range of services, from temporary shelter in a halfway house or other safe accommodation, to medical care, psychosocial support, and education and eventual return to the country/community of origin. The person or organizations responsible for this process includes the law enforcement organization such as police force, and labour office; social welfare department; immigration department and non-governmental organization.

In the current study, key informant interviews were conducted with the different organizations and from the interviews it was learnt that; only few cases were reported to the authorities. The police office reported to have only three cases for the period of 2017/2018, and only one case in the period of 2018/ 2019. They reported that the cases reported there are normally violence cases and not human trafficking cases. Once the case is reported all procedures are followed but at the end of the case the victim is normally reunited and reintegrated back to their home. For the case of social work office the same was reported. The social officers from Arusha city and district reported to have only few incidences of human trafficking, but a lot of labour disputes incidences. However they reported to reintegrate the victims back into their community.

The process of reintegration of the victims of human trafficking starts immediately after the victim is rescued. According to the social workers, the victims are provided with medical and physical care. During this time the victim is provided with shelter, clothes, food, medical checkups to identify is the victim needs any medical attention. If the victim needs medical attention then it is provided by specialists from different hospitals i.e. Mount Meru Hospital in Arusha for the case of victims from Arusha city. Afterwards the victim is provided with psychosocial service which involves trauma therapy, counseling and advising the victim to gain self-esteem and confidence back. Counseling goes hand in hand with life skill and vocational skills training where the victims are empowered so that they cannot go back to where they came from. They are empowered to avoid being vulnerable again to the pedophiles and traffickers. After some time the victim is now reunited with parents and family. The process of rehabilitation and reintegration was conducted by the law enforcement, social work office with assistance of the Non Governmental organization. FARAJA center and AMANI centre provided a number of services for the rescued victims of human trafficking. They provided shelter, psychosocial counseling and vocational skills to the victims. However, since the projects phased out the social work office can only manage to provide medical care to the victims if needed and immediately reintegrate them to the community. This is due to lack of funds which could facilitate the healing process of the victim. As a result, the victim ends up returning to the trafficker since they feel their communities discriminate them. The social worker emphasizes this in his interview;

*“Before 2015, we used to follow all the procedures to make sure the victims are reintegrated back to their communities. The process after rescuing them involved provision of medical treatment if they had injuries or any health problem, clothes, shelter followed by psycho social treatment. This required a lot of funds and specialists. But it was a good approach since the victims were empowered again and never went back to the trafficking cycle. However things have changed, a lot of steps are not followed after*

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*rescuing the victims, so once returned to their communities they tend to bounce back to the network, it is not once or twice we have met the same victim working in other places, the same person we sent home”.*

Rehabilitation is a very important step after rescuing the victims of human trafficking. Rehabilitation aims at healing and preparing the victim to face the world again after being confined in the trafficking world. Therefore without empowering the victims through provision of counseling and self-esteem sessions the victims will always return to the trafficking cycle. In the current study, a good number of the victims (65.5%) disagreed of the readiness to go back to their communities with the reason that they were afraid of being stigmatized and discriminated. However, the study believes that after being rehabilitated if they had a chance, they would accept into going back. Much as the victims were not ready to go back home, they showed enthusiasm into their future. The victims reported that, once this ordeal was over, they would like to be entrepreneurs and own their own small business. Table 4 shows the kind of activities the victims wish to have once they are reintegrated into their new life.

**Table 4.Type of activity victims prefer doing when reintegrated in the community (n=400)**

Type of activity	Frequency	Percent
Trading	274	68.5
Eatery (mama lishe)	52	13.0
Hair dresser	24	6.0
Farming	7	1.8
Go back to school	43	10.8
Total	400	100.0

From Table 4, it is clearly shown that the majority of victims (68.5%) prefer general trading in markets days that means they could sell a number of stuff in market days. The goods to be sold include cereals and other food stuff, clothes, shoes, school stuff, alcohol, etc. Thirteen percent of the victims also prefer opening their own eateries, while 10.8% of the victims prefer to go back to school to finish their education. It was also clear that only 1.8% of the victims preferred to go back to farming as a way of earning for their income.

### DISCUSSION

Much as these Governmental departments have been working on a daily basis to end this heinous act against humanity the current study showed that the Non Governmental Organisation, ward officers and community members, played a key role in the rescue and assistance of the victims of trafficking. The respondents reported to be rescued by friends (10.8%), neighbours (16.8%), and staff from NGO, CSO or Government (2%) and also from faith based organization (3%). A good number of the respondents reported to still be working under the hands of the traffickers (67.8%). From the focus group discussions it was however revealed that community members were a bit hesitant in rescuing the victims due to several reasons. The reasons mentioned included; fear of powerful pedophiles, corrupt actions by local government, and threats from the victim’s employer. These findings concur with results from other studies; in Mathias (2011) similar findings were reported whereby the victims reported to be rescued by neighbors, friends and other community members. After being rescued the victims remained in the rescuers home and eventually were taken to ward or village offices for further assistance. In other studies by UNODC (2014), neighbors and community members are also reported to rescue victims of human trafficking in Thailand. The neighbors with sensitization and proper information on how to identify a victim of human trafficking can help rescue the victims and thereafter work with other authorities in the rehabilitation process. In contrast to the neighbours and friends for rescue, other studies have shown that the law enforcement officers have succeeded to rescue victims of human trafficking i.e. Police in Niger managed to rescue 232 victims of human trafficking, including 46 under the age of 18, during an INTERPOL-supported operation targeting organized crime groups in West Africa, also in another heist in South and Central America INTERPOL managed to rescue of more than 2,700 victims, 134 arrests and the dismantling of at least seven organized crime networks. This was in between 2017 and 2018 respectively.

After rescue, a few respondents reported to have received different services as means of rehabilitation. Only 30.2% of the respondents reported to have received some sort of assistance and service from different stakeholders. Nine percent of the respondents reported to receive care and shelter from friends and neighbours while only 2% of the victims reported that they had received counseling services from different non-governmental organization and government organization. Among the non-governmental mentioned to provide counseling and shelter services to the victims included FARAJA and AMANI centre. Though only a few of them received these services they agreed that it had helped them recuperate and heal from the trauma they have faced. Similar findings and observation has been mentioned in many studies conducted in Tanzania (Mathias, 2011), Nepal

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(Childreach, 2013) and South Africa (Lutya, 2012). These studies unanimously agree that rehabilitation of victims of trafficking is a key step towards healing. Through educational, economic opportunities as well as extended psycho social care the victims' recovers and might be ready to re unite with their families. Much as rehabilitation is important, this studies and other studies (Mathias, 2011; Kamazima 2009; and IOM, 2011) mention that, they are inadequately provided to the victims, making them vulnerable to the traffickers again after being rescued. In the current study it was observed that there was lack of shelters, lack of medical services and even inadequate vocational training facilities. The victims depended on the Non Governmental Organisation facilities (FARAJA and AMANI centers) which were phasing out these programs. In that case the social welfare officer mentioned lack of facilities, funds and hence they had to stop the rehabilitation program for the rescued victims. The Tanzanian Anti-trafficking Act (2008) stipulates that;

*"Social rehabilitation of rescued victims shall be carried out by social welfare officers for the purpose of re-instating the victim back to into normal way of life and may include provision of legal assistance and material assistance, psychological, medical and professional rehabilitation employment and a dwelling place"* (URT, 2008).

This means that the social welfare officer is in charge of making sure that all rescued victims of human trafficking receive social rehabilitation before being reintegrated back into the community.

Reintegration was the last step towards helping the victim become normal and empowered again. The reintegration of trafficking victims often is a difficult, complex, and long-term process. It is different for each victim, and it involves not only the victim but also the environment and culture within which the reintegration is to take place. Reintegration of the victims to the victims always depends on how ready they are to face reality. That means it depends solely on rescue and rehabilitation process. If the victims recovers well they automatically becomes ready to go back to their family, but sometimes they refuse going back. Apart from the recovery process the victims also fear stigma from the society. The groups fearing stigma might include victims from sexual exploitation who might have contracted HIV/AIDS, and who fell pregnant. In the current study few respondents (34.5%) were willing to go back to their communities while a good number (65.5%) disagreed with the idea of going back to their communities. Reasons for disagreeing to go back to the communities were fear of being stigmatized due to the nature of job they were involved in and also the economic situation of their families. They preferred to remain in urban areas doing different entrepreneurial activities such as hair dressing (6%), eateries (13%), general trading (68%) and farming (2%). Apart from these activities few respondents (11%). also emphasized the need to go back to school to finish their education. Similar cases were reported in different studies conducted in different places worldwide. For example in the study conducted in Nepal by Childreach (2013) it was reported that if the girls are ever freed or even manage to escape, it is extremely difficult for them to return to their families in Nepal because of the stigma attached to their previous work in the sex industry, which often means they are rejected by their families and communities. Many of them therefore return to Nepal and, rather than returning home, they take up work in urban centers as prostitutes where they work as "free agents".

## CONCLUSION

In totality it is clearly evident that the recovery process of the victims of human trafficking is vital in making them whole again. They need to pass through the process of being rescued, rehabilitated and eventually reinstated back into their community. In cases where the victims do not receive proper social rehabilitation services it is easily for them to be trapped back into the trafficking chain. Social rehabilitation might involve education, social skills and entrepreneurship, psycho social services and also legal services. In other instances, some of the victims prefer to go back to school to complete their formal education which was cut short due to human trafficking. Much as these services seem to be crucial for the recovery of the victims, in the current study it was reported that they victims could not receive the said services due to lack of funds for implementing this services.

## REFERENCES

- 1) Childreach International (2013). *Child trafficking in Nepal: Causes and Consequences*. Pp 1-39. Accessed 2<sup>nd</sup> January, 2020.
- 2) International Organization for Migration (2008) Human Trafficking in Eastern Africa, Research Assessment and Baseline. About IOM.pp 5 – 8. Retrieved on the 10th October, 2021, from <http://www.iom.int/jahia/Jahia/about-iom/lang/en>
- 3) International Organization for Migration (2016). More Needs to Be Done to Address Stigma and Discrimination Towards Women Trafficked for Sexual Exploitation. Retrieved on 2<sup>nd</sup> January 2019. Available at <https://www.iom.int/statements/more-needs-be-done-address-stigma-and-discrimination-towards-women-trafficked-sexual-exploitation/>.
- 4) Kamazima S.R. (2009) Human Trafficking Baseline Assessment in Tanzania: Findings from selected regions. A Report published for International Organization for Migration. Pp 7-8.

## Rescue, Rehabilitation and Reintegration of female survivors of human trafficking in Northern Tanzania

- 5) Lutya T. and Mark L. (2012). *An Integrated Theoretical Framework to Describe Human Trafficking of Young Women and Girls for Involuntary Prostitution*. Department of Social Work and Criminology, University of Pretoria, Pretoria, Department of Criminal Justice, College of Arts & Sciences, University of Alabama, AL. South Africa and USA.
- 6) Magesa R. (2021). The Impact of Human Trafficking on young female's live. A PhD Dissertation. The Open University of Tanzania. Available at <http://repository.out.ac.tz/3466/>
- 7) Mathias A. (2011). *Child trafficking in Tanzania: Exploring Experiences of trafficked girls in Dar Es Salaam*. Unpublished Master of Philosophy thesis in Gender and Development. Faculty of Health Promotion and Development. University of Bergen. Pp 125.
- 8) Mtewe G. (2012). *The Influence of Traditional Customs and Practices on Girls Secondary Education in Morogoro Region in Tanzania*. Unpublished Thesis submitted for partial fulfillment of the requirement for the degree of Master of Philosophy in Comparative and International Education. Institute of Educational Research. University of Oslo. Norway. Pp 101.
- 9) The Global Slavery Index (2018). The Global Slavery Index 2018 report. Available at [https://downloads.globalslaveryindex.org/ephemeral/GSI-2018\\_FNL\\_190828\\_CO\\_DIGITAL\\_P-1676450728.pdf](https://downloads.globalslaveryindex.org/ephemeral/GSI-2018_FNL_190828_CO_DIGITAL_P-1676450728.pdf)
- 10) Shimba C., Magesa R., Magombola D. (2013). The Root Causes of the Girl Prostitution in Tanzania: A Case of Arusha Municipality, *IISTE Journal of Developing Countries studies*, Volume 3(9) 80-89. ISSN 2225-0565
- 11) Oxford English Dictionary (2011). Oxford University Press Retrieved on 19<sup>th</sup> March, 2016, from <http://www.oed.com/view/Entry/131970?redirectedFrom=opportunism>.
- 12) United Nations (2000). *Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, Supplementing the United Nations Convention against Transnational Organised Crimes*. New York: United Nations.
- 13) United Nations International Children Emergency Fund (UNICEF) (2010). *The Dynamics of Social Change: Towards the Abandonment of Female Genital Mutilation in Five African Countries*. Available at: [http://www.unicef-irc.org/publications/pdf/fgm\\_insight\\_eng.pdf](http://www.unicef-irc.org/publications/pdf/fgm_insight_eng.pdf)
- 14) United Republic of Tanzania (2008). *Report on the situation of irregular migration in Tanzania, prepared by: the Ministerial Task Force on Irregular Migration, April, 2008*. Dar Es Salaam, Tanzania. Pp 12 – 37.
- 15) United Nations Development Programme (2011). *Human Development Report: Sustainability and Equity: A Better Future for All*. Published for the United Nations Development Programme (UNDP). Pp 185.
- 16) United Nations Office on Drugs and Crime (2014). *United nations convention against transnational organized crime and the protocols thereto*, Vienna: Vienna International Centre. Pp 42. Retrieved on 16<sup>th</sup> may, 2018. Available at [https://www.unodc.org/documents/middleeastandnorthafrica/organised-crime/united\\_nations\\_convention\\_against\\_transnational\\_organized\\_crime\\_and\\_the\\_protocols\\_thereof.pdf](https://www.unodc.org/documents/middleeastandnorthafrica/organised-crime/united_nations_convention_against_transnational_organized_crime_and_the_protocols_thereof.pdf)
- 17) United States of America States Department (2007). The Rehabilitation of Victims of Trafficking in Group Residential Facilities in Foreign Countries. A study conducted pursuant to the trafficking victim protection reauthorization act of 2005. Available at [https://pdf.usaid.gov/pdf\\_docs/PNADK471.pdf](https://pdf.usaid.gov/pdf_docs/PNADK471.pdf)
- 18) United States of America States Department (2022). Trafficking in Person Report of 2022. Available at <https://www.state.gov/wp-content/uploads/2022/10/20221020-2022-TIP-Report.pdf>



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## Factors Influencing Women Inclusion in Fish Value Chain in Kilombero District, Tanzania



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**ABSTRACT:** Fishing is among livelihood activities for many residents around the world, however, women inclusion in the fishing value chain is not equal to men. This gap is attributed by different factors. The study analyses the factors that influence women inclusion in fish value chain in Kilombero District, Morogoro. Tanzania. Cross-sectional research design involving 132 women fishers was used. Systematic random and purposive sampling techniques were used. Questionnaire survey and key informant interviews were used to gather information from women fishers and Key informants for the study. The data analysis employed Multiple linear regression and thematic content analysis. It was found that awareness on fish activities, access to market fish supply, access to credit, access to license, social responsibilities, norms and customs are the important variables influencing women inclusion in fish value chain. The study concludes that awareness on fish activities, accessibility to fish markets, credit and to license are opportunities for women to engage into fish value chain while existing cultural norms and customs social responsibilities drawbacks. The study recommends that the government needs to advocate for environment that promote opportunities for women to engage into fish value chain whilst diminishing negative cultural situation that discourage women involvement into fish value chain.

**KEYWORDS:** Fish, value chain, fish value chain, women, inclusion.

### 1. INTRODUCTION

A value chain is the entire series of activities and transactions needed to make a product and deliver it to consumers. Fish value chain passes through four nodes or fishing activities usually starts at harvesting stage at sea, lakes, river, dams, or water bodies and then the catch is brought to landing sites, (centers). Then processing activity, storage and packaging activity, marked by wholesalers to retailers and finally marketing distribution and supply it reaches to the end users (consumers) (Kiminski *et al.*, 2018).

Globally, fishery industry plays a significant role in the livelihoods of many people in terms of creation of employment, income generation and provision of principal protein to the diet (Kizito *et al.*, 2017). For example, according to FAO (2017) there are an estimated worldwide that 180 million people working in fisheries and aquaculture, of those nearly half are women. It is estimated worldwide that women make up an estimated 47% of workers (56 million women) in fish value chains worldwide, making up nearly half of the overall fisheries sector workforce (Meetei *et al.*, 2016). There is disparity in terms of women inclusion in fisheries industry since this sector is mostly dominated by men (Arthur *et al.*, 2015).

African governments recognize gender as a cross-cutting issue including measures to enhance inclusion of women in fish value chain (Torell *et al.*, 2019). Government-led gender integration appears to focus on supporting the post-harvest processing sector by encouraging value-chain changes and addressing social needs (*ibid.*). There is also a need for government authorities to extend the scope of women inclusion from a mere post-harvest participation to pre-harvest engagement (Harper *et al.*, 2017).

In Tanzania, despite the long-standing notion that fishing is dominated by men, both men and women work in different stages in the fish value chain however gender roles vary regionally based on various factors including culture and economy (FAO, 2017; Medard *et al.*, 2019). While it is common for women to participate in capturing fisheries, particularly in near shore areas and along rivers, it is post-harvest activities such as processing and marketing that typically provide income for women (Alonso-Plobacion and Siar, 2018). Women often dry, smoke, and salt or fry fish to be sold or traded at regional markets.

In Kilombero District, fish value chain is still dominated by men counterparts (Mgana *et al.*, 2019). According to the annual report (2021) Kilombero District is facing low inclusion of women in its local fish value chain Condemned on the limed access.

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Only 12.1 percent of the fish value chain actors at Lumemo ward in Kilombero District are women. Men are the main owners of fishing gears such as motor boats propelled with engines (Onyango, 2017). Off-shore fishing is regarded as a sustainable practice as such as it captures mature fish. Once the fish is brought at the landing sites, mostly women transfer the catch from the fishing boats to the drying area (Jones *et al.*, 2018). On the other hand, In Kilombero District there are few studies done on assessing factors influencing women inclusion in fish value chain.

### 2. LITERATURE REVIEW

#### 2.1 Supply Chain Model

This study uses Supply Chain Model to explain the linkage between women inclusion in fish value chain and different factors that attribute to that chain. The model was pioneered by Nguyen (2018) who described that in the supply chain model there is a network between suppliers and the final buyers. This network includes different activities in fish value chain, people, entities, information, and resources. Nonetheless, in this study, people means inclusion of women. Therefore, in course of involving women in the fish supply chain there are different factors that influence the operation of the chain.

#### 2.2 Empirical Literature Review

Manyungwa *et al.* (2019) conducted a study to investigate whether there was the presence of gender inclusion in fishery. The study found that men and women are included in different fish value chain projects, but women have been restricted to less competitive form of utility that has had an effect on their level of inclusion in fish value chain. This was influenced by social factor like awareness in fish activities, security in fish harvesting, having social responsibilities apart from fishing. Also, another study which was conducted in Vietnam by Alonso and Siar (2018) found that women are constrained from market fish supply, access to credits, access to own fish licenses, transport cost, access technological fish equipment's costs like owning boats, knowledge in storage and packaging for processed fish as well as poor price determination. These factors contribute to decreasing women's prospect of advancement in correlation with men who win as managers and gifted specialists.

On the other hand, studies indicate that cultural perspective influence fishing activities (Gardner *et al.* 2017; Choudhury *et al.*,2017). Studied indicated that low women inclusion in fish value chain due to the cultural factors including cultural beliefs, norms and customs, structural prejudice and patriarchal systems. They established that culture and norms act as an informal regulatory mechanism that influences access and control of resources and patriarchy hinders women to be flexible in fish value chain.

### 3. RESEARCH METHODOLOGY

The study was conducted in Lumemo Ward of Kilombero District, Morogoro Region, Tanzania and adopted cross sectional research design whereby 165 fisher women were involved. The district was selected due to the fact that is among the major fish producing area in the region (Mligo, 2015) and it bears very conducive conditions for fishing activities. The Lumemo Ward was selected because it is facing low inclusion of women in its local fish value chain whereby only 12.1 percent of the fish value chain actors are found in Lumemo Ward (Kilombero District profile, 2021). Systematic random sampling was used to select women fishers and purposive sampling to select Ward Agricultural field Officer and District Fish officer as the Key informants. A questionnaire survey with the structured questionnaire and in-depth interviews with Key informants using checklist of questions were conducted to collect primary information. Qualitative information was collected using checklists.

Quantitative data on factors influencing women inclusion in fish value chain were analyzed using Multiple linear regression model. The model was specified as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \epsilon$$

Where:

Y= Dependent variable; Women inclusion (number of women fishers)

$\beta_1 - \beta_{12}$  = Coefficients of the predictor variables

$\beta_0$  = constant of the equation.

X1 = Age of respondents

X2 = Education level of the respondent (years of schooling)

X3 = Marital status (1= Married, 0= not married)

X4= Security in fish harvesting (scores)

X5= Having responsibilities apart from fishing, (1= Yes, 0= No)

X6= Awareness in fishing activities (scale)

X7= Market fish supply (1=Existing 0= non existing)

X8= Access to credit (1=Yes 0= No)

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X9= Access to own license (1= Yes 0=No)

X10= Access to fish equipment's (1= Yes 0=No)

X11= Culture beliefs (scores)

X12= Norms and customs (scores)

$\varepsilon$  = error term

Qualitative information were analyzed using content analysis.

### 4. RESULTS AND DISCUSSION

#### 4.1 Factors Influencing Women Inclusion in Fish Value Chain

The study analyzed the data using a multiple regression model to show the individual contribution of factors influencing women inclusion (age group of women, marital status, education, security in fishing harvesting, having social responsibilities apart from fishing, awareness in fishing activities, access to market fish supply, access to credit, access to fish licenses, access to fish equipment's, cultural beliefs, norms and customs) towards inclusion in fish value chain. The results are shown in Table 1.

**Table 1. Factors influencing women inclusion in fish value chain (n= 132)**

Variable	Unstandardized Coefficients		Standardized Coefficients	t- value	p - value
	$\beta$	Std. Error	Beta		
Constant	1.311	.142		9.263	.000
Age group of women	.002	.010	.004	.177	.860
Marital status	.007	.011	.014	.632	.528
Education level	.017	.013	.031	1.362	.176
Security in fish harvesting	-.013	.014	.030	.927	.356
Social responsibilities	-.056	.015	-.114	-3.741	.000***
Awareness in fish activities	.138	.021	.297	6.496	.000***
Access to market fish supply	.184	.017	.368	11.023	.000***
Access to credit	.086	.017	.215	4.941	.000***
Access to fish licenses	.205	.012	.452	17.018	.000***
Access to equipment's	.028	.018	.056	1.615	.109
Cultural beliefs	.011	.013	.024	.808	.420
Norms and customs	-.034	.015	-.074	-2.283	.024**

$\beta$  = Coefficient; SE= Standard error

Note: \*\* and \*\*\* indicate statistical significance at 10%, 5% and 1% significance levels respectively.

The results revealed that there is a negative relationship between having social responsibilities and women inclusion in the fish value chain ( $\beta = -0.056$ ;  $P = 0.000$ .) and the relationship between variables was statistically significant (Table 1). These results indicate that social responsibilities apart from fishing (e.g. generally combining work, household, community activities etc.) have negative contribution towards women inclusion. For instance the interview with District Fish Officer who had this to say; *"...Barriers are such as heavy family responsibilities (e.g. generally combining work, household, community activities etc.) have negative contribution toward women inclusion"*. ( District Fish Officer- Kilombero District, 03/08/2022)

The result implies that most of women reported that domestic activities such as caring family children limit their time to engage in fishing activities. Also their main obstacles appear to lack confidence in their abilities in finding sufficient time in participating in fishing activities, as result majority of them are holding back from participating in fishery activities.

The results revealed that there is a positive relationship between awareness in fish activities and women inclusion in the fish value chain ( $\beta = 0.138$ ;  $P = 0.000$ ) and the relationship between variables was statistically significant (Table 1). These results indicate that more the women have awareness in fish activities, the higher is the probability they engage in fish value chain. The result implies that most of women who were aware in fish value chain were engaged in fishing activities and this led to influence women inclusion in fish value chain. Some of women get aware through media women groups and involve in fish value chain. These results concur with Hara *et al.*, (2017) who found out that awareness in fish activities have positive significant contribution towards women inclusion.

The results revealed that there is a positive relationship between access to market fish supply and women inclusion in the fish value chain ( $\beta = 0.184$ ;  $P = 0.000$ ) and the relationship between variables was statistically significant (Table 1). These results indicate that most of women they access to market fish supply in fish value chain. The result implies that some of the women

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were directly participates in access to market fish supply in decision-making about market distribution. Having access to market fish supply is one of their reasons to why they are included in fishing activities. This finding also concurred with Lynch *et al.* (2016) which established that women may have advantaged in finding market, they still play a significant role in fishery value additions.

The results revealed that there is a positive relationship between access to credit and women inclusion in the fish value chain ( $\beta=0.086$ ;  $P=0.000$ ) and the relationship between variables was statistically significant (Table 1). These results indicate that more women have access to credit which support to involve in fish activities. These results imply that the more women have access to credit the more inclusive in fish value chain and vice versa is true. Most of them they get loans from government and private sectors and support to run fishing activities. These results concur with scholars such as Shelly and Costa (2001) who argued that access to credit have positive significant contribution towards women inclusion.

The results revealed that there is a positive relationship between access to licenses and women inclusion in the fish value chain ( $\beta=0.205$ ;  $p=0.000$ ) and the relationship between variables was statistically significant (Table 1). These results indicate that women who have access to licenses they participate in fish activities than women who have no access to licenses. These results imply that most of women who have access to fish licenses were engage in fishing activities in all chain or nodes and increase number of inclusion in fish value chain. License help women to involve with confidence in fishing activities due to government issues. These results concur with scholars such as Frangoudes and Gerard (2019) who argued that access to licenses have positive significant contribution towards women inclusion.

The results revealed that there is negative relationship between norms and customs and women inclusion in the fish value chain ( $\beta= -0.034$ ;  $P=0.024$ ) and the relationship between variables was statistically significant (Table 1). These results indicate that existence norms and custom discourage women to involve in fish value chain. The result implies that customs and norms discriminate women in engage in fishing activities and engage in other activities apart from harvesting activities. One of the interviews with the Ward Agriculture Field Officer- Lumemo Ward, reported that;

*"...There is some of norms and customs believe that women are not allowed in harvesting activities. This culture hinder by excluding women in harvesting stage they perceive that if women were in their monthly period menstruation cycle when inter into water fish are disappear."* (Ward Agriculture Field Officer - Lumemo Ward, 03/08/2022)

These result concur with Kleiber *et al.* (2017) who found norms and customs having negative contribution towards women inclusion in fish value chain.

## 5. CONCLUSION AND RECOMMENDATIONS

The study concluded that there is a strong significant relationship between women access and control over fish resources and inclusion in fish value chain. There was relationship between factors influencing women inclusion and inclusion in fish value chain, and some of the factors relationship between variables was statistically significant. These factors are such as awareness in fish activities, access to credit, access to licenses and access to market fish supply. Also these factor have positive contribution toward women inclusion in fish value chain because help women to involve in fish value chain. While factors like norms and customs, having social responsibilities have negative contribution toward women inclusion in fish value chain because these factors hinder women to be involved in fish value chain.

The study recommend that fish vendors need for policy makers to establish local fish forum so as to offer education regarding those cultural norms that play as barrier for the women to have a full participation in fish value chain. This can be done by strengthening Gender mainstreaming strategy which according to Tanzania National Fisheries Policy of 2015 is the strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation with regards to fisheries management and development. By doing so, we render with Tanzania National Fisheries Policy of 2015 which advocating on creation of more and better employment opportunities in fisheries and aquaculture for both women and men is necessary in poverty reduction in this country.

## REFERENCES

- 1) Adhuri, D. S., Rachmawati, L., Sofyanto, H., and Hamilton-Hart, N. (2016). *Green market for small people: Markets and opportunities for upgrading in small-scale fisheries in Indonesia.*
- 2) Aleidi, A. (2018). *Analyzing the Influence of Gender Stereotypes and Social Norms on Female IT Entrepreneurial Intention in Saudi Arabia.*
- 3) Allegretti, A. 2019 "We are here to make money": New terrains of identity and community in small-scale fisheries in Lake Victoria, Tanzania. *Journal of Rural Studies*, 70, 49-57.



## Factors Influencing Women Inclusion in Fish Value Chain in Kilombero District, Tanzania

- 4) Alonso E., and Siar, V. 2018 Women's participation and leadership in fisherfolk organizations and collective action in fisheries: a review of evidence on enablers, drivers and barriers. *FAO Fisheries and Aquaculture Circular*, (C1159), 1-48.
- 5) Arthur, R., Leschen, W., & Little, D. 2015 *Fisheries and aquaculture and their potential roles in development: an assessment of the current evidence*.
- 6) Choudhury, A., McDougall, C., Rajaratnam, S., & Park, C. M. Y. 2017 Women's empowerment in aquaculture: Two case studies from Bangladesh.
- 7) FAO 2017 *Global Fish Highlights*. Rome, Rome Publications.
- 8) Frangoudes, K., and Gerrard, S. 2019 Gender perspective in fisheries: examples from the South and the North. In *Transdisciplinarity for Small-Scale Fisheries Governance*
- 9) Gardner, C. J., Roccliffe, S., Gough, C., Levrel, A., Singleton, R. L., Vincke, X., and Harris, A. 2017 Value chain challenges in two community-managed fisheries in western Madagascar: insights for the small-scale fisheries guidelines. In *The Small-Scale Fisheries Guidelines* Springer, Cham.
- 10) Hara, M., Chimatiro, S. K., and Manyungwa-Pasani, C. L. 2017 Women's Participation in Fish Value Chains and Value Chain Governance in Malawi.
- 11) Harper, S., Grubb, C., Stiles, M., and Sumaila, U. R. 2017 Contributions by women to fisheries economies: insights from five maritime countries. *Coastal Management*, 45(2), 91-106. Hamilton-Hart, N., and Stringer, C. (2016). Upgrading and exploitation in the fishing industry: Contributions of value chain analysis. *Marine Policy*, 63, 166-171.
- 12) Jones, B. L., Unsworth, R. K., Udagedara, S., and Cullen-Unsworth, L. C. 2018 Conservation concerns of small-scale fisheries: by-catch impacts of a shrimp and finfish fishery in a Sri Lankan lagoon.
- 13) Kaminski, A. M., Genschick, S., Kefi, A. S., and Kruijssen, F. 2018 Commercialization and upgrading in the aquaculture value chain in Zambia.
- 14) Kilombero District Profile. 2021 *Full Council annual Report*, District report Kilombero Morogoro.
- 15) Kizito, P., Kimani, E., and Lodiaga, M. 2017 Ventures Within Fisheries Value Chain that Men and Women Participate in Nairobi City County, Kenya.
- 16) Kleiber, D., Frangoudes, K., Snyder, H. T., Choudhury, A., Cole, S. M., Soejima, K. and Porter, M. 2017 Promoting gender equity and equality through the small-scale fisheries guidelines: experiences from multiple case studies. In *The small-scale fisheries guidelines* Springer, Cham.
- 17) Lynch, A. J., Cooke, S. J., Deines, A. M., Bower, S. D., Bunnell, D. B., Cowx, I. G., and Rogers, M. W. 2016 The social, economic, and environmental importance of inland fish and fisheries. *Environmental Reviews*, 24(2), 115-121.
- 18) Manyungwa, C. L., Hara, M. M., and Chimatiro, S. K. 2019 Women's engagement in and outcomes from small-scale fisheries value chains in Malawi: effects of social relations. *Maritime Studies*, 18(3), 275-285.
- 19) Medard, M., Van Dijk, H., and Hebinck, P. 2019 Competing for kayabo: gendered struggles for fish and livelihood on the shore of Lake Victoria. *Maritime Studies*, 18(3), 321-333.
- 20) Meetei, W. T., Saha, B., and Pal, P. 2016 Participation of Women in Fisheries: A Study on Gender Issues in Manipur, India. *International Journal of Bio-resource and Stress Management*, 7(4), 906-914.
- 21) Mgana, H., Kraemer, B. M., O'Reilly, C. M., Staehr, P. A., Kimirei, I. A., Apse, C., and McIntyre, P. B. 2019 Adoption and consequences of new light-fishing technology (LEDs) on Lake Tanganyika, East Africa. *PloS one*, 14(10), 322-333.
- 22) Mligo, F. E. and Msuya, C. P. 2015 Farmers adoption of recommended. A case of Kilombero District of Morogoro Region Tanzania. *South african Journal of Agriculture Extension* 43(1), 41-56.
- 23) Nguyen, V. T. 2018 A Structural model for the impact of supply chain relationship traits on project performance in construction. *Production Planning and Control*, 29(2), 170-183.
- 24) Onyango, P. O. 2017 Socio-economic characteristics of the Lake Victoria Fisheries. In *Lake Victoria Fisheries Resources* (pp. 161-184). Springer, Cham. Patel, V. 2017 Unit-2 New International Division of Labour. .
- 25) Shelly AB and D Costa M. 2001 Women in aquaculture: Initiatives of CARITAS Bangladesh. In *Global Symposium on Women in Fisheries*, Sixth Asian Fisheries Forum, 29 November, Taiwan.
- 26) Torell, E., Bilecki, D., Owusu, A., Crawford, B., Beran, K., and Kent, K. 2019 Assessing the Impacts of Gender Integration in Ghana's Fisheries Sector. *Coastal Management*, 47(6), 507-526.



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## The Role of Educational Leadership and Practices to School System and Discipline



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**ABSTRACT:** The study investigates the role of educational leadership and practices to school system and discipline. Specifically, it focuses on the goals and expectation, resolution and alignment, quality teaching support, learning and development, safe and orderly learning atmosphere of the school setting.

Results show that the role of educational leadership and practices implements to reform in the school leaders in compliance of improvement and substantive practice, contribute in the understanding of insights on resolution and alignment to enact instructional leadership, provide attributes in understanding the quality of teaching to bring school leaders for a positive change, identify the learning quality and development opportunities in the factors addressed to success of teaching and learning process, and support the goals for an effective learning atmosphere in the school system, strong leadership process, clear vision in the learning process, and creates a climate for better learning.

Findings show that there is a significant correlation on the roles of educational leadership and practices as observed by the respondents.

**KEYWORDS:** Role of educational leaderships and practice, school system and discipline, goals and expectation, resolution and alignment, quality teaching support, learning and development, safe and orderly learning atmosphere

### INTRODUCTION

Educational leadership unites the talents and collaborates the process of teachers forces in the school setting. It is to improve the educational leadership in the school system and quality of education. Educational leadership purpose is to ensure success of the process in the academe, training, and material improvement Mallillin, (2022). It collaborates and accomplishes the various individuals such as educators, teachers, students, parents, and public policy makers in the system of education. From the perspective of leadership education is a management of academics and a form of quality control. It identifies the trends in the systematic management of educational leadership knowledge. It focuses on the techniques and role in educational leadership. It also reflects the feature characteristics and traits in most notable leadership in educational setting terms of school system and process. It provides support in the improved educational leadership and management practice. This is to enhance the concerted efforts in the quality of educational leadership ability, policy role and practice, (Hammad, et al., 2022, pp. 6-25). Hence, educational leadership and role has broadened the school practice in knowledge diverse tradition as to critical and functional among their constituents, policies, practitioners, and preferences. It explores the objectives of educational leadership practices in the school setting for better improvement and a disciplined atmosphere. The quality of the system in the school depends on how a leader manages to obtain quality of work improvement process and practices. It analyzes the systematic role of educational leadership and contribution for a quality school system. This enables them to understand the role of educational leadership and practices in the school system and discipline dynamics, (McGinity, Heffernan, & Courtney, 2022).

On the other hand, the role of educational leadership and practice is centered on qualities and key principles. It is an educational leadership to create academic success and vision for all teachers and students. It is necessary to know the historical gap among students and teachers in the various socio-economic levels and student achievement. Educational leadership roles are to strive for a receptive learning environment and maintain safety for both teachers and students through integration of knowledge and students learning enhancement Mallillin, et al., (2020). A healthy environment school is structured with an orderly and comfortable classroom atmosphere. Educational leadership is impressive when responsibility is delegated properly. This means that teachers, students, and parents empower the responsibility, accountability, and acceptance. Educational leadership provides curriculum content and instructional method for continued improvement. It adapts and borrows modern management

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in the educational fields, processes, tools, and techniques Mallillin, (2020, pp., 1-11). The role of educational leadership explores the practice and values in school setting discipline and system. It examines the contending alternative leadership practices that provide phenomena and understanding the school leadership. It is focused on transition behavior and traits of individual school leaders. It provides insights to unfold educational leadership as they work together for advanced quality education equipped with knowledge and practice as actors in the school setting and discipline Mallillin, & Mallillin, (2019). It advances the traditional approaches of leadership. It identifies leadership approaches in the school discipline system and practices. It draws attention in practice educational leadership and role to demonstrate illustrative phenomena for the practice lens and values. It expands the attention of the focus in the role of educational leadership and practice to the school system and discipline, (Nelson, 2022, pp. 197-210). Absolutely, the approach in leadership emphasizes an optimistic process in the role of educational leadership. It provides a cultural approach for school positive leadership and prospective educational systems. It explores the process and perspective role of leadership with positive results. The role of educational leadership and practices in the school system and discipline includes ethics, principles, staff outcome, affection of positive leadership, skills, behaviors, relationship, and wider benefits. It provides credence in scientific and positive leadership, (Kouhsari, et al., 2022, pp. 1-21).

Subsequently, the contribution of educational leadership and practices in the school discipline and approach provide a foundation among teachers. They manage students but also act as educational leaders among their colleagues. They provide resources to help teachers and students in the educational system Mallillin, et al., (2021). They contribute to valuable management school discipline and teaching techniques. They also provide constructive feedback as educational leaders in the improvement curriculum, school setting and environment. Becoming an educational leader is the best contribution in school discipline and school system. It promotes leadership in school organization involvement of the educational system where everybody develops leadership as contributory factors in the school system and discipline. It fosters contributions of educational leadership involvement in the school setting and practices where schools provide potential success of quality education in the society as part of the system to mold and to shape future leaders from students Mallillin, (2021). It supports school leaders and transformation in the educational system. Educational leadership transformation has an effect on the quality system and progress. This is sharing responsibilities in the school system and discipline. It contributes to the school system and discipline to include decision making for better results of the educational practices. It is a powerful tool in the educational system and contributes leadership skills in school Mallillin, & Laurel, (2022). Educational leaders are implementing design for school policies, school culture, expectation, and shaping norms of conduct. It creates educational leaders and practices in the school system and discipline atmosphere for trust and care in accordance with the mission and vision of various educational institutions to where they belong. This is essential support and involvement in the contribution of educational leadership in school system and discipline Mallillin, et al., (2022, pp. 1-31). Hence, the contribution of educational leadership explores knowledge of concepts and issues relevant to the school system and discipline weighing the possible solution in the issues to have a better working atmosphere in attaining the goals as one team in the educational system. It provides views in educational leadership to address and explore the crucial system in school improvement. It is concerned with leadership learning, knowledge, development, preparation, and challenges, (Harris, & Jones, 2021, pp. 41-53).

### **STATEMENT OF THE PROBLEM**

#### **1. What are the roles of educational leadership and practices of the respondents in terms of**

- 1.1 goals and expectation,
- 1.2 resolution and alignment,
- 1.3 quality teaching support,
- 1.4 learning and development,
- 1.5 safe and orderly learning atmosphere?

#### **2. Is there a significant correlation on the roles of educational leadership and practices as observed by the respondents?**

### **Hypothesis**

There is a significant correlation on the roles of educational leadership and practices as observed by the respondents.

### **Research Design**

The research employed the descriptive normative research design because it refers to the methods that describe the characteristics of the educational phenomena and variables of the study. It focuses on answering the questions posited in the statement of the problem. It quantifies and measures the roles of educational leadership and practices of the respondents in terms of goals and expectation, resources and alignment, quality teaching support, learning and development, safe and orderly learning atmosphere.

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On the other hand, the descriptive method of research observed influences the process of research. It provides information that focuses on the gathered survey questionnaire. It uncovers the details of the descriptive research association in quantitative research involved in the conduct of the study as a tool for research and variables. It provides the study to enhance awareness among the researcher in deeper reflection and analysis through descriptive normative results that makes the process impressive and attractive, (Jenkins, et al., 2021).

Möttus, et al., (2020, pp. 1175-1201) defines descriptive approach as explanatory and predictive research on various goals and approaches in the need and shares on the distinguished personality to attain priorities as to the role of educational leadership and practices as an approach to school system and disciplines.

### Sources of Data and Sampling Techniques

The populations of this study are the selected educational leaders from the various educational institutions such as Commission on Higher Education (CHED), Technical Educational Skills Development Authority (TESDA), and Department of Education (DepEd). They are directors, assistant directors, managers, administrators, deans, heads, principals, coordinators, and teachers. They are experienced respondents set for the criteria in the selection of the sample size. The study comprised seventy-five (75) respondents only.

Purposive sampling is utilized in the study. It is a challenge in the application of selecting the sample size in the study. It novices the researcher in real life expectation and practice considering the method of purposive sampling to provide process and understanding. It is a practical detail transparency of the decision in purposive sampling based set criteria defined by the researcher to get a reliable source of sample size in the study (Denieffe, 2020).

### Instrumentation and Data Collection

The instrument or questionnaire is a self-made questionnaire based on the objectives of the research. The questionnaire tool is made based on reading specified related literature and theoretical framework. It undergoes the process of validation by the expert in quantitative research. A self-made questionnaire determines the educational leadership and practices as an approach to the school system and disciplines. It indicates the various variables in the study. This will be subjected to statistical treatment like percentage, weighted mean, standard deviation, and pearson correlation  $r$ , (Anub, 2020, pp. 50-60).

## RESULTS AND DISCUSSION

### 1. What are the roles of educational leadership and practices of the respondents in terms of goals and expectation, resources and alignment, quality teaching support, learning and development, and safe and orderly learning atmosphere?

**Table 1: The Role of Educational Leadership and Practices in Terms of Goals and Expectation Among the Respondents**

Indicators	WM	I	R
Implements reform in the school leaders in compliance of improvement and substantive practice.	4.23	SA	1
It draws on the educational system to explore various ways of a leader in progress and success of school.	4.17	A	2.5
It analyzes the involvement of the process in leadership as refining themes, evaluating the usefulness and emergent themes within the school leaders.	4.07	A	4
It bridges to prioritize the function and reform of the concerns legitimacy and improvement.	3.56	A	5
It highlights the educational role in leadership skills and ideas for the schools and analyzes systematically the school responsible leadership on goals and expectations.	4.17	A	2.5
It offers integrative approaches to leadership and implementation on productive support and response.	3.07	MA	6
<b>Average Weighted Mean</b>	<b>3.88</b>	<b>A</b>	
<b>Standard Deviation</b>	<b>0.466</b>		

Table 1 presents the weighted mean and the corresponding interpretation on the role of educational leadership and practices in terms of goals and expectation among the respondents.

As gleaned in the table, it shows that rank 1 is "Implements reform in the school leaders in compliance of improvement and substantive practice", with a weighted mean of 4.23 or Strongly Agree which stresses that goals and expectations must be

## The Role of Educational Leadership and Practices to School System and Discipline

implemented based on the demand of the school system. Rank 2 is shared by the two indicators which are “It draws on the educational system to explore various ways of a leader in progress and success of school”, and “It highlights the educational role in leadership skills and ideas for the schools and analyzes systematically the school responsible leadership on goals and expectations”, with a weighted mean of 4.17 or Agree which means implementation reform in the school leaders is in compliance with improvement and substantive practice. Rank 3 is “It analyzes the involvement of the process in leadership as refining themes, evaluating the usefulness and emergent themes within the school leaders”, with a frequency of 4.07 or Agree which means it responds to the various ways of leadership on goals and expectations among them. The least in rank is “It offers integrative approaches to leadership and implementation on productive support and response”, with a weighted mean of 3.07 or Moderately Agree which means to reform the privilege of perceived compliance and needs of school. The overall average weighted mean is 3.88 (SD=0.466) or Agree on the role of educational leadership and practices in terms of goals and expectation among the respondents.

Therefore, it further emphasizes and addresses the school leaders' development and accountability. It implements the goals and expectations to evaluate the system. It frames predominantly the school leaders on the issues and advice solutions in the policy and implementation. The leaders enforce the highlights and framing response and context to the rules and ideas in the school system on goals and expectations. It encourages school leaders on the role and expectation from the goals in the educational leadership and practices in the school system and discipline, (Yurkofsky, 2022, pp. 300-347).

**Table 2: The Role of Educational Leadership and Practices in Terms of Resolution and Alignment Among the Respondents**

Indicators	WM	I	R
It explores the practices of resolution and alignment in educational leadership in the school system and discipline.	4.13	A	3.5
It contributes to understanding of insights on resolution and alignment to enact instructional leadership.	4.26	SA	1
It examines the impact of success by proposing alignment and resolution in the educational system and success through context of leadership and instruction.	4.06	A	5
The resolution and alignment compose of dimensions that improve the educational system and setting.	4.13	A	3.5
It provides deeper understanding resolution and alignment to school practices and discipline especially for instructional organization strategies and management to strive for the improvement process.	4.16	A	2
It contributes to the school leadership system in various dynamic, political, social and cultural conditions.	3.39	MA	6
<b>Average Weighted Mean</b>	<b>4.02</b>	<b>A</b>	
<b>Standard Deviation</b>	<b>0.317</b>		

Table 2 presents the weighted mean and the corresponding interpretation on the role of educational leadership and practices in terms of resolution and alignment among the respondents.

As revealed in the table, it shows that rank 1 is “It contributes to understanding of insights on resolution and alignment to enact instructional leadership”, with a weighted mean of 4.26 or Strongly Agree which means resolution and alignment from the role of educational leadership and practices in the school system and discipline has been emphasized. Rank 2 is “It provides deeper understanding resolution and alignment to school practices and discipline especially for instructional organization strategies and management to strive for the improvement process”, with a weighted mean of 4.16 or Agree which means resolution and alignment have been developed for the instructional model of leadership. Rank 3 is shared by the two indicators which are “It explores the practices of resolution and alignment in educational leadership in the school system and discipline”, and “The resolution and alignment compose of dimensions that improve the educational system and setting”, with a weighted mean of 4.13 or Agree which means provides success and impact on alignment and resolution for the educational system and success through context of leadership and instruction. The least in rank is “It contributes to the school leadership system in various dynamic, political, social and cultural conditions”, with a weighted mean of 3.39 or Moderately Agree which means to explore the discipline and alignment resolution to the school system and discipline. The average overall weighted mean is 4.02 (SD=0.317) or Agree on the role of educational leadership and practices in terms of resolution and alignment among the respondents.

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In addition, it further emphasizes that the resolution and alignment compose of dimensions that improve the educational system and setting. It provides deeper understanding resolution and alignment to school practices and discipline especially for instructional organization strategies and management to strive for the improvement process. Resolution and alignment have been designed in the concept of instructional leadership, organizational leadership, and student-centered leadership. It contributes to the school leadership system in various dynamic, political, social and cultural conditions, (Walker, & Qian, 2022, pp. 147-167).

**Table 3: The Role of Educational Leadership and Practices in Terms of Quality Teaching Support Among the Respondents**

Indicators	WM	I	R
Quality teaching supports and reforms the improvement of students' learning process in the school system and discipline.	3.29	MA	3
It provides attributes in understanding the quality of teaching to bring school leaders for a positive change.	3.39	MA	1
It is the approach to understand the mechanism of quality teaching support related to school improved learning outcomes.	3.23	MA	4
It analyses the quality of teaching support through value diversity, collaborative learning, and teachers professional learning.	3.30	MA	2
It influences the sentiments and decision-making of positive quality teaching outcome learning improvement.	3.17	MA	5
It contributes to potential professional learning improvement quality teaching support through school context.	2.87	MA	6
<b>Average Weighted Mean</b>	<b>3.21</b>	<b>MA</b>	
<b>Standard Deviation</b>	<b>0.180</b>		

Table 3 presents the weighted mean and the corresponding interpretation on the role of educational leadership and practices in terms of quality teaching support among the respondents.

As noted in the table, it shows that rank 1 is “It provides attributes in understanding the quality of teaching to bring school leaders for a positive change”, with a weighed mean of 3.39 or Moderately Agree which means support is needed in the quality of teaching. Rank 2 is “It analyses the quality of teaching support through value diversity, collaborative learning, and teachers professional learning”, with a weighted mean of 3.30 or Moderately Agree which means that there is a need to improve the quality of teaching in the educational system. Rank 3 is “Quality teaching supports and reforms the improvement of students' learning process in the school system and discipline”, with a weighted mean of 3.29 or Moderately Agree which means that quality of teaching should transform and support the students' learning process. The least in rank is “It contributes to potential professional learning improvement quality teaching support through school context”, with a weighted mean of 2.87 or Moderately Agree which means the support is needed from the school and administration to help one another for the success of the quality teaching among them. The overall average weighted mean is 3.21 (SD=0.180) or Moderately Agree on the role of educational leadership and practices in terms of quality teaching support among the respondents.

Hence, quality teaching supports and reforms the improvement of students' learning process in the school system and discipline. It provides attributes in understanding the quality of teaching to bring school leaders for a positive change. It is an approach to understand the mechanism of quality teaching support related to school improved learning outcomes. It analyses the quality of teaching support through value diversity, collaborative learning, and teachers professional learning. It influences the sentiments and decision-making of positive quality teaching outcome learning improvement. It contributes to potential professional learning improvement quality teaching support through school context. It adopted the sensemaking perspective on quality teaching support to be explored in the school system and discipline. It responds to the needs of the learners effort and accountability policies context. This has highlighted the school leaders and active role in the process of enacted policies, pedagogy, related curriculum, performance management, resource allocation, and data monitoring. This has been adjusted based on the policy of the school in quality of teaching support that will be given emphasis, (Carrington, et al., 2022, pp. 1-19).

**Table 4: The Role of Educational Leadership and Practices in Terms of Learning and Development Among the Respondents**

Indicators	WM	I	R
It improves the school system and discipline through teaching quality and development and learning.	3.76	A	4

## The Role of Educational Leadership and Practices to School System and Discipline

It assures the school system and appropriate learning process to identify opportunity, sustainability, and challenges in teaching and learning development.	3.56	A	5
It analyzes the quality of learning services, quality of education courses, and learning atmosphere.	3.36	MA	6
It identifies the learning quality and development opportunities in the factors addressed to success of teaching and learning process.	4.26	SA	1
Quality teaching, learning and development are considered in the educational system of various challenges, implementation, and organization of the school system.	4.21	SA	2
It analyzes the goals and sustainable organization and educational process relevant to teaching and learning development opportunities, outcomes, and quality factors in the various educational institutions.	3.97	A	3
<b>Average Weighted Mean</b>	<b>3.85</b>	<b>A</b>	
<b>Standard Deviation</b>	<b>0.361</b>		

Table 4 presents the weighted mean and the corresponding interpretation on the role of educational leadership and practices in terms of learning and development among the respondents.

As glimpsed in the table, it shows that rank 1 is “It identifies the learning quality and development opportunities in the factors addressed to success of teaching and learning process”, with a weighted mean of 4.26 or Strongly Agree which means there is a lead quality teaching learning and development in the educational organization practices in the school system and discipline. Rank 2 is “Quality teaching, learning and development are considered in the educational system of various challenges, implementation, and organization of the school system”, with a weighted mean of 4.21 or Strongly Agree which emphasizes challenges in the learning and development in the school system. Rank 3 is “It analyzes the goals and sustainable organization and educational process relevant to teaching and learning development opportunities, outcomes, and quality factors in the various educational institutions”, with a weighted mean of 3.97 or Agree which means proper implementation of learning development equips quality education. The least in rank is “It analyzes the quality of learning services, quality of education courses, and learning atmosphere”, with a weighted mean of 3.36 or Moderately Agree which means schools assure learning development in the educational system. The overall average weighted mean is 3.85 (SD=0.361) or Agree on the role of educational leadership and practices in terms of learning and development among the respondents.

Notably, quality teaching, learning and development is considered in the educational system of various challenges, implementation, and organization of the school system. It plays a significant role in facilitating the learning process. It adjusted in adequacy of the teaching platform. Global transformation in education produces teaching and learning positive outcomes. It facilitates a learning atmosphere and is conducive. It is organized to understand the educational organization and process in a systematic way in the school system and discipline. It develops criteria in the educational system relevant to opportunity that focuses on the quality learning and teaching development changes. It analyzes the goals and sustainable organization and educational process relevant to teaching and learning development opportunities, outcomes, and quality factors in the various educational institutions, Dagiene, et al., (2022).

**Table 5: The Role of Educational Leadership and Practices in Terms of Safe and Orderly Learning Atmosphere Among the Respondents**

Indicators	WM	I	R
It provides a safe and learning atmosphere in the educational system and advanced knowledge.	4.10	A	4.5
It explores and supports the learning atmosphere which indicates best practice to achieve better learning effectively in the model of learning.	3.19	MA	6
It supports the goals for an effective learning atmosphere in the school system, strong leadership process, clear vision in the learning process, and creates a climate for better learning.	4.26	SA	1
It mobilizes and holds the sage learning process atmosphere to improve the outcome of learning and quality.	4.10	A	4.5

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It carries various preparations in the educational system and discipline for the quality improvement of the learning process.	4.13	A	2
The instruction of learning is channeled in the school system for implementation that focus on training, teaching, and learning at all levels.	4.11	A	3
<b>Average Weighted Mean</b>	<b>3.98</b>	<b>A</b>	
<b>Standard Deviation</b>	<b>0.394</b>		

Table 5 presents the weighted mean and the corresponding interpretation on the role of educational leadership and practices in terms of a safe and orderly learning atmosphere among the respondents.

As shown in the table, rank 1 is "It supports the goals for an effective learning atmosphere in the school system, strong leadership process, clear vision in the learning process, and creates a climate for better learning", with a weighted mean of 4.26 or Strongly Agree which means there is safe and orderly learning atmosphere among the respondent. Rank 2 is "It carries various preparations in the educational system and discipline for the quality improvement of the learning process", with a weighted mean of 4.13 or Agree which means there is a need to improve the learning atmosphere for conducive learning among the respondents. Rank 3 is "The instruction of learning is channeled in the school system for implementation that focus on training, teaching, and learning at all levels", with a weighted mean of 4.11 or Agree which means the teaching instruction is done step by step for better learning. The least in rank is "It explores and supports the learning atmosphere which indicates best practice to achieve better learning effectively in the model of learning", with a weighted mean of 3.19 or Moderately Agree. This mobilizes better learning outcomes. The overall average weighted mean is 3.98 (SD=0.394) or Agree on the role of educational leadership and practices in terms of safe and orderly learning atmosphere among the respondents.

On the other hand, it shows that instruction of learning is channeled in the school system for implementation that focus on training, teaching, and learning at all levels. It requires professional leadership that determines the goals and vision of the channeled policy in the actual transformation and practice. The orderly manner of learning level and concept implements the realization of the efficient school in various issues and gaps in the system and discipline. The orderly learning atmosphere in the school system and level provides concept and application practice reliable to teachers, good leadership, and effective educational leadership management. It provides support in the school setting, discipline and system in educational organization to be efficient and effective for teaching and learning process. The educational organization and school system and discipline want success and effective transformation of students. The goals are to provide quality education in achieving a better learning atmosphere. The achievement depends on the efficiency of the school and the leader's integrity and capacity of the school organization for effective learning, (Lubis, et al., 2022, pp. 338-353).

### 2. On the significant correlation on the roles of educational leadership and practices as observed by the respondents

**Table 6: Test of significant correlation on the roles of educational leadership and practices as observed by the respondents**

Test of Variables on Educational Leadership Practices	z computed value	Comparison	z critical value	Decision
goals and expectation	49.2231	>	±1.96	rejected
resolution and alignment	61.8339	>	±1.96	rejected
quality teaching support	65.5238	>	±1.96	rejected
learning and development	57.5293	>	±1.96	rejected
safe and orderly learning atmosphere	54.9117	>	±1.96	rejected
<b>two-tailed test with z critical value of ±1.96 at 0.05 level of significance</b>				

Table 6 presents the test of significant correlation on the roles of educational leadership and practices as observed by the respondents.

It shows that all z computed values are higher than the z vale of ±1.96, two tailed test at 0.05 level of significance which resulted to significant and rejection of the hypothesis. Therefore, it is safe to say that there is a significant correlation on the roles of educational leadership and practices as observed by the respondents.

## CONCLUSION

It shows that the role of educational leadership and practices implements to reform in the school leaders in compliance of improvement and substantive practice, shows to contribute in the understanding of insights on resolution and alignment to enact



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instructional leadership, shows to provide attributes in understanding the quality of teaching to bring school leaders for a positive change, shows to identify the learning quality and development opportunities in the factors addressed to success of teaching and learning process, and shows to support the goals for an effective learning atmosphere in the school system, strong leadership process, clear vision in the learning process, and creates a climate for better learning.

It also shows that roles of the educational leadership and practices includes to offer integrative approaches to leadership and implementation on productive support and response, contributes to potential professional learning improvement quality teaching support through school context, analyzes the quality of learning services, quality of education courses, and learning atmosphere, and explores to support the learning atmosphere which indicates best practice to achieve better learning effectively in the model of learning.

### REFERENCES

- 1) Anub, C. D. (2020). Instructional leadership practices, teachers' satisfaction and school performance indicators. *Journal of World Englishes and Educational Practices*, 2(4), 50-64.
- 2) Carrington, S., Spina, N., Kimber, M., Spooner-Lane, R., & Williams, K. E. (2022). Leadership attributes that support school improvement: a realist approach. *School Leadership & Management*, 1-19.
- 3) Dagiene, V., Jasute, E., Navickiene, V., Butkiene, R., & Gudoniene, D. (2022). Opportunities, quality factors, and required changes during the pandemic based on higher education leaders' perspective. *Sustainability*, 14(3), 1933.
- 4) Denieffe, S. (2020). Commentary: Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing: JRN*, 25(8), 662.
- 5) Hammad, W., Samier, E. A., & Mohammed, A. (2022). Mapping the field of educational leadership and management in the Arabian Gulf region: A systematic review of Arabic research literature. *Educational Management Administration & Leadership*, 50(1), 6-25.
- 6) Harris, A., & Jones, M. (2021). Exploring the leadership knowledge base: evidence, implications, and challenges for educational leadership in Wales. *School Leadership & Management*, 41(1-2), 41-53.
- 7) Jenkins, E., D'Aoust, R., Elias, S., Han, H. R., Sharps, P., & Alvarez, C. (2021). Faculty peer review of teaching taskforce: A quantitative descriptive research study for the peer review process. *Nurse Education Today*, 106, 105055.
- 8) Kouhsari, M., Navehebrahim, A., Zeinabadi, H., & Abbasian, H. (2022). Exploring positive school leadership practices in Iranian primary schools. *International Journal of Leadership in Education*, 1-21.
- 9) Lubis, M. S. A., Damayanto, A., Bangkara, B. A., Fatoni, M. A., & Suherlan, H. (2022). Identification of Best Education Management Practices to Improve Learning Outcomes of Muslim Youth Adapting to 21st Century Competition. *AL-TANZIM: Jarmal Manajemen Pendidikan Islam*, 6(2), 338-353.
- 10) Mallillin, L. L. D. (2020). Different Domains in Learning and the Academic Performance of the Students. *Journal of Educational System*, 4(1), 1-11.
- 11) Mallillin, L. L. D. Educational System Theory, Concept, and Framework.
- 12) Mallillin, L. L. D. (2021). Teacher Theory and Adaptable Model: An Application to Teaching Profession. *European Journal of Education Studies*, 8(12).
- 13) Mallillin, L. L. D., Cabaluna, J. C., Laurel, R. D., Arroyo, P. A. C., Señoron Jr, T. M., & Mallillin, J. B. (2021). Structural domain of learning and teaching strategies in the academic performance of students. *European Journal of Education Studies*, 8(9).
- 14) Mallillin, L. L. D., Carag, E. A., Mallillin, J. B., & Laurel, R. D. (2020). Integration of knowledge through online classes in the learning enhancement of students. *European Journal of Open Education and E-learning Studies*, 5(1).
- 15) Mallillin, L. L. D., & Laurel, R. D. (2022). Professional Development System Theory for Quality Education. *European Journal of Education Studies*, 9(8).
- 16) Mallillin, L. L. D., & Mallillin, J. B. (2019). Competency skills and performance level of faculties in the higher education institution (HEI). *European Journal of Education Studies*.
- 17) Mallillin, L. L. D., Sy-Luna, G., Tecson, P. A. L., & Atendido, G. C. L. (2022). CULTURE, SOCIETY, IDEAS, AND INNOVATION OF GENERAL EDUCATION SUBJECT OF STUDENTS IN THE NOW NORMAL: A CONCEPT AND DEVELOPMENT IN TEACHING. *Isagoge-Journal of Humanities and Social Sciences*, 2(5), 1-31.
- 18) McGinity, R., Heffernan, A., & Courtney, S. J. (2022). Mapping trends in educational-leadership research: A longitudinal examination of knowledge production, approaches and locations. *Educational Management Administration & Leadership*, 17411432211030758.

## The Role of Educational Leadership and Practices to School System and Discipline

- 19) Möttus, R., Wood, D., Condon, D. M., Back, M. D., Baumert, A., Costantini, G., ... & Zimmermann, J. (2020). Descriptive, predictive and explanatory personality research: Different goals, different approaches, but a shared need to move beyond the Big Few traits. *European Journal of Personality*, 34(6), 1175-1201.
- 20) Nelson, T. (2022). Exploring leadership-as-practice in the study of rural school leadership. *International Journal of Leadership in Education*, 25(2), 197-210.
- 21) Walker, A., & Qian, H. (2022). Developing a model of instructional leadership in China. *Compare: A Journal of Comparative and International Education*, 52(1), 147-167.
- 22) Yurkofsky, M. (2022). From compliance to improvement: How school leaders make sense of institutional and technical demands when implementing a continuous improvement process. *Educational Administration Quarterly*, 58(2), 300-346.



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## Giant Floater (*Pyganodon Grandis*) as Feed Ingredient in Broiler Production



Lennie Mae G. Garma

**ABSTRACT:** The focus of the research was to determine how giant floater (*Pyganodon grandis*) worked as a feed ingredient in broiler production. A total of 120 one-day-old Cobbs 500 were reared for 42 days, regardless of sex. The chicks were weighed and brooded for 14 days. The chicks were weighed and distributed at random on the fourteenth day for four treatments with three replications, each containing ten chicks. They were given varied proportions of giant floater meal as a feed ingredient. Treatment 1 was simply home mixed; treatment 2 had a 3% addition of giant floater meal; treatment 3 had a 6% inclusion of giant floater meal; and treatment 4 had a 9% inclusion. The supplementation of giant floater meal as a feed ingredient for broilers had a significant effect on the broilers' weekly body weight gain. Broiler-fed diets containing a higher percentage of inclusion gained the most weight as compared to broiler-fed diets containing a lower percentage of giant floater meal or diets containing no giant floater meal. In terms of broiler feed consumption, the results showed that broilers fed with 9% (T4) and 6% (T3) giant floater meal had higher feed intake than broilers fed with 3% (T2) giant floater meal, and the least feed intake was found in the control group. The result of this study shows that using giant floater meat as a feed ingredient for broilers improves their development and production performance in terms of body weight gain and that it can be used as a replacement and/or supplementary source of protein in broiler feeds.

**KEYWORDS:** Broiler Production, Alternative feed ingredient, Giant Floater (*Pyganodon grandis*), Organic feeds

### INTRODUCTION

Poultry products, whether eggs or meat, have been one of the most popular dishes. In terms of economic relevance, the chicken was the most important source of eggs and meat in the Philippines. Due to the continuing price increases and inadequate availability of livestock products caused by the African Swine Flu (ASF), particularly in pork, broiler, and egg production, this is currently the most progressive. As a result, demand for poultry products has soared.

With the recent outbreak of the pandemic, the cost of several commodities has been steadily rising, and feed is one of them. Feeding is a crucial part of broiler production, accounting for the majority of costs. As a result, poultry growers and raisers must develop low-cost feed formulations.

According to Babatunde et al. (2019), there are several unused natural sources that can be optimized to lower feed production costs while enhancing chicken quality. This is in support of Republic Act 10068, the Philippine Organic Agriculture Act of 2010, which encompasses all agricultural systems that promote environmentally sound, socially acceptable, commercially viable, and technically feasible food and fiber production (Department of Agriculture Regional Field Office III, 2021).

Organic product demand has surged dramatically in recent years, with global sales more than doubling since the year 2000. Organic agriculture arose as a response to agriculture's industrialization and the resulting environmental and social problems. Some argue that organic farming is more profitable and environmentally beneficial than conventional farming (Reganold et al., 2016).

The cost of raw materials used to make feeds, such as fish meal, meat and bone meal, soybean meal, peanut meal, and other traditional sources of protein and vitamins in poultry rations, has been steadily rising, making the search for alternative feed sources necessary to reduce feed costs (Swain, 2017).

As a result, the giant floater (*Pyganodon grandis*) was used as an alternate protein source in the feed diet. It has a crude protein content of 47.43%. Protein is necessary for broiler muscle development and growth. Rice bran (darak), corn meal (corn bran), limestone (apog), salt, molasses, and oil were among the locally accessible raw materials.

## Giant Floater (*Pyganodon Grandis*) as Feed Ingredient in Broiler Production

In this study, a giant floater (*Pyganodon grandis*) was employed as a protein-based component substitute for broiler production, resulting in cheaper feed costs, less environmental impact, and improved product quality. It will be utilized in four distinct feed formulations for four different treatments as a feed ingredient.

Since it is rarely known and/or utilized, numerous of its kind can be found in the small water impounding project in Marannao, San Mariano, Isabela, ensuring its long-term viability. As a result, increasing the usage of giant floaters (*Pyganodon grandis*) increases farm earnings for poultry producers and farmers in general, reduces consumer health concerns due to their organic nature, and reduces negative environmental impacts.

### METHODS

The materials, ingredients, and methods used in developing the Giant Floater (*Pyganodon grandis*) as a feed ingredient in broiler production are presented below.

### MATERIALS

1. Utensils. The materials and equipment used were the following:

**Table 1. Materials and equipment used in conducting the study.**

DESCRIPTION		
Preparatory Tools	Materials	Equipment
Pail	Booster feeds	Record Book
Broom Stick		Feeders / Feeding Trough
Old/Used Papers		Drinkers / Drinking Trough
Clean Sack		Meat Grinder
		Digital Weighing Scale
		100 watts incandescent bulbs

### INGREDIENTS

**Table 2. Composition of Home-mixed Starter Ration used in the study.**

Ingredients	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Giant Floater Meal	-	3.00	6.00	9.00
Rice bran (D1)	6.00	6.00	6.00	6.00
Corn meal	50.97	47.01	45.26	44.23
Soybean Oil Meal	36.13	35.86	34.60	33.19
Limestone	0.78	0.77	0.77	0.77
Salt	0.50	0.50	0.50	0.50
Min/Vit. Premix	0.50	0.50	0.50	0.50
Molasses	2.00	2.00	2.00	2.00
Oil	0.76	1.00	1.00	2.44
DL Methionine	0.16	0.16	0.17	0.17
Toxin binder	0.20	0.20	0.20	0.20
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Table 3. Composition of Home-mixed Grower Ration used in the study.**

Ingredients	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Giant Floater Meal	-	3.00	6.00	9.00
Rice bran (D1)	8.00	8.00	8.00	8.00
Corn meal	55.34	52.67	49.96	46.53
Soybean Oil Meal	27.11	26.77	26.44	26.25
Limestone	1.21	1.22	1.22	1.23
Salt	0.50	0.50	0.50	0.50
Min/Vit. Premix	0.50	0.50	0.50	0.50
Molasses	2.00	2.00	2.00	2.00
Oil	-	-	0.03	0.64
DL Methionine	0.14	0.14	0.15	0.15
Toxin binder	0.20	0.20	0.20	0.20
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

## Giant Floater (*Pyganodon Grandis*) as Feed Ingredient in Broiler Production

### METHODS

In order to perform the research properly, the flowchart of procedures in preparing giant floater as feed ingredient was carefully and consistently followed. The needed tools, materials, and ingredients were prepared.

The giant floater underwent different stages of development such as harvesting, washing, selecting, boiling, shucking, sun drying, grinding, and mixing for different treatments.

The developmental procedure began with the preparation of the giant floater meat. The procedure started with harvesting giant floater. These were washed thoroughly to remove soil and other particles on the giant floater. Then, giant floaters were selected by removing the giant floaters that contains mud. The preparation of the Giant Floater (*Pyganodon grandis*) is shown in Figure 1.

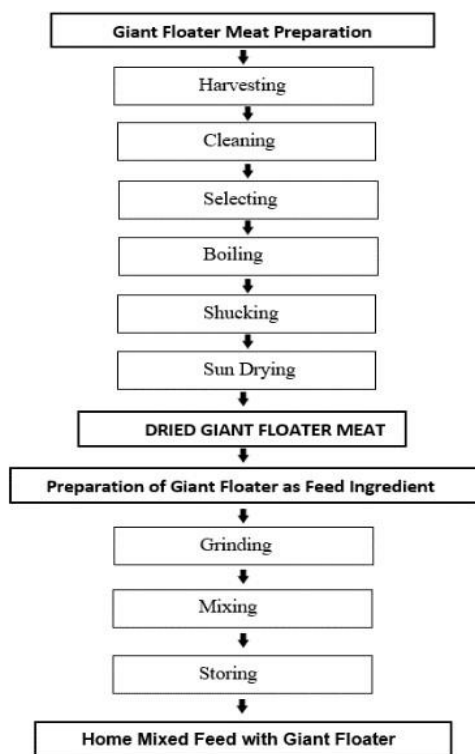


Figure 1. Flowchart on the preparation of the Giant Floater (*Pyganodon grandis*)

### Care and Management of the Experimental Poultry

All the facilities and equipment including the drinking and feeding troughs were prepared days before the arrival of the chicks.

The 120 one-day-old broiler chicks were brooded for up to 14 days. Old papers were scattered on the floor of their cages to avoid damage to the feet and legs of the chicks and to serve as an insulator. The lights were on day and night to keep them warm and encourage them to eat. Water and food were served to the chicks every morning and afternoon. The drinking and feeding troughs were cleaned before they were used.

On the fourteenth day, the chicks were randomly distributed into four treatments with three replications. The cages were 1 meter by 1 meter, each cage was labeled and covered with sacks around it. Every cage contains 10 chicks per treatment with three replications. The chicks were fed into transition with the different treatments of giant floater meal from the fifteenth day to the forty-second day.

The manure was removed every day during the brooding period until termination day. Rice hulls were spread on the manure and were properly managed during the entire duration of the study.

### Experimental Design

The study was laid out using a Completely Randomized Design (CRD). The broiler chicks were randomly distributed into four treatments. The different treatments used in the study were as follows:

Treatment 1 = 100% Home-mixed ration

Treatment 2 = 3 % Giant Floater Meal + 97% Home-mixed ration

Treatment 3 = 6 % Giant Floater Meal + 94% Home-mixed ration

Treatment 4 = 9 % Giant Floater Meal + 91% Home-mixed ration

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### Data Gathering Instrument and Procedure

120 one-day-old broiler chicks, regardless of sex, were obtained to determine the effect of a giant floater as a feed ingredient. There were four (4) treatments and replicated three times with 10 birds in each replication. The data were gathered and recorded weekly: (a) weekly weight gain and (b) daily feed intake and left over.

Weekly Body Weight Gain (BWG) and weekly feed intake (FI) and leftovers of the broiler were recorded from day 14 to day 42. Through observation and record keeping effects of Giant Floater (*Pyganodon gradis*) as a feed ingredient in terms of the weight of broilers were determined.

Data gathering was derived using the following formula:

**Initial Weight** = weight of the broiler chicks at the start of the feeding period or at day 14

**Final Weight** = weight of the broiler chicks at the end of the feeding period or at day 42

**Body Weight Gain** = Final Weight – Initial Weight

**Feed Consumption** = Total weight of feeds given – leftover (Weekly basis)

**Feed Efficiency** =  $\frac{\text{Final Weight}}{\text{The total amount of feeds consumed}} \times 100$

### Statistical Analysis

Mean, Analysis of Variance, and Post Hoc Analysis Using Duncan's Multiple Ranged Test was used to determine the average body weight gain of the broiler and the average consumption of feeds, whether there is a significant difference in the weight gain of the broiler in the different treatments, and to compare any significant treatment means.

## RESULTS

### Product Evaluation

Tables 4 and 5 show the composition and calculated nutrient analysis of the home-mixed feed formulation for starter and grower rations in the study.

The feed composition shows that there was no inclusion of giant floater meal in treatment 1, but there was 3 percent inclusion in treatment 2, 6 percent inclusion in treatment 3, and 9 percent inclusion in treatment 4. The computed nutrient content shows that the starting ration has 22 percent crude protein, whereas the growing ration contains just 20 percent crude protein.

According to Beski et al. (2015), protein products receive the most attention in poultry nutrition due to protein's relevance as a primary constituent of physiologically active substances in the body. It also aids in the production of body tissue, which is necessary for the body's renovation and growth. Broilers have high dietary protein requirements, so determining the optimal protein concentration in broiler diets, whether to maximize broiler performance or profit, necessitates a greater understanding of the birds' protein and amino acid requirements, as well as their effects on the birds' growth and development.

Protein is a critical constituent of poultry diets, and along with the other main nutrients such as carbohydrates, fat, water, vitamins, and minerals, it is essential for life. When formulating broiler diets, the main emphasis is placed on crude protein (CP), because protein is a critical constituent of poultry diets (Cheeke, 2005).

As a result, rather than simply reaching calorie or amino acid levels, it is vital to choose ingredients to maximize nutrient availability during broiler diet formulation (Ravindran, 2005).

**Table 4. Composition and Calculated Nutrient Analysis of Home-mixed Starter Ration used in the study.**

Ingredients	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Giant Floater Meal	-	3.00	6.00	9.00
Rice bran (D1)	6.00	6.00	6.00	6.00
Corn meal	50.97	47.01	45.26	44.23
Soybean Oil Meal	36.13	35.86	34.60	33.19
Limestone	0.78	0.77	0.77	0.77
Salt	0.50	0.50	0.50	0.50
Min/Vit. Premix	0.50	0.50	0.50	0.50
Molasses	2.00	2.00	2.00	2.00
Oil	0.76	1.00	1.00	2.44
DL Methionine	0.16	0.16	0.17	0.17
Toxin binder	0.20	0.20	0.20	0.20
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

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Calculated Content	Nutrient	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Nutrient Requirement
Crude Protein (%)		22.00	22.00	22.00	22.00	22.00
Metabolizable Energy (kcal)		2950.00	2862.37	2762.73	2662.72	2950.00
Crude Fiber		4.00	4.97	5.95	6.92	4.00
Calcium		1.00	1.00	1.00	1.00	1.00
Phosphorous		0.46	0.46	0.46	0.46	0.42
Lysine		1.24	1.23	1.22	1.20	1.20
Methionine		0.45	0.45	0.45	0.45	0.45

**Table 5. Composition and Calculated Nutrient Analysis of Home-mixed Grower Ration used in the study.**

Ingredients	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Giant Floater Meal	-	3.00	6.00	9.00
Rice bran (D1)	8.00	8.00	8.00	8.00
Corn meal	55.34	52.67	49.96	46.53
Soybean Oil Meal	27.11	26.77	26.44	26.25
Limestone	1.21	1.22	1.22	1.23
Salt	0.50	0.50	0.50	0.50
Min/Vit. Premix	0.50	0.50	0.50	0.50
Molasses	2.00	2.00	2.00	2.00
Oil	-	-	0.03	0.64
DL Methionine	0.14	0.14	0.15	0.15
Toxin binder	0.20	0.20	0.20	0.20
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Calculated Content	Nutrient	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Nutrient Requirement
Crude Protein (%)		20.00	20.00	20.00	20.00	20.00
Metabolizable Energy (kcal)		2961.85	2930.26	2900.00	2900.00	2900.00
Crude Fiber		3.84	3.74	3.64	3.53	<4
Calcium		1.00	1.00	1.00	1.00	1.00
Phosphorous		0.62	0.61	0.60	0.59	0.42
Lysine		1.08	1.07	1.05	1.04	1.00
Methionine		0.40	0.40	0.40	0.40	0.40

**Table 6. Report analysis of Department of Agriculture on the Crude Protein Content of Giant Floater (*Pyganodon grandis*)**

Analysis Name	Result
<b>Crude Protein</b>	<b>47.43%</b>

Table 6 displays a report of analysis of the Department of Agriculture (DA) on the crude protein of the giant floater. According to the data, the giant floater contains 47.43 percent crude protein.

The developed product is highly suggested as an alternative and/or additional protein source for broiler feed based on the proximate analysis of the crude protein of the giant floater. Mussel meal is a good alternative protein source in poultry diets, according to Jönsson (2009), and could be a solution in a 100 percent organic diet. Furthermore, protein is necessary for muscle growth and tissue repair, which is advantageous because broilers are raised for their meat.

Plant protein sources provide the majority of an animal's dietary protein requirements. Maize and soybean have traditionally been the most widely used energy and protein sources in the world. Cereals such as wheat and sorghum, as well as various plant-based protein meals, are used all over the world. In the production of chicken feed, soybean meal (SBM) is the

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predominant protein source. It has a CP content of 40–48 percent, depending on how many hulls are removed and how the oil is extracted. Soybean protein is preferred above the protein meal of other oilseed grains because of its well-balanced amino acid profile, particularly the necessary ones, which allows it to balance most cereal-based diets (Ravindran, 2013). Plant proteins frequently require an additional source of amino acids or other protein sources, such as animal protein, due to their shortage of specific amino acids. Plant proteins are typically less expensive than animal proteins; nonetheless, their use is limited due to the presence of anti-nutritional substances (ANFs).

Animal proteins are a good addition to poultry diets because they provide a lot of protein and amino acids, a lot of accessible phosphorus, a lot of other minerals, and a lot of energy (Beski et al., 2015).

### Comparison in the Average Weight Gain of Broilers using the Different Formulation of Giant Floater (*Pyganodon grandis*) as Feed Ingredient

**Table 7. Initial and Weekly Body Weight of Broiler Chicken.**

TREATMENT	WEEKLY BODY WEIGHT					
	Initial	1st	2nd	3rd	4th	5th
T <sub>1</sub>	138.86	380.91 <sup>d</sup>	1004.61 <sup>d</sup>	624.91	729.47 <sup>d</sup>	1268.35 <sup>d</sup>
T <sub>2</sub>	147.40	398.87 <sup>c</sup>	635.97	810.7 <sup>c</sup>	1112.23 <sup>c</sup>	1367.24 <sup>c</sup>
T <sub>3</sub>	140.73	481.65 <sup>b</sup>	1264.10 <sup>b</sup>	686.53	908.88 <sup>b</sup>	1816.35 <sup>b</sup>
T <sub>4</sub>	143.66	519.07 <sup>a</sup>	747.10	929.86 <sup>a</sup>	1304.83 <sup>a</sup>	1898.18 <sup>a</sup>
RESULT	Ns	*	ns	*	*	**
C.V. %	7.2	11.34	9.07	7.34	8.18	5.51

As shown in the table, the analysis of variance revealed that the means were based on the broiler chicken's starting body weight. On the first weekly body weight of broiler chicken, significant (>0.05) results were observed. Broilers fed with 9% (T<sub>4</sub>) inclusion of giant floater meal had the highest weight mean of 519.07 grams, followed by broilers fed with 6% (T<sub>3</sub>) inclusion of giant floater meal with a mean of 481.65 grams, broilers fed with 3% (T<sub>2</sub>) inclusion of giant floater meal had a weighted mean of 398.87 grams, and broilers fed without the inclusion of giant floater meal had the lowest weight mean of 380.91 grams.

The results demonstrated no significant differences among the treatment means on the second weekly body of the broiler chicken, indicating that all treatments are statistically equivalent.

The inclusion of giant floater meal had a significant (>0.05) influence on the third weekly body weight of broiler chickens. Broilers fed with home-mixed ration with 9% (T<sub>4</sub>) giant floater meal had the highest weight of 929.86 grams, followed by broilers fed with 6% (T<sub>3</sub>) inclusion of giant floater meal with 908.88 grams, broilers fed with 3% (T<sub>2</sub>) inclusion of giant floater meal with 810.70 grams, and broilers fed without the inclusion of giant floater meal with 729.4 grams. Similarly, the fourth weekly body weight of broiler chickens showed a similar trend, with mean values ranging from 1304.83 grams to 1004.61 grams respectively.

Similarly, Loh et al. (2005) discovered that earthworm muscle meal contains 580–710 g/kg CP (DM basis) and high lysine contents. The lysine requirement of chickens is relatively high; therefore, muscle meal made from earthworms would be an appropriate feed ingredient to meet this demand (Vielma et al., 2003; Istiqomah et al., 2009). Due to the increased intestinal microbiota profile (Husseiny et al., 2008) and high protein content, mixing muscle utilizing earthworm on the diet ration for chicken feeds is a significant strategy for boosting feed efficiency in poultry feeding (Bahadori et al., 2015). (Vielma et al., 2003).

The supplementation of giant floater meal as a diet ration for broiler chicken had a significant effect on their fifth weekly body, the heaviest weight was noted on broilers with 9% (T<sub>1</sub>) inclusion of giant floater meal with 1898.18 grams followed by broiler fed with 6% (T<sub>3</sub>) inclusion of giant floater meal with 1816.35 grams, while the broiler fed with 3% (T<sub>2</sub>) inclusion of giant floater meal obtained a weighted mean of 1367.34 grams and the least weight was found in broilers fed without the inclusion of giant floater meal with a weighted mean of 1268.35 grams.

This research supports Jönsson's (2009) study Mussel Meal in Poultry Diets – with a Focus on Organic Production, which found that mussel meal is an excellent source of protein and hence a suitable nutritional substitute for fish meal in laying hen and broiler chicken diets. This means that including giant floater meals in the diet boosted daily gain and feed efficiency. In addition, mussel meal has been found to be an excellent alternative protein source in poultry diets and may be a viable option in 100% organic diets. Furthermore, mussels are filter feeders, which means they filter coastal waters of nitrogen and phosphorus seeping from nearby farmland.



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According to Lindahl et al., (2009), blue mussel meal (*Mytilus edulis*) can be used as a protein replacement for other protein-rich feedstuffs. Additionally, blue mussels can be utilized to reduce water eutrophication by filtering nitrogen, phosphorus, and carbon from the water. Deshelled mussel meal has already been shown to have the ability to substitute fishmeal in laying hen nutrition (Jönsson et al., 2011; Afrose et al., 2016).

### Average Feed Consumption and Average Feed Efficiency of the Giant Floater (*Pyganodon grandis*) as Feed Ingredient in Different Treatments

**Table 8. Cumulative and Weekly Feed Consumption Broiler Chicken (grams)**

TREATMENT	WEEKLY FEEDS CONSUMPTION				
	1st	2nd	3 <sup>rd</sup>	4th	Cumulative Feed
	Consumption				
<b>T1</b>	3649.00	6014.72	4279.33	7802.35	6019.18
<b>T2</b>	3775.98	6059.99	4776.67	8015.30	6000.90
<b>T3</b>	4306.64	7852.15	4423.00	9926.38	7551.79
<b>T4</b>	4352.96	7046.57			6737.69
		4672.33	8646.57		
<b>RESULT</b>	*	ns	*	**	**
<b>C.V. %</b>	6.49	11.81	3.44	6.21	4.53

Table 8 shows that during biweekly measurement intervals over the entire experimental period (d 0–42), broiler chickens fed diets containing 9% (T4) and 6% (T3) giant floater meal had higher feed intake (significant at  $P > 0.05$  and  $> 0.01$ ) than control and diets supplemented with various amounts of giant floater meal (Table 8). On the other hand, it was discovered that broilers fed with or without giant floater meal had no significant changes in feed consumption after the second week.

Increasing the amount of muscle meal in a feed results in higher quantities of particular amino acids like arginine and cysteine, which are known to suppress the appetite of broiler chickens, resulting in lower feed consumption (Prayogi, 2011).

According to Mavromichalis (2016), every 1% increase in dietary protein causes a 3 percent increase in water intake in broilers. Furthermore, excessive water consumption will increase litter wetness, which will result in a variety of issues, including not insignificant implications on animal welfare in terms of diminished comfort. Wet litter also contributes to leg issues including pododermatitis and breast lesions, both of which reduce carcass value. The disposal of nitrogen-rich trash is a topic that does not require much explanation here, but it is a serious worry in several nations.

**Table 9. Final weight and Feed Conversion Efficiency of Broiler Chicken**

TREATMENT	FINAL WEIGHT (g)	FCE (%)
<b>T<sub>1</sub></b>	1,129.48 <sup>d</sup>	21.06 <sup>d</sup>
<b>T<sub>2</sub></b>	1,218.84 <sup>c</sup>	22.82 <sup>c</sup>
<b>T<sub>3</sub></b>	1,675.62 <sup>b</sup>	24.07 <sup>b</sup>
<b>T<sub>4</sub></b>	1,754.68 <sup>a</sup>	28.20 <sup>a</sup>
<b>RESULT</b>	**	**
<b>C.V. %</b>	5.92	7.28

The data illustrates that adding giant floater meals to broiler chicken diets has a significant effect on the broiler's final weight. Broilers fed 9 percent giant floater food had the heaviest weight of 1,754.68 grams, compared to broilers fed various percentages of giant floater meal with weights ranging from 1,675.62 grams to 1,218.84 grams, and broilers fed without giant floater meal had the lightest weight of 1,129.48 grams.

In terms of feed efficiency, the inclusion of giant floater meals as a diet ration for broiler chickens had a significant impact on feed conversion. A high Feed Conversion Efficiency (FCE) shows that the animal is consuming a lot of feed while gaining a lot of weight. When the FCE is high, the farmer of broiler chickens spends less on feeds. In general, a broiler chicken producer would strive to create feeds with a low intake, high FCE, and high Body Weight Gain (BWG) (Gunya et al., 2019b). Feed accounts for over 70% of the total cost of production in the poultry business (Willems et al., 2013), hence increasing feed efficiency is a critical goal.

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**Table 10. Post Hoc Analysis using Duncan's Multiple Range Test**

TREAT MENT	WEIGHT GAIN MEAN (Per Week)				R <sub>p</sub>	DIFFERENCE (MEAN - R <sub>p</sub> )					
	1st	2nd	3rd	4th		5th	1st	2nd	3rd	4th	5th
T <sub>1</sub>	242.05 <sup>d</sup>	486.05 <sup>d</sup>	590.61 <sup>d</sup>	865.75 <sup>d</sup>	1129.49 <sup>d</sup>	3.87	238.18	482.18	586.74	861.88	1125.62
T <sub>2</sub>	251.47 <sup>c</sup>	488.57 <sup>c</sup>	663.3 <sup>c</sup>	964.83 <sup>c</sup>	1219.84 <sup>c</sup>	4.03	247.44	484.54	659.27	960.8	1215.81
T <sub>3</sub>	340.92 <sup>b</sup>	545.8 <sup>b</sup>	768.15 <sup>b</sup>	1123.37 <sup>b</sup>	1675.62 <sup>b</sup>	4.12	336.8	541.68	764.03	1119.25	1671.5
T <sub>4</sub>	375.41 <sup>a</sup>	603.44 <sup>a</sup>	786.2 <sup>a</sup>	1161.17 <sup>a</sup>	1754.52 <sup>a</sup>	4.18	371.23	599.26	782.02	1156.99	1750.34

Table 10 shows the Post Hoc Analysis using Duncan's Multiple Range Test on the differences in treatment means.

During week one, among all treatments, weight gain means greater than 371.23 grams are the same. Treatment 4 is the only treatment greater than 371.23 grams. Thus, treatment 4 is significantly different from other treatments. Among treatments 1, 2, and 3, weight gain means greater than 336.8 grams are the same. Only treatment 4 is greater than 336.8 grams. Thus, treatment 3 is significantly different from treatments 2 and 1. Between treatments 1 and 2, weight gain means greater than 247.44 grams are the same. Only treatment 2 is greater than 336.8. Thus, treatment 2 is significantly different from treatment 1. Hence, the weight gain mean of the four treatments is significantly different from each other during week one.

In the second week, among all treatments, weight gain means greater than 599.26 grams are the same. Only treatment 4 is greater than 599.26 grams. Thus, treatment 4 is significantly different from other treatments. Among treatments 1, 2, and 3, weight gain means greater than 541.68 grams are the same. Only treatment 4 is greater than 541.68 grams. Thus, treatment 3 is significantly different from treatments 2 and 1. Between treatments 1 and 2, weight gain means greater than 484.54 grams are the same. Only treatment 2 is greater than 484.54. Thus, treatment 2 is significantly different from treatment 1. As a result, the weight gain mean of the four treatments is significantly different from each other within the second week.

In the third week, among all treatments, weight gain means greater than 782.02 grams are the same. Only treatment 4 is greater than 782.02 grams. Thus, treatment 4 is significantly different from other treatments. Among treatments 1, 2, and 3, weight gain means greater than 764.03 grams are the same. Only treatment 4 is greater than 764.03 grams. Thus, treatment 3 is significantly different from treatments 2 and 1. Between treatments 1 and 2, weight gain means greater than 659.27 grams are the same. Only treatment 2 is greater than 659.27. Thus, treatment 2 is significantly different from treatment 1. Henceforth, the weight gain mean of the four treatments is significantly different from each other during the third week.

For the fourth week, in all treatments, weight gain means greater than 1156.99 grams are the same. Only treatment 4 is greater than 1156.99 grams. Thus, treatment 4 is significantly different from other treatments. Among treatments 1, 2, and 3, weight gain means greater than 1119.25 grams are the same. Only treatment 4 is greater than 1119.25 grams. Thus, treatment 3 is significantly different from treatments 2 and 1. Between treatments 1, and 2, weight gain means greater than 960.8 grams are the same. Only treatment 2 is greater than 960.8 grams. Thus, treatment 2 is significantly different from treatment 1. For that reason, the weight gain mean of the four treatments is significantly different from each other during the fourth week.

During the fifth week, among all treatments, weight gain means greater than 1750.34 grams are the same. Only treatment 4 is greater than 1750.34 grams. Thus, treatment 4 is significantly different from other treatments. Among treatments 1, 2, and 3, weight gain means greater than 1672.5 grams are the same. Only treatment 4 is greater than 1671.5 grams. Thus, treatment 3 is significantly different from treatments 2 and 1. Between treatments 1 and 2, weight gain means greater than 1215.81 grams are the same. Only treatment 2 is greater than 1215.81 grams. Thus, treatment 2 is significantly different from treatment 1. As a result, the weight gain mean of the four treatments is significantly different from each other during the fifth week.

In conclusion, table 10 reveals that from week 1 to week 5, the weight gain mean of each treatment is significantly different following this trend treatment 4 > treatment 3 > treatment 2, and treatment 1 had the lowest.

### CONCLUSION AND FUTURE WORKS

Based on the findings of the study, feeding giant floater meat to broilers improves their growth and production performance in terms of body weight gain. Incorporating giant floater meals into broiler chicken diets improved feed conversion and efficiency significantly. A high Feed Conversion Efficiency (FCE) means the animal is consuming a lot of food while gaining a lot of weight. A

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higher percentage of feeding leads to a significant increase in body weight. Farmer feeds can include giant floater meat as an alternate and/or supplemental source of protein.

Further study should be conducted to determine the classification of the meat quality of the broiler that is fed with giant floater meals. Further research should be done, not only to verify the results by conducting a larger number of experimental trials but also to determine the economic viability, the ecological impacts and impact reductions, as well as the environmental sustainability of using giant floater meat as an addition to or substitute for fish meal and/or soybean meal in the diet of broilers. Finally, a comparative study should be conducted on the preparation of other treatments using giant floaters as a feed ingredient.

### ETHICAL CONSIDERATIONS

The researcher makes certain that the research was conducted in a manner that is respectful to the community and other human beings that may be influenced by the research process. The procedures were observed in accordance with the rules and guidelines of the University in which the panelist was involved.

### ACKNOWLEDGMENT

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### REFERENCES

#### A. Published and Unpublished Materials

- 1) F. Costa, † B. R. Miller, † G. M. Pesti, †, † R. I. Bakalli, † and H. P. Ewing (2001). Studies on Feeding Peanut Meal as a Protein Source for Broiler Chickens
- 2) Bovera et al., (2016). Use of larvae meal as protein source in broiler diet: Effect on growth performance, nutrient digestibility, and carcass and meat traits
- 3) Jönsson, L. (2009). Mussel meal in poultry diets. Doctoral diss. Dept. of Animal Nutrition and Management, SLU. Acta Universitatis agriculturae Sueciae vol. 2009:83.
- 4) Jönsson, L., Wall, H. & Tauson, R. (2011). Production and egg quality in layers fed organic diets with mussel meal. *Animal* 5: 387-393
- 5) K. V. Rajasekhar et al., (2020). Effect of feeding diet with alternate protein sources and quality protein maize on performance and nutrient utilization in broiler chickens
- 6) Laguna, E. B. (2015). Growth Performance of Broiler Chicken (*Gallus domesticus*) Fed Commercial Ration Supplemented with Varying Levels of Azolla (*Azolla pinnata*) Meal
- 7) McLaughlan, C., Rose, P., Aldridge, D. (2014). Making the Best of a Pest: The Potential for Using Invasive Zebra Mussel (*Dreissena Polymorpha*) Biomass as a Supplement to Commercial Chicken Feed
- 8) Mottet, A.; de Haan, C.; Falcucci, A.; Tempio, G.; Opio, C.; Gerber, P. Livestock: On our plates or eating at our table? A new analysis of the feed/food debate. (2017) *Glob. Food Secur*, 14, 1–8. [CrossRef]
- 9) Naluga, A., Komakech, A.J., Jjagwe, J., Magala, H., Lederer, J. Growth characteristics and meat quality of broiler chickens fed earthworm meal from *Eudrilus eugeniae* as a protein source. (2021) *Livestock Science* Volume 245, March 2021, Elsevier.
- 10) Popović, S.; Kostadinović, L.; Đuragić, O.; Aćimović, M.; Cabarkapa, I.; Puvačca, N.; Pelić Ljubojević, D. (2018). Influence of medicinal plants mixtures (*Artemisia absinthium*, *Thymus vulgaris*, *Menthae piperitae* and *Thymus serpyllum*) in broilers nutrition on biochemical blood status. *J. Agron. Technol. Eng. Manag.* 1, 91–98.
- 11) Puvačca, N.; Kostadinović, L.; Popović, S.; Lević, J.; Ljubojević, D.; Tufarelli, V.; Jovanović, R.; Tasić, T.; Ikonić, P.; Lukač, D. (2016). Proximate composition, cholesterol concentration and lipid oxidation of meat from chickens fed dietary spice addition (*Allium sativum*, *Piper nigrum*, *Capsicum annum*)
- 12) Puvačca, N.; Stanaćev, V.; Glamočić, D.; Lević, J.; Perić, L.; Stanaćev, V.; Milić, D.
- 13) Beneficial effects of phytoadditives in broiler nutrition. (2013). *Worlds Poult.* 69, 27–34. [CrossRef]
- 14) Rahim Abro<sup>1</sup>, Hakim Ali Sahito<sup>2\*</sup>, Azizullah Memon<sup>1</sup>, Rab Nawaz Soomro<sup>1</sup>, Hidayatullah Soomro<sup>1</sup> and Nisar Ahmed Ujjan<sup>3</sup> (2012). Effect of various protein source feed ingredients on the growth performance of broiler

## Giant Floater (*Pyganodon Grandis*) as Feed Ingredient in Broiler Production

- 15) Waldenstedt, L. and Jönsson, L. (2006). Mussel meal as a high-quality protein source for broiler chickens. Paper 214. EPC 2006 - 12th European Poultry Conference, Verona, Italy, 10-14 September.

### B. Internet Materials

- 1) FAO. 2006a. World agriculture: towards 2030/2050 interim report. Rome.
- 2) Haag, W. R. (2012). North American Freshwater Mussels: Natural History, Ecology, and Conservation. Cambridge University Press. ISBN 978-0521199384
- 3) Jönsson, L. and Elwinger, K. (2009). Mussel meal as a replacement for fish meal in feeds for organic poultry - a pilot short-term study', *Acta Agriculturae Scandinavica, Section A - Animal Science*, 59(1), 22-27. DOI: 10.1080/09064700902730158
- 4) Jönsson, L. and Holm, L. (2009). Effects of toxic and non-toxic blue mussel meal on health and product quality of laying hens. *Journal of Animal Physiology and Animal Nutrition* 94(3):405-12, DOI: 10.1111/j.1439-0396.2009.00922.x.
- 5) Jönsson L, Wall H, Tauson R. (2011). Production and egg quality in layers fed organic diets with mussel meal. *Animal* 5: 387-393. <https://doi.org/10.1017/S1751731110001977>
- 6) O.O. Babatunde, A.J. Cowieson, J.W. Wilson, O. Adeola, (2019). *Poultry Science* 98, 6742–6750 [doi.org/10.3382/ps/pez39](https://doi.org/10.3382/ps/pez39)
- 7) Shu-Biao Wu, R.A. Swick, J. Noblet, N. Rodgers, D. Cadogan, M. Choct, (2019). *Poultry Science* 98, 1222–1234 [doi: 10.3382/ps/pez442](https://doi.org/10.3382/ps/pez442)
- 8) W. Siegert, T. Zuber, V. Sommerfeld, J. Krieg, D. Feuerstein, U. Kurrle, M. Rodehutsord, (2019). *Poultry Science* 98, 5700–5713 [doi: 10.3382/ps/pez355](https://doi.org/10.3382/ps/pez355)
- 9) Yefei Zhou, Shanguo Mao, Meixian Zhou, (2019). *Poultry Science* 98, 2790–2799 [doi: 10.3382/ps/pez071](https://doi.org/10.3382/ps/pez071)
- 10) Z. Lu, A. Thanabalan, H. Leung, R. Akbari Moghaddam Kakhki, R. Patterson, E.G. Kiarie, (2019). *Poultry Science* 98, 6411–6421 [doi: 10.3382/ps/pez479](https://doi.org/10.3382/ps/pez479)



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## Promote Information and Communication Systems to Improve Internal Control Efficiency at Vietnam Personal Insurance Enterprises



Nguyen Zen Nguyen<sup>1</sup>, Duc Hieu Bui<sup>2</sup>

**ABSTRACT:** The article presented an overview of internal control and related concepts such as Information, communication, efficiency, and internal control in life insurance enterprises. Along with that, the article also provides some regulations on internal control activities at enterprises, and five parts of internal control (Control environment, Risk assessment, Control activities, and Information, Communication, Monitoring). The authors focus on understanding the components of information and communication, assessing the current status of information and communication activities at life insurance enterprises, and the remaining points such as the Shortage of personnel in work Information Communication; The information channel is not regularly updated for all employees. From the existing points, the authors have proposed several solutions to promote information, and communication, and improve the effectiveness of internal control activities departments in life insurance enterprises. These solutions include Updating documents, policies, and regimes regularly; Information transparency and effective implementation; Issuing regulations and publicizing documents summarizing business processes, regulations for each insurance product provided by the business, and instructions for customers.

**KEYWORDS:** Information; The media; Effective; Internal control; Life insurance business

### 1. THE PROBLEM

Internal control is the establishment of regulations, procedures, and business operations to improve the efficiency of business operations. Internal control helps enterprises comply with the laws and regulations of the organization, identify and eliminate risks, and create reliability and transparency in the financial statements of the enterprise. Life insurance enterprises have a large number of employees and insurance agents distributed across the country. This leads to businesses facing problems such as inefficient operations, wasted resources, lack of supervision, poor organization and function, vision, fragmented strategy, lack of alignment and control, complex control, high cost, information lack integrity, and lack of integrity process complexity unnecessarily. With the above characteristics of insurance enterprises, information, and communication here plays an important role and are a solution to improve the effectiveness of internal control at insurance enterprises. Accordingly, Information and communication help connect and ensure smoothness between all individuals and departments in the enterprise. Information and communication help external stakeholders connect and ensure the smooth performance of each object's tasks. Currently, information and communication systems at insurance enterprises have not been focused on. This study aims to promote information and communication to improve the internal control system's effectiveness.

### 2. THEORETICAL BASIS

#### 2.1. Some Concepts

**Information:** To ensure the performance of their functions, organizations need information. Information needs to ensure timeliness and accuracy when identifying, collecting, and communicating with relevant individuals and departments in the organization. The task of the unit is to create reports containing information to ensure the management and control of the unit by the manager. Dinapoli (2007) states that: "A single piece of information can be used for a variety of purposes, such as preparing financial statements, reviewing compliance with laws and regulations, and operating operations. production and business of enterprises" [1].

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### **Communication**

Dinapoli (2007) said that: "Communication is the exchange and communication of necessary information to stakeholders both inside and outside the enterprise. Each information system itself has a communication function, because only then can the information that has been collected and processed can reach the objects in need to help them fulfill their responsibilities" [1].

### **Effective**

Much research has been done into the definition and measurement of effectiveness. The effect depends on the level of the economy and the perspective of the observer or the user. The following are some definitions of efficiency from the point of view of different organizations and researchers: According to the Vietnam Encyclopedia (2010), "Effectiveness is the desired outcome, which produces results that are not what people wait and want". With this implication, the Vietnamese Dictionary (2010) of the Vietnam Language Institute also gives the definition "Effectiveness is the actual result of the work brought" [2].

### **Internal control**

According to the COSO Report (2013), Internal control is a process governed by an entity's management, board of directors, and employees, which is designed to provide reasonable assurance to achieve the following objectives: to ensure the reliability of financial statements; ensure compliance with regulations and laws; ensure operations are carried out efficiently [3].

## **2.2. Regulations On Internal Control Systems in Insurance Enterprises**

Law on Insurance Business No. 08/2022/QH15 has added regulations on the renovation of financial management of insurance enterprises. Accordingly, it is required that insurance enterprises determine their capital based on risk, and insurance enterprises must maintain higher real capital than risk-based capital according to regulations of the Ministry of Finance; supplement regulations on standardizing the organizational structure of insurers, managers, and supervisors; require enterprises to develop and implement risk management, internal control and inspection, and financial management; increase information disclosure...[4] This regulation will contribute to improving the competitiveness of insurance enterprises.

Along with that, according to the provisions of Article 36 of Decree 73/2016/ND-CP dated July 1, 2016, of the Government, insurance enterprises must develop, implement and supervise the implementation of regulations on assignment responsibilities, business processes, and setting up an internal control system. Internal control activities must be independent of business operations; The internal audit department must be independent of the internal control department, ensuring timely assessment and detection of all risks that may adversely affect the efficiency and operational objectives of the enterprise. At the same time, enterprises must regularly check the observance of laws, professional processes, and internal regulations, and perform internal audits annually [5].

## **2.3. Factors Affecting Internal Control**

Based on the 1992 COSO report [6], the COSO Organization updated its report in 2013.

In this report, four important contents of the 1992 COSO report are retained, including: Internal control definition.

Three target groups of the entity (Including Operational Objectives, Financial Statements).

Five parts of internal control (Control environment, Risk assessment, Control activities, Information, communication, and Monitoring). Apply judgment to the design, implementation, operation, and evaluation of internal control.

Based on COSO's theory of internal control system, apply five parts of internal control (Control environment, Risk assessment, Control activities, Information, communication, and Monitoring) to assess the impact on the effectiveness of the internal control system. However, towards the research goal in this article, the research team only mentions the factor "Information and communication" and its impact on improving the effectiveness of internal control in enterprises. The life insurance industry in Vietnam.

## **2.4. Information and communication in internal control in life insurance enterprises**

The Information and Communication component is responsible for supporting all components in internal control. This component is responsible for regularly looking up and updating information and legal documents related to insurance business activities as well as relevant legal documents to promptly issue instructions and warnings. Reporting compliance to the Departments/Departments/Sales Office during operation as well as complying with the provisions of law (if any). Maintain operations in compliance with the Regulations of the Departments/Departments/Sales Offices; Implement compliance training programs, and share information about regulations, laws / Company policies / Group regulations for the entire staff and business of the Company.

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### **3. RESEARCH METHODS**

Research using the most common method in scientific research is methodology. The authors have consulted many domestic and foreign documents related to internal control and parts of internal control. From the research documents, the authors have cited some concepts and theoretical bases in the article. All these conceptual content and theoretical basis are the foundation for the arguments in scientific research. Simultaneously with understanding the underlying theory, the authors also explore the actual situation of internal supervision activities at life insurance enterprises. Finally, the group used the theoretical method to prove the existence of the Information and Communication system and proposed some solutions to improve the effectiveness of internal control through the theoretical basis. presented earlier.

### **4. PROMOTE THE INFORMATION AND COMMUNICATION SYSTEM TO IMPROVE INTERNAL CONTROL EFFICIENCY AT VIETNAM PERSONAL INSURANCE ENTERPRISE**

#### **4.1. Viewpoints and Orientations to Enhance the Effectiveness of the Internal Control System in Life Insurance Enterprises in Vietnam.**

Along with the promulgation of the Law on Insurance Business No. 08/2022/QH15, the Strategy for the development of the insurance market to 2030 has also been developed to create a foundation for the sustainable development of Vietnam's insurance market in the future. next time. One of the viewpoints and orientations for the development of the insurance market in 2030 is to strengthen the management, supervision, inspection, and examination of the management agency. Improve market risk management capacity, and ensure safe, healthy, and sustainable market operation. The development of the insurance market is carried out synchronously and comprehensively, has a specific plan and roadmap, takes careful and sure steps, is publicly announced, does not disturb the operation of the insurance market, and ensures the legitimate rights and interests of participants. insurance and safety of the whole system; reduce social costs. Ensuring the market principle, enterprises are self-responsible, state management agencies perform the role of management and supervision, not acting on behalf of enterprises.

#### **4.2. The Current Situation of Information and Communication in Life Insurance Enterprises in Vietnam**

Life insurance businesses comply with current legal regulations on the organization of internal control and internal audit activities according to regulations. Through the survey results of experts and the summary report on the implementation of the Strategy for Vietnam's insurance market development for the period 2011-2020, the Ministry of Finance found that:

Internal control has not kept pace with the development of business activities in the insurance sector. Shortage of human resources to perform Information and communication tasks in internal control of enterprises.

Life insurance businesses have established information channels to report on unusual behaviors and events that are likely to cause damage to businesses. However, these information channels are rarely updated and refreshed. Many unusual events and violations of regulations are not disclosed to all employees.

Businesses that do not regularly update important information for employees at all levels can understand and understand the rules and standards of the organization. Therefore, information is not provided timely and accurately to the competent authorities as prescribed.

#### **4.3. Solutions Strengthening the Information and Communication System to Improve Internal Control Efficiency**

Update documents, policies, and regimes regularly to ensure that internal control activities of the unit are not outdated or outdated compared to the times.

Transparency of information and effective implementation of internal and external information channels. Insurers must publicize and transparently disclose information to the entire unit and external parties, and at the same time, they must perform well in communicating information and receiving feedback to effectively control and enhance the reputation of the insurance business by: Set up an information page to keep the image and all necessary information about the insurance business on it. Especially, it is necessary to continuously update news about insurance enterprises, and information about awards and titles that insurance enterprises have achieved.

Publicize in newspapers, magazines, and Websites the information on financial statements. Ensure the information provided is accurate, and truthful, increasing the trust of the outside, especially the trust of customers.

To stipulate and publicize documents summarizing professional processes, regulations for each insurance product provided by the enterprise, and instructions for customers. These regulations are announced on the website and at the insurance company so that all customers who come to the transaction know clearly. This way is not only convenient for customers in transactions, serving customers better but through customers, insurers can also regularly monitor insurance agents so that they follow the correct process that improves control performance.

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Select the appropriate form of communication for the customer. With notices about policies for customers, the introduction of products and services, promotion information, and instructions for customers, it is necessary to make specific and clear announcements at the insurance company and on its website. Karma. Particularly for responses to customer inquiries, the insurer must send a reply to the customer to explain to the customer. Especially when there are false rumors that affect the reputation of the insurance company, it is necessary to send a letter to each customer, and at the same time publish information in the media to correct the incorrect information. Protect the reputation of the insurance business.

Disseminate documents on policies, operations as well as directives of superiors so that all members of the insurance business understand and implement them. The most effective form of information dissemination is to notify all departments and branches and ask the head of the meeting to disseminate important relevant content. Sign and certify on documents proving that you have read and understood those regulations.

Organizing professional training and disseminating general regulations and policies of insurance enterprises for new employees and newly recruited agents so that they can understand the general insurance business as well as their work to perform. for good. Disseminating all regulations, processes, and policies of the insurance company to all employees helps them to stay informed, understand what they do and have a direction to strive for the future.

Every month, quarter, and year, the enterprise guarantees

Notify all employees about the results of their activities, the results achieved compared to the targets. Thereby, employees also evaluate the results they have done, and their contributions to the results of the insurance enterprise and continue to strive to perform well the assigned work for the benefit of the insurance enterprise. that has its benefit. Informing employees about the activities of an insurance company can be done through the release of internal newsletters or its internal website.

## 5. CONCLUSION

Through this study, we have realized the importance of information systems and traditions in improving the effectiveness of internal control in life insurance enterprises. With several solutions proposed by the authors based on the shortcomings of the Information and Communication system, it is hoped that this will help improve the efficiency of this activity at life insurance companies in Vietnam.

## REFERENCES

- 1) DiNapoli, T. P, (2007). Standards for Internal Control In New York State Government.
- 2) Y, N.N, (1998). Vietnamese Great Dictionary, Hanoi: Cultural and Information Publishing House.
- 3) COSO, (2013). The 2013 COSO Framework & SOX Compliance: One Approach to an Effective Transition
- 4) National Assembly, (2022). Law on Insurance Business, National Assembly, Hanoi, Vietnam.
- 5) National Assembly, (2016), Decree 73/2016/ND-CP guiding the Law on Insurance Business and the Amended Law on Insurance Business, National Assembly, Hanoi, Vietnam
- 6) Committee of Sponsoring Organisations of the Treadway Commission (COSO). (1992). Internal control-integrated framework. New York, NY: AICPA.



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## The Relationship Between Mother's Knowledge, Family Income, and Parenting Pattern with Stunting in Toddlers Aged 24-59 Months in the Working Area of Abepura Primary Health Center



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**ABSTRACT:** Stunting is a disorder of growth and development of children due to chronic malnutrition and repeated infections, which are characterized by their length or height being below standard. The purpose of this study was to determine the relationship between mother's knowledge, family income and parenting style with stunting in toddlers aged 24-59 months in the working area of the Abepura Primary Health Center. This research is an observational study conducted using a cross-sectional study approach, carried out in October 2022. The number of samples was 71 respondents, namely all mothers who have toddlers in the working area of the Abepura Primary Health Center obtained through a purposive sampling technique. Collecting data on mother's knowledge, family income and parenting patterns used a questionnaire while determining stunting using the height for age indicator. Data analysis was carried out using the Chi Square test with an error rate of 95% using SPSS version 21. The results showed that there was a relationship between mother's knowledge and stunting, there was a relationship between family income and stunting and there was a relationship between parenting style and stunting.

**KEYWORDS:** Mother's Knowledge, Family Income, Parenting, Stunting.

### I. INTRODUCTION

Stunting is a condition where a toddler has a length or height that is less when compared to age. This condition is measured by length or height that is more than minus two standard deviations (-2 SD) of the WHO median child growth standard [1]. Stunting under five is a chronic nutritional problem caused by many factors, such as socioeconomic conditions, maternal nutrition during pregnancy, infant illness, and lack of nutritional intake in infants. Stunted toddlers in the future will experience difficulties in achieving optimal physical and cognitive development [1].

The prevalence of stunting under five is one of the nutritional problems currently being experienced by toddlers in the world. In 2017 there were 22.2% or around 150.8 million toddlers in the world experiencing stunting. However, this figure has decreased when compared to the stunting rate in 2000, which was 32.6%. Data on the prevalence of stunting under five collected by the World Health Organization (WHO), Indonesia is included in the third country with the highest prevalence in the Southeast Asia/South-East Asia Regional (SEAR). The average prevalence of stunting under five in Indonesia in 2005-2017 was 36.4% or nearly 9 million under five [1].

Riskesdas data in 2018 shows the stunting rate in Papua was 33.1%, where the prevalence of very short nutritional status was 15.3% and short 17.8% [2]. Based on data from the Jayapura City Health Office from Regional Health Research or Riskesdas in Jayapura City, stunting cases were at 34.8% in 2013 and the 2018 Riskesdas were at 31.4%.

The cause of stunting in children under five due to the economic crisis is influenced by various interrelated factors, especially food intake and infectious diseases. Both of these factors are influenced by family purchasing power, family size, eating habits, parenting patterns, child care and pregnancy, basic health services, sanitation and other environmental and social factors

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[3]. The mother's knowledge factor about stunting has an important role in preventing stunting, knowledge is an important aspect of the domain to shape one's actions. The wider a person's knowledge, the more positive the behaviour he does [4].

Stunting is defined as a short or very short body condition based on the index of Body Length for Age or Height for Age with a threshold (z-score) between -3 SD to < -2 SD [5]. Stunting is a chronic condition of growth disturbance which is described on the z-score height for age < -2 SD caused by inadequate nutrition at the time of mass growth [6]. Stunting is a state of chronic malnutrition due to insufficient nutritional intake for quite a long time and other factors that can be seen based on the height/age indicator with a z-score value < -2 SD [7].

Here are some of the characteristics that appear in stunted children: 1). The face looks younger than its age, 2). Growth slows down, the lower limit of growth speed is 5 cm/year, 3). Late tooth growth, 4). Children aged 8-10 years are quieter, do not make much eye contact [8].

**Table 1. Classification of Nutritional Status Based on the height for age Index.**

Index	Nutritional Status	Standard Deviations (SD) (Z-Score)
Height for age or Body length for age	Very Short	< -3 SD
	Short	-3 SD to < -2 SD
	Normal	-2 SD to 3 SD
	Tall	>+3 SD

Source: Indonesian Health Ministry, 2020

## Mother Knowledge

Knowledge is a result of knowing that is obtained by individuals from sensory devices such as sight and hearing of an object, so that the individual is able to process all the things he gets. Mother's knowledge of stunting is a mother's understanding of stunting as well as the food she will consume and the relationship between food composition and health. Knowledge related to stunting is very important for mothers to have in order to prevent their children from stunting. Research found that there is a significant relationship between maternal knowledge and the incidence of stunting with a risk of 1.644 times greater [9].

## Family Income

According to Sulistyaningsih (2011), the ability of a family to buy food is influenced by the size of the family income level because if the income level is relatively low, it will be unable to meet its food needs, especially in various types of food [10]. Aridiyah's research (2015) revealed that family income influences the incidence of stunting in children under five in rural and urban areas [11]. Poverty in Indonesia is related to malnutrition causing stunted growth in children. Based on UNICEF data in 2012, one of the growth problems in toddlers is the stunted growth of children's height so that children grow tall not according to their age which is called short toddlers or stunting.

## Parenting

Parenting is how parents treat children, educate, guide, and discipline children in reaching the maturity process to the effort to form the norms expected by society in general [12].

Poor parenting or feeding patterns from the time the child is born causes the child to become short. The occurrence of short nutritional problems (height for age) as a result of long-lasting conditions that are not appropriate parenting. Inadequate parenting factors given by mothers to children are factors that can cause nutritional problems. In this case, the parenting style that can be given by the mother includes taking the time, paying attention to and supporting the fulfillment of the physical, social and mental needs of children who are in a phase of growth and development. Parenting is also closely related to sanitation practices, health and healthy and clean living, and health care. In addition, parenting is also related to how to provide and provide nutritious food for children in the growth and development phase [13].

## II. METHODS

### A. Types of Research

This research is a quantitative observational study conducted using a cross-sectional approach, meaning that the measurements of the variables studied, both independent and dependent variables, are carried out simultaneously [14].

### B. Location and Time of Research

This research was conducted in the Work Area of the Abepura Primary Health Center for 1 month, namely in October 2022.

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## C. Population and Sample

The population in this study were all mothers aged 24-59 months who were in the working area of the Abepura Primary Health Center, namely 276 respondents, then using the Lemeshow formula (1997) the number of mothers under five was obtained as many as 71 respondents. So, the number of samples for both mothers of toddlers and toddlers is 71 respondents each .

## D. Concept and Hypothesis Framework

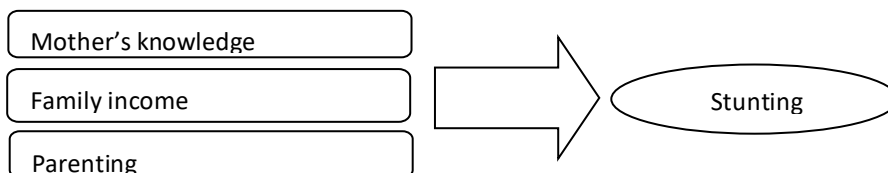


Figure 1. Research Concept Framework

Based on the research concept framework above, a research hypothesis is made as follows:

1. There is a relationship between mother's knowledge and stunting in toddlers aged 24-59 months in the working area of the Abepura Primary Health Center
2. There is a relationship between family income and stunting in toddlers aged 24-59 months in the working area of the Abepura Primary Health Center
3. There is a relationship between parenting style and stunting in toddlers aged 24-59 months in the working area of the Abepura Primary Health Center.

## E. Variables and Operational Definitions of Variables

Table 2. Variables and Variable Operational Definitions

No	Variable	Operational definition	Measuring Method	Criteria	Scale
1	Stunting	The condition of the height of the toddler is below the WHO standard as measured using height / age.	Microtoise (cm)	1. Stunting: If, the Z-Score value for height for age $\geq 2$ SD 2. Not Stunted: If, the Z-Score value for height for age $\geq -2$ SD [1]	Ordinal
2	Mother Knowledge	All information regarding stunting that is known and understood by the mother	Questionnaire	Poor knowledge: If Score $< 6$ (median) Good knowledge: If Score $\geq 6$ (median)[15]	Ordinal
3	Family Income	Total family income compared to UMP.	Questionnaire	Low: If Income $<$ UMP Rp. 3,561,932/month. High: If Income $\geq$ UMP Rp. 3,561,932/month.	Ordinal
4	Parenting	Actions taken by parents in fulfilling nutrition from the food consumed by children according to their age based on the type of food consumed, the amount of food consumed	Child Feeding Questionnaire	1 = Incorrect category, if the answer score $< 60\%$ 2 = Correct category, if the answer score is $\geq 60\%$ [16]	Ordinal

The above table describes variables and variable operational definitions used in this study.

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## F. Data analysis

The data in the study were analyzed by two methods, namely: 1). Univariate analysis which aims to see the description of the distribution and characteristics of each variable which is then displayed in the form of tables and descriptions. 2). Bivariate analysis which aims to examine the relationship between the independent variables and the dependent variable which is suspected to have a correlation relationship. This analysis was carried out by the chi square test with a degree of confidence used was 95% (0.05).

## III. RESULTS

### A. Results of Univariate Analysis

#### 1. Distribution of Respondents Based on Stunting Incidents

**Table 3. Distribution of Respondents Based on Stunting Events**

Under Five Children	(n)	(%)
Stunting incidence (height for age)		
Stunting	43	60,6
Not Stunting	28	39,4
Total	71	100

(Primary Data, 2022)

Based on table 3 above, it is known that the highest number of respondents are stunted, namely 43 people or 60.6%.

#### 2. Distribution of Respondents Based on Mother's Knowledge Level

**Table 4. Distribution of Respondents Based on Mother's Knowledge Level**

Knowledge	(n)	(%)
Lack of knowledge	33	46,5
Good knowledge	38	53,5
Total	71	100

(Primary Data, 2022)

Based on table 4 above, it is known that the highest number are respondents with a good level of knowledge, namely 38 people or 53.5%.

#### 3. Distribution of Respondents Based on Family Income

**Table 5. Distribution of Respondents Based on Family Income**

Family Income	(n)	(%)
Low	46	64,8
High	25	35,2
Total	71	100

(Primary Data, 2022)

Based on table 5 above, it is known that the highest number are respondents with low income, namely 46 people or 64.8%.

#### 4. Distribution of Respondents Based on Parenting Style

**Table 6. Distribution of Respondents Based on Parenting Style**

Parenting	(n)	(%)
Inappropriate	36	50,7
Appropriate	35	49,3
Total	71	100

(Primary Data, 2022)

Based on table 6 above, it is known that the highest number are respondents with inappropriate parenting, namely as many as 36 people or 50.7%.

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### B. Results of Bivariate Analysis

#### 1. Relationship between Mother's Knowledge and Stunting in Toddlers Age 24-59 months in the Work Area of Abepura Primary Health Center

**Table 7. Results of the Chi Square Test for Knowledge of Mothers with Stunting in Toddlers Aged 24-59 Months in the Work Area of the Abepura Primary Health Center**

Mother Knowledge	Stunting		Total	p-value
	Stunting	Not Stunting		
Lack	27	6	33	0,002
Good	16	22	38	
Total	43	28	71	

(Primary Data, 2022)

Based on table 7 above, it is known that the results of the chi-square test obtained  $p\text{-value} = 0.002 < 0.05$ , which means that there is a relationship between maternal knowledge and stunting in toddlers in the working area of the Abepura Primary Health Center.

#### 2. Relationship between Family Income and Stunting in Toddlers Aged 24-59 months in the Work Area of the Abepura Primary Health Center

**Table 8. Results of the Chi Square Test on Family Income with Stunting in Toddlers Aged 24-59 Months in the Working Area of the Abepura Primary Health Center**

Family Income	Stunting		Total	p-value
	Stunting	Not Stunting		
Low	40	6	46	0,000
High	3	22	25	
Total	43	28	71	

(Primary Data, 2022)

Based on table 8 above, it is known that the results of the chi-square test obtained  $p\text{-value} = 0.000 < 0.05$ , which means that there is a relationship between family income and stunting in toddlers in the working area of the Abepura Primary Health Center.

#### 3. Relationship between Parenting Style and Stunting in Toddlers Aged 24-59 Months in the Working Area of the Abepura Primary Health Center

**Table 9. Results of the Chi Square Test on Parenting with Stunting in Toddlers Aged 24-59 Months in the Work Area of the Abepura Primary Health Center**

Parenting	Stunting		Total	p-value
	Stunting	Not Stunting		
Inappropriate	30	6	36	0,000
sAppropriate	13	22	35	
Total	43	28	71	

(Primary Data, 2022)

Based on table 9 above, it is known that the results of the chi-square test obtained  $p\text{-value} = 0.000 < 0.05$ , which means that there is a relationship between parenting style and stunting in toddlers in the working area of the Abepura Primary Health Center.

## VI. DISCUSSION

### 1. Relationship between Mother's Knowledge and Stunting in Toddlers Aged 24-59 Months in the Work Area of the Abepura Primary Health Center

Research by Hutabarat Gilbert A (2021) [15], Rizqita Catur Wulandari [17] and Femidio (2020) [18], also Langi, et al (2019) [19] show that there is a significant relationship between mother's knowledge and the incidence of stunting.

Based on UNICEF (1997) in BAPPENAS (2018) it is explained that knowledge is an indirect causal factor that can affect the nutritional status of children, good knowledge about nutrition will affect individual behaviour in providing good food and parenting

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of children and vice versa, if knowledge is lacking in nutrition, it will have an impact on children's health and nutrition problems which can cause stunting problems.

Primary Health Care (Puskesmas) can partner with community organizations and the local government to form stunting cadres so they can reach the community in providing stunting CIE easily so that mothers with toddlers can have good knowledge of stunting and can prevent stunting and a good level of mother's knowledge does not guarantee having toddlers with normal nutritional status. Mothers who have less knowledge are expected to be able to apply the knowledge they have in everyday life.

### **2. Relationship between family income and stunting in toddlers aged 24-59 months in the working area of the Abepura Health Center**

Putri Anindita's research showed that there was a relationship between family income levels and stunting in children aged 6-35 months in the Tambalang sub-district, Semarang city [20]. The results of Ardiyah's research (2015) also revealed that family income influences the incidence of stunting in children under five in rural and urban areas [11]. Research by Nuralmasari et al., (2020) also shows that there is a relationship between family income and the incidence of stunting [21].

Family income is related to the ability of the household to meet the basic, secondary and tertiary needs of life. High family income makes it easier to meet life's needs, on the contrary, low family income has more difficulty in meeting life's needs. Low income will affect the quality and quantity of food consumed by the family.

Low levels of income and weak purchasing power make it possible to overcome eating habits in certain ways which impede effective improvement of nutrition, especially for their children. vitamins and minerals, thereby increasing the risk of malnutrition. These limitations will increase the risk of family members experiencing stunting [22].

### **3. The Relationship between Parenting Style and Stunting in Toddlers Aged 24-59 Months in the Work Area of the Abepura Health Center**

Research by Prakhasita (2018) found that there is a relationship between feeding patterns and the incidence of stunting in toddlers aged 36-59 months [16]. Another study conducted by Fauziah (2020) also found that toddlers who have a history of poor feeding patterns have less chance of experiencing stunting when compared to toddlers who have a history of good feeding patterns [23]. In line with previous research, research in 2022 also shows that there is a relationship between feeding patterns and the incidence of stunting in toddlers [18].

According to Sunardi (2000) who said that the mother's knowledge and role in fostering healthy eating is highly demanded in order to maintain the correct pattern of feeding to children [24]. Child snacks need to be introduced since the child enters the family diet. Children's health can be achieved through balanced feeding efforts according to their nutritional needs. Balanced eating, namely eating according to the composition of food ingredients needed by the body in portions that are adjusted to the needs of children at each age.

The pattern of feeding that has an impact on the incidence of stunting is due to the lack of knowledge of the mother about the quality of food that is processed properly and correctly without reducing the intake of protein, iron, calcium, energy and zinc. During the cooking process that requires it to be given at the right time. Toddlers who have a history of poor feeding patterns have less chance of experiencing stunting when compared to toddlers who have a history of good feeding patterns. If the pattern of feeding is wrong, it can cause stunting in toddlers.

## **V. CONCLUSION**

In conclusion, there was a relationship between mother's knowledge and stunting, there was a relationship between family income and stunting and there was a relationship between parenting style and stunting. Several recommendations based on this study result are:

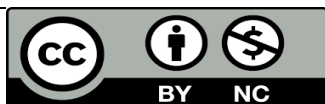
- A. Health service institutions through health workers need to carry out activities aimed at increasing public knowledge about the selection and processing of food ingredients as well as good and correct presentation.
- B. Communities must try to maintain food security at the household level, for example by using the yard as a source of food for the family.

## **REFERENCES**

- 1) Ministry of Health, "Cegah Stunting, itu Penting," Information and Data Center, Ministry of health, 2018.
- 2) K. P. Papua, "Profil Kesehatan Dinas Kesehatan Provinsi Papua Tahun 2018," Dinas Kesehatan Provinsi Papua, Jayapura, 2018.
- 3) Supriasa and D. Nyoman, Pendidikan dan konsultasi gizi, Jakarta: EGC, 2012.

## The Relationship Between Mother's Knowledge, Family Income, and Parenting Pattern with Stunting in Toddlers Aged 24-59 Months in the Working Area of Abepura Primary Health Center

- 4) B. C. C. B. D. K. H. M. L. M. W. J. Hall C, "Maternal knowledge of stunting in rural Indonesia," *International Journal of Child Health and Nutrition*, vol. 7, no. 4, pp. 139-45, 2018.
- 5) Olsa, D. Sulastri and E. Anas, "Hubungan Sikap dan Pengetahuan Ibu Terhadap Kejadian Stunting pada Anak Baru Masuk Sekolah Dasar di Kecamatan Nanggalo," *Jurnal Kesehatan Andalas*, vol. 6, no. 3, p. 523, 2017.
  - A. Rachim and R. Pratiwi, "Hubungan konsumsi ikan terhadap kejadian stunting pada anak usia 2-5 tahun," *JURNAL KEDOKTERAN DIPONEGORO (DIPONEGORO MEDICAL JOURNAL)*, vol. 6, no. 1, pp. 36-45, 2017.
- 6) Chairunnisa, A. Kusumastuti and B. Panunggal, "Asupan vitamin D, kalsium dan fosfor pada anak stunting dan tidak stunting usia 12-24 bulan di Kota Semarang," *Journal of nutrition college*, vol. 7, no. 1, pp. 39-44, 2018.
- 7) Sandjojo and EP, *Buku saku desa dalam penanganan stunting*, Kementerian Desa, Pembangunan Daerah Tertinggal dan Transmigrasi, 2017.
- 8) W. Wulandari, I. Budiastutik and D. Alamsyah, "Hubungan karakteristik sosial ekonomi dan pola asuh pemberian makan terhadap kejadian stunting pada balita di Puskesmas Ulak Muid Kabupaten Melawi," *Jumantik*, vol. 3, no. 2, 2016.
- 9) D. Sulistyarningsih, B. Panunggal and E. Murbawani, "Status Iodium Urine dan Asupan Iodium Pada Anak Stunting Usia 12-24 Bulan," *Media Gizi Mikro Indonesia*, vol. 9, no. 2, pp. 73-82, 2018.
- 10) Ardiyah, N. Rohmawati and M. Ririyanti, "Faktor-faktor yang mempengaruhi kejadian stunting pada anak balita di wilayah pedesaan dan perkotaan," *E-Jurnal Pustaka Kesehatan*, vol. 3, no. 1, 2015.
- 11) B. Septiari, *Printing Smart Toddler and Parenting Patterns*, Yogyakarta: Nuha Medika, 2012.
- 12) Y. Yuanta, D. Tamtomo and D. Hanim, "Hubungan riwayat pemberian asi dan pola asuh ibu dengan kejadian gizi kurang pada anak balita di kecamatan wongsorejo banyuwangi," *Jurnal Kesehatan Kusuma Husada*, vol. Jan 22, pp. 48-56, 2018.
- 13) S. Verhagen, L. Hasmi, M. Drukker, O. J. van and P. Delespaul, "Use of the experience sampling method in the context of clinical trials," *BMJ Ment Health*, vol. 19, no. 3, pp. 86-9, 2016.
- 14) Hutabarat, "Hubungan Pengetahuan Pendidikan, Dan Pola Asuh Pemberian Makan Terhadap Kejadian Stunting Pada Balita Usia 36-59 Bulan di Puskesmas Sigompul," Universitas Jambi, Jambi, 2021.
- 15) R. Prakhasita, "Hubungan Pola Pemberian Makan dengan Kejadian Stunting pada Balita Usia 12-59 Bulan di Wilayah Kerja Puskesmas Tambak Wedi Surabaya," Universitas Airlangga, Surabaya, 2018.
- 16) R. Wulandari and L. Muniroh, "Hubungan Tingkat Kecukupan Gizi, Tingkat Pengetahuan Ibu, dan Tinggi Badan Orangtua dengan Stunting di Wilayah Kerja Puskesmas Tambak Wedi Surabaya," *Amerta Nutrition*, vol. 4, no. 2, p. 95, 2020.
- 17) M. Femidio and L. Muniroh, "Perbedaan pola asuh dan tingkat kecukupan zat gizi pada balita stunting dan non-stunting di wilayah pesisir Kabupaten Probolinggo," *Amerta Nutrition*, vol. 4, no. 1, p. 49, 2020.
- 18) Langi, I. Djendra, R. Purba and R. Todanggene, "Pengetahuan Ibu Dan Pemberian Asi Eksklusif Dengan Kejadian Stunting Pada Balita 2-5 Tahun Di Puskesmas Kawangkoan Minahasa," *Jurnal GIZIDO*, vol. 11, no. 01, p. 17-22, 2019.
- 19) P. Anindita, "Hubungan Tingkat Pendidikan Ibu, Pendapatan Keluarga, Kecukupan Protein & Zinc dengan Stunting (Pendek) pada Balita Usia 6-35 Bulan di Kecamatan Tembalang Kota Semarang," *Jurnal Kesehatan Masyarakat Universitas Diponegoro*, vol. 1, no. 2, p. 18764, 2012.
- 20) N. Yesi, Anggunan and W. Tya, "Hubungan Tingkat pendidikan ibu dan pendapatan keluarga dengan kejadian stunting pada anak balita usia 6-59 bulan di Desa Mataram Ilir Kecamatan Seputih Surabaya tahun 2019," *Jurnal Kebidanan*, vol. 6, no. 2, 2020.
- 21) W. Hapsari and B. Ichsan, "Hubungan pendapatan keluarga, pengetahuan Ibu tentang gizi, tinggi badan orang tua, dan tingkat pendidikan ayah dengan kejadian stunting pada anak umur 12-59 bulan," *Doctoral dissertation*, Universitas Muhammadiyah Surakarta.
- 22) N. Fauziah, D. Mariana and M. Saputra, "Hubungan Pendapatan Pengasuh Dengan Kualitas Interaksi Pengasuh dan Anak Stunting Usia 6-23 Bulan," *Jurnal 'Aisyiah Medika*, vol. 5, no. 1, pp. 43-53, 2020.
- 23) T. Sunardi, *Makanan sehat peggugah selera makan balita*, Pustaka Utama, 2000.



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## Life Scenario System of Care for Stroke Survivors and Families: An Ethnography Study



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**ABSTRACT:** The Greek word “Apoplexies” or “Apoplexy” for violent who is 40-60 years old and being struck was called by Hippocrates in 460-370 BC to mention stroke today. The tardiness for 10-minute delays will increase the disability impact. The most significant effect, in this case, is stroke patients and their families. The aim of this study is to explore and describes the life scenario of stroke survivors and families in the community. Ethnography study is an approach for qualitative research in this study with details the main participants are seventeen stroke survivors and twenty-four stroke caregivers. The data collection method is observation, in-depth interviews, and continued field notes for the content analysis, the duration for collecting data is five months. The result of this study is two categories, life scenarios of stroke survivors and life scenarios of family. The life scenarios of stroke survivors support two scenarios, and the life scenario of families as stroke caregivers has three scenarios. Stroke is not a misfortune disease or a punishment from God. This disease is having a golden period for acute care and rehabilitation training times, when the stroke survivors and families optimize this time, the loss of body function is controlled. On the other hand, the main caregiver has several responsibilities in this condition. Further, both of them needed support to continue and adapt their lives to new roles.

**KEYWORDS:** caregiver, ethnography study, stroke, system of care

### I. INTRODUCTION

Indonesia is the highest stroke population in South Asia (Venketasubramanian, Yoon, Pandian 2017). Someone who had a stroke attack and still survive can call a stroke survivor. They still live but have some effect, in relation to weakness or limited body function. Because of that, they need support from their family to avoid stroke return attacks and keep themselves alive. The role of family members who undertake patient care is unarguably important for stroke rehabilitation. Caregivers play a key role in facilitating recovery (Sari, Mubasyiroh, and Supardi 2017). The impact on stroke survivors after an attack includes psychological and physical impairment. The different circumstances on largely stroke survivors confused and frustrated. Not stop depending on activity, but also, they must bear the psychological burden (Torregosa et al. 2018). Three of characteristics stroke survivors are related to body function, coping, and the last is the quality of life (Gorski 2013; Fang and Tao et al. 2017; Torregosa et al. 2018). The stroke incident would be negative consequences for the individual as a stroke survivor, related to this condition, almost stroke survivor dependence on others. The need for care having related to the position, function, and structure of families. Because of the unique culture in the family, those with similar conditions maybe have different maintaining states of health (Kaakinen R. Joanna 2010).

Family or informal caregiving is a stressful, life-consuming activity that often impacts the social, emotional, and financial health of the caregiver. The caregiver burden has been described as a negative reaction to the impact of providing care on caregivers’ social, occupational, and personal roles. Studies of family caregivers suggest that stress and burden can affect their physical and mental health. Negative health outcomes such as depression and overall poor health including a lowered immune system and higher blood pressure have been reported. Family caregivers may also experience burnout, which can cause early nursing home placement for the care recipient. Most alarming, family caregivers experience an increased mortality rate and are at a greater risk of abusing the care recipient as a consequence of stress and burden (Eifert et al. 2015).

Related to cardiovascular disease which is one of the NCDs, in Indonesia, we have acts and policies to support health, such as Act No. 36 of 2009 for equality health service, in the MoH National Strategic Plan for Universal Health Coverage for Indonesian peoples, and six Indonesian health systems. Furthermore, the government was to support verification of the Indonesian health system,



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such as; community health centers (Puskesmas) programs, for example, the community engagement program (Month) called Integrated Service Post (Posbindu) and Vigilant Village (Desa Siaga), The National Hospital Accreditation Agency (KARS), the government public insurance (BPJS), and existence of the Indonesian Medical Council (KKI) (Mahendradhata et al 2017). In Indonesia, East Kalimantan is the highest province for stroke incidents during 2013-2018. Specifically, the Palaran sub-district recorded for the sub-district with the highest number of hypertension case for 2018 and 2019.

A life scenario means describing a situation that most often immerses the respondent. The system includes elements that will stimulate the respondents' beliefs, perceptions, or attitudes. The aim of this study is to explore and describes the life scenario of stroke survivors and families in the community.

### II. RESEARCH METHODS

The procedure of inquiry in this study is qualitative research. Qualitative research is one of research design with more attention to understanding and exploring meaning from individuals or groups to ground of human or social problems, add more, on qualitative research having three assumptions, no single meaning, the quality of research design, and the approach of research design. This research design benefits for knowing construct meaning from human beings, studying the context or setting for understanding and making interaction in and out with community because of their setting (Ormston Rachel, Spencer Liz, Barnard Matt 2013; Creswell 2014).

The special resonance of ethnography has consisted of anthropologists and sociologists, cited by Denzim and Lincoln (2011) this study is to pay more attention to study about beliefs, behaviors, social interaction, participation, and observation. This methodology for understanding the cultural phenomenon, which some conditions not found in quantitative research (Loshini 2012; Boellstorff et al 2013). Participants in this study consist of seventeen stroke survivors and twenty-four stroke caregivers. Methods such as observation, focus group discussion, in-depth interviews, and field notes are used to collect data in this study and continue the content analysis. It starts from July to December 2021 in the Palaran sub-district setting. Khon Kaen University Ethics Committee published the KKU IRB letter in a number of HE642022 with approval on May 19, 2021, to support this study.

### III. RESULTS

The life scenarios consisted in this study is divided into two groups; there is the life scenario of stroke survivors and the second life scenario of families. The life scenario of stroke survivors inside two scenarios, there are regularly doing selfrehabilitation with family support and lying-in bed all the time with family support for daily activities. In addition, on life scenario of a family has three scenarios, such as being with stroke survivors on the side all time, multiple tasks of stroke caring, and having multiple families as caregivers.

#### 1. Life Scenario of Stroke Survivors

The sudden incidents of stroke attacks have many responses. It would be by stroke survivors themselves or another family member. Interrupting the blood supply to the brain would impact body paralysis as one of the impacts of stroke disease. Paralysis and aphasia are problems connected with stroke attacks in the Palaran sub-district. Some stroke survivors complain about their new habits for staying life. In other scenarios, half of them is accepted sincerely. The different feelings and body conditions before and after stroke can be considered for stroke recovery too. Therefore, some of the choices for stroke rehabilitation are stroke recovery treatment or self-care, although a little piece is not doing anything.

According to that, the groups of life scenarios of stroke survivors would be supported by two life scenarios: regularly doing self-rehabilitation with family support and lying in a bed all day with family support for daily activities.

##### a. Regularly doing self-rehabilitation with family support.

The further phase for stroke attack conditions depends on others. The stroke survivors feel weak for everything, feeling helpless after they can't change anything. Depending on all families for activity daily living, in other cases, they need stimulants for independent activity. Paralysis is the most significant for stroke survivors in Palaran, which is the left or right side of the body and a half or all side bodies.

The COVID-19 situation today makes stroke survivors and caregivers choose self-rehabilitation in a home setting. Of seventeen stroke survivors, eleven are doing stroke self-rehabilitation at home: from this amount, one stroke survivor doing rehabilitation with family help, and ten others doing it alone.

"I treat my husband by myself in my home. I can practice some rehabilitation technic when the clinician nurse treats my husband in the hospital. At home, I do it every morning, around 30 minutes until 1 hour depending on my condition and my husband's condition. Starting with moving his paralysis hand and continuing for his foot which is paralysis too." (CG1, Female, 54 years old)

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### b. Lying in a bed all day with family support for daily activities

Caused by the body's conditions after a stroke attack, the first impact for stroke survivors is living with dependency. The number of two-stroke survivors depends on their families as caregivers for their daily activity or are partially dependent, and two are totally dependent on stroke caregivers. Two reasons for lying in bed are that stroke survivors feel weak for everything and feel helpless after they can't change anything with a kind of stroke recovery and rehabilitation. The second is the conditions where stroke survivors must be stimulated before stroke survivors do the activity by themselves in the acute phase after back from the hospital or because they have paralysis in the right-side body, which is not usual to use the left side for ADL.

"I can't do anything after a stroke attacks me. Day by day I feel weaker than last time. I tried several treatments for stroke, but I keep weak, I am stopped, and just lying for waiting for my timing comes with my wife serve in my daily needs." (SS2, Male, 65 years old)

In conclusion, the life scenario of stroke survivors' groups is explored; the first life scenario of the experience of stroke survivors when getting a stroke attack is regularly doing self-rehabilitation with family support and lying in bed all the time with family support for daily activities. Ten stroke survivors are told about self-exercise ability by themselves, and one stroke survivors need their family as a caregiver to help with stroke rehabilitation in- a home setting. Further, two-stroke survivors are continuing to get treatment at the hospital. They are considering that instruction for treatments must be from the health professional. Continued response to becoming a stroke survivor is dependent on others as impacts stroke symptoms. Twentytwo stroke survivors are living with their nuclear families. Based on that, the most support for their daily activity, including stroke recovery, is from families. The last life scenario for the support of this group is lying in bed all the time with family support for daily activities. Lay in bed is their selection when was do some activity or treatments for stroke healing but never or just limited to health conditions change. In other statements, it's like the hopeless phase of stroke survivors related to their conditions.

## 2. Life Scenario of Family

The change conditions as the impact of a stroke attack on someone in your family has happened. Almost stroke survivors in the Palaran sub-district are ahead of their families, the person with the main responsibility for family living. Therefore, after a stroke attack, it makes something different inside their family. The family role is changing, responsibility is changing, and more than it, other needs are added to supply the stroke survivors. Not only change that, some caregivers told related benefits from their family member who is getting a stroke. This group's scenario is supported by three life scenarios of families. There are being with stroke survivors on the side at all times, multiple tasks of stroke care, and multiple families as caregivers.

### a. Being with stroke survivors on the side at all times.

Family is the primary care for stroke survivors caring. When the family is optimized to care, it can prevent recurrent stroke or other complications. Regarding stroke survivors' conditions, caregivers must attend to them all the time to cover all needs of stroke survivors. In these conditions, feelings, and experiences are raised about who is a caregiver of stroke survivors. Therefore, burden and worship are coming to explain the life scenarios of families, especially being with stroke survivors on the side all the time.

"My wife is totally depending on me after a stroke attack. Unfortunately, she depends on me but did not look into my situation. For example, when I am starting to sleep, she wakes me up to request something. I am a headache because I quickly weak up; when I am asking what she needs, she told us to forget what she wants. You know what my feeling at that time, angry and upset. It's often happened with me; I am burned to care for her." (CG9, Male, 65 years old)

"I am always thinking if our family conditions with my husband getting stroke are life's problem from Allah. Because of that, I am called to ibadat to care for my husband, and I am resigned about this. Yes, I am feeling tired, but never mind, it's my worship as a wife to my husband is like our holly book Qur'an direct for doing that." (CG6, Female, 60 years old)

### b. Multiple tasks of stroke care

Nine of a wife is the main caregiver of stroke for their spouse, and it's becoming the most caregiver in the family. In other meaning, the stroke survivor is the head of a family or husband position. Before the stroke attacked her husband, 4 of them were workers too. Therefore, after her husband gets a stroke attack, the four of them have more responsibility, becoming the family breadwinners and the main stroke survivors caring.

Suddenly attack without a sign first of a stroke attack is making panic. Further, continued to care about several weaknesses were didn't know. The situation is different and more burdensome for a wife who is a housewife and a worker. After a stroke attacks her husband, she comes to become a housewife or starts to be a worker for family coverage living needs.

"I am stressed with our finance after the stroke attacked my husband. Maybe in the early month, it's not heavy for me; my son keeps transferring money for caring for his father and supplying my family's needs because I am just a housewife. Then, his supply

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is difficult, so I am beginning to seek work. For work, I am starting from 8 am to 4 pm. Before I went to work, I was bathing and toileting my husband, preparing his breakfast, keeping stroke exercise, then entrusting my husband to my son.”  
(CG1, Female, 54 years old)

### c. Having multiple families as caregivers

Considering several problems and conditions as stroke survivors even during stroke disease, not only one family member is becoming a caregiver for them. In the Palaran sub-district, the researcher found too if the caregiver is not only a single person, but sometimes, they have companion caregivers. In research time, we found that 18 caregivers have companion caregivers, which would be their spouse, child, and nephew.

“I was doing everything to recover my body after a stroke attack, but I am aware if I can’t do by myself for all treatments. Fortunately, I have a good wife and my daughter. For example, to improve my condition, I am routine for a warm salt shower, my wife is helping me rub therapeutic salt three times a week, and when the timing for health control on last time, my daughter always pick-up me.” (SS5, Male. 65 years old, add moderately severe disability)

Stroke survivors and families have different needs living in the community. The problems growing up when they can’t know each other needs. Based on that, three life scenario of families was described as upper, beginning with being with stroke survivors on the side all time, multiple tasks of stroke caring, and having multiple families as caregivers.

Being with stroke survivors on the said all time is an experience for twenty caregivers who are living together in one home. Two themes in this category are burden and worship. Twenty-four caregivers are feeling burdened; some of them experience being angry, tired, and burdened, but five of the caregivers feel it’s ibadat because of worship. Multiple tasks of stroke care are rising for all caregivers. In these situations, four caregivers not only become the main caregiver but also money seekers, and all of them is the wife’s positions. The next is having multiple families as caregivers, considering paralysis, weakness from stroke survivors, and some duty as a caregiver and money seeker, not enough for one of the caregivers. Especially for they are who change roles in the family with double duty. However, the main caregivers need help for companion caregivers and it comes the last themes, having multiple families as caregiver.

## IV. DISCUSSION

The existence of stroke care in Samarinda, more concern in the central government of hospitals in there is supporting stroke survivors and their families. The next problem is the stroke center capacity, where the amount of stroke patients is always increasing. Not only the capacity but the distance between Palaran and Samarinda has also raised a new problem for continuing stroke rehabilitation. These conditions do not differ in a community setting when the stroke treatment or stroke facility is, of course, not only concerned with stroke disease but also other neurologist problems, for example, the physiatry clinic in the Palaran sub-district. Related to the physiatry clinic, it has a difference in the usual time to open. Indeed, in another hospital, stroke treatment is common, beginning in the morning until the evening, but in this physiatry clinic, the starting opens in the evening. Some conditions make it comfortable, and another is a burden to getting the service.

The importance of environmental management for stroke rehabilitation is explored in Sweden’s research. It starts with the connectivity between the physical environment and health outcomes. This research is more concerned with rehabilitation based on home caring which the participant and families are weak participation (Kylén et al. 2021). It is a little different from the situation in the Palaran sub-district, in there the caregiver is seeking or utilizing various equipment at home for the rehabilitation of stroke patients, but unfortunately without instructions. Maybe several practices are painful for stroke survivors. Rehabilitation for humans includes environmental enrichment; environmental rehabilitation could be physical, cognitive, and social facilities. Therefore, the environment should promote action to optimize stroke recovery and rehabilitation (Qin et al. 2021).

Lying in bed all the time with family support for daily activities of life scenario for stroke survivors in conclusion based on two options, there are hopeless conditions and in the acute phase during recently back from the hospital. Terms of the first option are ways to solve their impaired body as impacted by stroke diseases, which is included in negative coping style. These situations arise after they are feeling depressed; outcome negative emotions. It differs when they find a positive coping style, in this time they try ways to solve problems to deal with negative emotions (Donnellan et al. 2006; Ding et al. 2015; Sastrawan, Newton, and Malik 2019).

When timing in-depth interviews with participants in the Palaran sub-district, almost participants do rehabilitation without guides. In their minds, because the stroke attack is suddenly coming, they will avoid some of the signs with quick treatments. Therefore, they try several kinds of stroke treatments, conventional, alternative, and traditional medicine, or a mix among them. But unfortunately, they don’t have a standard for doing that. After they do several treatments which trust for stroke recovery but never change or out their expectation, they feel hopeless and lie in bed all the time comes for their choice.

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Meanwhile, the best timing for stroke recovery is during 2-3 years after attacking; with detail if do that more than 3 months will be a less significant recovery, and over 6 months is limited for spontaneous recovery (Grefkes and Fink 2020).

The second life scenario is the life scenario of the family. Neurological impairment is the impact of a stroke attack, a stroke survivor needs long-term support and care. Amount of 24 for a family as caregiver, the big number is the spouse (wife) and the second is the child. More than it consists of a brother, sister, and son-in-law. Family care is beginning from acute care until rehabilitation support. The nine wives are told about their experiences caring for their husbands with stroke conditions. Almost wives as stroke caregivers are part of the Javanese tribe, whereas in the Javanese cultural perspective, in a family, the men are dominant position. Based on their perspective, even though her husband is getting a stroke disease all decision is his decision. The decision for stroke care or stroke rehabilitation for example. Masculinity that connects with Javanese men is contributing and embedded with their perspective in a family on all conditions (Hidayat 2013).

In the case of families as stroke caregivers; in this study, the researcher finds two responses which opposite. Some stroke caregivers are burdened, but others feel worshiped with the new family role. The burden for the change of family role in half or almost caregivers feeling burdened. It start with fatigue, insomnia, pain, stiffness of their muscle, etc. (Settineri et al. 2014; Torregosa, Sada 2018). Another feeling or hidden feeling is worship. In this situation closely with the hand of God and grateful for learning a new skill for caring for others with stroke disease (Jackson 2014; Duthie, Roy 2015; Zarzycki and Morrison 2021). Furthermore, with several duties for caring the caregiver needs assistance to do that. It is because almost they are in a nuclear family, and the companion caregiver of stroke survivors are their other family members. Of 24 caregivers, eighteen caregivers in the Palaran sub-district have companion caregivers. The companion caregiver is usually their daughter, their son, or nephew, and only one of the caregivers needs their neighbor as his companion caregiver. The main function of companion caregivers in the stroke recovery phase is to be consultants and they could give consideration from another side of care in stroke recovery. More than it that companion caregivers in times of recovery with health professional services are improving communication and understanding of information (Andrades, Kausar, and Ambreen 2013; Tsai et al. 2015). One of the reasons for founding companion caregivers is knowing your limits. When someone becomes a stroke caregiver with a new role in their family almost feel burdened but not a little feeling of worship. But with kinds knowing your limits and capability for sharing responsibilities is more useful for continued life and avoid to come to a second victim (NIA 2017; AHA 2020).

Also, a result study explored the existence of a health facility to support stroke recovery, especially in the community. At Indonesia's health policies, it can start from the base level for health facilities; PHC, and continued to the district hospital level, and provincial hospital level (Mahendradhata et al 2017). Unfortunately, the geographic and transportations service facility provided in a previous study for coming as another problem in community fields (Islam and Aktar 2011; Kuupiel et al. 2019; Thompson et al. 2022).

## V. CONCLUSIONS

Two objects strongly affected by stroke in the community are stroke survivors and their families as stroke caregivers. Almost stroke survivors in the Palaran sub-district community are men of old age; where is the large population in the Palaran subdistrict are men of aging age. In stroke conditions, some of them feel lost in self-confidence. This term is related to their selfdignity. In Javanese culture, most ethnic stroke survivors are embedded white patriarchal culture. The husband is the main breadwinner, and the spouse is domestic; the husband is the primary decision in the family, and the wife follows the decision.

The loss of confidence is not only felt by men who are stroke survivors; women with stroke disease have this experience too, even though just a small number. The incidence of stroke attacks in Indonesian women is mostly  $\geq 70$  years old. The women are called "wanita/wanito" in Indonesian and interpreted in the Javanese language as acronyms from "wani ditoto." In several perspectives, based on that meaning, the women's position is subordinate to the men in their family; or comes to substitute for the second position after the leading man is gone in their family with more add attention under any circumstances.

In the case of families as stroke caregivers, the two responses are opposite. Some stroke caregivers are feeling burdened but others feel worship with the new family role. In summary, some problems and grateful were coming as their capability for stroke survivors and caregivers. Stroke survivors must optimize life performance with continued and regular for doing rehabilitation, which is self-rehabilitation or rehabilitation with support from other families. For advantage is more motivated caregivers for their duty. Connecting with some problems coming after becoming a caregiver, it is wise to give attention more to family health care, not only for stroke survivors. Therefore, the family needs physical support and emotional support; it can be a psychiatry profession for it. The last is related to transferring knowledge from main caregivers to companion caregivers, which is becoming responsible for health care for discharge planning to main and companion caregivers or ensuring transferring the discharge planning from the hospital to main and companion caregivers in the home setting.

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### REFERENCES

- 1) AHA. 2020. "Being a Stroke Family Caregiver." Andrades, Marie, Samreen Kausar, and Aisha Ambreen. 2013. "Role and Influence of the Patient's Companion in Family Medicine Consultations: 'The Patient's Perspective.'" *Journal of Family Medicine and Primary Care* 2 (3): 283. <https://doi.org/10.4103/2249-4863.120767>.
- 2) Boellstorff et al. 2013. *Ethnography and Virtual Worlds*. Princeton and Oxford. United Kingdom: Princeton University Press.
- 3) Creswell, John W. 2014. "Research Design Qualitative, Quantitative, and Mixed Methods Approaches." In Fifth Edition, edited by Vicki Knight, 400. London: SAGE Publication.
- 4) Ding, Yongqing, Yanjie Yang, Xiuxian Yang, Tiehui Zhang, Xiaohui Qiu, Xin He, Wenbo Wang, Lin Wang, and Hong Sui. 2015. "The Mediating Role of Coping Style in the Relationship between Psychological Capital and Burnout among Chinese Nurses." *PLoS ONE* 10 (4): 1–14. <https://doi.org/10.1371/journal.pone.0122128>.
- 5) Donnellan, C., D. Hevey, A. Hickey, and D. O'Neill. 2006. "Defining and Quantifying Coping Strategies after Stroke: A Review." *Journal of Neurology, Neurosurgery and Psychiatry* 77 (11): 1208–18. <https://doi.org/10.1136/jnnp.2005.085670>.
- 6) Duthie, Roy, and Niven. 2015. "Duty of Care Following Stroke: Family Experiences in the First Six Months," no. 2007.
- 7) Eifert, Elise K., Rebecca Adams, William Dudley, and Michael Perko. 2015. "Family Caregiver Identity: A Literature Review." *American Journal of Health Education* 46 (6): 357–67. <https://doi.org/10.1080/19325037.2015.1099482>.
- 8) Fang and Tao et al. 2017. "Patient and Family Member Factors Influencing Outcomes of Poststroke Inpatient Rehabilitation." *Archives of Physical Medicine and Rehabilitation* 98 (2): 249-255.e2. <https://doi.org/10.1016/j.apmr.2016.07.005>.
- 9) Gorski, Philip S. 2013. "Beyond the Fact/Value Distinction: Ethical Naturalism and the Social Sciences." *Society* 50 (6): 543–53. <https://doi.org/10.1007/s12115-013-9709-2>.
- 10) Grefkes, Christian, and Gereon R. Fink. 2020. "Recovery from Stroke: Current Concepts and Future Perspectives." *Neurological Research and Practice* 2 (1). <https://doi.org/10.1186/s42466-020-00060-6>.
- 11) Hidayat, Rachmad. 2013. "Authority Perspective: Javanese Men's Talk on Domestic Violence." *International Journal of Indonesian Studies* 1 (January 2013): 79–109.
- 12) Islam, Mohammed Shariful, and Shamima Aktar. 2011. "Measuring Physical Accessibility to Health Facilities--a Case Study on Khulna City." *World Health & Population* 12 (3): 33–41. <https://doi.org/10.12927/whp.2011.22195>.
- 13) Jackson, Roy. 2014. *What Is Islamic Philosophy? What Is Islamic Philosophy*. <https://doi.org/10.4324/9781315817552>.
- 14) Kaakinen R. Joanna, et al. 2010. "Family Health Care Nursing Theory, Practice and Research 4th Edition." In *Family Nursing*. USA: F. A. Davis Company.
- 15) Kuupiel, Desmond, Kwame Manu Adu, Vitalis Bawontuo, and Tivani P. Mashamba-Thompson. 2019. "Geographical Accessibility to District Hospitals/Medical Laboratories for Comprehensive Antenatal Point-of-Care Diagnostic Services in the Upper East Region, Ghana." *EClinicalMedicine* 13: 74–80. <https://doi.org/10.1016/j.eclinm.2019.06.015>.
- 16) Kylén, Maya, Charlotte Ytterberg, Lena von Koch, and Marie Elf. 2021. "How Is the Environment Integrated into PostStroke Rehabilitation? A Qualitative Study among Community-Dwelling Persons with Stroke Who Receive Home Rehabilitation in Sweden." *Health and Social Care in the Community*, no. March: 1–11. <https://doi.org/10.1111/hsc.13572>.
- 17) Loshini, Naidoo. 2012. "Ethnography: An Introduction to Definition and Method." *An Ethnography of Global Landscapes and Corridors*, no. November. <https://doi.org/10.5772/39248>.
- 18) Mahendradhata et al. 2017. *The Republic of Indonesia Health System Review Asia Pacific Observatory on Health Systems and Policies*. Health Systems in Transition. Vol. 7. <http://apps.who.int/iris/bitstream/handle/10665/254716/9789290225164eng.pdf;jsessionid=52CB57A62E59CA58949742AD7C5E7793?sequence=1>.
- 19) NIA. 2017. "How to Share Caregiving Responsibilities with Family Members." NIA. 2017. <https://www.nia.nih.gov/health/how-share-caregiving-responsibilities-family-members>.
- 20) Ormston Rachel, Spencer Liz, Barnard Matt, and Snape Dawn. 2013. *The Foundations of Qualitative Research, Qualitative Research Practice a Guide For Social Science Students and Researchers*. Science Education. Los Angeles: SAGE Publication.

## Life Scenario System of Care for Stroke Survivors and Families: An Ethnography Study

- 21) Qin, Helen, Isabella Reid, Alexandra Gorelik, and Louisa Ng. 2021. "Environmental Enrichment for Stroke and Other Non-Progressive Brain Injury." *Cochrane Database of Systematic Reviews* 2021 (11). <https://doi.org/10.1002/14651858.CD011879.pub2>.
- 22) Sari, Ida Diana, Rofingatul Mubasyiroh, and Sudibyo Supardi. 2017. "Hubungan Pengetahuan Dan Sikap Dengan Kepatuhan Berobat Pada Pasien TB Paru Yang Rawat Jalan Di Jakarta Tahun 2014." *Media Penelitian Dan Pengembangan Kesehatan* 26 (4): 243–48. <https://doi.org/10.22435/mpk.v26i4.4619.243-248>.
- 23) Sastrawan, Sastrawan, Jennifer Margaret Newton, and Gulzar Malik. 2019. "Nurses' Integrity and Coping Strategies: An Integrative Review." *Journal of Clinical Nursing* 28 (5–6): 733–44. <https://doi.org/10.1111/jocn.14702>.
- 24) Settineri, Salvatore, Amelia Rizzo, Marco Liotta, and Carmela Mento. 2014. "Caregiver's Burden and Quality of Life: Caring for Physical and Mental Illness." *International Journal of Psychological Research* 7 (1): 30–39.
- 25) [http://www.scielo.org.co/scielo.php?script=sci\\_arttext&pid=S2011-20842014000100004&lang=pt%0Ahttp://www.scielo.org.co/pdf/ijpr/v7n1/v7n1a04.pdf](http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S2011-20842014000100004&lang=pt%0Ahttp://www.scielo.org.co/pdf/ijpr/v7n1/v7n1a04.pdf).
- 27) Thompson, Stephanie G, P. Alan Barber, John H Gommans, Dominique A Cadilhac, Alan Davis, John N Fink, Matire Harwood, et al. 2022. "Geographic Disparities in Stroke Outcomes and Service Access: A Prospective Observational Study." *Neurology* 0: 10.1212/WNL.0000000000200526. <https://doi.org/10.1212/wnl.0000000000200526>.
- 28) Torregosa, Sada, Perez. 2018. "Dealing with Stroke : Perspectives from Stroke Survivors and Stroke Caregivers from an Underserved Hispanic Community," no. August 2016: 361–69. <https://doi.org/10.1111/nhs.12414>.
- 29) Torregosa, Marivic B, Rosemary Sada Bsn, R N Ilse, and Perez Bsn. 2018. "Dealing with Stroke : Perspectives from Stroke Survivors and Stroke Caregivers from an Underserved Hispanic Community," no. August 2016: 361–69. <https://doi.org/10.1111/nhs.12414>.
- 30) Tsai, Pei Chun, Ping Keung Yip, John Jen Tai, and Meei Fang Lou. 2015. "Needs of Family Caregivers of Stroke Patients: A Longitudinal Study of Caregivers' Perspectives." *Patient Preference and Adherence* 9: 449–57. <https://doi.org/10.2147/PPA.S77713>.
- 31) Venketasubramanian, Yoon, Pandian, Navarro. 2017. "Stroke Epidemiology in South , East , and South-East Asia : A Review" 19 (3): 286–94.
- 32) Zarzycki, Mikołaj, and Val Morrison. 2021. "Getting Back or Giving Back: Understanding Caregiver Motivations and Willingness to Provide Informal Care." *Health Psychology and Behavioral Medicine* 9 (1): 636–61. <https://doi.org/10.1080/21642850.2021.1951737>.



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## Description of the Caries Pattern of Stunted Toddlers in Panduman Village, Jelbuk District, Jember Regency, East Java



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**ABSTRACT: Introduction:** Stunting is a disruption of growth in toddlers, namely the height of toddlers is lower than the standard of age which is based on the body's long index compared to the age (PB / U) or height compared to the age (TB / U) with a z-score of less than -2 SD. Stunting can increase the risk of caries in the deciduous teeth because it cause atrophy in saliva and it also impairs the normal function of the salivary gland. The purpose of this study was to analyze the pattern of stunting children caries in Panduman Village, Jember, East Java.

**Methods:** This study used an descriptive observasional with cross sectional approach. Samples were chosen using purposive sampling, amounted to 45 children.

**Result:** The most commonly found caries were on occlusal surface of mandibular primary molar tooth with a profunda caries depth. It was found that 23 samples had caries on the occlusal surface of mandibular molar teeth with 11 samples having profunda caries depth.

**Conclusion:** The pattern of stunting children is most commonly found in mandibular primary molar on the occlusal surfaces with profunda caries depth.

**KEYWORDS:** Caries Pattern, Stunting, Toddlers, Body Long Index, Panduman Village

### I. INTRODUCTION

Stunting is a condition of impaired growth in toddlers, namely the toddler's height is lower or shorter (dwarf) than the standard age.<sup>1</sup> Stunting in toddlers is based on the index of body length for age (PB/A) or height for age (TB/A) with a z-score less than -2SD/standard deviation (stunted) and less than -3SD (severely stunted).<sup>2</sup>

Stunting in toddlers is caused by multidimensional factors in the form of direct and indirect factors.<sup>3</sup> Stunting begins in the process of growth and development which begins when the fetus is in the womb until the age of 2 years, so it is called the 1000 HPK period. The first 1000 days of life (HPK), which starts from the time the fetus is in the womb until the child is 2 years old, is the most critical period for improving children's physical and cognitive development.<sup>4</sup>

Indonesia is one of the countries that has a fairly high stunting problem, namely 36.4%, from this data Indonesia is included in the third country with the highest prevalence in the Southeast Asia region.<sup>1</sup> The results of the Nutrition Status Monitoring (NSM) survey in 2016 stated that in East Java high stunting exceeded 40% in Sampang district, and seven other areas were in the range of 30% - 39.2%, namely in Jember Regency (39.2%), Sumenep (32.5%), Bangkalan (32.1%), Bondowoso (34.6%), Pamekasan (32.2%), Lumajang (30.6%), and Bojonegoro (30.1%).<sup>5</sup> Jember Regency is a district in East Java Province with a high prevalence of stunting. The first number of cases of stunting under five in 2017 occurred in the working area of the Jelbuk Health Center with a percentage of 39.30%.<sup>6</sup>

Nutritional deficiencies in stunting toddlers have an impact on increasing the prevalence of dental and oral diseases.<sup>7</sup> The oral cavity of stunted toddlers, manifestations occur in the form of disruption of the development of the salivary glands, resulting in atrophy of the salivary glands.<sup>8</sup> Manifestations of nutritional deficiencies in the oral cavity can result in various kinds of dental and oral diseases, one of which is caries. Caries in primary teeth spreads more quickly, is extensive, and is more severe than permanent teeth.<sup>9</sup> Damage to primary teeth shows a certain pattern. The pattern of caries is the order of the number of caries on each surface and the type of primary teeth and the order of caries depth.<sup>10</sup>

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## II. METHODS

This type of descriptive observational research with cross-sectional data collection techniques. The research was conducted on stunting toddlers in Panduman village, Jelbuk sub-district, Jember district, East Java who were willing to be examined as research subjects. Parents/guardians signed an informed consent form before the clinical examination was carried out and if they were not willing, they were not included in the study. The examination was carried out by 2 students of the Faculty of Dentistry, Jember University, referring to the literature studies that had been carried out by researchers.

The study population was children aged 24-60 months and were stunted toddlers in Panduman village, Jelbuk sub-district, Jember district, East Java. The sampling technique used was purposive sampling, so that a total of 45 children as research subjects met the inclusion and exclusion criteria.

Examination was carried out using examination tools in the form of a mouth mirror and sonde and using the aid of light and a camera for documentation. The data obtained included: name, age, sex, type of tooth affected by caries (incisor, canine, and molar) depth, surface of caries (mesial, distal, occlusal, buccal, labial), caries depth (superficial, media, deep ) was recorded in the examination formula/odontogram, then processed using the Excel Office program and described through a frequency distribution table. Health research ethics recommendations were given by the Health Research Ethics Committee of the Faculty of Dentistry, University of Jember.

## III. RESULTS

The total number of stunted toddlers examined was 45, consisting of 23 girls and 22 boys with an age range of 24-60 months. Examination results in the maxillary region showed that the type of primary tooth and the surface most frequently affected by caries was the mesial surface of the central incisor. These results are shown in (Table 1). The most common caries depth found in central incisors was media caries in 9 study samples, followed by deep caries in 7 study samples, and superficial depth in 5 study samples (Table 2).

**Table 1. Frequency Distribution of Caries based on the number of surfaces involved in the maxillary teeth.**

	Mesial	Distal	Labial/Buccal	Palatal	Incical/Occlusal
51	19	5	8	0	5
52	7	4	5	1	5
53	3	3	8	4	3
54	2	1	1	3	11
55	0	0	2	1	9
61	19	9	6	1	5
62	7	4	3	1	2
63	6	5	3	2	2
64	4	1	0	2	10
65	1	2	0	1	13
Total	74	34	36	16	65

**Table 2. Frequency distribution of caries based on caries depth in maxillary teeth**

	Superficial	Media	Profunda
51	5	9	7
52	4	3	6
53	5	5	4
54	3	3	7
55	1	3	5
61	8	9	5
62	5	2	3
63	6	3	2
64	3	4	6
65	3	5	6
Total	43	46	51



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Examination results in the mandibular region showed that the type of primary tooth and the surface most frequently affected by caries was the occlusal surface of the molar teeth. These results are shown in (Table 3), the most common caries depth found in molars was deep caries in 11 study samples, followed by media depth in 8 study samples, and superficial depth in 7 study samples (Table 4).

**Table 3. Frequency Distribution of caries based on the number of surfaces involved in the mandibular teeth.**

	Mesial	Distal	Labial/Buccal	Palatal	Incisal/Occlusal
71	2	2	1	0	1
72	3	1	2	0	0
73	3	1	4	0	1
74	4	6	2	2	11
75	3	3	4	3	21
81	3	2	1	0	2
82	2	0	0	0	0
83	1	0	3	0	0
84	3	1	0	1	16
85	4	3	2	4	23
Total	28	19	19	10	75

**Table 4. Frequency distribution of caries based on caries depth in mandibular teeth.**

	Superfisial	Media	Profunda
71	2	1	1
72	3	2	0
73	3	2	1
74	5	6	7
75	3	9	10
81	2	3	1
82	2	0	0
83	2	1	1
84	2	6	9
85	7	8	11
Total	31	38	41

## IV. DISCUSSION

The condition of stunting caused by chronic malnutrition affects oral and dental health, such as causing disturbances in the development of the salivary glands which can increase the risk of dental caries.<sup>12</sup> Primary tooth caries in toddlers shows a certain pattern. The pattern of caries consists of the type of primary tooth affected, the tooth surface affected by caries and the severity of caries.<sup>13</sup>

Mandibular molars are much more susceptible to caries when compared to other teeth. The results of Triana's study in 2020 study showed that molar teeth are teeth that are prone to caries with a percentage of 66-88% when compared to all teeth in children.<sup>14</sup> These conditions are related to the depth of the pits and fissures of the teeth and the extent of contact with the adjacent teeth and the space between the mandibular primary molars.<sup>15</sup> Surfaces of primary teeth are susceptible to caries in order, namely occlusal surfaces, proximal contacts (mesial and distal), labial, incisal and lingual surfaces. The increase in caries in the occlusal area is caused by the morphology of the occlusal surface which makes bacterial plaque difficult to clean mechanically.<sup>16</sup> According to research studies that have been conducted, the occlusal surface is eight times more susceptible to caries compared to other tooth surfaces, this is because the occlusal surface has pits and fissures. The risk of caries in pits and fissures is quite high, amounting to 83% of all carious lesions.<sup>17</sup> The severity of caries as seen from the depth of caries is superficial caries, media caries and deep caries. The pattern of caries depth in primary teeth is reversed compared to permanent teeth. Primary teeth are more commonly found to have deep caries, followed by media, and superficial.<sup>18</sup>

The results of the study in table 1 show the highest caries of the maxillary central incisor or tooth order 51 and tooth 61 on the mesial surface respectively regarding 19 research subjects. Central incisors are susceptible to caries because the maxillary

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central incisors are the first teeth to erupt in the maxilla so that the teeth will experience caries attacks first.<sup>19</sup> Maxillary central incisors are prone to caries, especially in the proximal contact (mesial and distal). According to a study conducted by Lucas, et al, 2019, caries on the proximal contact has a prevalence of 88.2% compared to caries on other surfaces, this is because the proximal area of the teeth is more prone to caries due to frequent food impaction and difficult to remove the plaque accumulation.<sup>20</sup>

The results of the study in table 2 show that the highest caries depth was in the maxillary central incisor region, namely media caries regarding 9 research subjects. This condition is influenced by the morphology of the primary incisor teeth, namely the thickness of the enamel is half the thickness of the enamel on permanent teeth, has a higher pulp horn and a pulp chamber that is wide enough to make it easier for the pulp to open due to caries.<sup>21</sup>

The results of the study in table 3 show the highest caries regarding the mandibular primary molars or teeth of order 85. The morphology and anatomy of the mandibular primary molars influence because there are deep gaps or grooves on the occlusal surface of the mandibular primary molars which are often difficult to clean so that they can become location of caries development.<sup>22</sup>

The condition of stunting in toddlers can also be a factor causing caries, which is due to developmental disorders in the salivary glands. Stunted children are more susceptible to caries as a result of decreased salivary function, so that the caries experience of stunted children is found to be higher when compared to normal children.<sup>23</sup> Shrinking in the size of the salivary glands has an impact on reducing the protective properties of saliva, where saliva plays an important role in cleaning non-adherent bacteria and debris in the oral cavity, reduces self-cleansing in the oral cavity, can reduce the immunological components that play a role as an antimicrobial to neutralize viruses, bacteria, and toxins from enzymes and increases the risk of caries due to an imbalance between the demineralization and remineralization processes due to disruption of these salivary functions.<sup>24</sup>

## V. CONCLUSION

The description of the caries pattern of primary teeth in stunted toddlers in Panduman village, Jelbuk District, Jember Regency, East Java, aged 24-60 months, shows a distinctive pattern. The prevalence of caries was found as many as 23 out of 45 toddlers experiencing caries in the mandibular primary molars, tooth 85 with the most frequently affected surface, namely the occlusal surface with deep caries depth.

## REFERENCES

- 1) Kementerian Kesehatan RI. 2018. Profil Kesehatan Indonesia 2017. Jakarta: Kemenkes RI.
- 2) Kementerian Kesehatan RI. 2016. INFODATIN Pusat Data dan Informasi Kementerian Kesehatan RI Situasi Balita Pendek. Jakarta: Kemenkes RI.
- 3) PERSAGI Persatuan Ahli Gizi Indonesia. 2018. Stop Stunting dengan Konseling Gizi. Jakarta: Penebar Swadaya Grup.
- 4) Wellina, W., Kartasurya, M., and Rahfiludin, M.Z., 2016. Faktor risiko stunting pada anak umur 12-24 bulan. *Jurnal Gizi Indonesia (The Indonesian Journal of Nutrition)*, [Online] Volume 5(1), pp 55-61.
- 5) Bappeda, 2017. *Buku Data Dinamis Jawa Timur*. Surabaya: Badan Perencanaan Pembangunan Daerah Provinsi Jawa Timur.
- 6) Depkes RI. 2017. *Riset Kesehatan Dasar*. Jakarta: Badan Penelitian dan pengembangan Kesehatan Kementerian Kesehatan RI.
- 7) Abdat, M. 2019. Stunting pada balita dipengaruhi kesehatan gigi geliginya. *J Syah Kuala Dent Soc* 4(2): 33-37.
- 8) Rahman, T., R. Adhani., dan Triawanti. 2016. Hubungan antara status gizi pendek (stunting) dengan tingkat karies gigi tinjauan pada siswa-siswi taman kbalita-kbalita di Kecamatan Kertak Hanyar Kabupaten Banjar tahun 2014. *Dentino Jurnal Kedokteran Gigi* 1(1): 88-93.
- 9) Susi, S., H. Bachtiar., dan U. Azmi. 2012. Hubungan status sosial ekonomi orang tua dengan karies pada gigi sulung balita umur 4 dan 5 tahun. *Majalah Kedokteran Andalas* 36(1):96-105.
- 10) Suratri, M. A. L., T. A. Jovina., dan I. Tjahja. 2017. Pengaruh (pH) saliva terhadap terjadinya karies gigi pada balita usia prasekolah. *Buletin Penelitian Kesehatan* 45(4): 241-248
- 11) *Riset Kesehatan Dasar (Riskesdas)*. 2018. Badan Penelitian dan Pengembangan Kesehatan Kementerian RI tahun 2018. Jakarta: Riskesdas.
- 12) Delgado-Angulo, E.K, Hobdell, M.H.H,&Bernabe, E. (2013). Childhood stunting and caries increment in permanent teeth: a three and a half year longitudinal study in Peru. *International journal of paediatric dentistry*, 23(2), 101-109.

## Description of the Caries Pattern of Stunted Toddlers in Panduman Village, Jelbuk District, Jember Regency, East Java

- 13) Fajriani., dan J.N. Andriani. 2015. Reduction of salivary streptococcus mutans colonies in children after rinsing with 2.5% green tea solution. *J of Dent Indonesia* 21(3): 81-6.
- 14) Listriah, R.A, Zainur, dan Saputra, L. 2018. Gambaran karies gigi molar pertama permanen pada siswa-siswi Sekolah Dasar Negeri 13 Palembang tahun 2018. *Jurnal Kesehatan Poltekkes Palembang*. 13(2): 136-149
- 15) Sis Wulandari, Y., 2012. Jarak tanduk pulpa terhadap permukaan oklusal gigi molar satu sulung rahang bawah.
- 16) Anwar AY. Tingkat keparahan karies pada gigi molar pertama permanen berdasarkan kelompok umur 6 dan 12 tahun wilayah kerja Puskesmas Pertiwi, Makassar
- 17) Purnamawati, N. N. S. (2019). Gambaran Karies Gigi Susu pada Anak-Anak TK Widya Murti Ulakan Kabupaten Karangasem Tahun 2019. (Doctoral dissertation, Politeknik Kesehatan Kemenkes Denpasar)
- 18) Prisinda, D., I. S. Wahyuni., P. Andisetyanto., dan Y. Zaenab. 2017. Karakteristik karies periode gigi campuran pada balita usia 6-7 tahun di kecamatan Tanjungsari Sumedang. *Padjajaran J Dent Res Student* 1(2): 95-101.
- 19) Shaffer, J.R., E.J. Leslie., E. Feingold., M. Govil., dan D.W. McNeil., R.J. Crout., R.J. Weyant., dan M.L. Marazita. 2015. Caries experience differs between female and males across age groups in Northern Appalachia. *International J of Dentistry*, 1-8.
- 20) Mesfin, F., Y. Berhane., dan A. Worku. 2015. Prevalence and associated factors of stunting among primary school children in Eastern Ethiopia. *Journals Nutrition and Dietary Supplements* 7(7): 61-68.
- 21) Walton, R.E., dan M. Torabinejad M. 2008. Prinsip dan Praktek Ilmu Endodonsi. Alih bahasa: Narlan. S., Winiati, S., dan Bambang, N. ed ke - 3. Jakarta: EGC.
- 22) Lakhanpal, M., A. Chopra., NC. Rao., N. Gupta., dan S. Vashisth. 2014. Dietary pattern, tooth brushing habit, and caries experience of school children in Panchkula District, India. *Annals of Public Health and Research* 1(1): 1001. 1-5.
- 23) Angela, A. 2005. Pencegahan primer pada balita yang berisiko tinggi. *Maj.Ked. Gigi.(Dent. J.)* 38 (3) :130-134
- 24) Abdat, M. 2019. Stunting pada balita dipengaruhi kesehatan gigi geliginya. *J Syah Kuala Dent Soc* 4(2): 33-37



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## Statistical Analysis of the Best Athlete (MPV) in the Men's Grand Final in the 2023 Proliga Volleyball Competition



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**ABSTRACT:** This research was motivated by the determination of the best athlete (MPV) in the PLN Mobile Proliga 2023 competition in Yogyakarta. The purpose of this study was to select the best athletes in the team that won the competition in the Jakarta Lavani Vs Jakarta Bayangkara match in a national level competition. Descriptive research method with survey techniques. The subjects of the study were 12 male players, consisting of six Lavani players and six Bhayangkara players. The study sample used purposive random sampling. The research instrument uses an observation rubric by looking at several aspects of both skills and psychological aspects, namely attitude or attitude and leadership or leadership in the team. Data collection techniques using observation sheets. Observations are made only during peak or grandfinal matches. The points (+) collected in each set are combined and added to the most points, the athlete is chosen as the best athlete (MPV) in the competition. Data analysis using quantitative descriptive techniques. The results showed that: in the grand final match won by the Jakarta Lavani team and one of the male players from the Lavani team with a total of 22 points consisting of (spike: 20 points, serve ace: 1 point, and block: 1 point) became the best athlete with an average point per set of 5 points. Best players are obtained from observing skills and psychology that are able to determine ideally the best player in a volleyball event. The conclusion of the study was selected the best athlete (MPV) in a competition based on the number of points obtained from the athlete's skills during the grand final match between Lavani vs Bayangkara and psychologically the attitude of the athlete in his team.

**KEYWORDS:** Statistic, analysis, MPV, volleyball, athletes

### I. INTRODUCTION

Sport is a general daily activity that helps a person develop a healthy body and spirit (Welch et al., 2021). Sports have made a real and positive contribution to improving public health. In addition, sport contributes to the country's ability to implement sustainable development strategies. People will truly be able to achieve physical and spiritual health with regular exercise (Burtscher et al., 2022).

In Indonesia, volleyball has established itself as a very popular sport. The results of the public assessment are of individual interest to the ideal exhibition of volleyball players in Indonesia. In accordance with current sports developments, volleyball coaches and athletes are always required to carry out training programs that incorporate sports science (Suharjana et al., 2020).

The game of Volleyball often undergoes drastic paradigm shifts. The development of volleyball lately presents an increasingly dynamic and fast game. Every volleyball game performance requires a solid foundation in technique, strategy, and psychology. At the peak competition, each athlete will try their best to show their best performance to win and achieve the results that are their training goals. Well-programmed training must certainly adjust to the preparation for the match to be faced (Ozawa et al., 2021). Well-controlled training will cause soul volleyball athletes to become strong (Zhang, 2021).

Training is also designed according to the abilities and physical factors required by each athlete's specialty (et al., 2014). The difference in position in the volleyball team greatly determines the performance of each player (Palao et al., 2014) Thus, training must follow the principle of specialization of each athlete, where the training program will differ depending on the position of each athlete with each other will be different training programs. Each player's roaming range in volleyball is very different; The player with the shortest cruising power is the middle blocker, and the player with the farthest cruising power is the setter. Physical training should consider the somatotype of volleyball athletes when designing individualized exercise programs for each athlete (Zareian et al., 2014). The physical training component must be able to form athletes with power abilities, especially the

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lower limbs and upper limbs (Milić et al., 2017). Physical exercise in the form of power jumps is predominantly carried out when doing spikes and blocks (Pawlik et al., 2020). Holistic exercises will increase the popularity and success of the athlete in achieving his goals and will also improve the health of the athlete. Holistic training includes instruction in physical fitness, technical proficiency, tactical awareness, psychological stability, and moral character (Li et al., 2016).

By using current technology that allows for more precise visualization, such as video challenges in each session, spike time detection, and jump serves, the development of an athlete's skill or technical prowess can be observed. Every time facing a competition, the coach must have criteria to choose the athlete to be brought, the selection of athlete criteria is certainly based on several factors, in terms of physical, skill, tactical, or psychological. This is in accordance with research (Balaji et al., 2021) which shows that a coach can choose athletes who will be able to participate in the race with physical abilities, namely high jumping power of 56.1 cm and spike ability of 17.9 m/s better than other athletes. Another physical component that also determines volleyball athletes can perform well if body fat and also their ideal body weight are always well maintained (Bojanic et al., 2020).

In terms of ability or technique, the only player in beach volleyball who must have strong blocking skills in a volleyball game is a defender. In indoor volleyball, the middle blocker must have more block power than other athletes' positions. Thus, the posture of an athlete in a special position must have a high posture; this is in accordance with research (Tili & Giatsis, 2011). An athlete's performance also greatly influences their standing in top-level competition (Serrien et al., 2016) However, if an athlete does not have alignment with an even posture, they will find it difficult to compete at the international level (Wnorowski & Ciemiński, 2016).

The selection of athletes is not only when participating in the competition, but during the peak match or Grand Final, usually the committee will choose the best athlete or Most Valuable Player (MVP) in the match. The selection of the best athletes is only for local athletes in the team that wins the competition, the selection of the best athletes is used as an indicator or criterion to see the skills of the best volleyball athletes in each competition, so it is necessary to analyze the best players in each competition. In addition, the coach makes a training program that refers to the best skills in the athlete. Depending on how many of the best athletes in each specialty are: spikers, setters, blockers, liberos, servers, and more. Observation of athletes in rounds during the course of a competition can be made for selection, or simply observed and assessed at the time of the peak competition. Therefore, the purpose of this study is to identify the best athletes whocompete in National level competitions (Proliga).

## **II. METHOD**

Quantitative descriptive research methods with survey techniques. This type of research is descriptive research where this research describes the reality of real conditions in the field and systematically, factually, and accurately regarding the facts and nature of certain populations or tries to describe phenomena in detail. The number of samples in this study used purposive random sampling. Sampling using certain considerations according to desired criteria to be able to determine the number of samples to be studied Purposive sampling represents a group of different non-probability sampling techniques. Also known as judgmental, selective or subjective sampling, purposive sampling depends on the judgment of the researcher when it comes to selecting the units (e.g., people, cases/organizations, events, pieces of data) to be studied. The sample number was 12 athletes, consisting of 6 Jakarta Lavani male athletes and 6 Jakarta Bhayangkara male athletes. The research instrument uses an observation rubric by looking at several aspects of both skills and psychological aspects, namely attitude or attitude and leadership or leadership in the team. Data collection techniques using observation sheets. The points (+) collected in each set are combined and added up to the most points, the athlete is selected as the best athlete (MPV) in the competition. Data analysis techniques use quantitative descriptive.

## **III. RESULT AND DISCUSSION**

### **RESULT**

The results of research on the best players in the PLN Mobile Proliga 2023 volleyball championship at the National level for puta Lavani vs Bayangkara volleyball athletes can be seen in tables 1 and 2 below.

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Table 1. Lavani Athlete Observation Rubric

Set 1-5 Athlete Name	No. Back	SPIKE	Skill SERVE	BLOCK	Total Skill	Psychology Attitude/Leadership
Leandro	6	16	1	2	19	
Boy Arnes	3	14	2	1	17	Performance
Gave	15	1	2	3	6	Lifting the Team
Honorary	10	20	1	1	22	
Hendra	4	5	1	2	8	
Malizi	11	4	2	4	10	

The results of the study based on the table above showed that Fahri Septian Putra with TB (187 cm) from the Jakarta Lavani team was able to display his performance with a total of 22 points, an average of 4 points per set, becoming the best athlete representative (MVP) on the Lavani team in the PLN Mobile Proliga 2022 competition. Then, for the results of the analysis of the best male athletes of Jakarta Bhayangkara can be seen in table 2 below.

Table 2. Bhayangkara Athlete Observation Rubric

Set 1-5 Athlete Name	No. Back	SPIKE	Skill SERVE	BLOCK	Total Skill	Psychology Attitude/Leadership
Rendy	17	14	1	2	17	
Judah	9	4	0	3	7	Performance
Nizar	8	0	1	2	3	Lifting the Team
Nanda	13	5	1	2	8	
David	4	22	1	2	25	
Garrett	18	12	2	1	15	

The results of the study based on the table above showed that Rendi Febrian Tamamilang with TB (188 cm) became one of the local athletes from the Jakarta Bhayangkara volleyball club donated with a total of 20 points, an average of 4 points per set, becoming the best athlete representative (MVP) at the Bhayangkara club in the PLN Mobile Proliga 2023 competition.

When viewed in the observations of the two best player representatives (MPV), both Lavani and Bhayangkara athletes, in skill, these two athletes dominate more than other athletes. Then from the psychic these two athletes were able to contribute to the team lifting the team in collecting points and also bringing the team to be more motivated.

### DISCUSSION

Based on the results of research that the best athlete (MPV) in the prestigious competition in Indonesia PLN Mobile Proliga 2023 can be determined from various aspects of ability, both skill or skill and also psychic or psychological, and obtained by athletes whose team won the PLN Mobile Proliga 2013 competition. In volleyball games, the skill aspect or skill in volleyball can be assessed from ability: spike, serve, block and receive serve (Risma et al., 2020) As for psychics, it can be assessed from the attitude of athletes when performing on the field and also the leadership of children in the team and in the match (Gogolev et al., 2018). Athletes who are dominant in giving points from the skills displayed during the peak match have the opportunity to become the best athletes. In addition to qualified skills and gaining many points, the attitude or psychic of athletes also needs to be an assessment so that athletes understand the importance of character today.

Ability assessment should indeed be accompanied by a psychological assessment of athletes, because skills without a good attitude will make athletes too proud and will not be liked in their team (Bisagno et al., 2019). In addition to these two aspects of assessment, both skill and psychic, there are still factors that are no less important according to (Chunmei, 2021), including: body posture, physiological function, genetics, motor skills. Body posture for volleyball athletes is currently very decisive, the minimum to be able to be at the top level of volleyball the height of female volleyball athletes is between 185 – 195 cm, while for male volleyball athletes is: 185 – 210 cm, this is also according to opinion (Grabara, 2020). Some problems in the development of volleyball athletes in Indonesia are the lack of funding from the government and also the private sector to sports, especially volleyball, then coach education is still lacking and rarely carried out both regionally, nationally and also

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internationally, good rewards in the form of study scholarships for volleyball athletes are very minimal or even non-existent, this is also in accordance with research (Hopkinson et al., 2016).

According to research (Piepiora & Witkowski, 2018), athletes will perform optimally if they have goals in each match. It is also influenced by their ability to learn from and follow the coach's instructions during practice and competition. The display of skills of volleyball players can be dismantled in plain sight or directly by a group of experts, it can also be by dissecting video accounts, this is according to the assessment (Silva et al., 2016).

According to research (García-De-alcázar et al., 2016), it would be easier and simpler to present data and immediately provide informational data to the head coach, but nowadays technology must still support each other. The use of volleyball data applications or volleyball information systems is also very helpful in recording the ability of volleyball athletes when competing. However, this app is not cheap and also requires the ability to use it. Unlike the observation form, it is convenient and simple to present the data and immediately provide the information data to the head coach.

Volleyball athletes, both core players and novice players, with substitutes or substitutes must always be in more or less the same physical condition. Because, depending on the coach's strategy, athletes must be ready to take positions at any time (ADIN MARIAN & MARILENA, 2012). The dominant factor affecting volleyball performance is the anthropometric profile and motor skills of players (Nasuka, 2020). The best volleyball players have good physical condition and have basic technical skills (Zerf & Louglaib, 2019). Even though these two aspects are very closely related to a player's ability to play volleyball. Because good physical condition requires good basic volleyball technique skills (Rubajczyk & Rokita, 2020). The biomechanical factors of motion in a volleyball match are very different for the strength of each player (Fattahi et al., 2014). Mentors must continue to focus on their competitors' ability to rise to assist in the execution of their skills (Gonçalves et al., 2021) Athletes' adaptation to muscle strengthening exercises, especially jumping exercises with heavy loads in elite volleyball athletes (You et al., 2020).

#### IV. CONCLUSIONS

The conclusion of this study is the selection of the best athletes for the PLN Mobile Proliga 2023 competition, and these athletes are as follows: Fahri Septian Putratama from the Lavani Jakarta team, based on the calculation of skill points from the Grand Final match. To determine the best volleyball player in a competition, the best athlete (MVP) is determined by observing skill and psychology. The athlete's psychology and skill abilities must be accurately assessed by an observer or rater. In volleyball competitions, the best athletes can be evaluated and selected using rubrics to observe their abilities. Recommendations for future researchers: The selection of the best athletes can be more tailored to each volleyball athlete's area of expertise. It can also be seen that points are counted not only in the grand final match but also from the first match.

#### REFERENCES

- 1) ADIN MARIAN, C., & MARILENA, C. (2012). Contributions of Shares of Game Development in Defence Efficiency in Areas By the Specialization, the National Volleyball Team Junior of Romania. *Ovidius University Annals, Series Physical Education & Sport/Science, Movement & Health*, 12(2), 308–314. <http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=85380146&lang=pt-br&site=ehost-live>
- 2) Balaji, S. R., Karthikeyan, S., & Manikandan, R. (2021). Performance measurement of volleyball player in attacker position through object detection and tracking techniques. *Journal of Theoretical and Applied Information Technology*, 99(17), 4173–4185.
- 3) Bisagno, E., Morra, S., Basciano, M., Rosina, C., & Vitali, F. (2019). Assessing individual performance in team sports: A new method developed in youth volleyball. *Journal of Functional Morphology and Kinesiology*, 4(3). <https://doi.org/10.3390/jfkm4030053>
- 4) Bojanic, D., Ljubojevic, M., Krivokapic, D., & Bjelica, D. (2020). Morphological characteristics and body composition of elite volleyball players: Three montenegrin clubs with most trophies participating in european competitions. *International Journal of Morphology*, 38(4), 903–908. <https://doi.org/10.4067/S0717-95022020000400903>
- 5) Burtscher, J., Strasser, B., Burtscher, M., & Millet, G. P. (2022). The Impact of Training on the Loss of Cardiorespiratory Fitness in Aging Masters Endurance Athletes. *International Journal of Environmental Research and Public Health*, 19(17). <https://doi.org/10.3390/ijerph191711050>
- 6) Chunmei, C. (2021). Research Progress on Selection Methods of Volleyball Players. *J Adv Sport Phys Edu*, 8642, 172–181. <https://doi.org/10.36348/jaspe.2021.v04i08.001>
- 7) Fattahi, A., Masoud, A., Kalani, A., Nemat, S., & Hossein, M. (2014). Differences between biomechanical variables of professional volleyball attackers due to game ' s position. *European Journal of Experimental Biology*, 4(2), 406–411.

## Statistical Analysis of the Best Athlete (MPV) in the Men's Grand Final in the 2023 Proliga Volleyball Competition

- 8) García-De-alcaraz, A., Ortega, E., & Palao, J. M. (2016). Technical-tactical performance profile of the block and dig according to competition category in men's volleyball. *Motriz. Revista de Educacao Fisica*, 22(2), 102–109. <https://doi.org/10.1590/S1980-6574201600020013>
- 9) Gogolev, N., Sabaraykin, S., & Glukhareva, M. (2018). The analysis of leadership qualities of veterans of volleyball players in the training process. *SHS Web of Conferences*, 55, 03031. <https://doi.org/10.1051/shsconf/20185503031>
- 10) Gonçalves, C. A., Lopes, T. J. D., Nunes, C., Marinho, D. A., & Neiva, H. P. (2021). Neuromuscular jumping performance and upper-body horizontal power of volleyball players. *Journal of Strength and Conditioning Research*, 35(8), 2236–2241. <https://doi.org/10.1519/JSC.0000000000003139>
- 11) Grabara, M. (2020). Posture of adolescent volleyball players- A two-year study. *Biomedical Human Kinetics*, 12(1), 204–211. <https://doi.org/10.2478/bhk-2020-0026>
- 12) Hopkinson, M., Smolianov, P., Dion, S., & Schoen, C. (2016). Identifying Best Practices for Advancement of Us Volleyball. 161–164.
- 13) Li, Y., Zhang, T., & Chen, Q. (2016). Research on the Key Issues in the Modern Volleyball Athletic Training. 85(Msetasse), 1870–1873. <https://doi.org/10.2991/msetasse-16.2016.421>
- 14) Milić, M., Grgantov, Z., Chamari, K., Ardigò, L. P., Bianco, A., & Padulo, J. (2017). Anthropometric and physical characteristics allow differentiation of young female volleyball players according to playing position and level of expertise. *Biology of Sport*, 34(1), 19–26. <https://doi.org/10.5114/biolsport.2017.63382>
- 15) Nasuka, N. (2020). The Anthropometric Profile and Motor Skill of Men Elite Volleyball Players. 21(Icsshpe 2019), 34–37. <https://doi.org/10.2991/ahsr.k.200214.010>
- 16) Ozawa, Y., Uchiyama, S., Ogawara, K., Kanosue, K., & Yamada, H. (2021). Biomechanical analysis of volleyball overhead pass. *Sports Biomechanics*, 20(7), 844–857. <https://doi.org/10.1080/14763141.2019.1609072>
- 17) Palao, J. M., Manzanares, P., & Valadés, D. (2014). Anthropometric, physical, and age differences by the player position and the performance level in volleyball. *Journal of Human Kinetics*, 44(1), 223–236. <https://doi.org/10.2478/hukin-2014-0128>
- 18) Pawlik, D., Kawczyński, A., Chmura, J., Maćkała, K., Kutrzyński, M., & Mroczek, D. (2020). Jumping flying distance and jump performance of elite male volleyball players at FIVB volleyball men's world championship. *Applied Sciences (Switzerland)*, 10(6), 1–10. <https://doi.org/10.3390/app10062045>
- 19) Piepiora, P., & Witkowski, K. (2018). Personality traits of competitive athletes according to type of pressure exerted on opponents. *South African Journal for Research in Sport, Physical Education and Recreation*, 40(1), 97–109.
- 20) Risma, S. A., Dlis, F., & Samsudin, S. (2020). Variation of Volleyball Basic Technique Through Games Approach. *ACTIVE: Journal of Physical Education, Sport, Health and Recreation*, 9(2), 131–136. <https://doi.org/10.15294/active.v9i2.39056>
- 21) Rubajczyk, K., & Rokita, A. (2020). The Relative Age Effect and Talent Identification Factors in Youth Volleyball in Poland. *Frontiers in Psychology*, 11(July), 1–9. <https://doi.org/10.3389/fpsyg.2020.01445>
- 22) Serrien, B., Ooijen, J., Goossens, M., & Baeyens, J.-P. (2016). A Motion Analysis in the Volleyball Spike - Part 1: Three-dimensional Kinematics and Performance. *International Journal of Human Movement and Sports Sciences*, 4(4), 70–82. <https://doi.org/10.13189/saj.2016.040403>
- 23) Silva, M., Sattler, T., Lacerda, D., & João, P. V. (2016). Match analysis according to the performance of team rotations in volleyball. *International Journal of Performance Analysis in Sport*, 16(3), 1076–1086. <https://doi.org/10.1080/24748668.2016.11868949>
- 24) Suharjana, Priyanto, E., & Ndayisenga, J. (2020). Contribution of leg power, arm power, stomach muscle power, and back muscle power on jumping services. *International Journal of Human Movement and Sports Sciences*, 8(5), 240–248. <https://doi.org/10.13189/saj.2020.080512>
- 25) Tili, M., & Giatsis, G. (2011). The height of the men's winners FIVB Beach Volleyball in relation to specialization and court dimensions. *Journal of Human Sport and Exercise*, 6(3), 504–510. <https://doi.org/10.4100/jhse.2011.63.04>
- 26) Welch, R., Taylor, N., & Gard, M. (2021). Environmental attunement in health, sport and physical education. *Sport, Education and Society*, 26(4), 339–348. <https://doi.org/10.1080/13573322.2021.1890009>
- 27) Wnorowski, K., & Ciemiński, K. (2016). Volleyball players' somatic composition in the light of sports results at 2014 FIVB Volleyball Men's World Championship. *Baltic Journal of Health and Physical Activity*, 8(4), 24–31. <https://doi.org/10.29359/bjhpa.08.4.03>
- 28) You, D. Z., Tomlinson, M., Borschneck, G., Borschneck, A., MacDonald, M., Deluzio, K., & Borschneck, D. (2020). The Effect of Ankle Brace Use on a 3-Step Volleyball Spike Jump Height. *Arthroscopy, Sports Medicine, and Rehabilitation*, 2(5), e461–e467. <https://doi.org/10.1016/j.asmr.2020.04.015>



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- 29) Zareian, E., Rabbani, V., & Saeedi, F. (2014). The Effect of Physical Biorhythm Cycle on Some Physical Fitness Factors of Adolescent Volleyball Players. *Annals of Applied Sport Science*, 2(1), 11–20. <https://doi.org/10.18869/acadpub.aassjournal.2.1.11>
- 30) Zerf, M., & Louglaib, L. (2019). Maximal aerobic speed as prior reference point skills fitness capacities among elite male volleyball players. *Physical Education of Students*, 23(3), 160–166. <https://doi.org/10.15561/20755279.2019.0308>
- 31) Zhang, Z. (2021). Analysis of Volleyball Video Intelligent Description Technology Based on Computer Memory Network and Attention Mechanism. *Computational Intelligence and Neuroscience*. <https://doi.org/10.1155/2021/7976888>



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## An Approach from Internet of Things to Cloud of Things using Fog Computing



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**ABSTRACT:** With the proliferation of Internet of Things (IoT) devices, there is an increasing demand for real-time data processing and analysis. However, the traditional cloud computing architecture is not well-suited for IoT applications due to its inherent limitations such as high latency, limited bandwidth, and high-power consumption. Fog computing has emerged as a promising solution that brings computation and storage capabilities closer to the edge of the network. This paper explores the transition from IoT to Cloud of Things (CoT) using Fog computing. We discuss the benefits and challenges of Fog computing and analyse its architecture and components. Additionally, we examine various use cases of Fog computing and discuss their advantages and limitations. We conclude by highlighting the potential of Fog computing to enable the transition from IoT to CoT.

**KEYWORDS:** Internet of thing, cloud of thing, fog computing, connected cars, smart grids, fog application

### 1. INTRODUCTION

Internet of thing consist of loosely connection of end devices to connect, process and store data in order to perform efficient and effective decision making.

The aim of this study is to explore the feasibility of transitioning from IoT to CoT using Fog computing and to evaluate the potential benefits and challenges of this approach for enabling efficient and scalable IoT applications.

The objectives of the study are follows:

1. To review the existing literature on Fog computing and its application in IoT and CoT.
2. To evaluate the technical requirements and challenges of implementing Fog computing for transitioning from IoT to CoT.
3. To analyze the performance and scalability of Fog computing in comparison to traditional cloud computing for IoT applications.
4. To assess the potential economic, social, and environmental impacts of Fog computing for IoT applications.
5. To propose a framework for implementing Fog computing in enabling the transition from IoT to CoT.

The research will answer the following question.

1. How can Fog computing enable the transition from IoT to CoT, and what are the technical requirements and challenges of implementing this approach?
2. What are the potential benefits and drawbacks of using Fog computing for IoT applications, and how does it compare to traditional cloud computing architectures?
3. What is the optimal configuration and deployment strategy for Fog computing in enabling efficient and scalable IoT applications?
4. How can Fog computing contribute to the development of smart cities, smart agriculture, and other IoT-driven sectors?
5. What are the economic, social, and environmental implications of adopting Fog computing for IoT applications, and how can they be addressed?

According to research that is held by cisco the number of connected devices will be doubled to population of the world, thus storing, managing and analysing the information generated by this connected device are difficult. The following figure show the number of connected devices versus the world population.

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Table 1. Connected devices vs world population.

World population and number of connected devices			
No.	Year	Number of Connected Devices	World population
1	2003	6.3 billion	500 million
2	2010	6.8 billion	12.5 billion
3	2015	7.2 billion	25 billion
4	2020	7.6 billion	50 billion

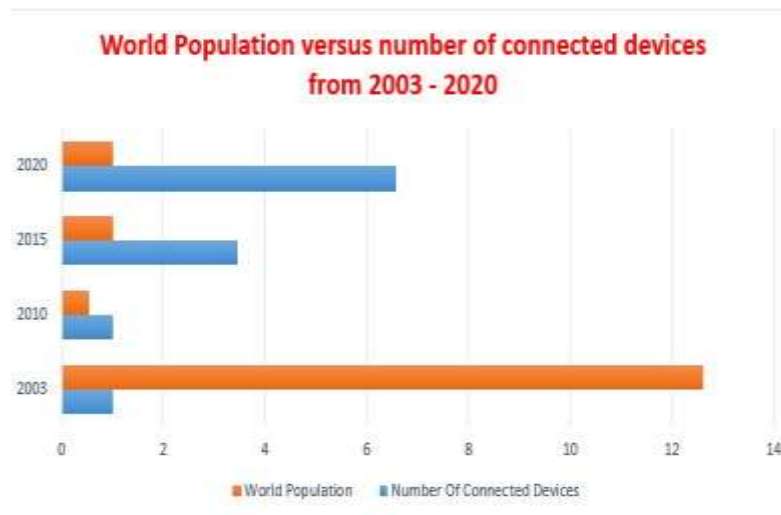


Figure 1 Connected devices vs world population

The IOT technology provide many opportunities and millions of Giga byte data, so storing and managing these massive amounts of data is difficult work and need high space for storing these amounts of data, so efficient mechanism should be considered for storing and analysing the amount of data. The other problem with the IOT technology is the security and reliably issues. Secure and reliable accessibility to these massive amounts of data is quite difficult task and need powerful mechanism to tackle the above issues.

One solution is to use cloud computing technology with the IOT devices to store and manage these massive amounts of data. Cloud computing provider, provides high space based on “pay as you go” to store and analyse the information generated by the IOT device, this technology integrates the technology of IOT and cloud computing which is known as cloud of thing or CoT, that encamps both IOT technology and cloud computing facilities to connect the end devices with one another and store them generate data into the cloud for further processing and intelligent decision making. This solution sounds good but the problem with cloud of thing technology is latency for storing and retrieving is high, because the data generated by the IOT devices are stored in the cloud and it takes much time to retrieve the information. It means high latency is required to store and retrieve the data stored in the cloud and if there is low internet connection this may be a terrific problem because in real time application the time is very important. To solve this problem cisco, suggest another solution which is “fog computing” also known as fogging or fog computing or edge computing.

Fog computing tries to store the sensed data by the end devices in the edge of the network rather than a centralized data center that high latency is need to retrieve back the data to the end users, this will help the end device to store and retrieve data in high-speed manner, thus low latency is required. The edge may be a router or a switch or a smart gateway or dedicated fog computing device that are placed near to the end user to sense the generated information by the IOT devices. Fog computing also support the mobility computing resources, communication protocols, interface heterogeneity, cloud integration, and distribute analysis to address requirement of application that need low latency with a dense geographical distribution.

## 2. RESEARCH METHODOLOGY

The research methodology for this study on transitioning from IoT to CoT using Fog computing may involve the following steps:

1. Literature review: Conduct a comprehensive review of existing literature on Fog computing, IoT, and CoT to identify the key concepts, theories, and trends in this field.

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2. Case studies: Analyse case studies of Fog computing implementations in IoT applications to understand the technical requirements and challenges of implementing this approach in practice.
3. Data collection: Collect data on the performance and scalability of Fog computing in comparison to traditional cloud computing architectures using simulation models, experimental setups, and other relevant methods.
4. Data analysis: Analyse the data collected to evaluate the potential benefits and drawbacks of using Fog computing for IoT applications, as well as its economic, social, and environmental implications.
5. Framework development: Develop a framework for implementing Fog computing in enabling the transition from IoT to CoT, based on the findings of the literature review, case studies, and data analysis.
6. Recommendations: Provide recommendations for policymakers and industry stakeholders on the adoption and implementation of Fog computing for IoT applications, based on the research findings and framework development. The research methodology may also involve a mix of qualitative and quantitative research methods, such as surveys, interviews, focus groups, and statistical analysis, to gather insights from different stakeholders and perspectives.

### **3. FOG COMPUTING CHARACTERISTICS**

- i. Heterogeneity:** Fog Computing is a highly virtualized platform that yields compute, storage, and networking services between end devices and traditional Cloud Computing Data centers, typically, but not elite located at the edge of network. Compute, storage, and networking resources are the building blocks of both the Cloud and the Fog [11].
- ii. Edge Location:** The origin of fog computing focus to provide computation and analysis of information at the edge of the network rather than centralized data centres to provide low latency services.
- iii. Geographical Distribution:** In sharp contrast to the more centralized Cloud, the services and applications targeted by the Fog demand widely distributed deployments. The Fog, will play an active role in delivering high quality streaming to moving vehicles, through proxies along highways and tracks [12]
- iv. Large-scale sensor networks:** monitoring environments such video surveillances, smart grid, smart cities are examples of inherently distributed system, requiring distributed computing and storage resource [13].
- v. Support for mobility:** Fog computing application require to communicate with many end devices to sense them generate data, protocols such as LISP use to separate host identity for location identity.
- vi. Real-time interactions:** Important Fog applications involve real-time interactions rather than batch processing [13].

### **4. FOG COMPUTING APPLICATION**

Fog computing encamps a wide range of applications that are listed follow:

#### **a) connected devices:**

The emergence of semi-automatic and self-propelled cars only creates a large amount of vehicle data. Owning cars independently requires a local capability to analyse specific information in real time, such as the environment, driving conditions, directions, and more. Other information may need to be returned to the manufacturer to help improve vehicle maintenance and / or track of vehicle use. The environment enables fog calculations to enable communication for all data sources, both on the edge (in the car) and on the end point (constructor).

#### **b) Smart cities and Smart grids:**

Smart cities and smart grids, such as connected cars, system tools, are increasingly using real-time data to make systems more efficient. Sometimes this information is in distant areas, so processing near the place of creation is necessary. Once again, the data must be collected from a large number of sensors. To solve both issues, the fuzzy computing architecture can be designed.

### **5. CLOUD COMPUTING CHALLENGES**

#### **1. Excessively data**

There is massive amount of data generated by the cloud edges.

#### **2. High latency required**

A high latency is required to store and retrieve the data stored in the cloud data canthers.

#### **3. Resiliency impractical**

The data security and privacy are unpredictable.

### **6. CLOUD COMPUTING CHALLENGES SOLVED BY THE FOG COMPUTING**

Following table shows that how fog computing help cloud computing:

## An Approach from Internet of Things to Cloud of Things using Fog Computing.

Table 2 Cloud vs fog

No.	Cloud computing challenges	Fog computing paradigm
1	Critical latency requirement	Fewer network hops
2	Data rich mobility	Data locality & local caches
3	Geographic diversity	Intelligence localized as appropriate.
4	Network bandwidth limit	Local processing / less core Net, Load
5	Reliability/Robustness	Fast Failover, local resp. in energy
6	Analytics challenges	Analytics & storage at the right tier
7	User data / geo privacy	Fog can aggregate user data

### 7. RESULT

The results of this study on are to demonstrate the potential of Fog computing in addressing the limitations of traditional cloud computing architectures for IoT applications. The study is to show that Fog computing can provide a more efficient and scalable approach to processing and analysing IoT data, while also reducing latency, improving security, and lowering costs. The study may also identify some of the technical requirements and challenges of implementing Fog computing for IoT applications, as well as the economic, social, and environmental implications of adopting this approach. Overall, the study is expected to contribute to a better understanding of the role of Fog computing in enabling the transition from IoT to CoT, and provide insights and recommendations for policymakers and industry stakeholders on the adoption and implementation of this approach.

### 8. CONCLUSIONS

Internet of thing consist of loosely connection of end devices to connect, process and store data in order to perform efficient and effective execution.

To store and analyse the data generated by the IOT devices are immersive storage, first solution can be cloud computing paradigm to overcome data storage and analyse problem.

But cloud computing requires high latency and high-speed internet connection to transfer data to the cloud data centre. second solution is promoted by the cisco which the fog computing architecture, fog computing stores the data near to the end user edge rather than cloud data centre to reduce the high latency to store and retrieve data back to the end user.

Fog computing provide many opportunities for instance; connected devices, smart grid, smart cities, smart health care services, smart traffic lights and video surveillance.

Fog computing also supports the cloud computing and solve the cloud computing challenges.

### REFERENCES

- 1) Bonomi, F., Milito, R., Zhu, J., Addepalli, S.: Fog computing and its role in the internet of things. In: Proceedings of the 1st edn. of the MCC workshop on Mobile cloud computing (2012)
- 2) Pao, L., Johnson, K.: A tutorial on the dynamics and control of wind turbines and wind farms. In: American Control Conference (2009)
- 3) Botterud, A., Wang, J.: Wind power forecasting and electricity market operations. In: International Conference of 32<sup>nd</sup> International Association for Energy Economics (IAEE), San Francisco, CA (2009)
- 4) Cristea, V., Dobre, C., Pop, F.: Context-aware environ internet of things. Internet of Things and Inter-cooperative Computational Technologies for Collective Intelligence Studies in Computational Intelligence, vol. 460, pp. 25–49 (2013)
- 5) Haak, D.: Achieving high performance in smart grid data management. White paper from Accenture (2010).
- 6) S. Agarwal, J. Dunagan, N. Jain, S. Saroiu, A. Wolman, and H. Bhogan. Volley: Automated data placement for geo-distributed cloud services. In NSDI, 2010.

## An Approach from Internet of Things to Cloud of Things using Fog Computing.

- 7) A. Basta, W. Kellerer, M. Hoffmann, H. J. Morper, and K. Hoffmann. Applying nfv and sdn to lte mobile core gateways, the functions placement problem. In workshop on All things cellular. ACM, 2014.
- 8) F. Bonomi, R. Milito, J. Zhu, and S. Addepalli. Fog computing and its role in the internet of things. In workshop on Mobile cloud computing. ACM, 2012.
- 9) N. Cao, C. Wang, M. Li, K. Ren, and W. Lou. Privacy-preserving multi-keyword ranked search over encrypted cloud data. TPDS, 2014.
- 10) C. Chen, H. Raj, S. Saroiu, and A. Wolman. ctpm: a cloud tpm for cross-device trusted applications. In NSDI, 2014.
- 11) B.-G. Chun, S. Ihm, P. Maniatis, M. Naik, and A. Patti. Clonecloud: elastic execution between mobile device and cloud. In Eurosys. ACM, 2011.
- 12) Cisco. Iox overview. <http://goo.gl/n2mfiv>, 2014.
- 13) E. Cuervo, A. Balasubramanian, D.-k. Cho, A. Wolman, S. Saroiu, R. Chandra, and P. Bahl. Maui: making smartphones last longer with code offload. In Mobisys. ACM, 2010.
- 14) H. T. Dinh, C. Lee, D. Niyato, and P. Wang. A survey of mobile cloud computing: architecture, applications, and approaches. WCMC, 2013.
- 15) C. Dsouza, G.-J. Ahn, and M. Taguinod. Policy-driven security management for fog computing: Preliminary framework and a case study. In IRI. IEEE, 2014.
- 16) C. Dwork. Differential privacy. In Encyclopedia of Cryptography and Security. 2011.
- 17) N. I. M. Enzai and M. Tang. A taxonomy of computation offloading in mobile cloud computing. In MobileCloud. IEEE, 2014.
- 18) ETSI. Mobile-edge computing. <http://goo.gl/7NwTLE>, 2014.
- 19) Gil Press. Idc: Top 10 technolog



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## Indonesian Regulations Related to State Losses in Persero State-Owned Enterprises Partly Owned by the State



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**ABSTRACT:** Indonesian Regulations Related to State Losses in Persero State-Owned Enterprises Partly Owned by the State. Persero SOE as a form of SOE has capital in the form of share ownership which is wholly or at least 51% (fifty-one percent) of its shares owned by the Republic of Indonesia. The main objective is to pursue profit. Thus, it is possible that in an SOE Persero, the shares are not only owned by the state but also partially owned by other parties. Therefore, the capital of the SOE is partly or wholly derived from state finances. The type of research used was qualitative research, especially doctrinal legal research. It used a statute approach, collecting data and legal materials through library research and analyzing using qualitative analysis. The research results obtained were state assets that have been transformed into SOE capital whose management was subject to the business paradigm (business judgment rules). However, the separation of state assets does not turn them into SOEs assets which are independent of state assets. Therefore, the operationalization of SOEs is based on both private law and public law.

**KEYWORDS:** Regulation; state loss; State Owned Enterprises; share.

### A. INTRODUCTION

Indonesia is a constitutional state with the concept of a welfare state. It means that a welfare state or *welfarestaat* concept or commonly known as a material rule of law state (Thamrin, 2013). Kadek Wibawa stated that this is in line with the objectives of the state as stated in the Preamble to the 1945 Constitution of the Republic of Indonesia (1945 Constitution of the Republic of Indonesia) paragraph IV, which is further formulated: "government of Indonesia protects all the people of Indonesia and all the independence and the land that has been struggled for, and to improve public welfare, to educate the life of the nation and to participate toward the establishment of a world order based on freedom, perpetual peace, and social justice" (Susila Wibawa, 2019). This national goal is implemented through the administration of the state by the government as the bearer of people's sovereignty in the form of implementing general administration and development activities in all aspects of national life.

Indonesia as the state according to the law, the state financial management system must also be based on the main rules stipulated in the 1945 Constitution of the Republic of Indonesia Chapter VIII regarding Financial Matters. In Article 23 paragraph (1), it is stated "The state revenue and expenditure budget as a form of state financial management is determined annually by law and implemented openly and responsibly for the greatest prosperity of the people." Furthermore, Article 23C of the 1945 Constitution of the Republic of Indonesia states, "Other matters regarding state finances are regulated by law."

Article 23 C of the 1945 Constitution of the Republic of Indonesia was then implemented with 3 (three) packages of laws, namely Law Number 17 of 2003 concerning State Finance (State Finance Law), Law Number 1 of 2004 concerning the State Treasury (State Treasury Law), and Law Number 15 of 2004 concerning Examination of State Financial Management and Responsibility. Article 6 paragraph (1) of the Law on State Finance states that: "The President as the head of government holds the power to manage state finances as part of government power." This power includes general authority and special authority. Due to the widening and complexity of state financial management activities, the State Finance Law also regulates financial relations between the government and state companies, regional companies, private companies, and public fund management bodies.

Based on Article 24 paragraphs (1) and (2) of the State Finance Law and Article 1 point 1 of the State Treasury Law, State-Owned Enterprises (hereinafter referred to as SOEs) are also included in the scope of state finance and treasury. Article 3 paragraph (1) of the Law on State Financial Management and Accountability Examination confirms that the audit of state financial management and responsibility carried out by BPK covers all elements of state finance as referred to in Article 2 of the State Finance Law. Therefore, based on these provisions, BPK has the authority to conduct audits of SOEs.

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In its development, the number of SOEs from year to year has decreased. The number of SOEs continues to decrease every year. In fact, the number of SOEs in 2020 reached its lowest point in the last seven years. Based on data from the Central Statistics Agency (BPS), only 107 SOEs are remaining in 2020. This number is six fewer companies compared to the previous year's 113 SOEs. The Minister of SOEs, Erick Thohir stated, "The reduction in SOEs occurred due to the restructuring of SOEs through the formation of consolidation in the pharmaceutical and insurance sectors. This is one of the government's efforts to increase the efficiency, productivity, and competitiveness of SOEs" (M Ivan Mahdi, 2021).

The implementation of good corporate governance in SOEs is a necessity. According to Ilya Avianti, the issue of corporate governance occurred when the economic crisis hit Asian countries, especially Southeast Asia, including Indonesia (Avianti, 2017). Furthermore, Tricker stated, "Good corporate governance is a term that arises from interactions between management, shareholders, the board of directors and other related parties, due to inconsistencies between "what" and what should be" (Tricker, 1994).

Edward UP Nainggolan explained that by seeing the enormous potential of SOEs, the Government needs to improve the performance of SOEs, namely by increasing the value of SOEs and returns for the Government (Nainggolan, 2020). Persero SOEs as a form of SOEs have capital in the form of share ownership which is wholly or at least 51% (fifty-one percent) of its shares owned by the Republic of Indonesia whose main objective is to pursue profit. Hence, it is possible that in Persero SOEs, the shares are not only owned by the state but also partly owned by other parties, so, the capital of the SOEs is partly or wholly derived from state finances.

From the perspective and function, the Persero SOEs cannot be fully considered a private legal entity. Several previous studies have been recorded regarding SOEs and state losses, including Tiyas Asri Putri and Tundjung Herning Sitabuana (Asri Putri & Herning Sitabuana, 2022) 2022 wrote about the Supervision of State Financial Management of State-Owned Enterprises (SOEs); Nelvia Rosa (Roza, 2022) in 2022 also wrote regarding the Problems of Determining State Financial Status in Persero State-Owned Enterprises; in 2016, Henny Juliani (Juliani, 2016) in the Journal of Legal Issues also wrote regarding the Responsibility of the Board of Directors of SOEs for Actions Causing Loss of State Finances; and in 2014, Dian Ety Mayasari (Dian Ety Mayasari, 2014) wrote about the Position of State-Owned Enterprises as State Assets concerning State Financial Losses. However, the research that the author wrote about state loss regulations on Persero SOEs where the state has a majority stake in the company.

Based on this description, this research is entitled: " Indonesian Regulations Related to State Losses in Persero State Owned Enterprises Partly Owned by the State"; with the formulation of the problem, namely: what is the scope of state losses in the context of SOEs and state finances? And what about the management and accountability of Persero SOEs, whose shares are partly owned by the state, in the event of a risk that results in state losses? The research aims to explain and analyze the scope of state losses in the context of SOEs and state finances as well as the management and accountability of Persero SOEs whose shares are partly owned by the state in the event of a risk resulting in state losses.

## B. RESEARCH METHOD

This type of research was qualitative research, especially doctrinal legal research. Doctrinal legal research focuses on the law as an independent rule, which can be traced through legal texts and statutes, with little (even 'no') references to other disciplines (Hakim, 2016).

Pendekatan dalam penelitian ini merupakan statute approach. Statute approach merupakan penelitian yang mengutamakan bahan hukum yang berupa peraturan perundang-undangan sebagai bahan acuan dasar dalam melakukan penelitian. (Peter Mahmud Marzuki, 2006) Kadek Wibawa dan Sri Nurhari lebih lanjut menyatakan bahwa: "Doctrinal law research is carried out by searching and analyzing legal materials, both primary legal materials, secondary legal materials, and tertiary legal materials". (Wibawa & Susanto, 2020) Mendasarkan pada hal tersebut, maka penelitian ini berada di bawah payung paradigma positivisme, dimana ontologi dalam paradigma ini adalah "Naive realism: "real" reality but apprehensible (Indarti, 2016).

Data collection and legal materials were conducted through literature studies or document studies. The analysis in this research used qualitative analysis. This is because the research process is inductive and the final results are descriptive (Merriam, 2014; Rumata, 2017).

## C. RESULT AND DISCUSSION

### 1. Measuring State Losses by SOEs in the Context of State Finances

In achieving state goals and being able to realize people's welfare and Article 33 of the 1945 Constitution of the Republic of Indonesia, the government has the authority to manage state finances so that these state tasks can be realized immediately. The government obtains authority based on Article 23 of the 1945 Constitution of the Republic of Indonesia which is then implemented in Law Number 17 of 2003 concerning State Finance, in Article 1 point 1 formulates that state finances are all rights and obligations



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of the state that can be valued in money. In addition, everything either in the form of money or in the form of goods can be owned by the state in connection with the implementation of these rights and obligations.

Article 2 letter g of the Law on State Finance further stipulates that "state assets/regional assets that are self-managed or by other parties in the form of money, securities, receivables, goods, and other rights that can be valued in money, including assets that are separated in state companies/regional companies. These provisions indicate that SOEs assets as separated state assets are also included in the category of state finances. Law Number 19 of 2003 concerning State-Owned Enterprises (hereinafter referred to as Law No. 19 of 2003 concerning SOEs), in its elucidation, states that an SOE whose entire or majority of the capital comes from separated state assets is one of the economic actors in the economic system. nationally in addition to private enterprises and cooperatives. SOEs also play a role in producing goods and/or services needed to realize the greatest prosperity of the people.

As one of the executives of national economic activity, SOEs have an important role in realizing people's welfare. The role of SOEs is important in the provision of goods and services for the people of Indonesia, being able to compete in global competition and on the other hand also playing an important role in contributing to state revenues cannot be separated from the function of SOEs as an agent of development, even though on the other hand Others are profit-oriented (Nugroho & Wrihatnolo, 2008). As an agent of development, the management of SOEs must be carried out using the paradigm of business judgment rules and the principles of good corporate governance to improve people's welfare.

Article 23C of the 1945 Constitution of the Republic of Indonesia states, "Other matters concerning state finances are regulated by law". The provisions of Article 23C are then implemented through 3 (three) packages of laws. There are Law Number 17 of 2003 concerning State Finance, Law Number 1 of 2004 concerning the State Treasury, and Law Number 15 of 2004 concerning the Examination of Management and Accountability Responsible for State Finances. Terminology of state finance according to Law no. 17 of 2003 concerning State Finances can be seen in the formulation of Article 1 point 1. Thus, state finances are all state rights and obligations that can be valued in money, as well as everything both in the form of money and in the form of goods that can be owned by the state in connection with the implementation rights and obligations.

In the formulation of laws and regulations, there is the formulation of "state financial losses" which is interpreted or analogous to "state losses", this can be seen in the formulation of Criminal Provisions, Administrative Sanctions, and Compensation according to Article 35 of Law no. 17 of 2003, as follows:

- (1) Every state official and non-treasurer civil servant who violates the law or neglects his/her obligations either directly or indirectly causing losses to state finances is required to compensate for said losses.
- (2) Everyone who is given the task of receiving, keeping, paying, and/or handing over money or securities or state goods is a treasurer who is obliged to submit an accountability report to the Audit Board.
- (3) Each treasurer as referred to in paragraph (2) is personally responsible for losses in state finances under his management.
- (4) Provisions regarding the settlement of state losses are regulated in the law regarding the state treasury.

The term "state loss" used is based on the formulation of Law no. 1 of 2004 concerning the State Treasury Article 1 point 22 which states, "state/regional losses are shortages of money, securities, and goods, the real and definite amount as a result of unlawful acts, whether intentional or negligent". In the general elucidation of point 6 concerning the Settlement of State Losses, it is emphasized that any state/regional loss caused by an unlawful act or a person's negligence must be reimbursed by the guilty party. With the settlement of these losses, the state/region can be recovered from the losses that have occurred. In this regard, each head of the ministry/institution/head of the work unit of the regional apparatus is obliged to immediately file a claim for compensation after knowing that the state ministry/institution/work unit of the regional apparatus in question has suffered a loss. The imposition of state/regional compensation for treasurers is stipulated by the Supreme Audit Agency, while the imposition of state/regional compensation for non-treasurer civil servants and other officials who have been assigned to compensate state/regional losses may be subject to administrative sanctions and/or criminal sanctions if they are proven commit administrative and/or criminal violations.

According to Hernold Ferry Makawimbang, in practice (in concreto) at the corruption court, the use of the term "state loss" is interpreted or analogous to "state financial loss" as referred to in Article 2 and Article 3 of Law no. 1 of 1999 (Makawimbang, 2014). Even though the area for the regulation of "state losses" contained in Article 1 number 22 of Law no. 1 of 2004 is the realm of administrative law, it is different from the regulation of "state financial losses" as the realm of criminal law.

From the aspect of the normative and practical approach, the regulation of the area of "state financial losses" in the realm of criminal acts of corruption is:

- a) The word "can" before the phrase "harm the country's finances or economy" indicates that the criminal act of corruption is a formal offense. Thus, a criminal act of corruption is sufficient by fulfilling the elements of the (criminal) act that have been formulated not by the emergence of consequences (Explanation of Article 2 b of Law Number 31 of 1999) and other meanings

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according to the opinion of the Constitutional Court in the Decision of the Constitutional Court Number 003/PUU-IV/2006 dated 24 July 2006. The legal considerations state that the word "can" before the phrase "financial loss state and the economy must be proven and can be calculated" first, then stated, "such matter is interpreted that the element of state loss must be proven and must be calculated, even though it is an estimate or even though it has not occurred. Such a conclusion must be determined by an expert in the field."

- b) Even the slightest reduction in "state finance" if it is the result of an unlawful act, is considered a "criminal act" (the criminal act of corruption).
- c) Returning state financial losses or the country's economy does not abolish punishment against the perpetrators of these crimes. Recovery of state financial losses or the country's economy is only one of the factors considered by the judge (meaning still being punished, not acquitting).
- d) Losses to state finances (material offenses) as a result of "formal offenses" (formal offenses) are not the result of negligence or force majeure, or because of the authority of a position order that is misused in carrying out a government policy ("beleid", "vrijsbestuur" or "discretionary power"), but due to acts of "deliberately breaking the law or abusing authority", (detournement de pouvoir or abus de droit).
- e) State financial losses are equated with the element of a criminal act, "unlawful act of enriching oneself, another person or corporation" or equated with the element of delict (criminal act), "benefiting oneself, another person or corporation by abusing authority and opportunity."
- f) There are no administrative sanctions, only criminal penalties: prison, confinement, and fines (KUHP/Criminal Code Article 10) and/or additional criminal penalties (reimbursement of money or recovery of state financial losses) by returning "results of corruption" or substitute prison sentences.

There are different perceptions about state losses and SOEs losses. Some argue that the losses suffered by SOEs must be the result of acts of corruption because SOEs assets are stated (financial) assets and something that causes state losses to be declared as corruption. On the other hand, some argue that SOE losses can occur due to several things, namely mismanagement, increased operational costs, tighter business competition and other causes of state losses that can occur in business entities. The Supreme Court mediated this difference in perception through letter number: WKMA/yud/20/VIII/2006 dated August 16, 2006, which decided that the management of separated state assets (SOEs) was based on the principle of a healthy company (not the State Budget system). Therefore, SOEs receivables are declared not as state receivables. Provisions in the Law on State Finances which include separated state assets as elements of state finances are declared to have no legal force.

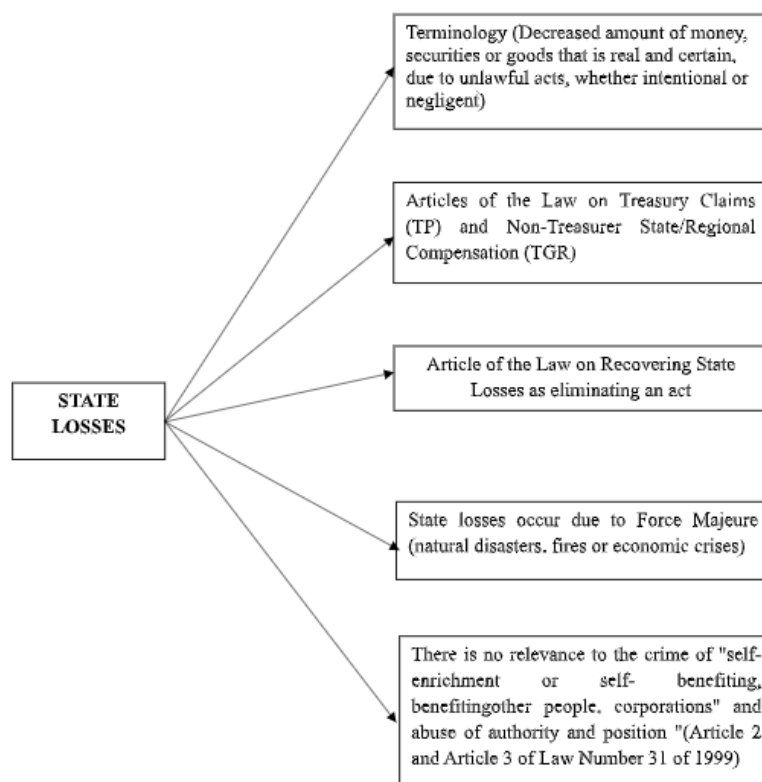


Figure 1. The Scheme of State Loss as Regulatory Realm State Administrative Law (Article 1 point 22 of Law No. 1 of 2004)

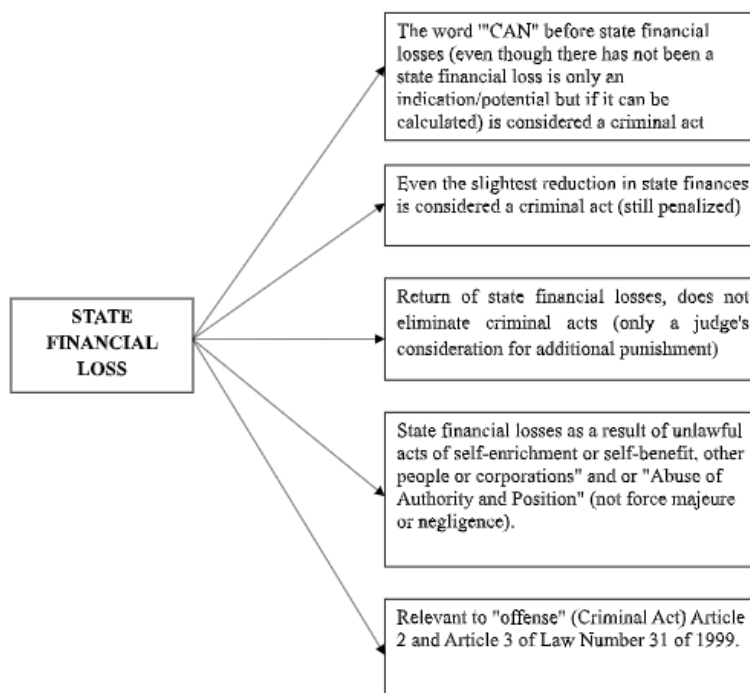


Figure 2. Scheme of State Financial Losses as a Domain of Criminal Law Regulations

**2. Management and Accountability for State Losses by State-Owned Enterprises Partially Owned by the State**

According to Law no. 19 of 2003 concerning SOEs, SOEs consist of 2 (two) types of companies, namely Limited Liability Companies (Persero) and Public Companies (Perum). Article 1 number 2 No.19 of 2003 states that a Persero is a SOEs in the form of a Limited Liability Company whose capital is divided into shares of which all or at least 51% (fifty-one percent) of the shares are owned by the Republic of Indonesia whose main objective is to pursue profits.

BUMN capital comes from separated state assets. This is regulated in Article 4 paragraph (1) of Law No. 19 of 2003. In the elucidation of Article 4 paragraph (1) what is meant by being separated is the separation of state assets from the State Budget to be used as state capital participation in SOEs for further development and management which is no longer based on the principles of a healthy company. State assets mean originating from the State Budget to be used as the state capital in Persero and/or Perum and other limited liability companies. According to the Rulings of the Constitutional Court Number 48/PUU-XI/2-13 and Number 62/PUU-XI/2013, in essence, SOEs whose entire or most of the shares owned by the state are an extension of the state in carrying out some of the state's functions to achieve state goals. The country's wealth has indeed been transformed into SOEs capital whose management system is subject to the business paradigm (business judgment rules), but the country's wealth does not turn into SOEs wealth which is independent of state wealth. As a result, there is no transformation of public law into private law.

Directors of SOEs must always remember that SOEs assets are state assets. Thus, in carrying out the management and accountability for SOEs management, they must be based on laws and regulations even though their management is also subject to the business paradigm (business judgment rules) and the principles of good corporate governance. This is based on statutory provisions and decisions of the Constitutional Court. Thus, in leading and managing SOEs, the Board of Directors must understand that the Board of Directors plays a very important role in bringing SOEs as an extension of the state in carrying out some of the state's functions to achieve state goals based on the 1945 Constitution of the Republic of Indonesia, for people's welfare.

Based on the formulation of laws and regulations that separate state assets that have been transformed into SOEs capital, it does not make the separation of state assets turn into SOEs assets that are separated from state assets. As a result, there is no transformation of public law to private law (Fitriyanti; 2022). Thus, if the Board of Directors in managing SOEs results in financial losses, SOEs can be interpreted as detrimental to the state as long as its management is not based on the principles of business judgment rule and good corporate governance and violates the provisions of the applicable laws and regulations.

The Supreme Court through Letter Number WKMA/Yud/20/VIII/2006 provided the basis for the government to revise Government Regulation Number 14 of 2005. Based on the Supreme Court's fatwa, the Government issued Government Regulation Number 14 of 2005 concerning Procedures for Writing Off State Receivables. Initially, SOEs receivables were considered state receivables which were settled according to Law Number 49 of 1960 concerning the Committee for State Receivable Affairs (PUPN), then with the issuance of Government Regulation Number 33 of 2006, the legal status of SOEs /BUMD (Persero)

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receivables no longer had the status of state receivables. however, these receivables have legal status as receivables or receivables from the relevant BUMN/ Regional owned enterprises (Persero) legal entity (Wibowo; et al., 2021).

According to Article 20 paragraph (2) and paragraph (6) of Law Number 30 of 2014 concerning Government Administration, government officials who commit administrative errors causing state financial losses must return the state losses if the administrative error occurs due to an element of abuse of authority (Wibowo; et al., 2021). Based on Supreme Court Regulation Number 4 of 2015 concerning Procedural Guidelines in Assessing Elements of Abuse of Authority, the Administrative Court has the authority to assess before criminal proceedings (Nugroho & Wrihatnolo, 2008). Thus, it is clear that the actions of the directors of SOEs that result in losses to state finances can be subject to administrative sanctions and/or criminal sanctions. This is explicitly regulated in Article 64 paragraph (1) of Law Number 1 of 2004 concerning the State Treasury. Paragraph (2) emphasizes again that a criminal decision does not absolve from claims for compensation.

In Article 2 and Article 3 of Law Number 31 of 1999 concerning the Eradication of Corruption along with the General Explanation of the fourth paragraph, Hernol Ferry Makawimbang provides the formulation that states financial losses (material offenses) as a result of "actions against the law" (formal offenses) occur not due to negligence or force majeure, or due to an official order that was misused in carrying out a government policy ("beleid", "vjisjsbestuur", or "discretionary"), but due to an act of "deliberately against the law" or "abuse of authority", (detournement de pouvoir or abus de droit) (Makawimbang, 2014). Even the slightest decrease in "state finances", if it is the result of an unlawful act, is considered a criminal act (criminal act of corruption). Returning losses to the state or the state's economy does not abolish the crime against the perpetrators of these crimes and returning state financial losses or the state's economy is only one of the factors considered by the judge. It means that the perpetrators of criminal acts are still punished, not set free.

### D. CONCLUSION

According to the description above, it can be concluded that in order to carry out duties, the directors of SOEs must always comply with the articles of association of the SOEs concerned, laws and regulations, and the principles of good corporate governance. Hence, in carrying out their duties, they do not conflict with the law. In essence, Persero SOEs, whose shares are partly owned by the state, is an extension of the state in carrying out some of the functions of the state to achieve state goals as stipulated in Law Number 19 of 2003 concerning SOEs. Furthermore, the provisions in Article 2 letter g of Law Number 17 of 2003 specifically Regarding assets that are separated into state companies/regional companies also do not have legally binding force. The country's wealth has been transformed into SOE capital whose management is subject to the business paradigm (business judgment rules). However, the separation of state wealth does not turn it into SOEs wealth which is independent of state wealth. Therefore, the operationalization of SOEs is based on both private law and public law.

The advice given is that SOEs directors in conducting their duties must always be in good faith and full of responsibility and comply with the articles of association of the SOEs concerned, laws and regulations, as well as the principles of good corporate governance and business judgment rules. Thus, they did not conflict with good law, state administrative law, civil law, and criminal law.

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### REFERENCES

- 1) Asri Putri, T., & Herning Sitabuana, T. (2022). Pengawasan Pengelolaan Keuangan Negara Terhadap Badan Usaha Milik Negara (BumN). *SIBATIK JOURNAL: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan*, 1(7), 1003–1018. <https://doi.org/10.54443/sibatik.v1i7.118>
- 2) Avianti, I. (2017). Privatisasi BumN Dan Penegakan Good Corporate Governance Dan Kinerja BumN. *Kinerja*, 10(1), 57–65. <https://doi.org/10.24002/kinerja.v10i1.919>
- 3) Dian Ety Mayasari. (2014). KEDUDUKAN BUMN SEBAGAI KEKAYAAN NEGARA DALAM KAITANNYA DENGAN KERUGIAN KEUANGAN NEGARA. *Sapientia et Virtus*, 1(1), 82–102. <https://doi.org/https://doi.org/10.54443/sibatik.v1i7.118>
- 4) Fitriyanti,, F. P. (2022). Teori Sumber vs Teori Badan Hukum dan Teori Transformasi Keuangan Dalam Menafsirkan Status Hukum Keuangan Badan Usaha Milik Negara. *Syntax Literate, Jurnal Ilmiah Indonesia*, 7(8), 10708–10723. <https://doi.org/https://doi.org/10.36418/syntax-literate.v7i8.9179>
- 5) Hakim, M. H. (2016). Pergeseran Orientasi Penelitian Hukum: Dari Doktrinal Ke Sosio-Legal. *Syariah Jurnal Hukum Dan Pemikiran*, 16(2), 105–114. <https://doi.org/10.18592/sy.v16i2.1031>
- 6) Indarti, E. (2016). Bridging the Gaps : a Paradigmatic Insight Into Philosophy of Law. *Diponegoro Law Review*, 1(1), 1.

## Indonesian Regulations Related to State Losses in Persero State-Owned Enterprises Partly Owned by the State

<https://doi.org/10.14710/dilrev.1.1.2016.1-16>

- 7) Juliani, H. (2016). Pertanggungjawaban Direksi Bumh Terhadap Perbuatan Yang Mengakibatkan Kerugian Keuangan Negara. *Masalah-Masalah Hukum*, 45(4), 299–306. <https://doi.org/10.14710/mmh.45.4.2016.299-306>
- 8) M Ivan Mahdi. (2021). Jumlah BUMN Tinggal 107 pada 2020. *DataIndonesia.Id*.
- 9) Makawimbang, H. F. (2014). *Kerugian Keuangan Negara*. Liberty.
- 10) Merriam, S. . (2014). *Qualitative Research: A Guide to Design and Implementation, Revised and Expanded from Qualitative Research and Case Study Applications in Education*. Jossey-Bass.
- 11) Nainggolan, E. U. (2020). Raksasa Itu Bernama BUMN. <https://www.djkn.kemenkeu.go.id>.
- 12) Nugroho, R., & Wrihatnolo, R. R. (2008). *Manajemen Privatisasi BUMN*. Gramedia.
- 13) Peter Mahmud Marzuki. (2006). *Penelitian Hukum*. Kencana.
- 14) Roza, N. (2022). Problematika Penentuan Status Keuangan Negara Dalam Badan Usaha Milik Negara Persero. *Jurnal Lex Renaissance*, 7(1), 41–54. <https://doi.org/10.20885/jlr.vol7.iss1.art4>
- 15) Rumata, V. M. (2017). Dinamika Tata Kelola Kebijakan Industri Penyiaran dan Telekomunikasi Indonesia Menuju Konvergensi. *Jurnal Penelitian Pos Dan Informatika*, 5(1), 93–108. <https://doi.org/10.17933/jppi.2015.0501006>
- 16) Susila Wibawa, K. C. (2019). Urgensi Keterbukaan Informasi dalam Pelayanan Publik sebagai Upaya Mewujudkan Tata Kelola Pemerintahan yang Baik. *Administrative Law and Governance Journal*, 2(2), 218–234. <https://doi.org/10.14710/alj.v2i2.218-234>
- 17) Thamrin, H. (2013). *Hukum Pelayanan Publik di Indonesia*. Aswaja Pressindo.
- 18) Tricker. (1994). *International Corporate Governance*. Prentice Hall, Inc.
- 19) Wibawa, K. C. S., & Susanto, S. N. (2020). Establishing a special autonomy model in Bali as a means of preserving hindu balinese culture and space. *International Journal of Scientific and Technology Research*, 9(4), 1609–1614.
- 20) Wibowo, R. A., Simamora, Y. S., Anisah, S., Putri, K. D. N., & Jurniawan, F. (2021). *Kontrak Pemerintah: Konsep, Ragam, Perkembangan Regulasi, dan Kajian Putusan*. Kencana.



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## Career Intervention to Enhance Student's Career Maturity

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**ABSTRACT:** Career interventions aim to improve students' career maturity. Career maturity needs to be improved in the era of society 5.0. Most students do not yet have career planning and career readiness. 3 career intervention programs, including identification of the Indonesian Interest Test (TMI), career counseling, and career workshops. The method used is Participatory Action Research (PAR) with five stages, namely problem identification, action planning, taking action, evaluation, and reflection. There were 24 vocational school students aged 15-18 years. Effectiveness of intervention using pretest and posttest. analyzed using a different paired sample test. As a result, career planning, career exploration, and decision making were classified as inadequate by 50% (12 people out of 24 participants); Career information and self-knowledge of career are quite adequate at 50% (12 people out of 24 participants). Descriptive statistical results with a mean pre-test value of 47.50 and a mean post test value of 81.25. The mean value is  $81.25 > 47.50$ , meaning that descriptively there is a difference in the average career maturity value before and after the intervention. The correlation results of paired samples show the correlation test pre and post test. The correlation coefficient is 0.348 with its significance value of 0.187. Probability 0.05, significance  $0.187 > 0.05$ , meaning there is no relationship between pre test and post test. The results of the paired samples test, known significance value (2-tailed) of  $0.000 < 0.05$  means that there is an average difference between pre-test and post-test career maturity, meaning that there is an effect of intervention on increasing student career maturity. Recommendations need to further improve students' career maturity by optimizing soft skills, digital skills, and social skills involving families, schools, and communities.

**KEYWORDS:** career interventions, career maturity, student's

### I. INTRODUCTION

Career maturity as the ability to make career decisions independently and responsibly based on integration about oneself and the world of work (Kleine *et al.*, 2021). Career maturity means the extent to which individuals master personal tasks according to their age that are relevant to the stage of development in productive age. It is mentioned that career maturity is if you are willing to make career choices in a directed manner and get alternative knowledge about education and employment prospects (Sivakumar & Sridhar, 2016). Career readiness and social skills in adolescence were found in 47 systematic article reviews with supporting characteristics of being able to recognize strengths and weaknesses (Rasyidi *et al.*, 2021).

Career maturity that places individuals directing their personalities in psychological, social, economic, and cultural contexts. Career maturity from the psychological side as a conscious effort to make choices, independence includes the dynamics of needs, self-esteem, desires, portraits of the way individuals view themselves, and career goals. The role of social ecology in careers is highlighted as individuals who are in the interaction between themselves and the environment, there are variations in social structure in the form of levels, positions, the amount of income and their social contribution. While the cultural side experienced by individuals, related to the distinctive position and uniqueness because it is influenced by career attitudes that are in accordance with their attitudes and habits, does not look at ethnic and religious differences (Sivakumar & Sridhar, 2016).

Furthermore, a survey was also conducted by the WEF, *World Economic Forum* that it is predicted that by 2025 there will be 97 million new career choices and 85 million jobs replaced by machines, and there are 20 jobs that are most needed, namely data analysts and scientists, AI and machine learning specialists, big *data* specialists, *digital marketing and strategy specialists*, *process automation specialists*, *business development professionals*, *digital transformation specialist*, *information security analysts*, *software and application developers*, *internet of things specialist*, *project manager*, *business services and administration managers*, *database and network professionals*, *robotic engineers*, *strategic advisors*, *management and*

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organization analysts, fin-tech engineers, mechanics and machinery repairs, organizational development specialist, and risk management specialist (Kompas, 2022).

The choice of new types of careers and jobs is carried out independently as a form of personal responsibility. The career maturity of vocational students can be increased by providing mentoring, counseling, and support to increase knowledge, understanding, and training in making career decisions and collecting information from various fields. Vocational career maturity is needed because students will step up for further studies or take part in the field of work in the era of society 5.0. Students need to be prepared and mature in careers. The era of society 5.0 is expected to reduce the gap between humans with economic problems and other advanced technological developments. Referred to as the era of society 5.0 is a development of industry 4.0. Where in the industrial era 4.0 is marked by the use of *Artificial Intelligence* (AI), while the Era of Society 5.0 is marked by the needs of the community in terms of products and capabilities in the use of machines, including penetrating into the educational environment, which will produce graduates to be ready to work in the industrial field, and take part in the community. In the era of society 5.0, humans play a very important role, especially SMK graduates must have good career maturity so that they are better prepared to welcome the era of society 5.0 (Usmaedi, 2021).

Vocational high schools become a place for students of productive age to gain knowledge and face challenges in the realm of career maturity. In fact, which was published in 2014 in the *Educational Psychologist of Integrity Development Flexibility* (IDF), 87% of Indonesian students felt wrong in choosing a major (Hidayat & Prabowo, 2019). Based on the survey, there is a need for career guidance programs for students in career planning. Students need to be given an understanding and assistance regarding career readiness and maturity, especially at the secondary school level. Some students from the survey results are in addition to work, some want to continue to higher education, or open entrepreneurship.

Career intervention is needed by individuals, especially students who are currently pursuing junior high school and high school education because of its success in being able to facilitate the world of school to the world of work. But in reality, there are still few middle school and high school students who have access to career guidance. The results of the Indonesian youth labor market survey and the impact of dropping out of school at a young age/child labor conducted by ILO-IPEC (2006) stated that in eastern Indonesia, 88% of respondents never received career guidance services, while 80% of those who received career guidance services were useful for finding work (Wibowo, 2015; *Career Guidance Service Guide*, 2011). The purpose of reviewing career interventions to improve student career maturity and determine the effectiveness of career interventions on student career maturity.

## II. METHOD RESEARCH

*Participatory Action Research* (PAR) method is carried out to identify problems and find solutions to problems. PAR consists of five stages, namely *problem identification*, *action planning*, *taking action*, *evaluation*, and *reflection* (Datta *et al.*, 2015). Furthermore, PAR focuses on skill building and implementing ideas through collaborative activities with participants. PAR plays an important role in improving competence as a form of intervention (Datta *et al.*, 2015).

The participants were 24 vocational students aged 15-18 years. The effectiveness of interventions using *pretest* and *posttest*. Analysis using the *paired sample test difference test*. Participants in this activity were representatives of class X, XI, and XII students of State Vocational High School 1 Purwokerto. The identification instrument of the Indonesian Interest Test with the Indonesian Interest Test (TMI) was created by Jelpa Periantalo, consisting of 20 aspects and 99 interests for school specialization, career, and determination of majors. TMI has obtained an Intellectual Property Rights certificate from the Director General of IPR of the Ministry of Law and Human Rights of the Republic of Indonesia in 2015 (Periantalo, 2017).

Data collection was carried out from September to November 2022. Activities that have been carried out, namely a). Interest identification activities with the Indonesian Interest Test psychological scale on October 26, 2022, the number of participants was 24 students representing classes X, XI, and XII., b). Career Counseling individually on October 28, 2022, October 31, 2022, November 2, 2022, November 4, 2022, and workshop on November 8, 2022, the number of participants was 16 students, 8 students were unable to attend because they participated in Field Work Practice (PKL) activities. The data collection procedure is as follows:

1. The first stage, including *problem identification* and *action planning*, activities in the form of identifying data about self-identity and organizing the Indonesian Interest Test (TMI) for students of SMK 1 Purwokerto. Students consist of representatives of classes X, XI, and XII and are drawn from representatives of various majors. Personal identity data in the form of name, gender, place of birth, address information, telephone number, religion, school, class, major, self-strength, self-deficiency, hobbies, extracurricular, work interests, physical complaints, psychological complaints, social complaints, life mottoes, subject preferences, plans after graduating from vocational school, and career goals.

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2. The second stage, including *taking action* to conduct a career counseling process and extract personal data about career maturity, specifically about: *concern, curiosity, confidence, consultation, planning, exploration support, decision making* and *solutions* about careers in vocational students and teachers. Facilitators conduct an individual career counseling process from students who have done the TMI process and self-identity identification.
3. The third activity, including *evaluation and reflection*, held a career maturity workshop for State Vocational High School 1 Purwokerto students in welcoming the Society Era 5.0. This career intervention is based on research on career maturity. In this workshop, identification is used by measuring and assessing understanding of career maturity. The effectiveness of this intervention program will be used *pretest* and *posttest* measurements using questionnaires prepared based on concepts from Super (1973) which include thinking ahead of anticipation, developing career interests, understanding needs and reflecting identity, choosing jobs that meet the needs of identity, committing to the choices made. The results of the *pretest* and *posttest* were analyzed using *the paired sample* test difference test, which is a test used to determine the difference in paired data after treatment (Ghozali, 2011).

### III. RESULT AND DISCUSSION

The results of the identification of the Indonesian Interest Test and self-identity that vary about: job interests, plans after graduating from SMK, surrounding support, and career goals of participants, summarized as follows:

- a) Job interests, including graphic design, civil servant, office admin, programmer, photographer, diplomat, pharmacist, teacher, accountant, content creator, psychologist, private employee, civil servant, lecturer, etc.
- b) Plans after graduating from State Vocational High School include wanting to continue their studies, study in college, study while working, study and live in boarding schools, official lectures, work, etc.
- c) Surrounding support, including family, friends, parents, teachers, fathers, mothers, brothers, grandmothers, cousins, aunts, friends, etc.
- d) Career goals, including programmers, entrepreneurs, successful people, photography entrepreneurs, education schools, pharmacists, state servants, poster designers, working in companies, bank employees, judges, accountants, teachers, office employees, pharmacists, business people, flight attendants, etc

Career counseling activities are described in five dimensions of career maturity as follows, namely:

#### a. Career Planning

Career planning is needed so that individuals prepare themselves to enter the world of work as well as efforts to design their potential to suit the field of work. The individual makes a plan, prepares for his career plan, what job plan or profession he wants.

DW participants, conveying about their career plans for business or management

*"..... After graduating I really want to plan to study business or management, there are plans but sometimes they are still changing, still hesitant in the future."*

From these statements shows the dynamics of unpreparedness in planning his career.

#### b. Career Exploration

Individuals strive to do career exploration after doing career planning. There is self-development and the exploration of one's potential responsibly. Placing self-abilities in accordance with career, interests and work / life goals so that they can better adjust to themselves and to their careers in the future or community environment.

SN participants, conveyed about their career exploration in the form of self-exploration by participating in activities at school to develop themselves.

*"..... I work as an activist at school, active so that I can learn to teach underclassmen, and I have a desire to study Primary School Teacher Education....."*

The statement shows individuals who are active organizations in the school.

#### c. Career Information

Individuals need to understand and seek information about careers. Career guidance can help individuals to obtain information, help self-understanding, understand the world of work, determine steps and strategies to collect and manage information about themselves, their jobs, or adequate and appropriate professional / employment information.

RT participants, conveyed about career information obtained in the form of curiosity in the field of management but did not get the information.

*"..... interested in the field of management but the curiosity of information about management is not too great because it is still in grade 11....."*



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The statement shows that he has not collected career information about him

### d. Decision Making

The ability of individuals to make decisions, especially deciding on a career. The ability to make meaningful decisions for his future according to interests, abilities, and personality as well as factors supporting his progress, such as family, school, and community.

SN participants, conveyed about decision making regarding their careers who are still experiencing confusion about majoring in college later or choosing to work.

"..... Still confused and there is no decision between choosing the list of flight attendants or studying Primary School Teacher Education majors, the decision will be seen from the final grades....."

From this statement, it shows that decision making has not been fully mastered

#### Self Knowledge of Career

Self-knowledge about career is adjusted to his future career goals. Understanding or knowledge of himself and job adjustments should make individuals have a clear picture of their career in the form of abilities, skills, excellence, self-strengths and realize that individuals are able to carry out their work and obtain personal satisfaction in career. In other words, his career is in accordance with the values (norms) that are his life principles.

SN participants, conveyed about self-knowledge about their career in the form of their self-awareness about laziness and their willingness to learn maximally

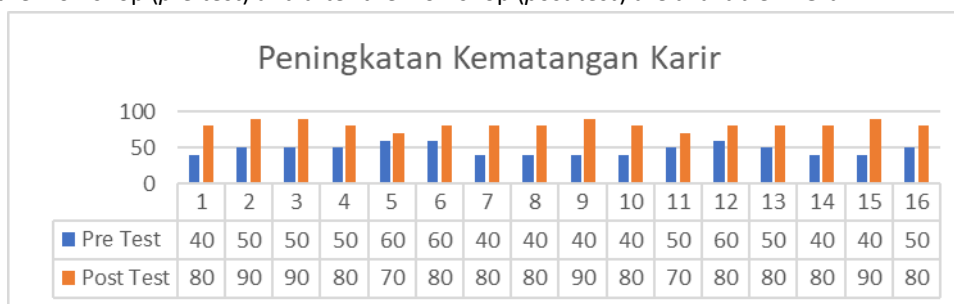
"..... The client tries to fight his laziness and tries to learn as much as possible to improve his grades so that the final grade results can determine his career desires....."

From this statement, it shows that the dynamics of self-knowledge about career are quite sufficient.

The results of career counseling implementation activities are as follows:

- From the implementation of observation and career counseling, it shows that data on *career planning* is inadequate by 50% (12 people out of 24 participants).
- From the implementation of observation and career counseling, it shows that data on *career exploration* is inadequate by 50% (12 people out of 24 participants).
- From the implementation of observation and career counseling, it shows that data on *career information* is quite adequate by 50% (12 people from 24 participants).
- From the implementation of observation and career counseling, it shows that data on *decision making* is inadequate by 45.8% (11 people out of 24 participants).
- From the implementation of career observation and counseling, it shows that data on *self-knowledge of career* is quite adequate at 50% (12 people out of 24 participants).

The results of the workshop activity by providing pre test and post test about career maturity, data on increasing career maturity before the workshop (*pre test*) and after the workshop (*post test*) are available in Grafik 1.



**Grafik 1. Pre Test and Post Test Results**

*Descriptive statistics* on data before the career maturity workshop and data after being studied, namely *pre-test* data and *post-test* data. The mean *pre-test* value is 47.50 and the *mean post-test* value is 81.25. The *mean* value is 81.25 > 47.50, meaning that descriptively there is a difference in the average career maturity score between the *pre-test* and *post-test*. Participants who participated in the workshop as a research sample were 16 participants. The standard deviation in the *pre-test* was 7.74 and the *post-test* standard deviation was 8.19. The standard deviation error mean *pre test* data is 1.93 and the standard deviation error *mean pre test* data is 2.54.

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**Table1. Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	Pre Test			
	Post Test	16	.348	.187

Table 1 *Paired Samples Correlations* shows a correlation test or relationship between the two data, namely *pre test* and *post test*. The correlation coefficient is 0.348 with a significance value of 0.187. Probability 0.05, significance 0.187 > 0.05 then it can be said that there is no relationship between *pre test* and *post test*.

**Table 2. Paired Samples Test**

		Paired Differences					Sig.		
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	Df	(2-tailed)	
					Lower	Upper			
Pair 1	Pre Test	-	11.4746	2.86865	-	-27.63561	-11.765	15	.000
	Post test	33.75000	1		39.86439				

Table 2. The results of the *Paired Samples Test*, namely the presence or absence of the influence of workshop activities on increasing career maturity in participants. It is known that the significance value (*2-tailed*) of 0.000 < 0.05 can be concluded that there is an average difference between *pre-test* and *post-test* career maturity, meaning that there is an influence of workshops on increasing the career maturity of State Vocational High School 1 Purwokerto students.

The mean paired samples test of -33.75 shows the difference between the *pre-test* of 47.50 and the mean *post-test* value of 81.25,  $81.25 - 47.50 = -33.75$ . The difference is between -39.86 to -27.63 with a 95% confidence interval of the difference lower and upper. The data shows a negative t count of -11.765. There is a negative sign because the *pre-test* career maturity value is lower than the *post-test* career maturity score. This means that a negative t-count value can be positive, so the t-count becomes 11.765. It is also proven that the calculated t value is greater than the table t (table t is 2.131, df 0.025), 11.765. 2,131 It can be concluded that there is an average difference in the career maturity scores of *pre-test* and *post-test*, which means that there is a significant influence of the workshop in increasing the career maturity of State Vocational High School 1 Purwokerto students.

Career services are needed by individuals, especially students who are pursuing junior high school and high school education because of their success in being able to facilitate the world of school to the world of work. But in reality, there are still few middle school and high school students who have access to career guidance. The results of the Indonesian youth labor market survey and the impact of dropping out of school at a young age/child labor conducted by ILO-IPEC (2006) stated that in the eastern part of Indonesia, 88% of respondents never received career guidance services, while 80% of those who received career guidance services were useful in finding a job (*Career Guidance Service Guide*, 2011). According to Uhre *et al.*, (2020) career services need to be explored by the environment with the aim of collecting career-related information. Based on the *Career Self Management* (CSM) model, Lent & Brown (2013) career exploration has a positive correlation with environmental support, and has a negative correlation with personal barriers. In addition, career exploration to get success in a career, it is necessary to have the ability to make decisions and have *work skills*. This relationship is also influenced by age, gender, and cultural background characteristics. This research concludes the relationship between *person*, *self-cognitive*, and *efficacy* in career development practices (Uhre *et al.*, 2020).

Welcoming the era of society 5.0, it is necessary to assist people to be ready to grow and process to realize career maturity, this is done to anticipate the increase in the number of unemployed. Various factors have led to a lot of unemployment because the country's economic conditions are unable to provide adequate employment for all the country's young generation. Another problem is the lack of funding for people who want to continue their education. Unemployment is caused by the fact that teenagers are not motivated to find work, they are poorly prepared for their careers. Some SMK class XII

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students with outstanding grades and show great hope for the future, it seems easy to wait for work to come, but in reality teenagers are not actively striving and maximizing their potential (Puebla, 2022).

Active students, especially those who have a desire to enter college, begin to set career-related goals and explore their career paths. However, choosing a career path and building a career-related self-identity is a challenge, for example, the number of choices related to desires according to career interests becomes difficult to make one choice and difficult to commit to the choice (Uhre et al., 2020). Several studies mention psychological factors involved in deciding career choices, one of which was a study on people with disabilities totaling 257 people compared to 258 people without disabilities, found there were psychological factors that focused on the task of mediating the relationship between self-awareness and self-efficacy in decision making. The relationship between the two variables of self-awareness and self-efficacy was lower in participants without disabilities. Psychologically, people with disabilities often get stigma, prejudice, discrimination, marginalization, and self-helplessness, thus influencing future career decisions (Liu et al., 2022).

Career choices in the future one of them by working, this choice of work is a vital need, but work should not only be a means to fill time. There is a need for career counseling because individuals who have career planning have better mental health than jobs without career plans or jobs that are less satisfying. As a result, individuals who are satisfied with their career choices have better physical health and live longer. Although the balance of nutrition, regular exercise, and medical care has been fulfilled. Before career guidance in the form of career counseling, it is necessary to identify individual interests and career identities. Students' career choices and preferences are strongly influenced by the portrait of career planning, potential self-excess, self-limitations. Identify interests to avoid individuals experiencing ambiguity and stress. Some teenagers who are approaching adulthood have difficulty recognizing themselves, knowing their wants and career needs. The majority of adolescents are unaware of the factors that influence job choices due to lack of guidance and lack of identification about career interests, career potential, and ignorance of career knowledge, low experience, and lack of support or advice from parents, friends, teachers and the surrounding environment (Puebla, 2022).

Support in addition to human resources, it is also necessary to support related to *soft skills* and *digital skills*. Vocational students who are teenagers ideally after graduating from vocational school or graduating from college have a job that matches their potential. The potential in question includes skills, creativity, attitudes towards work, and the ability to work together, as well as being able to use digital technology effectively. Decision making is a combination of the desired job and career with personal potential. There are three stages that need to be internalized after the individual has identified interests. The first stage is *development* to learn self-abilities, opportunities, various jobs, education, and activities focused on developing more targeted as an alternative career. The second stage, *acomodation*, is the internalization of the values that underlie the consideration of choosing career alternatives. The third stage, *action*, is to start developing alternative career solutions by considering abilities, opportunities, and career variations (Afdal et al. , 2019) . According to Super in Sharf (2016) on career development theory, vocational students are at the exploration stage. Winkel & Hastuti (2004) mention individual career exploration, one of which is by thinking of various alternatives, but have not taken binding ones and have not taken the decision to set on one career choice (Lika et al., 2022).

Students who in doing career exploration think about the long term and the future are referred to as students who are mature in careers. Career maturity, proven to have crystallized his interests and desires. Crystallization is a time when students formulate job opportunities and understand the relationship between career development and self-concept when determining relevant education and work in the present, present, and future (Lika et al., 2022). Career maturity is a reflection of an individual's career development process to increase capacity in making future career decisions. Research conducted (Arismen & Hakim, 2022) analyzes career interventions and career guidance digitally can affect the development of career maturity of high school students. This study used a systematic literature review research design. The findings of this study mentioned that career interventions have a significant influence on career maturity, especially on aspects of students' career knowledge. Digital career counseling can help students make decisions (Arismen & Hakim, 2022).

Furthermore, career decisions determine career maturity. If individuals step by step carry out career exploration, career maturity will be achieved. Career intervention, one of which is career exploration. The intervention function can be done individually or classically. The results of the research review stated that career interventions were not influenced by gender and socioeconomic status of students, classical interventions can increase confidence in making the right career decisions. *Online* counseling is an effective breakthrough in helping students build career maturity, but intervention can also be done in the form of workshops through integration into the learning curriculum in schools. The method can serve as a career education service center that can help students find their vocational orientation and prepare for future careers (Arismen & Hakim, 2022). Career maturity in research using longitudinal data, Lim & You's (2019) research examined the direct and indirect effects of parental support on career maturity, mediated with self-esteem and gender variables. The sample was 4187 adolescents. As a result,

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parental support has a different effect on career maturity through self-esteem. Empirically, there are differences in the development of parental support, self-esteem, and career maturity according to gender, meaning that it is necessary to consider sex differences in looking at adolescent career maturity (Lim & You, 2019).

Other research findings from Puebla (2022) stated that there was a significant difference between respondents' assessments in terms of self-awareness of the need to make career decisions and perceptions in making career decisions when grouped according to age and gender. And there was a significant relationship between respondents' self-awareness of the need to make career decisions and career decision making. It is necessary to validate the results of this study and family members, especially parents, become role models who have a major influence on adolescent career choices and maturity (Puebla, 2022).

Adolescence is a critical period where career choices are explored and career decisions are made regarding future employment. Therefore, some experts emphasize the importance of identification, individual counseling, and classical counseling about careers. The impact manifests career maturity which is closely related to the stage of mental development of the individual. It needs successful completion of developmental tasks at each stage in adolescence. In early adolescence, recognizing oneself and one's environment and exploring personal talents and abilities play an important role in career development. According to Super, career maturity is the readiness of developmental tasks faced by individuals in reaching certain stages of development, especially biological/social development stages and social expectations. The stage is planning, practicing, and modifying a career based on an understanding of personal career with an understanding outside the person. Career maturity as an affective attitude involves the personality that adolescents need independently in exploring and planning their careers, based on their cognitive abilities, and the extent to which they implement adolescent decisions. Environmental context, especially parental support is an important aspect in career maturity (Lim & You, 2019).

Adolescent experiences with parents play an important role in adolescent career development and decisions. Parental support for their children's education, including psychological support, academic support, and support for cultural-related activities. The psychological bond of parents with children, the actions of parents to provide support so as to increase academic achievement in school, and the provision of cultural experiences. Another study on internal variables, namely regarding self-esteem showed a significant relationship with career maturity. Previous studies have consistently reported that teens with high levels of self-esteem have higher career maturity. Furthermore, higher self-esteem leads teens to act more concisely with a more focused self-evaluation of the teen's career path. Higher self-esteem helps adolescents have more positive self-ideals which ultimately equip adolescents with more confidence to pursue careers according to their abilities (Lim & You, 2019).

Acculturation research related to culture in high school students in Korea, as many as 335 overseas Chinese students were asked to fill out a questionnaire, the aim was to explore the relationship between *parental attachment*, basic psychological needs, career identity, and depression. As a result, parental attachment negatively affects depression, basic psychological needs play a role in mediating between parental attachment and depression. In addition, career identity moderates the mediating effect of basic psychological needs between parental attachment and depression. His findings provide a more comprehensive picture of the interaction of various variables in overseas students studying in different countries and backgrounds. Students who attend high school and college students are in the transition period from adolescence to adulthood. In this period it is required to develop the ability to deal with social, psychological, and personal problems. Recently, cases of depression have increased due to the pressure of academic, economic, and career/work problems (Zhao *et al.*, 2022). This career identity, one of which is concretely ready for a career. Preparing for a career is a major developmental task of adolescents (Kleine *et al.*, 2021; Savickas, 2001; Szabo & Parkin, 2001), adolescents are increasingly spending longer periods in education, so they sometimes delay entering the workforce. Career readiness is important because early career experience greatly influences future work experience. Several factors contribute to career maturity, namely career readiness and adaptability, and there are other terms of career preparedness. Career readiness includes cognitive and affective factors resulting in effective decisions. Some literature on career readiness, defined in three things, first synonymous with maturity, namely maturity to make decisions, second, there is planning for career choices, third cognitive information processing is carefully considering choices, self-knowledge, knowledge about work, and decision making. One of the theoretical implications is the ability of adolescents to identify potential obstacles in career, mature adolescents better prepare settlement strategies, seek to develop resources and identify sources of social support (Liu *et al.*, 2022; Marciniak *et al.*, 2022; Savickas, 2001).

Some cases of high school or vocational students who are lazy, and have no motivation and do not know the college requirements or jobs that become their goals. As a result, these students often leave school without cause, behave as they want, are easily influenced by negative things, lack of self-control, are easily discouraged, have the habit of delaying work, and spend time on unproductive activities (Puebla, 2022).

So welcoming the era of society 5.0 requires interests, abilities, personalities, socioeconomic conditions, including culture, and other positive abilities to prepare themselves for career growth and maturity. Teenagers are able to take advantage of

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appropriate technological advances to produce works. Many factors, including intrinsic, extrinsic, and interpersonal aspects affect adolescent career maturity. Intellectual capacity, talent, school, family, personality, self-esteem, values, interests, and environmental influences are all elements that influence a person's choice of profession (Kankam & Onivehu, 2000). Taylor and Books (2006) lists abilities, needs, and interests, as well as stereotypes, status, values, school success, education, family, placement, aspirations affect career maturity. While Mankoe (2007) mentions interests, abilities, personality, job preferences, life satisfaction, job satisfaction, job variables are factors that affect a person's career maturity tendencies (Puebla, 2022). Therefore, interest identification activities, exploration of students' potential, individual career counseling, and organizing workshops contribute to increasing the career maturity of SMK Negeri 1 Purwokerto students in the era of society 5.0.

## IV. CONCLUSIONS

Participants are advised to have more complex data involving participants / subjects of junior high, high school, college students, and the community. It takes counselors who understand about careers, so that the career counseling process runs effectively, information about student careers, information about work needs to be conveyed accurately and precisely. Further counseling sessions are needed to identify and introduce career/work skills, especially when dealing with students with complex problems

Students need to learn to plan, explore themselves, make decisions, get information, and complete career knowledge, especially developing *soft skills* and *digital skills*. Students need to be equipped with the ability, skills, and ability to interact socially in order to connect with peers or a positive environment and support each other for productive activities. The process of exploring students' career potential requires complete data on school achievement and complete information about actual employment. It needs support and appreciation from family, as one of the supporters of student career success, and the importance of establishing closeness between schools, parents, and students. Teachers direct and guide students to prepare for careers and make career decisions towards career maturity. Need career guidance for students both individually and classically, and help accompany youth career development tasks. Further interventions are recommended using more comprehensive sample criteria, program types, and implementation techniques.

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## REFERENCES

- 1) Afdal, A., Iswari, M., Alizamar, A., Ildil, I., Syahputra, Y., & Nurhastuti, N. (2019). Career planning differences between male and female deaf students. *Specialis Ugdyamas*, 1(39), 99–108. <https://doi.org/10.21277/se.v1i39.409>
- 2) Arismen, & Hakim, D. L. (2022). How Career Interventions and Digital Career Counselling Affect Students' Career Maturity. *Proceedings of the 4th International Conference on Innovation in Engineering and Vocational Education (ICIEVE 2021)*, 651(Icieve 2021), 4–9. <https://doi.org/10.2991/assehr.k.220305.002>
- 3) B. Sivakumar, & N. Sridhar. (2016). A Study on Career Maturity of XI Standard Students. *International Journal of Indian Psychology*, 3(2). <https://doi.org/10.25215/0302.027>
- 4) Datta, R., Khyang, N. U., Prue Khyang, H. K., Prue Kheyang, H. A., Ching Khyang, M., & Chapola, J. (2015). Participatory action research and researcher's responsibilities: an experience with an Indigenous community. *International Journal of Social Research Methodology*, 18(6), 581–599. <https://doi.org/10.1080/13645579.2014.927492>
- 5) Hidayat, D. R., & Prabowo, A. S. (2019). A Career Development Program for Higher Education in Indonesia; The Strategy to Achieve Career Maturity. *227(Icamr 2018)*, 125–129. <https://doi.org/10.2991/icamr-18.2019.32>
- 6) Kleine, A. K., Schmitt, A., & Wisse, B. (2021). Students' career exploration: A meta-analysis. *Journal of Vocational Behavior*, 131(November), 103645. <https://doi.org/10.1016/j.jvb.2021.103645>
- 7) Kompas. (2022). No Title. <https://www.kompas.com/edu/read/2022/11/17/061400771/20-pekerjaan-paling-dibutuhkan-di-masa-depan-menurut-survei-wef?page=all>
- 8) Lika, Iswari, M., & Daharnis. (2022). Implementation of Career Guidance in Improving Career Planning Skills in Students in Senior High School. *Literasi Nusantara*, 2(2), 655–665.
- 9) Lim, S. A., & You, S. (2019). Long-Term Effect of Parents' Support on Adolescents' Career Maturity. *Journal of Career Development*, 46(1), 48–61. <https://doi.org/10.1177/0894845317731866>

## Career Intervention to Enhance Students' Career Maturity

- 10) Liu, S., Lu, A., Chen, X., Zhang, M., Liu, C., & Li, M. (2022). The relationship between self-consciousness and career decision-making self-efficacy in disabled and non-disabled people: Two moderated mediation models. *Psihologija*, 00, 14–14. <https://doi.org/10.2298/psi210403014l>
- 11) Marciniak, J., Johnston, C. S., Steiner, R. S., & Hirschi, A. (2022). Career Preparedness Among Adolescents: A Review of Key Components and Directions for Future Research. *Journal of Career Development*, 49(1), 18–40. <https://doi.org/10.1177/0894845320943951>
- 12) Panduan Pelayanan Bimbingan Karir. (2011). International Labour Office-ILO.
- 13) Periantalo, J. (2017). Uji validitas konstruk Tes Minat Indonesia melalui aspek minat ilmu psikis. *Psycho Idea*, 15(1), 9–17. <https://doi.org/10.30595/psychoidea.v15i1.2234>
- 14) Puebla, J. N. (2022). Career Decisions and Dilemmas of Senior High School Students in Disadvantaged Schools: Towards the Development of A Proposed Career Guidance Program. *International Journal of Multidisciplinary: Applied Business and Education Research*, 3(5), 888–903. <https://doi.org/10.11594/ijmaber.03.05.15>
- 15) Savickas, M. L. (2001). Developmental Perspective on Vocational Behavior: Career Pattern, Saliency, and Themes. *International Journal for Educational and Vocational Guidance.*, 1(1), 49–57. <https://doi.org/doi:10.1023/A:1016916713523>
- 16) Sharf, R. S. (2016). *Applying Career Development Theory To Counseling*. Brooks Publishing Company.
- 17) Szabo, A., & Parkin, A. M. (2001). The psychological impact of training deprivation in martial artists. *Psychology of Sport and Exercise*, 2(3), 187–199. [https://doi.org/10.1016/S1469-0292\(01\)00004-8](https://doi.org/10.1016/S1469-0292(01)00004-8)
- 18) Uhre, C. F., Uhre, V. F., Lønfeldt, N. N., Pretzmann, L., Vangkilde, S., Plessen, K. J., Glud, C., Jakobsen, J. C., & Pagsberg, A. K. (2020). Systematic Review and Meta-Analysis: Cognitive-Behavioral Therapy for Obsessive-Compulsive Disorder in Children and Adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 59(1), 64–77. <https://doi.org/10.1016/j.jaac.2019.08.480>
- 19) Usmaedi. (2021). Education Curriculum for Society 5.0 to The next Decade. *Jurnal Pendidikan Dasar Setiabudhi*, 4(2), 63–79.
- 20) Wibowo, M. eddy. (2015). *Panduan Pelayanan Bimbingan Karir Mahasiswa*. International Labour Office. [www.ilo.org/publns](http://www.ilo.org/publns)
- 21) Winkel, W. S., & Hastuti, S. 2004. B. K. di I. P. Y. M. A. (2004). *Bimbingan Karir di Institusi Pendidikan*. Media Abadi.
- 22) Zhao, L., Chang, S., & Tang, H. (2022). An Analysis of the Structural Relationships Among Parental Attachment, Basic Psychological Needs, Career Identity and Depression of Chinese College Students in Korea. *Psychology Research and Behavior Management*, 15(July), 1721–1730. <https://doi.org/10.2147/PRBM.S357837> .



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## Problems Encountered in the Implementation of the Citizen's Charter: The Case of 4<sup>th</sup> District, Camarines Sur, Philippines



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**ABSTRACT:** Stakeholders' feedback is one contributing factor in the attainment of an organization's objectives. It clearly identifies strengths and weaknesses and other corrective measures to improve the implementation of public policies and programs. The study delved into the problems encountered in the implementation of the Citizen's Charter and recommendations for the improvement of its implementation in the 4th District, Camarines Sur, Philippines. Using thematic analysis, three themes were generated from forty-five (45) interviewees composed of frontline service providers and users from the Local Treasury, Business Permit and Licensing Office, and Engineering Office of LGUs Tigaon, Goa, and Lagonoy, Camarines Sur. These themes are 1) Knowledge/Attitude, 2) Clarity of procedures/flow of transactions, and 3) Structural barriers. Specifically, the findings revealed that service users are not aware of the Citizen's Charter, lack understanding of its purpose and procedures, the procedures in the Citizen's Charter are not followed during actual transactions, there are delays in the flow of transactions, problems in the queuing system, and structural designs hamper the clearness of instructions from the frontline service providers. The study recommends that LGUs, CSC, and other line agencies sternly monitor the Citizen's Charter implementation vis-à-vis, conduct awareness programs and capacity building, implement procedural innovations, address structural barriers, and conduct continuous research and extension activities of academic and field practitioners.

**KEYWORDS:** Social Sciences, Problems, Citizen's Charter, Thematic Analysis, Philippines

### INTRODUCTION

Section 6 of Republic Act No. 11032 otherwise known as the Ease of Doing Business for Efficient Government Service Delivery Act of 2018, states:

*All government agencies including departments, bureaus, offices, instrumentalities, government-owned and/or controlled corporations, or LGUs shall set up their respective most current and updated service standards to be known as the Citizen's Charter in the form of information billboards which shall be posted at the main entrance of offices or at the most conspicuous place, in their respective websites and in the form of published materials written either in English, Filipino or in the local dialect, that detail: (a) A comprehensive and uniform checklist of requirements for each type of application or request; (b) The procedure to obtain a particular service; (c) The person/s responsible for each step; (d) The maximum time to conclude the process; (e) The document/s to be presented by the applicant or requesting party, if necessary; (f) The amount of fees, if necessary; and (g) The procedure for filing complaints.*

The use of Citizen's Charter was first developed in the United Kingdom (Saguin, 2013; Spark, 2016 Vol.9, Issue 4). First known as RA 9485 in the Philippines to improve government service delivery, reduce bureaucratic red tape and prevent graft and corruption. It was later repealed by RA 11032 or the Ease of Doing Business for Efficient Public Service Delivery Act of 2018. It aims to improve services by re-engineering, simplifying requirements and procedures, and promptly responding to the needs of the public.

According to Gabriel (2018), there are three core components of ARTA namely, (1) the Citizen's Charter which is the benchmark of performance to know the standard of service that the clients can demand from their service providers; (2) Frontline Services where the public can access the government service and (3) Report Card Survey (RCS) which serves as a feedback mechanism that measures the quality of service of the agency. These three core components of ARTA were also present in the amended law.

Citizen's Charter is an effort made by public organizations to inform their clients/users of their service types, standards, and time frame of receiving particular service and introduce a complaint procedure to let the users complain if service is not

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provided according to the stipulated time without any real explanation. It plays an important role in providing public services, conceived as the most effective tool for implementing New Public Management (NPM) values. (Ullah & Rahman, 2018).

The Citizen's Charter also serves as a pledge of commitment between the agency and the citizens, both with reciprocal obligations—the government to fulfill its duties in the delivery of frontline services and the citizens to comply with the requirements to expedite the transaction (Calina, 2015).

However, despite the presence of law which criminalizes acts of bribery, extortion, abuse of office, and conflict of interest, the legislative framework is still inadequate to improve service delivery (GAN, 2017; Romero, et al., 2019). A myriad of problems was identified in the implementation of the Citizen's Charter.

Del Mundo (2022) revealed that problems encountered in availing frontline services by 93 teachers and staff at Nueva Vizcaya State University are *reasonably serious*. This includes: The personnel did not meet the maximum time to finish requests, the awareness campaign to educate clients about the Charter was not conducted systematically, the standards/time norms of services mentioned in the Citizen's Charter were either too lax or too tight, and were, therefore, unrealistic and created an unfavorable impression on the clients. Nineteen of the teachers also mentioned that the frontline service providers are not courteous and helpful. Huque & Ahsan (2016) found that the implementation of the Citizen's Charter in Bangladesh had minimal impact due to a poor publicity campaign that resulted in low awareness among the citizens, a person-centered approach to service delivery in local councils, and apathy and lack of interest among stakeholders. A top-down approach adopted in formulating the charter further contributed to its ineffectiveness of the charter. The study also revealed that citizens found it difficult to access services and were dissatisfied with their quality. While some of the problems were attributed to the performance of public officials, implementation failures made the initiative ineffective.

Compliance with the Citizen's Charter was not also consistent with the principles of New Public Management and charters. The CC was developed with the absence of stakeholder involvement with varying levels of compliance, inconsistencies of information provided in the CC, and lack of innovation and customization on the part of LGUs in terms of content and form (Saguin, 2013).

Moreover, employee behavior towards clients was one of the most felt problems in the implementation of the Citizen's Charter at Western Philippines University, Aborlan, Palawan. Continued information campaigns, hastening of the processes, employees' adherence to the norms of conduct, strengthening of feedback and redress mechanism, and improvement of the basic facilities were the recommendations of the study (Limsa, et al., 2022)

Seven factors affect the implementation of the Citizen's Charter in Iranian State Agencies, these are 1) the level of development and awareness of citizens, 2) employees' willingness and organizational strength, 3) citizens' trust in governmental resources and supportive policies, 4) network and infrastructure of appropriate institutional culture, 5) culture of ambiguity avoidance, power distance, and leadership commitment, 6) citizenship rights, 7) complexity of laws and motivation of government officials (Pedroud, et al., 2022).

The above situations are not different in local government units. In fact, for seven years, local government units received the most accusations of corruption based on the Finance and Management Ombudsman's findings (FMIO). A total of 3,189 complaints were made against local government unit officials in 2017, then 939 complaints against the Philippine National Police (PNP), 310 Department of Education employees, and 184 from the Department of Environment and Natural Resources, 117 complaints against officials from state universities and colleges. All the grievances brought up against the staff of the aforementioned agencies were both administrative and criminal in nature (Antiporda, 2018; Romero, et al., 2019).

"People in the government are generally and unfairly treated as crooks, slow in the delivery of services, inefficient and corrupt. Making the situation worst is the inadequate citizen engagement in public affairs and the inherently complex built-in procedures in the public offices which slow down the process of transactions in the government" (Ong & Gabriel, 2018). Therefore, it is imperative to involve stakeholders in the formulation of the Citizen's Charter. The stakeholders know the drawbacks of the service providers and vice-versa. Feedback from both is important. The legislative bodies should consider the issues in the implementation of the same.

Initiating reforms to change the administrative system based on the purpose of the legal framework is not easy and cannot be resolved overnight, especially in a political system like the Philippine bureaucracy. It is important to strengthen the implementation and monitor the law, likewise, involving citizens in the policy-making process, which includes monitoring and evaluation of the policy.

This study delved into the 1) problems encountered in the implementation of the Citizen's Charter and 2) recommendations to strengthen the implementation of the Citizen's Charter in the 4<sup>th</sup> District, Camarines Sur, Philippines



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## METHODOLOGY

The study is descriptive-evaluative. Forty-five (45) frontline service providers and users from the frontline offices of LGUs Tigaon, Goa, and Lagonoy, Camarines Sur, Philippines were interviewed using a semi-structured interview guide. The purposive sampling technique was used in choosing the service providers, while convenience sampling was used in choosing the service users. Thematic analysis was used in analyzing the responses to the problems encountered by both the service providers and users. From the themes generated, the researcher crafted the policies for the improvement of the implementation of the Citizen's Charter. The data gathering was conducted for fifteen days in July 2022.

## RESULTS AND DISCUSSIONS

This section presents the discussions of the study. Works of literature affirm as well in the findings of the study. **Figure 1. Problems Encountered in the Implementation of the Citizen's Charter** The problems encountered in the implementation of the Citizen's Charter were generated using interviews. The problems were clustered into three themes: 1) knowledge and attitude, 2) clarity/flow of transaction, and 3) structural barrier.



**Figure 1. Problems Encountered by the Frontline Service Providers and Users in the Implementation of the Citizen's Charter**

Three themes were verbalized after the interview. First is knowledge and attitude. Clients do not read the Citizen's Charter and unfortunately are unaware of the same. They still ask the staff or frontline service providers about the procedures and steps for a specific transaction because they do not know it. One key personnel when asked during the interview was not certain where the CC was placed. Below are some excerpts,

*"siguro sa main building, recently kaya binagyo kaya dae pa naaayos, pero usually nakalaag sa main building."*  
(Maybe at the main building, recently, a typhoon hit the area which is not yet fixed, but the CC is usually placed at the main building. (Key Personnel 1)

Other key personnel said,

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*"Clients do not read the CC; they are not aware of the CC; neither they understand it." (Key personnel 2)*

*"Clients usually ask the staff about the procedures, requirements, fees, etc. because they do not know the CC." (Key Personnel 3)*

Conversely, there is a disparity between the key personnel and the client's responses. Here, the second theme emerged which is the clarity/ flow of the transaction. Some clients professed,

*"grabe sanang kamag-kamag" (They rush the transaction, they do not attend to clients one at a time). (Client 1)*

*"We do not understand the information on the CC because it is written in English." (Client 2)*

*"Unarranged documents cause a delay in the transaction." (Client 3)*

*"There is a problem with the queuing system; the line is long." (Client 4)*

*"The procedures in the CC are not followed during the actual transaction." (Client 5)*

Moreover, another theme emerged which is the structural barrier. The design of the transaction windows hampers the clarity of the information by the frontline service provider or staff. *"Dae mi nadandangog na maray ang instructions ta may nakaulang na plastic sa bintana"* (The clients cannot hear the instructions by the staff well because the window is blocked by a plastic cover in compliance with IATF and health protocols). This was placed during the peak of the Covid pandemic.

The problems mentioned above were also evident in Nayem (2010) who focused on the problems of implementing the Citizen Charter in the Upazila Land Office. The study revealed that after two years of its existence, implementation was very low. All services were not reflected in the charter; thus, political executives do not have the initiatives to improve the same. The staff and officials are not fully aware of the CC. The citizens are totally ignorant about the CC initiatives.

Similarly, De Leon (2009) also confirmed that some information was not reflected in the CC of the Bureau of Customs Port of Clark and the Clark Development Corporation. The procedures for filing complaints, allowable extension periods for unusual circumstances, and contact numbers for giving feedback were the problems in the study areas.

Ua-O (2022) further found that the improper posting of the Citizen's Charter needs to be addressed by the National Labor Relations Commission-Regional Arbitration Branch 10.

### RECOMMENDATIONS TO STRENGTHEN THE IMPLEMENTATION OF CITIZEN'S CHARTER

After a thorough analysis of the themes generated from the interviews, the following are the recommendations that would help local legislative bodies formulate policies to strengthen the implementation of the Citizen's Charter:

1. LGUs must update the information requirements on the Citizen's Charter in accordance with the mandates of RA 11032.
2. The local chief executives (LCEs) through the Human Resource Management must require each frontline office to post the Citizen's Charter in front of their office or in conspicuous places, prepared in billboard or poster size using Filipino or local dialect.
3. LGUs must conduct more capacity-building and awareness activities on the implementation and purpose of the Citizen's Charter to the stakeholders, specifically, the service users and frontline service providers.
4. Line agencies such as the Civil Service Commission (CSC) and the Department of the Interior and Local Government (DILG) must regularly conduct an ocular audit on the implementation of the Citizen's Charter. The audit findings must not only serve as a report or a piece of paper but be the bases for interventions in improving such implementation.
5. Academic Institutions should spearhead more need-based extension projects to the LGUs, specifically, the frontline service providers and users.

### CONCLUSIONS AND RECOMMENDATIONS

Problems in the implementation of the Citizen's Charter are evident in the locale of the study. The same must be properly addressed with innovations and customization so as not to deviate from the service standards mandated by law. The CC must not only be implemented for compliance but should serve its purpose by re-engineering, simplifying requirements and procedures, reducing bureaucratic red tape, and promptly responding to the needs of the public. The local legislators must consider the recommendations generated from this study to improve the implementation of the Citizen's Charter.

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### REFERENCES

- 1) Ahsan, A.H.M & Huque, Ahmed. (2016). Citizen's Charter and Implementation Failure: Performance of Local Councils in Bangladesh. *Public Administration and Policy An Asia-Pacific Journal*. 19. 6-22.
- 2) De Leon, Patrick C., (2009). Assessing the Citizen's Charter Formulation and Implementation at the Bureau of Customs Port of Clark and the Clark Development Corporation. University of the Philippines Open University. *Journal of Management and Development Studies*. Retrieved from: [https://jmds.upou.edu.ph/wp-content/uploads/2020/03/Vol5\\_1-DeLeon\\_Abstract.pdf](https://jmds.upou.edu.ph/wp-content/uploads/2020/03/Vol5_1-DeLeon_Abstract.pdf)
- 3) Limsa, M.D, Gabileo, E.C. & Olano, R.G. (2022). IMPLEMENTATION OF CITIZEN'S CHARTER IN WESTERN PHILIPPINES UNIVERSITY, ABORLAN, PALAWAN. *European Journal of Humanities and Educational Advancements*, 3(4), 70-87. Retrieved from <https://scholarzest.com/index.php/ejhea/article/view/2113>
- 4) Nayem, Z. (2010) Problems of Implementing Citizen Charter: A Study of Upazila Land Office (A.C Land Office). Master in Public Policy and Governance, Department of General and Continuing Education North South University, Dhaka. Retrieved from [http://www.northsouth.edu/newassets/files/ppg-research/ppg-1st-3rd-batch/119\\_Zannat\\_Citizen%20charter.pdf](http://www.northsouth.edu/newassets/files/ppg-research/ppg-1st-3rd-batch/119_Zannat_Citizen%20charter.pdf)
- 5) Ong, D.U. & Gabriel, A.G. (2018). Linking Transparency and Accountability to Local Legislative Performance in the Province of Nueva Ecija in the Philippines. *Journal of Public Administration and Governance* ISSN 2161-7104 2018, Vol. 8, No. 2. URL: <https://doi.org/10.5296/jpag.v8i2.13345>
- 6) Pedroud A, Memarzadeh Tehran G, Alimoradi M. Identifying and Prioritizing Factors Affecting the Implementation of the Citizen's Charter in Iranian State Agencies. *JMDP* 2022; 35 (2) :3-28 URL: <http://jmdp.ir/article-1-4361-en.html>
- 7) Perante-Calina, L. E. (2015). Citizen's Charter: An Assessment of Contributions to Frontline Service Delivery. *Philippine Journal of Public Administration*
- 8) RA 11032 Ease of Doing Business for Efficient Government Service Delivery
- 9) RA 11032 Ease of Doing Business for Efficient Government Service Delivery
- 10) Romero, Mary Jane, et al. (2019). Degree of Observance of Ease of Doing Business and Efficient Government Service Delivery Act in the Department of Education in Nueva Ecija in the Philippines. *Journal of Public Administration and Governance*. ISSN 2161-7104 2019, Vol. 9, No. 1. doi: 10.5296/jpag.v9i1.14238 URL: Retrieved from: <https://doi.org/10.5296/jpag.v9i1.14238>
- 11) Saguin, K. (2013). Critical challenges in implementing the citizen's charter Initiative: Insights from selected local government units. *Philippine Journal of Public Administration*, 57(1).
- 12) Ua-O, Amor. (2015). Implementation of the Anti-Red Tape Act of 2007 by the National Labor Relations Commission-Regional Arbitration Branch 10. *IAMURE International Journal of Social Sciences*. 13. 10.7718/ijss.v13i1.
- 13) Ullah, Md. W, & Rahman, A. (2018). Effectiveness of Citizen's Charter in Public Service Delivery: A Study on Trishal Municipality and Boilor Union Parishad. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)* Volume 23, Issue 10, Ver. 3 (October. 2018) 66-71 e-ISSN: 2279-0837, p-ISSN: 2279-0845. [www.iosrjournals.org](http://www.iosrjournals.org)



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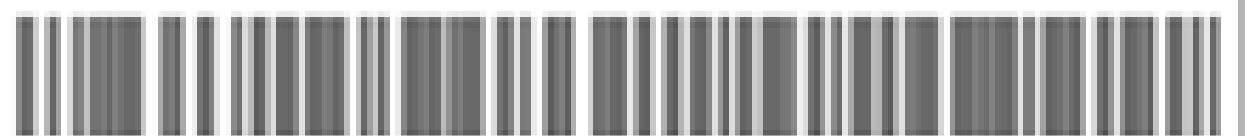
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