

Teachers' Global Preparedness and Learners' Mathematics Performance



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ABSTRACT: Teachers must acquire new skills beyond traditional methods to equip students for the evolving job market and technology, particularly in Mathematics. This study aimed to determine the level of teachers' global preparedness, learners' Mathematics, and the relationship between the teachers' global preparedness to the learners' Mathematics performance. The study employed a descriptive-correlational research design with documentary analysis. It utilized a universal sampling technique to get the 140 teacher-respondents. Descriptive statistical techniques such as Frequency, Percentage, Mean, Standard Deviation, and Pearson Product Moment Correlation Coefficient were used to evaluate and interpret the data from a researcher-made questionnaire which was validity and reliability tested. Results showed that teachers' global preparedness was Highly Prepared while the learners' Mathematics Performance was registered High. Significant positive correlation was established between teachers' global preparedness and learners' Mathematics performance specifically with Learning and Innovation skills. It can be concluded that teachers and students alike, are globally competitive. Thus, it is recommended that continuous training programs aimed at enhancing students' performance through global preparedness and specific interventions should be sustained.

KEYWORDS: global preparedness, learning and innovations, mathematics performance

I. INTRODUCTION

Educators today face a lot of challenges, from adapting to ever-changing educational trends and technologies, to feeling stretched thin with limited resources. Teachers face numerous hurdles. Proficiency gaps and technical difficulties add to the pressure, while a lack of professional development opportunities can hinder their ability to stay ahead of the curve.

Teachers are the bedrock of the education system. Educators ignite inspiration in every classroom, serving as the beacon for endless possibilities and shaping the bright futures of those who will construct the nation's aspirations. Numerous dreams began within classroom walls, and many were sparked by the passion of teachers (Duterte, 2023). Teachers' influence on the lives of children is profound and immeasurable. They possess the extraordinary power to instill inspiration, motivation, and encouragement in their learners, enabling them to recognize and realize their full potential.

Teachers' proficiency affects how effective their lessons are. Some scholars define students' achievement as a measure of a teachers' effectiveness. Since teachers have a wide-ranging impact, it can be difficult to identify what results could show their efficacy and how to quantify them (Stronge, 2018). By investing in teachers, everyone invests in the future of the country. They assist educators in guiding students to develop into highly skilled and competitive graduates, prepared to succeed in a constantly evolving global environment by equipping them with essential skills and support. In today's fast-paced world, people live in a continuously changing society, technologically driven and influenced greatly by social media. Hence, the internet has opened up avenues, for communication and knowledge sharing. This necessitates the development of global preparedness to keep up with society's changing expectations. Thus, the educational system needs to launch various reforms to improve education quality and excellence (Varghese et al., 2021). The success and unity of society need to focus on the development and enhancement of teachers' skills and abilities. This can be accomplished through education and continuous learning. These elements have an impact, on driving prosperity and improving well-being (World Economic Forum, 2020). This highlights the crucial role of teacher development in driving prosperity and improving well-being, ultimately contributing to a society's success and unity. By prioritizing the continuous learning and skill development of educators, every individual can empower learners to reach their full potential, drive prosperity, and build a brighter future for all.

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As the world keeps changing, the skills required for teachers to be successful are continuously developing. Previously, educators might have relied solely on their expertise in their subject and the capability to teach in a conventional classroom environment. However, in the modern landscape, teachers must effectively utilize technology, tailor their instruction to accommodate the diverse needs of all students, and work collaboratively with colleagues. (González et al., 2022). These concepts enable teachers to have a more in-depth and proficient discussion about the evolving landscape of teachers' effectiveness.

Teachers need new skills different from traditional methods such as the global preparedness. They must possess these skills to prepare learners for the ever-evolving job market and technological advancements, especially in the field of Mathematics. These abilities are categorized into three primary themes: skills related to innovation and learning and abilities, as well as skills in media, information, technology and life and career (Kalemkus et al., 2022).

In an increasingly interconnected world, teachers need to move beyond traditional methods and embrace skills for global preparedness. This includes fostering cultural understanding, developing digital literacy, and equipping learners with the critical thinking skills to navigate a complex global environment.

The current situation regarding teachers' global preparedness reveals a significant mismatch between the requirements of modern education and the training that educators typically receive. Many teachers feel unprepared to navigate the complexities of contemporary classrooms, especially when it comes to integrating technology, promoting cultural awareness, and meeting the varied needs of learners in a globalized world. Despite meaningful advancements in educational technology and teaching strategies, opportunities for professional development often fall short, leaving teachers struggling to adapt to the swift changes in education. This disconnect emphasizes the critical need for comprehensive training programs that not only strengthen teachers' knowledge in their subject areas but also cultivate essential global skills. By prioritizing teachers' global preparedness, they can foster capable and adaptable learners who are well-equipped to succeed in our diverse and ever-changing environment.

Hence, this research aimed to determine the relationship between teachers' global preparedness and learners' Mathematics performance. By offering insightful analysis and potential solutions, the researcher hoped to contribute to a future where teachers feel empowered and their unique skills are valued, ultimately leading to improved educational outcomes for all.

This study's framework was Vygotsky's Sociocultural Theory of learning as cited by Mcleod (2022), which means that students learn best when they actively participate in educational activities with classmates, teachers, or family members. Vygotsky's zone of proximal development (ZPD) was relevant in this study because it distinguishes between what learners can achieve alone and what they can do with the assistance of a more competent person, such as their teachers. To produce globally competitive learners, teachers' global preparedness shall be developed so can help their learners to learn more effectively and to reach their full potential.

However, this research highlights how several key factors contribute to fostering global competencies in Mathematics education. Building on Vygotsky's idea of collaborative learning which emphasized the importance of teachers being well-prepared to guide Learners from diverse backgrounds.

Studies from Cushner et al. (2022) examined the relationship between teachers' intercultural competence and their ability to foster global perspectives in Mathematics education. This suggested that culturally competent teachers are better at creating Mathematics classrooms that are welcoming and engaging for learners from all backgrounds, which can help learners develop a more global understanding of mathematics.

Moreover, Chen et al. (2023) explored how teachers' effective technology integration in Mathematics classrooms can enhance Learners' global skills. Their study suggests that when technology is used effectively, it can connect learners to diverse perspectives and real-world problems across borders, enhancing their understanding of different cultures and their applications in Mathematics. This means that a tech-savvy Mathematics teacher can open doors for learners to develop crucial global competencies through their learning.

Similarly, Borko et al. (2023) connected teachers' own learning and innovation skills with their ability to promote similar skills in their learners' Mathematics learning. This study explores how teachers who prioritize their own creative and innovative skills in learning also tend to create Mathematics classrooms that spark these same qualities in their learners. They found that professional development programs that encourage teachers to experiment and embrace fresh approaches in their own learning empower them to do the same for their learners, fostering a classroom environment where Mathematics becomes a playground for exploration and invention. This suggests that nurturing a teacher's own innovative spirit can ripple outwards, igniting similar sparks in their learners' Mathematics journeys.

However, Martin et al. (2022) argued that teaching Mathematics through a culturally responsive lens, which values and integrates learners' diverse backgrounds and experiences, can be a powerful tool for nurturing global competencies. By creating classrooms that celebrate different Mathematics perspectives and connect Mathematics to real-world contexts across cultures. Learners develop broader understanding, critical thinking skills, and empathy, all key ingredients for navigating a globalized world.

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These theories were relevant to this study since the independent variable is the teachers global preparedness specifically on innovation and learning abilities, as well as skills in media, information, technology, and life and career.

II. METHODOLOGY

This study utilized a descriptive-correlational with content analysis to determine the relationship between teachers' global preparedness and learners' Mathematics performance. The study employed surveys and potentially existing school records to gather data from a representative sample of teachers and learners. In this approach, the researcher refrained from interfering with the variables or phenomena being studied.

A technique for examining the relationship between two or more variables without changing them is descriptive-correlational research. Instead of proving causality, it seeks to explain the relationships between these factors and offer insights into their correlations. (Adi Bhat, 2023). On the other hand, documentary analysis is a qualitative research method that systematically examines documents to derive insights related to a specific research question or social phenomenon. It has become increasingly popular for analyzing various materials, such as textual documents, images, audiovisual content, and digital media (Bowen, 2021).

The following statistical treatment were utilized to analyze the data of the study. In Problem 1, Mean and Standard Deviation was used to showcase the teachers practices on global preparedness. Meanwhile, in Problem 2, Frequency and Mean percentage were used to determine the level of students' Mathematics performance. Finally, Pearson Product Moment Correlation Coefficient was used in Problem 3 to analyze the significant relationship between Teachers' Global Preparedness and Learners' Mathematics Performance.

III. RESULTS AND DISCUSSION

Problem 1. What is the level of teachers' global preparedness in terms of:

- 1.1 information, media and technology skills
- 1.2 learning and innovation skills, and
- 1.3 life and career skills?

Table 1 exhibits the overall teachers' global preparedness. It registered an overall Mean of 4.46 and SD=0.56 described as Always and interpreted as Highly Prepared. This implies that the teachers achieved the highest level of global preparedness. This means that the teachers can compete with their foreign counterparts in terms of learning, teaching and even in utilizing technologies that are widely used abroad. Being well trained to international standards is a big factor to the teachers' part as they can also apply for job opportunities abroad. Moreover, on the learners' part they can also get an assurance that what they learn at school prepares them to be a globally ready and competitive person as well. (Owens, 2022) Achieving the highest level of global preparedness establishes a cyclical relationship between teachers and learners. Skilled teachers inspire and prepare students for global challenges, while well-prepared students validate and enhance the effectiveness of teaching practices.

Table 1: Overall Teachers' Global Preparedness

Variables	Mean	SD	Description	Interpretation
Learning and Innovation Skills	4.51	0.56	Always	Highly Prepared
Information, Media, and Technology Skills	4.34	0.57	Always	Highly Prepared
Life and Career Skills	4.54	0.54	Always	Highly Prepared
Overall Mean	4.46	0.56	Always	Highly Prepared
Note:	4.21 – 5.00 Highly Prepared 3.41 – 4.20 Prepared 2.61 – 3.40 Moderately Prepared 1.81 – 2.60 Less Prepared 1.00 – 1.80 Not Prepared			

In the same table, the variable *Life and Career Skills* was rated-highest with the score of 4.54 and SD=0.54 described as Always and interpreted as Highly Prepared. This suggests that educators recognize the relevance of teaching life and job skills as they may teach them to students who are still in the learning and development stage. These skills will help the Learners learn the practical, effective and efficient things to do in order to cope up with the challenges in life. It will make them stronger in facing their struggles in life. (Bradley, et. al., 2023) The emphasis teachers place on life and career skills significantly impacts their students' development. By fostering a learning environment that prioritizes these essential skills, educators contribute to the formation of well-rounded people who are equipped to handle life's challenges with confidence and competence.

According to Johnson et. Al. (2018), improving relationships leads to a happier atmosphere and better results. Learners are motivated to express themselves and complete their assignments in this type of setting because they understand that they

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will support one another in completing and resolving these kinds of chores. Positive relationships also foster a link that is compassionate and caring for one another.

Meanwhile, variable *Information, Media and Technology Skills* was rated-lowest with the Mean score of 4.34 with SD=0.57 described as Always and interpreted as Highly Prepared. This implies that there are still aspects on these skills that the teachers need to master. In the field of technology wherein changes are rapid the teachers sometimes face challenges adjusting and learning its concepts and usage. Thus, teachers oftentimes participate in trainings and seminars to abreast themselves with these new trends. (West, et. al., 2024) Through these professional development opportunities, educators can gain insights into cutting-edge technologies, instructional strategies, and assessment methods that leverage digital tools.

According to Abella et al. (2023), teachers' abilities to fully utilize the functionality of different applications and technology are still developing. It is imperative that they receive training and seminars aimed at supporting them, as there are instances where pupils possess more technological and internet navigation skills than teachers. For learners to adapt and become proficient with modern tools, teachers need to be receptive to them.

Problem 2. What is the learners' level of Mathematics performance in SY 2022-2023?

Table 2 :Learners' Mathematics Performance

Range	Frequency	Percentage	Mean & SD	Interpretation
90% - 100%	107	24	87.92 (2.32)	High
85% - 89%	130	29		
80% - 84%	156	35		
75% - 79%	54	12		
74% & below	0	0.00		
Total	447	100.00		
Note:	90% – 100% Very High	85% - 83% High	80% – 84 % Moderately High	
	75% – 79% Low	74% and below Very Low		

Table 2 showcased the learners' Mathematics performance. It registered an overall Mean of 87.92 with SD=2.32, described as Very Satisfactory and interpreted as High. Majority of the learners or 156 at 35% of the learners got the performance at moderately high level while there are still few of the learners or 54 at 12% that were at low performance level. This data imply that the performance of the learners is not concentrated in a particular level which means that there are learners that are able to achieve the highest level while there are also at the lowest level. Education must be equally distributed and shared by the Learners. Therefore, the teachers must find ways and means to make sure that everyone will have better opportunities to learn and acquire knowledge and skills that will help them have equal opportunities and chances for work and other means of living (Morrison et al., 2024). Teachers should ensure that all students have the chance to acquire the skills and knowledge necessary for success in the workforce and in life.

Chuang et al. (2017) as well as Oco and Comahig (2023) stated that learners' performance not just in the field of Mathematics but in all subject areas is something that teachers and parents should always monitor. The mastery of various concepts is intertwined in terms of applying it to real life scenarios and challenges. Thus, learners must learn and master the concepts presented in different subjects as they can be useful in their daily living.

Problem 3. Is there a significant relationship between teachers' global preparedness and learners' Mathematics performance?

Table 3: Test of Correlation Between Teachers' Global Preparedness and Learners' Mathematics Performance

Variables	r- value	p-value	Level of Correlation	Description	Interpretation
Learning and Innovation Skills	0.518	0.001	Moderate Positive Correlation	Reject Ho	Significant
Information, Media, and Technology Skills	0.468	0.018	Weak Positive Correlation	Reject Ho	Significant
Life and Career Skills	0.443	0.023	Weak Positive Correlation	Reject Ho	Significant
Note:	1.00 Perfect Positive Correlation 0.50 – 0.69 Moderate Positive Correlation 0.00 – 0.09 No Positive Correlation				
	0.70 – 0.99 Strong Positive Correlation 0.10 – 0.49 Weak Positive Correlation Significant when computed p-value <0.05.				

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Table 3 shows the teachers' global preparedness and learners' Mathematics performance. It registered a computed p-value of 0.001 and a computed r-value of 0.518 for Learning and Innovation Skills. The calculated p-value is less than the significance level of 0.05. This suggests that when learning and innovation abilities were considered, a moderately favorable link was established between teachers' global preparedness and students' performance in Mathematics. Learning and innovation skills are essential in today's educational framework, as they enable both teachers and students to effectively navigate complex challenges and thrive in a rapidly changing environment. These skills include critical thinking, creativity, collaboration, and communication, allowing individuals to explore problems from diverse perspectives and develop innovative solutions. According to Reese (2024), fostering creative thinking is crucial for driving innovation, which can significantly enhance the ability of individuals to contribute positively to their communities. By emphasizing creativity, educators prepare students to face new challenges and adapt to evolving technologies and roles in the workforce.

Educators play a pivotal role in instilling learning and innovation skills in their students through engaging instructional approaches. Research by Morrison et al. (2024) suggested that teaching strategies incorporating real-world applications significantly boost student engagement and retention of knowledge. By creating collaborative projects and problem-based learning scenarios, teachers not only enhance academic performance but also promote a growth mindset among students. Furthermore, exposure to dynamic learning environments—where experimentation and collaboration are encouraged—helps students build resilience and adaptability, preparing them to tackle unexpected challenges with confidence. Hargreaves et. al (2023) emphasized that students who engage in innovative problem-solving develop a sense of agency that is critical for navigating life's complexities.

Hence, the cultivation of learning and innovation skills is vital for both educators and learners, equipping them with the necessary tools for success in an increasingly competitive world. As noted by De Zúñiga et al. (2017), these skills empower individuals to face life's challenges with confidence, providing them the knowledge and analytical abilities to formulate effective solutions. Through supportive teaching practices that inspire creativity and resilience, educators can prepare students to not only succeed academically but also to thrive in their future endeavors.

It recorded a computed r-value of 0.468 and a computed p-value of 0.018 for information, media, and technology skills. The calculated p-value is below the significance level of 0.05. This suggests that, when information, media, and technology skills are considered, a weakly positive association was established between teachers' global preparedness and students' mathematical performance. Information, media, and technology skills are critical for both teachers and learners in combating the pervasive issue of fake news in today's digital landscape. As highlighted by Aleid et al. (2021), one of the significant challenges in the modern information era is the rampant dissemination of misleading content and unverified data sources. It has become imperative for educators to possess the necessary skills to discern credible information from fake news, as these skills directly influence their ability to guide students in becoming responsible digital citizens. Training educators in media literacy not only enhances their own understanding but also empowers them to teach their students the importance of critical evaluation of information encountered online.

Teachers play an essential role in fostering a culture of media literacy within the classroom. As noted by Morgan et al. (2023), educators must actively incorporate discussions about digital citizenship and media literacy into their curricula, emphasizing the importance of verifying sources and recognizing bias in the information. They should engage students in activities that promote critical thinking, enabling them to assess the credibility of online content. This approach is vital as it equips students with the necessary tools to navigate the complexities of digital information and to understand their responsibilities as consumers and sharers of information.

Furthermore, the integration of media literacy education into the school system is increasingly recognized as essential for preparing students to participate fully in society. Research by Smith et al. (2024) indicates that students who receive instruction in media literacy demonstrate improved skills in identifying fake news and understanding the ethical implications of sharing information online. By learning to critically evaluate sources, students not only enhance their academic performance but also become more informed citizens capable of engaging thoughtfully in public discourse. The involvement of community resources, such as local libraries and media organizations, can further enrich this educational experience, providing students with a diverse range of perspectives and practical insights into the significance of media literacy in today's world.

It recorded a computed r-value of 0.443 and a computed p-value of 0.023 for Life and Career Skills. The calculated p-value is below the significance level of 0.05. This suggests that, when considering life and career skills, a weakly positive association was established between instructors' global preparation and students' success in Mathematics.

The significance of life and career skills in education cannot be overstated, as these skills provide students with essential knowledge and competencies necessary for thriving in both personal and professional contexts. Equipped with these skills, students are better prepared to navigate challenges, adjust strategies, and take proactive actions towards achieving their goals.

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The development of these capabilities contributes not only to individual resilience but also to enhancing overall academic performance and employability in an increasingly competitive job market.

Jamael et al. (2023) asserted that teachers play a crucial role in guiding students through the career exploration process, as they are often the first to observe and understand each student's strengths and potential within the classroom environment. This insight allows educators to help students align their career aspirations with their unique skills and interests, thus facilitating the path to fulfilling and satisfying career choices. When students embark on careers suited to their personal attributes, they are more likely to experience job satisfaction and a sense of fulfillment. Conversely, students who fail to make informed career choices may find themselves in roles that do not align with their skills or passions, leading to decreased job satisfaction and overall life dissatisfaction.

Recent research has highlighted the impact of life and career skills education on student outcomes. Incorporating life skills into the curriculum prepared pupils to successfully navigate real-world obstacles, according to Talbot (2024). Skills such as problem-solving, communication, and adaptability are foundational for students, enabling them to respond to workplace demands and societal expectations efficiently. Likewise, Daniels (2023) found that students who engage in structured career guidance and planning are better positioned to make informed career decisions, leading to improved educational attainment and long-term career success.

Additionally, incorporating career readiness programs into the school curriculum fosters a comprehensive approach to student development. Research from the National Center for Education Statistics (2023) illustrated how effective career pathways and readiness programs significantly contribute to students' preparedness for post-secondary education and professional life. By emphasizing skill development and offering practical experiences, students gain a clearer understanding of their potential career paths, equipping them with the necessary tools to adapt in a constantly evolving job market.

Hence, life and career skills are essential components of modern education that equip both teachers and learners to confront challenges with confidence. The guidance provided by educators in aligning students' skills and aspirations with suitable career options is invaluable, affecting long-term satisfaction and success. Therefore, it is imperative for educational institutions to prioritize the development of these skills alongside traditional academic knowledge.

IV. CONCLUSIONS

In the light of the above-cited findings, the following conclusions are drawn from the study:

1. Teachers upgrade and abreast themselves to current trends. Besides, trainings are given to them in order to be updated with the 21st century skills.
2. It can be highlighted that the effectiveness of the teaching strategies is in place and teachers have their foundational skills acquired which could be attributed to teachers' high level of global preparedness.
3. Teachers' sophistication of 21st century skills radiates to the learners' Mathematics performance.

V. RECOMMENDATIONS

Based on the above findings and conclusions, the following recommendations are presented:

1. School heads should foster active and on-going collaborative expertise sessions emphasizing the integration of technology into the classroom to enhance teacher's Information, Media, and Technology Skills such as workshops on educational software, digital tools for assessment, and effective online teaching strategies will be enhanced further.
2. Teachers and school heads may collaborate to maintain high grades of learners Mathematics performance like developing effective Mathematics intervention programs such as enhancement and enrichment activities, tutoring programs, mentoring partnerships and differentiated instruction strategies.
3. School heads may establish collaborative learning communities or peer mentoring programs where teachers can share best practices, resources, and experiences in integrating technology and innovating teaching methods, thereby enhancing their pedagogical strategies and supporting each other's growth such as during Learning Action Cell (LAC) Sessions.

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