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Teachers' Pedagogical Competence and Technological Skills in Relation to Learners' Performance in Mathematics

Rica Orong Boquecosa
Graduate School, Misamis University, Philippines

***Abstract*—** Teacher's pedagogical competence and technological skills are important to prepare learners effectively for a continuously changing global context. The study determined the level of the teacher's pedagogical competence and the level of teachers' technological skills in relation to the learners' performance in Mathematics. It was conducted in three secondary schools in the Division of Misamis Occidental during the School Year 2024-2025. The descriptive-correlational design was used in the study. There were 120 STEM students chosen through stratified random sampling were the respondents of the study. The researcher-made Teachers' Pedagogical Competence Questionnaire and Teachers' Technological Skills Questionnaire were used as research instruments. Documentary analysis was made to determine the learners' academic achievement. Frequency and Percentage, Mean, Standard Deviation, and Pearson Product-Moment Correlation Coefficient were used as statistical tools in analyzing the data gathered. Results revealed that the teachers were highly competent in pedagogy and were very skillful in technology. The learners' academic achievement was generally very satisfactory. In terms of pedagogical competence, only assessment and feedback impacts learners' performance in Mathematics. The level of technological skills was not influential to the learners' performance in Mathematics. Regardless of the teachers' technological skills, the learners could excel academically. Teachers may explore strategies that can help learners reach their maximum potential.

***Keywords*—** academic performance, mathematics education, pedagogical competence, technological skills.

I. INTRODUCTION

Academic performance remains a fundamental indicator of educational quality, demanding concerted efforts across various levels of the education system (Kamran et al., 2022). In Mathematics, learners' performance encompasses their capacity to comprehend, apply, and demonstrate mathematical concepts, problem-solving skills, and logical reasoning (Oco & Sabasaje, 2023). However, student achievement in Mathematics is influenced by multiple interconnected factors, including teacher competence, instructional practices, learning resources, motivation, and the integration of technology (Abalde & Oco, 2023; Capuno et al., 2019). Strong performance in Mathematics is also associated with enhanced critical thinking abilities and improved prospects for success in STEM-related pathways (Hacioglu & Gulhan, 2021).

Teachers' pedagogical competence, defined as their ability to design, implement, and assess instruction effectively, plays a pivotal role in shaping student learning outcomes (Jacob et al., 2020). This competence encompasses content mastery, application of research-based strategies, effective classroom management, and adaptive lesson delivery tailored to diverse learner needs (Fakhrutdinova et al., 2020). Similarly, technological competence—referring to teachers' ability to integrate digital tools into instruction—has been shown to foster interactive, student-centered learning experiences that enhance engagement and support academic success (Salleh et al., 2021; Evans, 2021). Despite these benefits, challenges such as limited confidence or expertise among educators still hinder the effective utilization of educational technologies, especially in Mathematics (Akram et al., 2022).

Globally and locally, Mathematics continues to pose significant learning challenges. In the Philippines, for instance, the 2022 Programme for International Student Assessment (PISA) ranked the country 77th out of 81 nations in Mathematics, reflecting persistent difficulties despite slight improvements from previous cycles (OECD, 2023; OECD, 2019). Responding to these issues, the Department of Education (DepEd) has implemented several initiatives, including the National Learning Camp (DepEd DO No. 014, s. 2023), "Catch-Up Fridays" (DepEd DO No. 001, s. 2024), and partnerships with Khan Academy Philippines (DepEd DM No. 002, s. 2025; DM No. 068, s. 2025) to strengthen literacy and numeracy through enhanced instruction and access to quality digital resources.

Research highlights the significance of teachers' mathematical proficiency, pedagogical practices, and technological integration in elevating learner performance. Studies revealed that teachers with robust content knowledge and student-centered approaches positively impact conceptual understanding and engagement (Jacob et al., 2020; Catubig, 2023; Roble et al., 2019). Similarly, effective use of technology has been linked to improved Mathematics achievement both internationally and in the Philippine setting (Copur-Gencturk et al., 2023; Chiu & Lim, 2020; Gamit, 2023). Despite these findings, gaps remain in the existing literature, as most studies focus on higher education or urban contexts, often overlooking the realities of senior high school learners in varied local settings. Moreover, limited research has explored the combined effects of pedagogical competence and technological skills on Mathematics performance, considering mediating factors such as instructional methods, resource access, and learner attitudes (Begum, 2020; Gamit, 2023).

Against this backdrop, the present study aimed to examine the relationships between teachers' pedagogical competence, technological skills, and learners' performance in Mathematics. Through empirical data collection and analysis, this research sought to provide evidence-based insights on how these competencies influence student outcomes. The findings aim to inform teachers on the need for continuous improvement in both mathematical and technological proficiency to enhance instructional effectiveness. Additionally, the results could assist school leaders in designing targeted professional development programs and guide policymakers, particularly in DepEd, in crafting policies that strengthen subject mastery and promote technology integration in Mathematics instruction. Ultimately, this study aspires to support efforts toward improving Mathematics education in the Philippines and contribute to the broader discourse on advancing student academic achievement.

II. RESEARCH METHODOLOGY

A. Design

This research employed a descriptive-correlational design to examine the relationship between teachers' pedagogical competence, technological skills, and learners' performance. A descriptive-correlational design was a non-experimental research method used to describe and assess the degree of association between two or more variables without manipulating them. It sought to determine whether relationships existed and to what extent they were significant, but it did not establish causal relationships (Lappe, 2000). This design was appropriate for the study to determine the significant relationship between teachers' pedagogical competencies, technological skills, and students' performance in Mathematics.

B. Setting

This study was conducted in three secondary schools in the Division of Misamis Occidental. These institutions were selected due to their significant student populations and established academic programs, particularly in the Science, Technology, Engineering, and Mathematics (STEM) strand. The presence of the STEM strand provided a rich and dynamic context for examining the relationship between teachers' pedagogical competence, technological skills, and students' performance in Mathematics. By focusing on these key educational institutions, the study explored the relationship between teachers' pedagogical competence, technological skills, and students' performance in Mathematics.

C. Respondents

The respondents for this study were 120 Grade 11 Science, Technology, Engineering, and Mathematics (STEM) students. A stratified random sampling technique was used to choose the respondents to ensure representation from different schools. The selection of the respondents was based on the following criteria: (1) students had to be officially enrolled in Grade 11 STEM; (2) they must have taken General Mathematics; and (3) they had to be willing to participate in the study.

D. Instruments

The following instruments were used in gathering the data:

A. Teachers' Pedagogical Competence Questionnaire.

This was a researcher-developed tool designed to measure teachers' pedagogical competence across three key constructs: instructional strategies in Mathematics, classroom management and student engagement in Mathematics, and assessment and feedback practices in Mathematics.

The questionnaire consisted of thirty statements, with ten items per construct, rated using a 4-point Likert scale. Respondents indicated their level of agreement with each statement, ranging from "Strongly Disagree" (1) to "Strongly Agree" (4).

The instrument underwent a validation process by experts in the field. Its reliability was established through a pilot test conducted with teachers who were

not included as respondents. The research instrument yielded a Cronbach's Alpha of 0.730 for instructional strategies, 0.880 for classroom management, 0.825 for student engagement, and 0.872 for assessment and feedback, making the questionnaire reliable for use by the target respondents.

The following scale was used to interpret the results:

Responses	Continuum	Interpretation
4	3.25 – 4.00	Highly Competent
3	2.50 – 3.24	Competent (C)
2	1.75 – 2.49	Less Competent (LC)
1	1.00 – 1.74	Not Competent (NC)

B. Teachers' Technological Skills Questionnaire. This researcher-made instrument assessed teachers' technological competencies, focusing on three constructs: proficiency with educational technology, adaptability to new technology, and technology-supported instructional design. Like the mathematical competence tool, this questionnaire also contained thirty statements, divided equally among the constructs and rated on a 4-point Likert scale. The instrument underwent a validation process by experts in the field. Its reliability was established through a pilot test conducted with teachers who were not included as respondents. The research instrument yielded a Cronbach's Alpha of 0.857 for proficiency with educational technology, 0.782 for adaptability to new technology, and 0.835 for technology-supported instructional design, making the questionnaire reliable for use by the target respondents.

The interpretation of the results followed the same continuum:

Responses	Continuum	Interpretation
4	3.25 – 4.00	Very Skillful (VS)
3	2.50 – 3.24	Highly Skillful (HS)
2	1.75 – 2.49	Less Skillful (LS)
1	1.00 – 1.74	Not Skillful (NS)

C. Learners' Academic Performance. The researcher used documentary analysis in determining the learners' academic achievement by utilizing the average of the mathematics grades in the first quarter of the School Year 2024-2025, obtained from the class advisers. The following scale in DepEd Order 8 series of 2015 was used to determine the learners' academic achievement:

Rating	Interpretation
90 – 100	Outstanding (O)
85 – 89	Very Satisfactory (VS)
80 – 84	Satisfactory (S)
75 – 79	Fairly Satisfactory (FS)
74 and below	Did not Meet Expectations (DME)

D. Data Gathering Procedure: Before gathering the data, the researcher sought approval and secured certification from the Dean of Misamis University's Graduate School to authorize the conduct of the study. Additionally, a formal request letter outlining the purpose and significance of the research was obtained from the Schools Division Superintendent in the Division of Misamis Occidental. Upon receiving the necessary permissions, the researcher informed and coordinated with the District Supervisor and the Principal of the identified school to ensure their support and cooperation.

Subsequently, the research instruments were administered to the students, who served as the target respondents. Comprehensive instructions were provided to ensure accurate and consistent responses. The collected data were then carefully tallied, analyzed using appropriate statistical methods, and interpreted in alignment with the study's objectives. The researcher ensured confidentiality and ethical considerations

throughout the process, adhering to institutional guidelines and ethical research practices.

E. Ethical Considerations: This study obtained the approval of the Misamis University Research Ethics Board. The study prioritized the protection of respondents by securing informed consent at every stage of the research process. Respondents were provided with a detailed explanation of the study's nature, purpose, objectives, possible benefits, and any minimal risks involved. It was emphasized that participation in the study was entirely voluntary, and they had the right to withdraw at any time without fear of penalty or negative consequences.

To ensure informed decision-making, respondents were given sufficient time to review all the statements in the questionnaires. If any statement caused discomfort, respondents were informed that they could choose not to answer or withdraw their participation entirely. Their anonymity was safeguarded by omitting names or identifying information from the questionnaires, ensuring no personal data was linked to their responses.

Additionally, the researcher guaranteed the confidentiality and privacy of all collected data. The researcher personally administered and retrieved the research instruments to prevent unauthorized access. Number coding was employed during the tallying and analysis of the data to maintain anonymity.

If respondents had concerns or questions, they were provided with the researcher's contact details, including a phone number and email address, which were listed on the Informed Consent form. All queries were addressed thoroughly to ensure respondents felt comfortable and supported throughout the process.

Completed questionnaires were securely stored in a locked filing cabinet, accessible only to the researcher. After a six-month retention period following the study's completion, all research data were safely discarded through shredding to uphold privacy. Even if the research findings were published, the confidentiality of respondents' identities was strictly maintained, ensuring that no personal details were disclosed.

G. Data Analysis: With the use of SPSS software, the following statistical tools were used:

Mean and Standard Deviation were utilized to identify the levels of teachers' pedagogical competence and technological skills.

Frequency and Percent were used to evaluate the learners' academic performance in Mathematics.

Pearson Product-Moment Correlation Coefficient was used to determine the strength and direction of the relationship between teachers' pedagogical competence and learners' performance in Mathematics, and the association between technological skills and learners' performance in Mathematics.

III. RESULTS AND DISCUSSIONS

Level of the Teachers' Pedagogical Skills

Table 1 shows the level of teachers' pedagogical competence based on the four constructs – instructional strategies, classroom management, student engagement, and assessment and feedback. Overall, the teachers demonstrated a "Highly Competent" level in pedagogical competence (M = 3.53, SD = 0.62). The result indicated that most of the teachers were very capable in their work and proficient in various aspects of teaching. Although there were some variations among teachers, the majority of them possessed comparable skills, as indicated by the low standard deviation. Overall, this suggested that most teachers were confident in their ability to instruct, with very few holding markedly different views.

The teachers exhibited high competence in pedagogical competence in terms of instructional strategies (M = 3.58, SD = 0.60). The findings implied that educators were very adept at creating and presenting lessons that accommodated different learning requirements and preferences. The outstanding performance in this area showed how well the teachers could implement effective teaching strategies, make wise use of instructional resources, and change their approaches in response to student input and learning objectives. Their mastery allowed them to create more inclusive and interesting teaching settings that would help different students. As a result, students were more likely to participate actively and achieve better learning outcomes due to the tailored instructional approaches.

Teachers' pedagogical competence in terms of Assessment and feedback received a highly competent rating (M = 3.54, SD = 0.62). The outcome shows that teachers are adept at giving prompt, helpful feedback and measuring student learning using a variety of assessment techniques. Reasonable evaluation methods track student development, guide instructional changes, and enable varied learning (Granberg et al., 2021). The results show that teachers understand how important

assessments are to promoting academic development and guiding students toward self-regulation of their learning. This level of ability shows that teachers connect assessments to what students are expected to learn and adjust their lessons based on how students are doing. Because of this, they create learning spaces where all students can be supported and grow at their own pace.

The research findings also show that teachers' pedagogical competence in terms of classroom management was highly competent (M = 3.53, SD = 0.63). This finding indicates that teachers are successful at establishing organized, respectful, and conducive classroom settings. Effective classroom management is central to reducing disruptions and maximizing instructional time. It also shows how well teachers can establish explicit rules, keep student behavior under control, and support constructive classroom activities meant to support a decent learning environment. Such surroundings help students' emotional and social well-being in addition to their intellectual concentration. When students feel safe and respected, they are more likely to engage actively in lessons and take responsibility for their learning.

Furthermore, the study also shows that teachers' pedagogical skills in terms of student engagement were highly competent (M = 3.49, SD = 0.62. While teachers generally succeed in engaging learners, the slightly lower mean may indicate challenges in sustaining student interest or motivating active participation consistently. Keeping students engaged plays a key role in helping them learn in a deeper and more meaningful way, and even minor issues in this area can lessen their interest and involvement in school (De Bruijn-Smolders & Prinsen, 2024). The results imply that although teachers are good at sparking students' attention at the start, they may find it challenging to keep that interest going throughout the lesson. Continued professional development in strategies to sustain motivation could help bridge this gap and further enhance the overall learning experience.

For the students, this outcome may have a number of positive effects. To begin with, the quality of education that students receive can be significantly improved by having a teaching staff that consistently possesses a "Highly Competent" level of pedagogical competence. Explicit instruction, well-run classrooms, stimulating activities, and prompt, insightful feedback—all essential for academic development and motivation—are more likely to be experienced by students. Also, the slight difference in the proficiency of teachers indicates that students in various classes are being taught of approximately equal quality, closing gaps in learning and enhancing school improvement. Additionally, this consistency can support teachers in creating a strong professional culture by encouraging collaboration, the sharing of best practices, and continuous professional development.

Teachers' highly competent level in pedagogical competence across instructional strategies, classroom management, student engagement, and assessment and feedback aligned with several recent Philippine-based studies. For instance, a study found that public secondary school teachers in Naic, Cavite, demonstrated high instructional competence, particularly in instructional delivery, assessment, and classroom management (Asis et al., 2023). Similarly, another study reported that teachers in Laguna public schools possessed very high pedagogical competence and classroom management skills, contributing to students' academic achievement (Dumaguing and Yango, 2023). In the Buhi South District of Camarines Sur, another study observed that elementary teachers were highly competent in content knowledge and pedagogy. However, they noted that research-based teaching ideas needed more application (Manigbas et al., 2024). These results support the prevalent claim that Filipino instructors are relatively competent in important pedagogical domains.

Other studies, meanwhile, offer a more complex picture of pedagogical competence. Studies have revealed, for example, that although many teachers show excellent competency in areas including instructional techniques, classroom management, student involvement, and evaluation and feedback, differences remain in how successfully these are used in practice. For instance, a study emphasized that although pedagogical knowledge significantly contributes to overall teaching effectiveness, other related skills, such as research ability, may not directly enhance classroom performance, indicating a need for more targeted professional support in certain areas (Disonglo and Limpot, 2023). This finding suggests that not all competencies equally influence student learning. As a result, there is a need for more focused professional development in specific areas where gaps remain.

Teachers are encouraged to pay particular attention to improving student engagement strategies, even though they are generally highly competent in all pedagogical

areas. Capacity-building activities that emphasize cutting-edge engagement strategies like project-based learning, gamification, cooperative group work, and the incorporation of technology-driven interactive lessons ought to be given top priority by school administrators and professional development coordinators. Peer mentoring programs, which connect seasoned teachers who excel in student involvement with those who show potential, can help accomplish this. These initiatives give an opportunity for best practices sharing and support, and encouragement. Additionally, teachers can improve their engagement strategies and create more holistic, student-driven learning options by integrating frequent classroom observations with personalized feedback.

Table 1: *Level of the Teachers' Pedagogical Competence (n=120)*

Constructs	Mean	SD	Interpretation
Instructional Strategies	3.58	0.60	Highly Competent
Classroom Management	3.53	0.63	Highly Competent
Student Engagement	3.49	0.62	Highly Competent
Assessment and Feedback	3.54	0.62	Highly Competent
Overall Pedagogical Competence	3.53	0.62	Highly Competent

Note:
Scale:

- 3.25–4.00: Highly Competent
- 2.50–3.24: Competent
- 1.75–2.49: Less Competent
- 1.00–1.74: Not Competent

Level of Teachers' Technological Skills

Table 2 presents the level of teachers' technological skills based on the evaluated constructs. Overall, the teachers demonstrated a "Very Skillful" level of technological competence (M = 3.39, SD = 0.64). This result suggests that, on average, teachers possess a strong ability to utilize technology to support instructional practices effectively. The high total mean reflects that teachers are not only familiar with a range of technological tools but also aware of how to employ them in class. Such competency reflects that teachers are capable of adjusting to increased technology use within the classroom, which facilitates more innovative and stimulating teaching and learning processes.

Teachers were very skilled in terms of adaptability to new technology (M = 3.41, SD = 0.61). The result indicates that teachers are highly skilled in adjusting to new technology and integrating it into their lesson plans. Such adaptability is crucial, as highlighted by Gangmei and Thomas (2025), who found that teachers with strong ICT proficiency can enhance instructional efficacy and raise educational standards. Similarly, Culajara et al. (2023) noted that younger teachers tend to perform well in dealing with modern technology, which highlights the ongoing relevance of training programs in assisting in developing and sustaining such skills over the long term. Taking together, these findings show the need for giving teachers consistent training and assistance so they may keep using technology efficiently and improve the general standard of instruction. These results, taken together, highlight the need for constant guidance and instruction to ensure teachers can properly use technology to enhance the learning process.

Teachers also obtained a very skillful rating in technological skills in terms of technology-supported instructional design (M = 3.40, SD = 0.64). This result suggests that teachers are very skillful in designing and structuring instructional activities that incorporate technology effectively. Innovative learning experiences are encouraged, and student engagement is increased when teachers are able to incorporate technology into lesson planning and content delivery. These findings demonstrate that many educators strategically integrate technology to improve student outcomes and instructional quality rather than merely using it for its own sake.

This study also disclosed that in terms of technological skills, teachers were rated very skillful in proficiency with educational technology (M = 3.37, SD = 0.66). The results imply that although teachers are usually good at using resources like learning management systems, interactive whiteboards, and educational software, there is still space for improvement in smoothly including these technologies into daily teaching. Mastery in operating various digital tools ensures smooth technology integration, minimizes disruptions, and allows teachers to model effective tech use for students.

Supporting this, Ramaila and Molwele (2022) and Kalyani (2024) emphasized how digital tools, and interactive platforms improve student involvement and critical thinking, so stressing the need for continuous professional development to equip teachers with the required skills for efficient technology integration. These insights highlight the need for continuous training and support to ensure educators can fully leverage technological tools to enrich the learning experience.

The overall outcome was in line with a number of studies. An instance is a study that evaluated the ability of secondary school teachers to adapt to technology in the new normal. The findings indicated that teachers are very proficient in the use of digital resources for teaching, proving their adaptability and willingness to integrate technology in their curricula (Castañeros et al., 2024). Similarly, research conducted in Misamis Oriental examined the impact of computer upskilling training on teachers' technological literacy. The study found that teachers who underwent targeted training programs demonstrated significant improvements in their technological skills, suggesting that professional development initiatives play a crucial role in enhancing educators' technological competence (Siyam et al., 2025).

However, in some situations, difficulties still exist. According to an evaluation of teachers' proficiency with technology in last-mile schools in Maramag, Bukidnon, teachers demonstrated competence in basic digital tasks. However, they had limited ability to successfully incorporate technology into their teaching methods (Ballenas, 2024). This disparity highlights the need for continuous support and professional growth, especially in rural areas where resources may be less available. Dealing with these issues guarantees that every teacher, wherever, is ready to give technologically advanced learning opportunities that satisfy the demands of students of the twenty-first century.

The findings suggest that while teachers possess a strong overall technological skill set, efforts to strengthen their hands-on proficiency with educational technologies could be beneficial. School leaders, ICT coordinators, and professional development teams are encouraged to organize targeted training programs that focus on advancing teachers' technical expertise in using educational platforms, applications, and digital tools. Suggested activities include hands-on workshops, certification programs on advanced tech tools for education, and technology boot camps that address specific areas of need. Furthermore, peer mentorship initiatives whereby tech-savvy teachers assist their peers could serve to improve the general technical fluency of the school, therefore guaranteeing that technology use always promotes high-quality, engaging, and efficient teaching.

Table 2: *Level of Teacher's Technological Skills (n=120)*

Constructs	Mean	SD	Interpretation
Proficiency with Educational Technology	3.37	0.66	Very Skillful
Adaptability to New Technology	3.41	0.61	Very Skillful
Technology-Supported Instructional Design	3.40	0.64	Very Skillful
Overall Technological Skills	3.39	0.64	Very Skillful

Note:
Scale:

- 3.25–4.00: Very Skillful
- 2.50–3.24: Highly Skillful
- 1.75–2.49: Less Skillful
- 1.00–1.74: Not Skillful

Level of the Learners' Academic Achievement

Table 3 presents the level of learners' performance in Mathematics. Overall, the learners demonstrated a "Very Satisfactory" level of performance, with a mean score of (M = 89.25). According to the distribution, most students received an "Outstanding" rating (n = 88,73%), demonstrating a high degree of mathematical competency. The result was followed by those who performed at a "Very Satisfactory" level (n = 26, 22%). A smaller portion of the learners attained a "Satisfactory" performance (n = 6, 5%), showing that while the majority of students excelled, a small number may need additional support to improve their understanding of mathematical concepts.

A closer examination of the data reveals that the students generally reach really high standards. The significant

proportion of students falling into the "Outstanding" category shows that most of them have strong mathematics knowledge and ability. The presence of learners performing at the "Very Satisfactory" level also indicates that, while still commendable, there is a group that may benefit from additional enrichment to push them toward the highest level of achievement. The low percentage of students in the "Satisfactory" group suggests that some of them could need focused treatments to grasp the mathematical ideas taught entirely. Notably, the absence of students in the lower performance categories underscores the effectiveness of the current instructional practices and student learning strategies.

Despite the very satisfactory performance in mathematics, Filipino students continue to underperform in international evaluations such as the Programme for International Student Assessment (PISA). In the 2022 PISA, the Philippines ranked 77th out of 81 participating countries in mathematics, with an average score of 355, significantly below the OECD average of 472. Only 16% of Filipino students achieved at least Level 2 proficiency, indicating that the majority struggle with fundamental mathematical concepts and problem-solving skills (OECD, 2022). This discrepancy implies that even though students may excel on standardized local tests, they may not be sufficiently ready for tasks requiring higher-order thinking and application of information in real-life situations. The disparity underscores the need for aligning local assessment standards with international benchmarks to ensure that students are equipped with the necessary competencies to succeed globally.

Building upon these performance trends, recent studies provide deeper insights into the factors influencing the mathematical proficiency of Grade 11 STEM students. Parcon and Bearneza (2024) discovered that although students displayed approaching proficient mathematical skills, their general performance in General Mathematics remained at a developing level, suggesting a requirement of focused interventions to close this gap. Hermano and Hinoguin (2025) identified that learning styles, access to educational resources, and study habits positively affect mathematical proficiency among STEM students. In contrast, limited parental engagement and poor time management negatively impact performance. Canayong and Mabansag (2023) emphasized that during modular distance learning, students faced challenges in understanding complex topics and managing distractions but adapted through self-regulated learning and utilization of online resources. These findings underscore the importance of continuous support and tailored strategies to enhance the mathematical competencies of Grade 11 STEM students in the Philippines.

The findings suggest that while the overall mathematics performance of learners is commendable, efforts should be directed toward elevating those who are performing at "Very Satisfactory" and "Satisfactory" levels to reach "Outstanding" status. Also, it is important to consider these findings within a broader context. The contradicting studies highlight ongoing issues and actual differences that might not be reflected in localized assessments. Thus, even as they celebrate the successes shown in Table 3, teachers and legislators should remain aware of the larger difficulties in mathematics education to guarantee thorough and fair learning results for every student. It is also recommended that Mathematics teachers, academic coordinators, and curriculum planners adopt differentiated instruction strategies, enrichment programs, and special tutorials to respond to the different needs of the learners. Advanced problem-solving workshops, peer tutoring programs, and math competitions might inspire learners and offer further challenges to sharpen their skills. Continuous monitoring and formative assessments should also be used to map learners' particular areas for improvement and offer timely help to optimize their mathematical ability.

Table 3: *Level of the Learners' Performance in Mathematics (n=120)*

Interpretation	Frequency	Percentage
Outstanding	88	73.00%
Very Satisfactory	26	22.00%
Satisfactory	6	5.00%
Overall Performance		89.25 - Very Satisfactory

Note:
Scale:

- 90–100: Outstanding
- 85–89: Very Satisfactory
- 80–84: Satisfactory

- 75–79: Fairly Satisfactory
- Below 75: Did not Meet the Expectations

Relationship between the Levels of the Teachers' Pedagogical Skills and the Learners' Performance in Mathematics

Table 4 presents the test of significant relationships between teachers' pedagogical skills and learners' performance in Mathematics. Among the variables assessed, only Assessment and Feedback showed a significant relationship with learners' performance in Mathematics ($r = -0.181$, $p = 0.048$). There was a statistically significant, though weak and negative, relationship between how teachers assess and provide feedback and the performance outcomes of learners. This finding indicates that as teachers increase assessment and feedback activities, student performance in Mathematics slightly decreases. Specifically, as the emphasis or style of assessment and feedback changes, it may have a subtle but meaningful influence on how learners perform in Mathematics.

The negative direction of the relationship suggests that certain aspects of the teachers' assessment and feedback practices, although well-intentioned, may be associated with slightly lower learner performance in Mathematics. This result may indicate that the quality of feedback is lacking—perhaps it is not sufficiently constructive, specific, or timely to support learning. Additionally, assessments may be overly complex or stressful, potentially leading to student frustration or disengagement. In some cases, frequent assessments might also reduce valuable instructional time or contribute to heightened anxiety, ultimately hindering students' academic performance. These findings highlight the importance of reviewing not just the frequency, but also the effectiveness and appropriateness of assessment and feedback strategies in the mathematics classroom.

This result agrees with some research studies in the Philippines. For instance, a study examined the assessment practices of senior high school mathematics teachers and their relation to students' test performance. The study found that while teachers demonstrated effective assessment practices, students' test performance remained poor, indicating that current feedback mechanisms might not be effectively enhancing student learning outcomes (Paglomutan et al., 2023). Similarly, another study investigated the teaching competencies of primary school teachers in Tinoc District, Ifugao, and their association with students' mathematics performance. The study found that students' mathematical performance showed no appreciable correlation despite teachers regularly evaluating instructional competencies, including assessment of learning, despite their frequent observations (Libiado and Canuto, 2023). It emphasizes the need for more efficient feedback techniques since it implies that following evaluation procedures alone could not be enough to improve student outcomes.

Conversely, a study looked at how Grade 4 pupils' task performance responded to feedback in multiplication assignments. Feedback clearly improved post-test results in the experimental group compared to the control group, suggesting that, when used well, it can help students perform better (Coronado et al., 2022). Furthermore, studies done at Leyte Normal University revealed that in the new typical learning environment, positive teacher feedback raised student motivation. The study underlined how closely students' willingness to learn depends on the quality of feedback, thereby influencing their academic achievement as well.

This research taken together shows how closely feedback in mathematics education's efficacy depends on its alignment with student performance, delivery style, and perceptions by the students. Inaccurate calibration of feedback to student performance might cause either under confidence or overconfidence, both of which could hinder learning. Teachers should thus aim to give timely, accurate, and helpful comments so creating an environment in which students may evaluate their knowledge and areas for development.

On the other hand, teachers' pedagogical competence in terms of instructional strategies showed a non-significant relationship with learners' performance in mathematics ($r = -0.062$, $p = 0.502$). This result suggests that variations in how teachers deliver content, such as through lectures, group work, or differentiated instruction, do not have a statistically significant impact on students' mathematics achievement in the sample studied. Although instructional techniques are a fundamental component of teaching, this outcome suggests that the approaches currently used are not matched enough to the learning needs of the students or are not used with enough consistency or depth to affect performance results. Additionally, if instructional approaches lean heavily on rote learning or procedural drills without fostering deep understanding, students may struggle to apply concepts in more complex

assessments (Parcon & Bearneza, 2024). It is also possible that instructional methods alone, without reinforcement from other supportive practices such as formative assessments or feedback mechanisms, may not be sufficient to drive significant improvements in academic results.

The r value of -0.062 indicates a very weak negative correlation between instructional strategies and Mathematics performance. This outcome implies that changes in instructional approaches by themselves do not directly result in increases in student achievement, despite the employment of several teaching strategies, as there is almost a minimal inverse link. This result emphasizes the need for teaching tactics applied not enough to challenge students to interact meaningfully with mathematical knowledge or acquire higher-order thinking ability. It also raises the consideration that these methods might not be contextually appropriate for the STEM learners' needs, especially if they lean heavily toward traditional or teacher-centered approaches. This finding contradicts research by Sagge Jr. and Nabayra (2022), who found that the adoption of creative instructional tactics, including game-based learning and ICT-integrated materials, greatly improved teaching efficacy and favorably affected students' mathematics performance. These findings emphasize the need to adopt more creative, interactive, and student-centered instructional approaches that are tightly aligned with the cognitive demands of Mathematics.

Teachers' pedagogical competency in terms of classroom management also revealed a non-significant link with learners' mathematical performance ($r = -0.118$, $p = 0.201$). This result implies that good classroom management by itself does not continually improve learning results. One such possibility is that classroom management techniques could be consistently employed by all teachers, thus minimizing the disparity in student performance. Further, classroom management at times prioritizes discipline overactive engagement, which may lead to passive compliance rather than deep learning. Overly strict environments might also discourage student inquiry, which is crucial in Mathematics. Therefore, effective classroom management must be combined with interactive and cognitively engaging instruction to affect achievement positively. This result is opposite to Tacadena (2021), who reported a positive correlation between effective class management and better Mathematics performance, emphasizing the learning environment's impact on academic success through effective classroom management.

The computed r value of -0.118 indicates a very weak negative correlation between teachers' classroom management competence and students' Mathematics performance. This finding suggests that as classroom management skills increase, students' Mathematics achievement shows a slight decrease; however, this relationship is not statistically significant ($p = 0.201$). In practical terms, the relationship is too low to make any meaningful connection, implying that the other instructional or environmental factors play a greater role in determining the academic performance of Mathematics. It also emphasizes how difficult teaching is, since good learning calls for an environment that promotes critical thinking, involvement, and problem-solving rather than only discipline maintenance. As supported by Verdeflor et al. (2024), combining good classroom management with learner-centered strategies creates a more productive and engaging classroom climate that supports academic success in subjects like Mathematics.

Lastly, teachers' pedagogical competence about student involvement ($r=-0.038$, $p=0.682$) also showed a non-significant correlation with learners' mathematical performance. This outcome implies that teacher-initiated engagement tactics have little to no direct correlation with student achievement in the subject. Many factors could contribute to explaining this outcome. Often, engagement strategies focus more on behavioral or emotional aspects—such as assuring attention or offering a pleasant environment—than on cognitive engagement, which calls for more intellectual processing and critical thinking. Consequently, while students may appear behaviorally engaged, if they are not being intellectually challenged, such engagement does not necessarily translate into academic improvement.

Moreover, the r value of -0.038 denotes a very weak negative correlation, suggesting an almost negligible inverse relationship between student engagement strategies and Mathematics performance. This result means that, in this sample, increases in teacher-initiated engagement do not correlate with improved academic outcomes and may even show a slight, though statistically insignificant, decline. This result suggests that either other elements—such as preexisting knowledge gaps, test anxiety, or lack of family support—diminish their efficacy or that the engagement

tactics used might lack alignment with the complex cognitive demands of Mathematics. As Mamolo (2022) observed, high levels of engagement in flipped classroom settings did not significantly elevate student performance in Mathematics, reinforcing the idea that unless engagement activities are both cognitively demanding and content-specific, their impact on achievement remains limited. This finding highlights the importance of refining engagement methods to promote deeper learning and mathematical reasoning.

Table 4: *Test of Significant Relationship between the Teachers' Pedagogical Skills and Learners' Performance in Mathematics (n=120)*

Construct/Variable	r value	p-value	Decision
Instructional Strategies	-0.062	0.502	Do not reject Ho
Classroom Management	-0.118	0.201	Do not reject Ho
Student Engagement	-0.038	0.682	Do not reject Ho
Assessment and Feedback	-0.181*	0.048	Reject Ho

Ho (Null Hypothesis):
There is no significant relationship between the teachers' pedagogical skills and learners' performance in Mathematics.
Note:

- $p < 0.01$: Highly Significant
- $p < 0.05$: Significant
- $p > 0.05$: Not Significant

Test of Significant Relationship between Teachers' Technological Skills and the Learners' Performance in Mathematics

Table 5 presents the test of significant relationships between teachers' technological skills and learners' performance in Mathematics. Based on the results, none of the assessed variables showed a statistically significant relationship with learners' performance, as all p-values were greater than 0.05. Teachers' proficiency in educational technology was found to have no significant correlation with learners' Mathematics performance ($r = -0.026$, $p = 0.776$). This outcome indicates that teachers' proficiency in using educational technology tools does not have a direct effect on student performance in Mathematics. One interpretation of this result is that technical proficiency alone does not guarantee improved student learning outcomes. While technological skills are essential for modern teaching environments, they may serve more as facilitating tools rather than as core determinants of academic success, especially in content-heavy subjects like Mathematics.

The r-value of -0.026 reflects a very weak and negative correlation between teachers' technological proficiency and learners' Mathematics performance. This near-zero correlation suggests that improvements in teachers' technological skills alone are unlikely to produce noticeable changes in students' academic outcomes in Mathematics. This outcome highlights that technology, although a significant asset, cannot replace pedagogical depth, content expertise, and strategies that foster conceptual understanding and critical thinking. Technology use in the observed classrooms was also limited to administrative or presentational purposes rather than being utilized as an interactive and cognitively engaging tool for Mathematics instruction. The results confirm the study conducted by Ramaila and Molwele (2022), highlighting that technology integration needs to be pedagogically driven to enhance higher-order skills and meaningful learning outcomes.

The adaptability of teachers to new technology was not significantly related to performance in mathematics ($r=-0.105$, $p=0.253$). This outcome implies that even if the teachers are willing to adapt to new digital technologies and learning platforms, this does not necessarily lead to measurable improvements in student performance. One possible explanation is that being open to technology is not sufficient unless accompanied by effective pedagogical strategies, proper implementation, and alignment with curricular goals. It suggests that adaptability, while beneficial for long-term professional development, may not have an immediate or direct impact on learner performance unless it is translated into meaningful instructional practices.

The r-value of -0.105 indicates a weak negative correlation between teachers' adaptability to new technology and students' Mathematics performance. This result suggests that, within the studied sample, increased adaptability among teachers did not correspond to improved student outcomes in Mathematics. The non-significant p-value ($p = 0.253$) further confirms that this relationship is not statistically meaningful. This finding is consistent with the research conducted by Lumbao (2022), which indicated that

although teachers' adaptability had a positive impact on teaching effectiveness, it did not directly lead to improved student performance in Mathematics. This finding underscores the importance of not only being adaptable but also ensuring that such adaptability is effectively integrated into pedagogical practices to impact student learning outcomes.

Lastly, teachers' technological skills in terms of technology-supported instructional design also demonstrated no significant relationship with learners' performance in Mathematics ($r = -0.091$, $p = 0.325$). This result shows that integrating technology into lesson preparation and delivery may improve engagement and resource accessibility, but it does not improve Mathematics performance. One view is that technology can improve information display and delivery, but its success depends on improving conceptual understanding, critical thinking, and problem-solving skills. Without intentional alignment between technology use and learning objectives, digital tools may remain superficial enhancements rather than transformative instruments of learning.

The computed correlation coefficient of -0.091 suggests a very weak negative relationship between teachers' use of technology-supported instructional design and students' Mathematics performance. As technology in instructional design rises, learners' performance drops, but this influence is minor and largely incidental. The link is not statistically significant because the p-value is 0.325, over 0.05. This result indicates a lack of sufficient evidence to determine that differences in teachers' instructional design skills with technology significantly affect learners' academic outcomes. Such interpretation is aligned with the explanation provided by Santos et al., (2025), who noted that low and non-significant r-values often indicate the absence of a direct relationship between the variables under study, particularly when other mediating factors such as pedagogical alignment and content delivery quality are not accounted for.

These non-significant findings suggest that although technological skills are important in modern education, they may not independently influence student performance in content-specific areas like Mathematics. This is supported by a study that found that mathematics teachers' digital abilities increased students' communication but not academic performance (Joshi et al., 2023). While technology can improve contact and engagement, it may not improve mathematical understanding or outcomes. Other variables—such as the depth of mathematical instruction, the quality of teacher-student interaction, learners' prior knowledge, study habits, and socioeconomic factors—may have a stronger impact on learners' success in Mathematics. Thus, technological competency enhances teaching and learning but does not predict academic success.

The findings emphasize the necessity for balanced teacher development. School administrators, ICT coordinators, and curriculum developers are encouraged to continue supporting technological skill development, but also to invest heavily in strengthening Mathematics content mastery and pedagogical content knowledge. Suggested activities include Mathematics-focused professional development sessions, coaching programs that integrate both tech tools and deep content understanding, and lesson study groups where teachers collaboratively design and refine technology-enhanced but content-centered Mathematics lessons. Further, it is recommended that evidence-based instructional strategies that blend traditional and technology-supported methods to maximize student learning should be taught.

IV. SUMMARY

The study determined the teachers' pedagogical competence and technological skills in relation to learners' performance in Mathematics. Specifically, it sought to address the following research questions: (1) What is the level of teachers' pedagogical competence in terms of instructional strategies in Mathematics, classroom management, student engagement in Mathematics, and assessment and feedback in Mathematics? (2) What is the level of technological skills of the teachers in terms of proficiency with educational technology, adaptability to new technology, and technology-supported instructional design? (3) What is the learners' academic performance in mathematics as reflected in their grades? (4) Is there a significant relationship between teachers' pedagogical competence and learners' academic performance in mathematics? (5) Is there a significant relationship between teachers' technological skills and learners' academic performance in mathematics?

It was conducted in the secondary schools in the Division of Misamis Occidental during the School Year 2024-2025. The descriptive-correlational design was used in the study. There were 120 students who participated as the respondents and were selected through a stratified random sampling technique. Researcher-made questionnaires, such as the Teachers'

Pedagogical Competence Questionnaire and the Teachers' Technological Skills Questionnaire, were used in collecting the data. A documentary analysis was made of the learners' academic achievement. Frequency and Percentage, Mean and Standard Deviation, and Pearson Product-Moment Correlation Coefficient were the statistical tools used in analyzing the data gathered.

V. Findings

The following are the findings of the study:

1. Teachers are highly competent in pedagogical skills across the four constructs: instructional strategies, classroom management, assessment and feedback, and student engagement.
2. Teachers are very skilled in technological competence in terms of adaptability to new technology, technology-supported instructional design, and proficiency with educational technology.
3. The learners' level of performance in Mathematics is very satisfactory.
4. Teachers' pedagogical competence in terms of assessment and Feedback had a significant relationship with learners' performance in Mathematics. On the other hand, instructional strategies, classroom management, and student engagement showed no significant relationship with learners' performance.
5. Teachers' technological skills showed no significant relationship with learners' performance in Mathematics.

VI. CONCLUSIONS

Based on the findings of the study, the following are the conclusions drawn:

1. Teachers are well-equipped with essential teaching practices that support effective instruction and classroom management in Mathematics.
2. Teachers demonstrated strong technological skills, particularly in adapting to new technologies and incorporating them into instructional design. However, the slightly lower score in proficiency with educational technology indicates that, despite their overall competency, there are still opportunities to further refine their technical expertise for smoother integration of technology into teaching.
3. Students are achieving commendable performance levels in Mathematics, which may reflect effective classroom instruction, student effort, and supportive school environments.
4. Assessment and feedback significantly impact learners' mathematics performance, suggesting their effectiveness in improving mathematical understanding and achievement.
5. Although teachers are technologically skilled, these abilities alone do not significantly influence student achievement in Mathematics, suggesting that the impact of technology depends more on its purposeful instructional application.

VII. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following are the recommendations:

1. School administrators and instructional coaches should sustain this high level of pedagogical competence by organizing regular in-service training focused on differentiated instruction, inquiry-based learning, and student-centered approaches in Mathematics. Curriculum developers should also align support materials with pedagogical best practices to reinforce these competencies.
2. Information and Communications Technology (ICT) coordinators and Division Training Units should provide workshops on designing technology-integrated lessons specifically for Mathematics. These should include practical modules on using data analytics tools to monitor student progress and digital simulations to teach abstract concepts effectively. School leaders must also ensure teachers have access to up-to-date tools and platforms.
3. Teachers should conduct regular formative assessments to monitor student learning and provide enrichment tasks for high-performing students. Meanwhile, academic coordinators should implement remedial programs and peer tutoring systems for students who need additional support, ensuring that all learners are progressing toward mastery.
4. School heads should prioritize professional development programs on formative assessment, timely and constructive feedback, and data-driven instruction. Master teachers and department heads should lead learning action cells (LACs) where teachers analyze student work, refine rubrics, and practice effective feedback techniques that promote student improvement in Mathematics.
5. Education supervisors and curriculum planners should revise training modules to include strategies for integrating technology in ways that enhance conceptual learning in Mathematics (e.g.,

using visualizations for algebra or geometry). School-based instructional leaders should also facilitate lesson demonstrations that model how technology can support critical thinking and problem-solving, not just content delivery.

APPENDIX

The appendix sits at the junction of the small intestine and large intestine. It's a thin tube about four inches long. Normally, the appendix sits in the lower right abdomen.

The function of the appendix is unknown. One theory is that the appendix acts as a storehouse for good bacteria, "rebooting" the digestive system after diarrheal illnesses. Other experts believe the appendix is just a useless remnant from our evolutionary past. Surgical removal of the appendix causes no observable health problems.

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REFERENCES

[1] Abalde, G., & Oco, R. (2023). Factors associated with mathematics performance. Asian Research Journal of Mathematics, 19(6), 45-60. https://doi.org/10.9734/arjom/2023/v19i6665

[2] Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' Perceptions of Technology Integration in Teaching-Learning Practices: A Systematic review. Frontiers in Psychology, 13.

[3] Almerino, P., Guinocor, M., Mamites, I., Lumayag, C., Villaganas, M. A., & Capuyan, M. (2020). Mathematics performance of students in a Philippine state university. International Electronic Journal of Mathematics Education, 15(3).

[4] Asis, J. M. N., Caballes, D. G., & Ortiz Jr, O. E. (2023). Instructional competence of public secondary school teachers in the district of Naic: Basis for instructional enhancement program. Polaris Global Journal of Scholarly Research and Trends, 2(1), 38-57. https://doi.org/10.58429/pgjsrt.v2n1a114

[5] Ballenas, G. J. SCHOOL GOVERNANCE, DIGITAL PROFICIENCY, AND ENTREPRENEURIAL LEADERSHIP ON RESEARCH PRACTICES OF SCHOOL ADMINISTRATORS. International Journal of All Research Writings. https://www.academia.edu/download/122112298/IJARW2452.pdf

[6] Begum, H. (2020). Impact of Mathematics Teacher's Competency on Achievement of Primary School Students. Pakistan Social Sciences Review, 4(I), 699–712.

[7] Canayong, J. and Mabansag A. (2023). Lived Experiences of Grade -11 STEM Students in Mathematics Using Modular Distance Learning. International Journal of Current Science Research and Review, 6573-6584. https://doi.org/10.47191/ijcsrr/V6-i10-09

[8] Capuno, R., Necesario, R., Etcuban, J. O., Espina, R., Padillo, G., & Manguilimotan, R. (2019). Attitudes, Study Habits, and Academic Performance of Junior High School Students in Mathematics. International Electronic Journal of Mathematics Education, 14(3), 547-561. https://doi.org/10.29333/iejme/5768

[9] Castañeros, J. P., & Paglinawan, J. L. (2024). DIGITAL PROFICIENCY AND ENGAGEMENT ON THE TECHNOSTRESS COPING MECHANISM OF BASIC EDUCATION TEACHERS. International Journal Of All Research Writings, 5(10), 192-201. https://www.researchgate.net/profile/Joyce-Castaneros/publication/380153592_10_wwwijarwcom_IJARW2101/links/662de92906ea3d0b7413a49e/10-wwwijarwcom-IJARW2101.pdf

[10] Catubig, V. (2023). School Leaders' Crisis Leadership Competencies and their Pandemic Response Strategies:

The Case of DEPED Division of Northern Sumar. Diversitas Journal, 8(4), 2691-2710. https://doi.org/10.48017/dj.v8i4.2691

[11] Chiu, T. K. F., & Lim, C. P. (2020). Strategic Use of Technology for Inclusive Education in Hong Kong: A Content-Level Perspective. ECNU Review of Education, 3(4), 715–734.

[12] Copur-Gencturk, Y., & Orrill, C. H. (2023). A promising approach to scaling up professional development: intelligent, interactive, virtual professional development with just-in-time feedback. Journal of Mathematics Teacher Education, 1-25. https://doi.org/10.1007/s10857-023-09615-1

[13] Coronado, K. S. F., Sales, K. A. F., & Marasigan, P. R. (2022). Effect of Feedback on the Task Performance of Grade 4 Students. International Journal of Educational Management and Development Studies, 3(2), 1-20. https://doi.org/10.53378/352883

[14] Culajara, C. J., Culajara, J., Portos, O., & Villapando, M. (2022). Technological capabilities of teachers in using digital modality. ASEAN Journal of Education, 8(2), 1-8.

[15] De Bruijn-Smolders, M., & Prinsen, F. R. (2024). Effective Student Engagement with Blended Learning A systematic review. Heliyon.

[16] Dumaguing, M. L., & Yango, A. R. (2023). Teachers' Pedagogical Competence, Classroom Management Skills, and Students' Academic Achievement among Selected Public City Schools Division in the Province of Laguna. Technium Soc. Sci. J., 44, 573. https://pdfs.semanticscholar.org/21ff/4de3f4fde0e4396ca27e1fb305d41bbad035.pdf

[17] Evans, D (2021). Education Technology for Effective Teachers. Teachers Thematic Group: World Bank.

[18] Fakhrutdinova, A. V., Ziganshina, M. R., Mendelson, V. A., & Chumarova, L. G. (2020). Pedagogical Competence of the High School Teacher. International Journal of Higher Education, 9(8), 84. 10.5430/ijhe.v9n8p84

[19] Gangmei, N., & Thomas, K. A. (2025). Teachers' Technology Proficiency for Quality Learning and Teaching—A Scoping Review. International Journal of Educational Reform, 10567879251316213.

[20] Gamit, A. M. (2023). Embracing Digital Technologies into Mathematics Education. Journal of Curriculum and Teaching, 12(1), 283.

[21] Granberg, C., Palm, T., & Palmberg, B. (2021). A case study of a formative assessment practice and the effects on students' self-regulated learning. Studies in Educational Evaluation, 68, 100955.

[22] Hacioglu, Y., & Gulhan, F. (2021). The Effects of STEM Education on the Students' Critical Thinking Skills and STEM Perceptions. Journal of Education in Science, Environment and Health, 7(2), 139–155. https://doi.org/10.21891/jeseh.771331

[23] Hanaysha, J. R., Shriedeh, F. B., & In'airat, M. (2023). Impact of classroom environment, teacher competency, information and communication technology resources, and university facilities on student engagement and academic performance. International Journal of Information Management Data Insights, 3(2), 100188. https://doi.org/10.1016/j.jjimei.2023.100188

[24] Hermano, R. H., & Hinoguin, J. N. (2025). Advancing Math Competency Among Science, Technology, Engineering and Mathematics (STEM) Students: A Comprehensive Exploration of Learning Styles, Educational Resources, Parental Engagement, and Study Habits. Canadian Journal of Family and Youth/Le Journal Canadien de Famille et de la Jeunesse, 148-169. https://doi.org/10.29173/cjfy30099

[25] Jacob, F. I. L. G. O. N. A., John, S. A. K. I. Y. O., & Gwany, D. M. (2020). Teachers' pedagogical content knowledge and students' academic achievement: A theoretical overview. Journal of Global Research in Education and Social Science, 14(2), 14-44.

[26] Joshi, D. R., Adhikari, K. P., Khanal, J., & Belbase, S. (2023). Impact of digital skills of mathematics teachers to promote students' communication behavior in the classroom. Contemporary Educational Technology, 15(4), ep454.

[27] Kalyani, L. K. (2024). The role of technology in education: Enhancing learning outcomes and 21st century skills. International journal of scientific research in modern science and technology, 3(4), 05-10. https://ijsrmst.com/index.php/ijsrmst/article/view/199

[28] Kamran, A., Naeim, M., Mohammadi, M., & Masoumi, N. (2022). Prediction of academic performance based on learning style and critical thinking among medical students. Journal of Pedagogical Research, 6(1), 57-66. https://doi.org/10.33902/JPR.2022175483

[29] Lappe, J.M. (2000). Taking the mystery out of research: Descriptive Correlational design. Orthopedic Nursing, Vol. 19 NO.2.

[30] Libiado, F., & Canuto, P. P. (2023). Examining the teaching competencies and their relation to the mathematics performance of primary pchool students. International Journal of Multidisciplinary: Applied Business and Education Research, 4(7), 10-11594. https://dx.doi.org/10.11594/ijmaber.04.07.22

[31] LUMBAO, G. M. F. (2022). Adaptability and Teaching Effectiveness Among Mathematics Teachers in Junior Public Schools Amidst the New Normal. AIDE Interdisciplinary Research Journal, 3, 11-19. https://doi.org/10.56648/aide-irj.v3i1.49

[32] Mamolo, L. A. (2022). Online Learning and Students' Mathematics Motivation, Self-Efficacy, and Anxiety in

the "New Normal". Education Research International, 2022(1), 9439634. https://doi.org/10.1155/2022/9439634

[33] Manigbas, J. I., Ollet, A. L., Noble, M. P. L., Angeles, J. R., Cayetano, N. M., & Fucio, M. P. (2024). Teachers' Competency in Content Knowledge and Pedagogy in Buhi South District, Philippines. International Education Trend Issues, 2(1), 21-30.

[34] Nabayra, L. J., & Sagge, R. G. (2022). The Mathematics Teaching Performance of Scholar Education Graduates in Selected Public Schools in the Philippines: An Explanatory Sequential Mixed Method Study. Canadian Journal of Educational and Social Studies, 2(4), 23-36. https://doi.org/10.53103/cjess.v2i4.47

[35] Oco, R., Jade, S., Sabasaje, N., & Oco, R. M. (2023). Students' Mathematical Skills and Performance. International Journal of Multidisciplinary Research and Publications (IJMRAP), 6(2), 328-332.

[36] Paglomutan, P. M., Valdesimo, R., Cabarubias, R., & Lachica, R. (2023). Assessment Practices of Senior High School Mathematics Teachers in Relation to Students' Test Performance. Psychology and Education: A Multidisciplinary Journal, 10(8), 1-1. https://doi.org/10.5281/zenodo.8148805

[37] Parcon, C. A. S., & Bearneza, F. J. D. (2024). Mathematical Skills and General Mathematics Performance of Grade 11 Students in a Public National High School in Southern Negros Occidental, Philippines. Philippine Social Science Journal, 7(2), 105-116. https://doi.org/10.52006/main.v7i2.995

[38] PISA 2022 Results (Volume I). (2023). In Programme for international student assessment/Internationale Schulleistungsstudies

[39] PISA 2022 Results (Volume II). (2023). In Programme for international student assessment/Internationale Schulleistungsstudie.

[40] Ramaila, S., & Molwele, A. J. (2022). The Role of Technology Integration in the Development of 21st Century Skills and Competencies in Life Sciences Teaching and Learning. International Journal of Higher Education, 11(5), 9-17. 10.5430/ijhe.v11n5p9

[41] Roble, D. B., Ubalde, M. V., & Castillano, E. C. (2019). TEACHERS' PERCEPTIONS OF INTEGRATING TECHNOLOGY IN MATHEMATICS CLASSROOM AMONG SCHOOL TEACHERS IN CAGAYAN DE ORO CITY, PHILIPPINES. Science International, 31(6), 841–845.

[42] Salleh, S. M., Musa, J., Jaidin, J. H., & Shahrill, M. (2021). Development of TVET Teachers' Beliefs about Technology Enriched Instruction through Professional Development Workshops: Application of the Technology Acceptance Model. Journal of Technical Education and Training, 13(2). https://penerbit.uthm.edu.my/ojs/index.php/JTET/article/view/6872

[43] Santos, M. S. M. D., BATIANCILA, R. M., CABARAL, J. O., CABIGAS, M. B., & PETEROS, E. D. (2025). Using Information and Communication Technology on Students' Mathematics Performance in National High Schools in the Philippines. British Journal of Teacher Education and Pedagogy, 4(1), 12-26. https://doi.org/10.32996/bjtep.2025.4.1.2

[44] Tacadena, J. E. (2021). Classroom management and students' learning in mathematics. International Journal of Research and Innovation in Social Science, 5(03), 418-423.

[45] Verdeflor, R., Tenedero, E., Bordios A. & Espinosa C. (2024). Instructional Management Strategies for Addressing Low Student Engagement in Mathematics. Environment and Social Psychology, 9(12), 2424-7979. 10.59429/esp.v9i12.3229