Advanced International Journal for Research (AIJFR)
E-ISSN: 3048-7641 ● Website: www.aijfr.com ● Email: editor@aijfr.com

Technology Tools in Teaching-Learning Mathematics of Key Stage 2

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ABSTRACT

This study assessed the technology tools used in teaching-learning Mathematics among Key Stage 2 teachers in three selected public elementary schools in Carmen III District, Bohol Province during the School Year 2025–2026. Specifically, it described the demographic profile of the teacher-respondents in terms of age, gender, designation or rank, highest educational attainment, and years in teaching; determined the extent of technology utilization in terms of faculty readiness, current teaching practices, institutional IT infrastructure, and student performance; assessed learners' academic performance in selected Mathematics competencies; examined the significant relationship between technology tools and learners' academic performance; and identified the concerns encountered by teachers in utilizing technology in Mathematics instruction. The study employed a quantitative descriptive-correlational research design involving thirty (30) teacher-respondents selected from the participating public elementary schools. Data were gathered using a researcher-made questionnaire and analyzed using frequency, percentage, weighted mean, and the Pearson Product-Moment Correlation Coefficient. Findings revealed that the respondents were predominantly female, aged 31–40 years, Teacher I, Bachelor's degree holders, and had ten years or more of teaching experience. Teachers demonstrated a High Extent of faculty readiness (4.41), current teaching practices (4.43), and institutional IT infrastructure (4.07), while student performance obtained an overall mean of 4.25 (Agree). Learners generally achieved Very Satisfactory performance in the selected Mathematics competencies. Correlation analysis revealed a statistically significant positive relationship between technology tools and learners' academic performance ($r = 0.684$, $p = 0.000$), indicating that greater utilization of technology was associated with higher Mathematics achievement. The major concerns identified by teachers included lack of ICT resources, poor internet connectivity, limited faculty training, and time constraints. Based on these findings, an Instructional Guide on Technology Integration in Teaching-Learning Mathematics was developed to strengthen teachers' technological competencies, improve instructional practices, and enhance learners' academic performance in Mathematics.

Keywords: technology integration, Mathematics education, Key Stage 2, technology tools, academic performance, faculty readiness, instructional technology, elementary education

1. THE PROBLEM AND ITS SCOPE

Introduction

Rationale of the Study

The rapidly evolving educational landscape brought about by the Fourth Industrial Revolution has significantly transformed teaching and learning processes across higher education institutions. The integration of advanced technologies, digital platforms, and innovative pedagogical approaches has redefined the roles of educators, requiring them to adapt to more flexible, learner-centered, and technology-driven environments. As emphasized in global education frameworks, Education 4.0 highlights the need for student-centered learning, digital competence, and adaptive teaching strategies to meet the demands of the modern world (Schwab, 2016; World Economic Forum & ADB, 2017; Welsh, 2018). In the Philippine context, higher education institutions are also undergoing transitions aligned with these global shifts, emphasizing the importance of equipping faculty with relevant teaching strategies suited for digital and hybrid learning environments .

In this context, effective teaching strategies have become increasingly complex and multifaceted. Educators are expected to not only deliver content but also integrate technology, foster engagement, and support diverse learning needs. Studies have shown that good teaching practices involve adaptability, student-centered approaches, and continuous professional development to address the dynamic nature of education (Lundberg, 2022; Pace, 2023; Low, 2023). Moreover, curriculum design must align with technological advancements to ensure meaningful learning experiences, highlighting the importance of integrating digital tools strategically rather than using them as mere supplements (Thelma et al., 2024; Xu, 2025).

Furthermore, the emergence of digital and online learning environments has intensified the need for faculty to develop competencies in virtual teaching, instructional design, and digital pedagogy. The transition to online and blended learning modalities has reshaped higher education, emphasizing flexibility, accessibility, and innovation in teaching practices (Salama & Hinton, 2023; Bozkurt, 2022; Alieto et al., 2024). However, despite these advancements, challenges such as limited technological skills, inadequate institutional support, and resistance to change continue to hinder effective teaching implementation (Singun, 2025; Phulpoto et al., 2024; Pervaiz et al., 2024).

In addition, the integration of emerging technologies such as artificial intelligence (AI) has further influenced teaching strategies and educational practices. AI-powered tools provide opportunities for personalized learning, automated feedback, and enhanced instructional materials, but they also raise concerns regarding ethical use, teacher preparedness, and reliability (Almuhanna, 2025; Gamlem et al., 2026). Consequently, teachers must be equipped with the necessary skills and training to effectively utilize these technologies while maintaining pedagogical integrity and human-centered learning approaches.

Another critical aspect of effective teaching lies in professional development and institutional support systems. Research highlights that teacher mentoring, leadership strategies, and continuous training programs play a vital role in enhancing pedagogical competencies and teaching effectiveness (Larsen et al., 2023; Mushadi et al., 2025; Rehman et al., 2025). Additionally, factors such as teacher motivation, job satisfaction, and resilience significantly influence teaching performance and educational outcomes,

particularly in rapidly changing educational environments (Muñoz-Fernández et al., 2025; Fu & Zhang, 2024).

Given these developments, there is a need to examine faculty strategies for effective teaching in the contemporary education landscape. This study aims to bridge existing gaps by exploring how educators adapt their teaching strategies in response to technological advancements, institutional demands, and evolving learner needs. By understanding these strategies, the study seeks to contribute to the development of more effective, inclusive, and sustainable teaching practices that align with the demands of 21st-century education (Adeoye & Otemuyiwa, 2024; Manera et al., 2025; Momdjian et al., 2025; Andrin et al., 2024).

Theoretical Background

The theoretical foundation of this study is anchored on the principles of Education 4.0, Constructivist Learning Theory, Situated Cognition, and Technological Pedagogical Integration, which collectively explain how faculty strategies evolve within a rapidly transforming educational landscape. Education 4.0 emphasizes learner-centered, technology-driven, and flexible learning environments that respond to the demands of the Fourth Industrial Revolution (Schwab, 2016; Welsh, 2018; Brown-Martin, 2017; Dunwill, 2016; James, 2019). This paradigm shift highlights the importance of integrating digital tools, artificial intelligence, and innovative pedagogies into teaching practices to enhance learning outcomes and prepare students for future challenges. In the Philippine context, higher education institutions are increasingly aligning their instructional strategies with these global transformations, emphasizing adaptability, digital competence, and innovation in teaching .

Constructivist Learning Theory further supports this study by emphasizing that knowledge is actively constructed by learners through interaction, experience, and reflection. Learning is not a passive process but an active engagement where students build understanding based on prior knowledge and real-world experiences (Bell & Winn, 2000; Myers & Wilson, 2000; Brown & Cole, 2000). This theoretical lens underscores the importance of student-centered teaching strategies such as collaborative learning, problem-based learning, and experiential activities. In modern education, these approaches are enhanced by digital tools and online platforms, enabling more interactive and meaningful learning experiences (Chambers et al., 2007; Honey et al., 2003; Lundberg, 2022; Pace, 2023; Low, 2023).

In addition, the concept of Situated Cognition explains that learning occurs within authentic contexts and is influenced by social interaction and environmental factors. This theory suggests that knowledge is best acquired when learners are engaged in real-life situations, making learning more relevant and applicable (Myers & Wilson, 2000; Brown & Cole, 2000; Bell & Winn, 2000). In the context of faculty strategies, this implies that educators must design instruction that connects theoretical concepts with practical applications, particularly in digital and hybrid learning environments. The integration of technology facilitates this process by providing simulations, virtual environments, and interactive tools that replicate real-world scenarios (Alieto et al., 2024; Salama & Hinton, 2023; Bozkurt, 2022; Andrin et al., 2024).

Moreover, the Technological Pedagogical Content Knowledge (TPACK) framework and digital pedagogy theories highlight the necessity for teachers to integrate technology effectively with pedagogy and subject content. Effective teaching in the digital age requires not only subject expertise but also the

ability to utilize technology to enhance instruction and student engagement (Thelma et al., 2024; Xu, 2025; Adeoye & Otemuyiwa, 2024; Momdjian et al., 2025). The emergence of artificial intelligence and smart classroom technologies further reinforces this need, as these tools offer opportunities for personalized learning, adaptive instruction, and data-driven decision-making in education (Almuhanna, 2025; Gamlem et al., 2026; Singun, 2025).

Additionally, theories on Teacher Professional Development and Organizational Support emphasize that continuous learning, mentoring, and leadership play a crucial role in enhancing teaching effectiveness. Teachers must continuously update their skills and adapt to new instructional approaches to remain effective in a rapidly changing educational environment (Larsen et al., 2023; Mushadi et al., 2025; Rehman et al., 2025). Institutional support, including training programs, access to resources, and leadership initiatives, significantly influences teachers' ability to implement effective teaching strategies. Furthermore, teacher motivation, job satisfaction, and resilience are key factors that impact teaching performance and overall educational outcomes (Muñoz-Fernández et al., 2025; Fu & Zhang, 2024; Phulpoto et al., 2024).

Finally, this study is also grounded in Digital Transformation Theory, which explains how technological advancements reshape educational systems, teaching practices, and learning environments. The transition to digital and blended learning has introduced new opportunities and challenges, requiring educators to navigate issues such as accessibility, digital literacy, and technological barriers (Singun, 2025; Pervaiz et al., 2024; Alieto et al., 2024). At the same time, culturally responsive pedagogy and inclusive teaching approaches highlight the importance of addressing diverse learner needs in multilingual and multicultural contexts (Manera et al., 2025). These theoretical perspectives collectively provide a comprehensive framework for understanding faculty strategies for effective teaching in the modern educational landscape, emphasizing the integration of technology, pedagogy, and contextual factors in achieving meaningful learning outcomes.

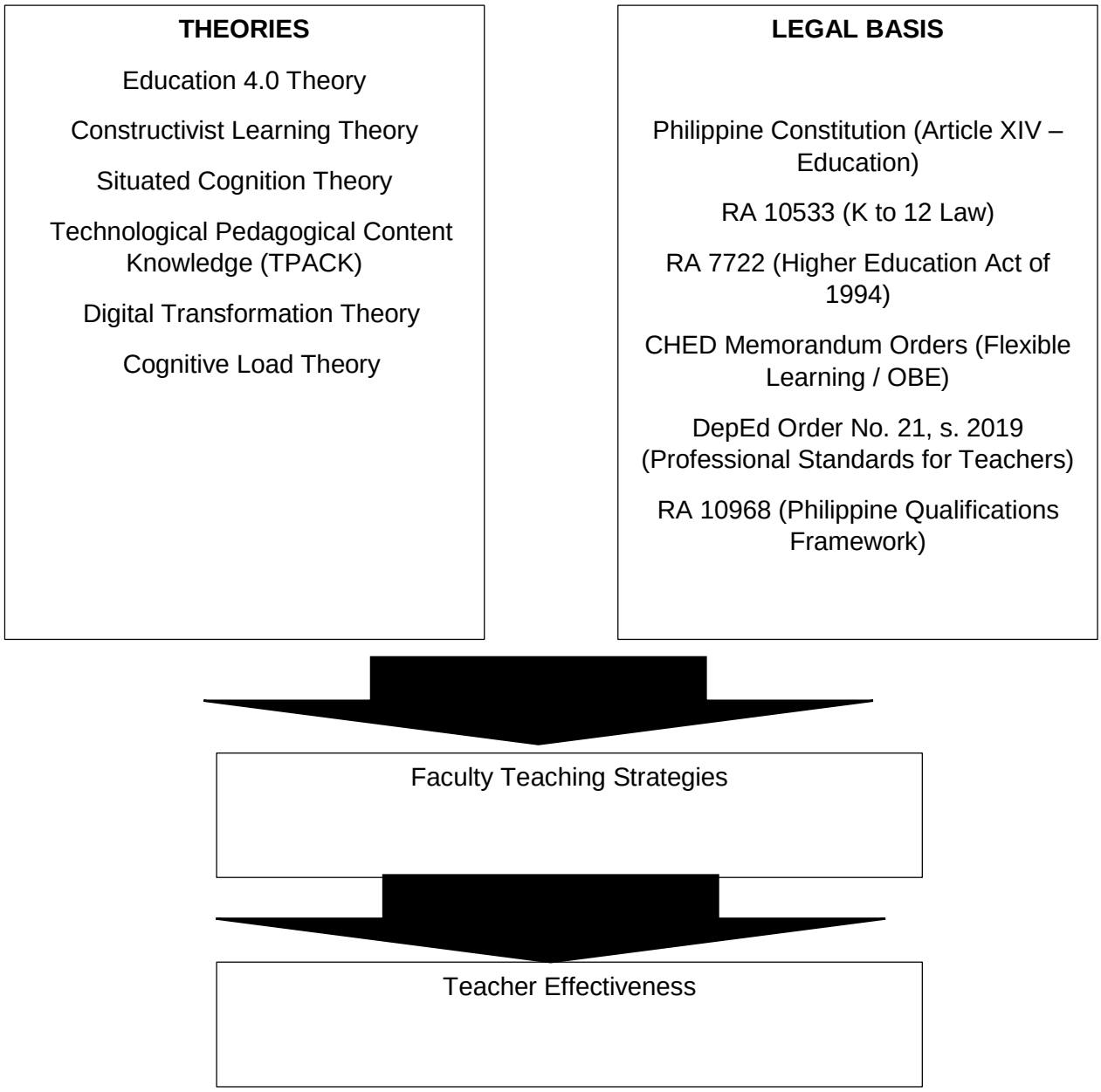

Figure 1.
Theoretical Background

Figure 1. Theoretical Framework

THE PROBLEM FACULTY STRATEGIES FOR EFFECTIVE TEACHING IN THE EDUCATION LANDSCAPE

Statement of the Problem

This study aims to assess the instruction in Mathematics in the selected three public elementary school of Carmen III District, Bohol Province for the School Year 2025 - 2026 as basis for instruction guide on how to use technology in teaching-learning process.

Specifically, this study seeks to answer the following questions:

1. What is the profile of the teachers:

   1.1 Age and gender;

   1.2 Designation or rank;

   1.3 Highest educational attainment; and

   1.4 Number of years in teaching?

2. What are the technology tools used in teaching mathematics?

3. What is the academic performance of the learners in math competencies as to:
   3.1 Add and subtract decimals with decimal parts of up to 4 decimal places.
   3.2 Perform three or more different operations by applying the GMDAS rules.
   3.3 Draw and state the properties of triangles and quadrilaterals.

4. Is there a significant relationship between technology tools used in teaching and academic performance?

5. What are the concerns related to the utilization of technology tools in teaching mathematics?

6. Based on the findings, what technology tools oriented instruction guide crafted?

Null Hypothesis

There is no significant relationship between teaching and learning practices, institutional IT infrastructure, and student performance among the selected elementary school in Carmen III District, Bohol Province.

Significance of the Study

This study examines the teaching and learning practices, institutional readiness, and pupil performance among elementary school teachers in selected elementary schools in Carmen III District, Bohol Province. The findings of this study provide meaningful insights that may contribute to improving instructional strategies, strengthening institutional preparedness, and enhancing learning outcomes in the context of Education 4.0.

Carmen III District Administrators. The results of this study may serve as a basis for administrators in developing policies, programs, and strategic interventions aimed at improving teaching effectiveness and institutional readiness. It may help identify gaps in teachers' preparedness and the availability of technological resources, enabling more efficient allocation of support and funding.

Faculty Members. This study may benefit teachers by providing insights into effective teaching strategies and current instructional practices that enhance pupil learning. It may guide them in refining their teaching approaches, integrating appropriate technology, and adapting to modern educational demands within the elementary level.

Elementary Learners (Pupils). The findings of the study may contribute to improving the quality of learning experiences among pupils. Enhanced teaching practices and improved institutional support may lead to better academic performance, increased engagement, and the development of foundational digital literacy and critical thinking skills.

Policy Makers and Educational Stakeholders. This study may provide valuable information for policymakers and stakeholders in designing and implementing educational policies, programs, and initiatives that support technology integration and quality basic education. It may also serve as a reference in strengthening the delivery of technology-enhanced learning in elementary schools.

Future Researchers. This study may serve as a reference for future research related to teaching strategies, institutional readiness, and pupil performance. It may also provide a foundation for further studies on educational innovation, digital transformation, and instructional effectiveness in various educational contexts.

2. THE RESEARCH METHODOLOGY

This section presents the research methodology, which includes the research design, flow of the study, research environment, research respondents, research instruments, data gathering procedures, statistical treatment of data, scoring procedures, and definition of terms.

Research Design

The study employed a descriptive-correlational research design. The descriptive component aimed to determine the level of teaching and learning practices, faculty readiness, institutional IT infrastructure, and student performance in the Elementary School in Carmen III District, Bohol Province. This allowed the researcher to describe the current status of instructional practices and institutional readiness in response to the demands of Education 4.0.

The correlational component examined whether a significant relationship exists between teaching and learning practices, institutional infrastructure, and student performance. Through this design, the study identified how faculty strategies and technological resources influence the academic performance of IT students.

Research Environment

This study was conducted in three selected elementary schools within Carmen III District, Bohol Province, namely Buenavista Elementary School, Montesuerte Elementary School, and Carmen III Central Elementary School. These schools were chosen based on their active engagement in integrating technology into classroom instruction and their initiatives aligned with the principles of Education 4.0. As key educational institutions in the district, they play a significant role in shaping the academic development of elementary learners.

The selected schools are committed to fostering pupils' foundational digital literacy, critical thinking, and adaptive learning skills appropriate to the elementary level. Their instructional environments reflect the integration of modern teaching strategies, including blended learning, the use of digital tools, and technology-assisted instruction aimed at enhancing pupil engagement and learning outcomes.

Furthermore, these schools provide a relevant setting for examining teaching practices and institutional readiness, particularly in terms of teachers' preparedness and the availability of IT resources. Their continuous efforts to improve instructional delivery and upgrade technological facilities make them appropriate venues for assessing how elementary education responds to the demands of contemporary learning.

Overall, Buenavista Elementary School, Montesuerte Elementary School, and Carmen III Central Elementary School represent a cohesive academic environment within Carmen III District, allowing for a comprehensive evaluation of how teaching strategies and institutional infrastructure influence the academic performance of elementary learners.

Figure 3. Locale of the Study

Respondents

The respondents of this study were faculty members from selected public elementary schools in Carmen III District, Bohol Province. Specifically, ten (10) faculty members were chosen from each of the following schools: Montesuerte Elementary School, Carmen 3 Central Elementary School, and Buenavista Elementary School, resulting in a total of thirty (30) respondents.

The study employed a purposive sampling technique, selecting respondents who were directly involved in teaching and had relevant experience in instructional practices and technology integration.

The inclusion criteria were as follows:

a) Respondents were currently employed as faculty members or administrators with teaching responsibilities in the selected institutions;

b) Respondents had at least one (1) year of teaching experience in their respective institutions; and

c) Respondents voluntarily agreed to participate in the study.

This selection ensured that respondents possessed adequate knowledge and experience in teaching practices and institutional systems, providing reliable and relevant data for the study.

Distribution of Respondents

Institution	**Respondents (f)**	**Percentage (%)**
Montesuerte Elementary School	10	33.3
Carmen 3 Central Elementary School	10	33.3
Buenavista Elementary School	10	33.3
Total	30	**100%**

Table 1

This distribution shows a total of thirty (30) respondents representing the selected three public elementary school in Carmen III District, Bohol Province. The inclusion of faculty members with teaching and administrative roles ensures a comprehensive perspective on teaching practices, institutional readiness, and technological integration within the academic setting.

Instrument

The primary instrument used in this study was a structured questionnaire designed to assess teaching practices, faculty readiness, and institutional IT infrastructure. The questionnaire was developed based on relevant educational frameworks and aligned with the objectives of the study to ensure its appropriateness and relevance to the research context.

The instrument underwent content validation by a panel of experts composed of educators, administrators, and research professionals to ensure clarity, accuracy, and suitability. It was also pilot-

tested among selected respondents outside the study group to establish reliability, readability, and ease of understanding.

The questionnaire consisted of three main sections:

(1) the demographic profile of respondents, including age, gender, designation or rank, highest educational attainment, and number of years in teaching;

(2) teaching and learning practices, which covered faculty readiness and current teaching practices measured using a five-point Likert scale ranging from Very High Extent to Very Low Extent; and

(3) institutional IT infrastructure, which assessed the availability, adequacy, and effectiveness of technological resources supporting teaching and learning, also measured using a five-point Likert scale.

The data gathered through this instrument served as the basis for analyzing the relationship between teaching practices, institutional infrastructure, and student performance, as well as for identifying areas for improvement and developing a proposed intervention program.

Data Gathering Procedure

This study adopted a systematic and ethical approach to ensure accuracy, reliability, and confidentiality throughout the data collection process.

First, a formal letter of request was prepared and addressed to the administrators of the selected elementary school in Carmen III District, Bohol Province. The letter sought permission to conduct the study and administer the validated questionnaire to qualified faculty members. Copies of the approved correspondence were forwarded to the respective school administrators for coordination and endorsement.

Upon receiving the necessary approvals, the researcher coordinated with designated school principal to schedule the distribution of questionnaires. Prior to administering the survey, respondents were briefed on the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. Clear instructions were provided to ensure that respondents fully understood each section of the questionnaire.

The validated researcher-made questionnaire was then personally distributed to the respondents during their available time to avoid disruption of their teaching responsibilities. Respondents were given sufficient time (approximately 20–30 minutes) to complete the instrument, and the researcher remained available to address any questions or clarifications during the process.

After completion, all accomplished questionnaires were collected, checked for completeness, and organized for data encoding. The gathered data were then encoded and prepared for statistical analysis using appropriate descriptive and inferential statistical tools to determine the level of teaching practices, institutional infrastructure, and student performance, as well as to examine the relationships among these variables.

Following the statistical analysis, the results were interpreted and discussed under the guidance of the research adviser to address the research questions and test the null hypotheses. Finally, the research report was reviewed, refined, and finalized in accordance with academic standards, ensuring that all procedures upheld confidentiality, ethical considerations, and research integrity.

3. SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, findings, conclusions, and recommendations of the study entitled "Technology Tools in Teaching-Learning Mathematics of Key Stage 2." The study aimed to assess the technology tools utilized by teachers in teaching Mathematics in the selected three public elementary schools in Carmen III District, Bohol Province during the School Year 2025–2026. Specifically, the study determined the respondents' demographic profile, identified the technology tools used in teaching Mathematics, assessed the academic performance of learners in selected Mathematics competencies, determined the significant relationship between technology tools and learners' academic performance, identified the concerns encountered by teachers in utilizing technology tools, and proposed an Instructional Guide for the effective integration of technology in Mathematics instruction.

The study employed a quantitative descriptive-correlational research design. The respondents consisted of thirty (30) public elementary school teachers from the three selected schools in Carmen III District, Bohol Province. Data were gathered through a researcher-made questionnaire and competency assessment records. Frequency, percentage, weighted mean, and Pearson Product-Moment Correlation Coefficient were utilized to analyze and interpret the collected data.

Summary

The study assessed the respondents' profile in terms of age, gender, designation or rank, highest educational attainment, and number of years in teaching. These variables provided the demographic characteristics of the respondents and served as the basis for describing the teaching workforce involved in Mathematics instruction.

The study further determined the extent of technology utilization in teaching Mathematics by examining faculty readiness, current teaching practices, institutional IT infrastructure, and student performance. Likewise, it evaluated the academic performance of learners in three selected Mathematics competencies, namely: adding and subtracting decimals with decimal parts of up to four decimal places, performing three or more different operations using the GMDAS rule, and drawing and stating the properties of triangles and quadrilaterals.

Finally, the study determined the significant relationship between technology tools used in teaching Mathematics and learners' academic performance. It also identified the concerns encountered by teachers in utilizing technology tools and utilized the findings as the basis for developing an Instructional Guide that will strengthen technology integration in Mathematics teaching and learning.

Table 15
Summary of Results

Major Area	Key Findings	Overall Result	Interpretation
Respondents' Profile	Majority were 31–40 years old, female, Teacher I, Bachelor's degree holders, and had 10 years and above teaching experience.	—	The respondents represented experienced public elementary school teachers capable of implementing technology-assisted instruction.

Faculty Readiness	Grand Mean = **4.41**	High Extent	Teachers demonstrated high readiness in utilizing technology in Mathematics instruction.
Current Teaching Practices	Grand Mean = **4.43**	High Extent	Teachers consistently implemented learner-centered and technology-supported instructional practices.
Institutional IT Infrastructure	Grand Mean = **4.07**	High Extent	Schools generally possessed adequate technological facilities, although improvements in internet connectivity and classroom equipment remain necessary.
Student Performance	Grand Mean = **4.25**	Agree	Learners demonstrated satisfactory academic performance and active classroom engagement.
Academic Performance in Adding and Subtracting Decimals	Majority (40.0%) obtained **Very Satisfactory**	Very Satisfactory	Learners demonstrated satisfactory mastery of decimal operations.
Academic Performance in Applying GMDAS	Majority (43.3%) obtained **Very Satisfactory**	Very Satisfactory	Learners demonstrated satisfactory understanding of the order of operations.
Academic Performance in Geometry	Majority (36.7%) obtained **Very Satisfactory**	Very Satisfactory	Learners demonstrated satisfactory understanding of geometric concepts.
Relationship Between Technology Tools and Academic Performance	**r = 0.684, p = 0.000**	Significant Positive Relationship	Greater utilization of technology tools was associated with better academic performance in Mathematics.
Concerns Encountered by Teachers	Lack of ICT resources, poor internet connectivity, limited faculty training, and time constraints.	High Concern	These factors affected the effective integration of technology into Mathematics instruction.

Findings

Based on the results of the study, the respondents were predominantly teachers aged 31–40 years, female, holding the Teacher I position, possessing Bachelor's degrees, and having ten years or more of teaching experience. This demographic profile indicates that the respondents possess sufficient

professional experience and instructional competence to implement technology-assisted teaching strategies while remaining receptive to educational innovations.

The study further revealed that teachers demonstrated a High Extent of technology utilization in Mathematics instruction. Faculty readiness, current teaching practices, and institutional IT infrastructure all obtained high ratings, indicating that teachers were confident in integrating technology into classroom instruction and continuously improved their instructional competencies. Likewise, teachers effectively implemented learner-centered teaching approaches, collaborative learning activities, and technology-supported assessment practices. Institutional support in terms of ICT facilities, digital learning platforms, and technical assistance was likewise evident, although improvements in internet connectivity and classroom technological resources remain necessary.

Learners generally demonstrated satisfactory academic performance in the selected Mathematics competencies. The majority obtained Very Satisfactory ratings in adding and subtracting decimals, applying the GMDAS rule, and identifying the properties of triangles and quadrilaterals. The correlation analysis further established a statistically significant positive relationship between technology tools and learners' academic performance ($r = 0.684$, $p = 0.000$), indicating that effective technology integration contributes positively to learners' achievement in Mathematics. The most common concerns encountered by teachers included lack of ICT resources, poor internet connectivity, limited faculty training, and insufficient time for technology integration.

Conclusions

Based on the findings of the study, it may be concluded that teachers in the selected public elementary schools demonstrate a high level of readiness and competence in integrating technology into Mathematics instruction. Their positive instructional practices, continuous professional development, and willingness to adopt educational innovations contribute significantly to the effective delivery of Mathematics lessons.

The study further concludes that institutional support through adequate ICT facilities, accessible digital learning platforms, and technical assistance enhances teachers' ability to integrate technology into classroom instruction. Although the participating schools generally exhibited a satisfactory level of technological infrastructure, improvements in internet connectivity, classroom technological resources, and continuous faculty training remain necessary to maximize the benefits of technology-enhanced learning.

Finally, the significant positive relationship between technology tools and learners' academic performance confirms that technology integration contributes to improved learner engagement, conceptual understanding, and Mathematics achievement. Consequently, strengthening teachers' technological competencies and improving institutional technological resources may further enhance learners' academic performance and support the effective implementation of the Mathematics curriculum in Key Stage 2.

Recommendations

1. School administrators should strengthen technology integration by providing adequate ICT facilities, updated technological equipment, reliable internet connectivity, and continuous technical support to teachers.
2. The Department of Education should conduct regular seminars, workshops, Learning Action Cell (LAC) sessions, and professional development programs that enhance teachers' competencies in utilizing emerging educational technologies and digital instructional resources in Mathematics.
3. Teachers should continuously improve their technological skills by participating in professional learning opportunities and incorporating innovative digital instructional strategies, interactive learning applications, multimedia presentations, and educational software into Mathematics instruction.
4. School administrators should implement the proposed Instructional Guide on Technology Integration in Teaching Mathematics and regularly evaluate its effectiveness in improving classroom instruction and learners' academic performance.
5. Greater collaboration among teachers, school heads, ICT coordinators, and other stakeholders should be encouraged to promote the sharing of best practices, instructional innovations, and effective technology-assisted teaching strategies.
6. Future researchers may conduct similar studies involving larger samples, additional public and private schools, or different educational settings. They may also investigate other variables such as teachers' digital competence, learner motivation, technology acceptance, instructional innovation, and digital literacy to further strengthen research on technology integration in Mathematics education.

4. OUTPUT OF THE STUDY

INSTRUCTIONAL GUIDE ON TECHNOLOGY INTEGRATION IN TEACHING-LEARNING MATHEMATICS

RATIONALE

The findings of the study revealed that technology tools play a significant role in improving the teaching-learning process in Mathematics among Key Stage 2 learners in the selected public elementary schools of Carmen III District, Bohol Province. Teachers demonstrated a high extent of faculty readiness, current teaching practices, institutional IT infrastructure, and student performance. These findings indicate that teachers are generally prepared and willing to integrate technology into Mathematics instruction to enhance learner engagement, participation, and academic achievement.

The study also showed that learners obtained generally satisfactory to very satisfactory performance in the selected Mathematics competencies, particularly in adding and subtracting decimals, applying the GMDAS rule, and identifying the properties of triangles and quadrilaterals. Furthermore, the correlation analysis revealed a significant positive relationship between technology tools used in teaching Mathematics and learners' academic performance. This implies that the effective use of digital learning resources, multimedia presentations, interactive applications, educational videos, and other technology-based tools contributes to better understanding and improved Mathematics performance.

However, several concerns were identified, including lack of ICT resources, poor internet connectivity, limited faculty training, time constraints, insufficient institutional support, resistance to technology use, and difficulty adapting to new technology. These challenges may limit the full implementation of technology-enhanced Mathematics instruction. Thus, an Instructional Guide on Technology Integration in Teaching-Learning Mathematics is proposed to support teachers in effectively using technology tools, improving Mathematics instruction, and enhancing learner performance.

5. OBJECTIVES

This Instructional Guide aims to:

1. Strengthen teachers' skills in integrating technology tools in Mathematics instruction.
2. Improve learners' understanding of selected Mathematics competencies through interactive and technology-assisted activities.
3. Provide teachers with practical strategies for using multimedia presentations, educational applications, digital platforms, and online resources.
4. Enhance learner participation, collaboration, and engagement in Mathematics lessons.
5. Address common concerns related to ICT resources, internet connectivity, faculty training, and time management.
6. Promote the effective use of technology in teaching decimal operations, GMDAS, and geometry.
7. Improve the academic performance of Key Stage 2 learners through technology-supported instruction.

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