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BEST PRACTICES OF TEACHERS AND TECHNOLOGY-AIDED INSTRUCTION IN RELATION TO PUPILS' ACADEMIC PERFORMANCE

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ABSTRACT

This study determined the levels of teachers' best practices, technology-aided instruction, and pupils' academic performance among public elementary school teachers in Districts 3A and 3B of the Division in the Negros Island Region during School Year 2024–2025. A quantitative descriptive-correlational research design was employed, involving 123 public elementary school teachers selected through total enumeration. Data were collected using a standardized 30-item questionnaire. The respondents were predominantly teachers with 5–10 years of teaching experience, bachelor's degree holders, and those who had attended 0–5 relevant ICT training programs. The findings revealed that teachers demonstrated a moderate level of best practices and technology-aided instruction, while pupils' academic performance was at a very satisfactory level. However, the results showed no significant relationship between teachers' best practices and pupils' academic performance. Likewise, no significant relationship was found between technology-aided instruction and pupils' academic performance. These findings indicate that although teachers demonstrated moderate levels of best practices and technology-aided instruction and pupils achieved very satisfactory academic performance, the variables examined did not demonstrate a significant association within the context of the study.

Keywords: teachers' best practices, technology-aided instruction, pupils' academic performance, elementary education, public school teachers

INTRODUCTION

The quality of education largely depends on teachers' ability to implement effective instructional practices that promote meaningful learning and improve pupils' academic performance. In 21st-century education, teachers are expected to employ learner-centered and evidence-based approaches that support learner engagement, critical thinking, collaboration, assessment, and meaningful learning experiences. Teachers' best practices, including lesson planning, differentiated instruction, formative assessment, collaborative learning, classroom management, and continuous feedback, contribute to an effective learning environment that responds to pupils' diverse learning needs.

The integration of technology has further transformed the teaching-learning process. Technology-aided instruction through digital tools, multimedia presentations, educational applications, interactive learning platforms, and online resources can enhance the delivery of lessons and provide opportunities for greater learner engagement and collaboration. Technology can also support the development of pupils' critical thinking, creativity, communication, and other competencies needed in contemporary education. However, the effective use of educational technology depends on

teachers' competence and confidence, as well as their ability to integrate digital tools meaningfully into instruction (UNESCO, 2023).

In the Philippine educational system, the Department of Education (DepEd) has promoted the integration of Information and Communication Technology (ICT) through various educational initiatives and programs. These efforts seek to strengthen teachers' pedagogical and technological competencies and maximize digital resources in support of learning. Nevertheless, challenges involving technological resources, teachers' digital competencies, internet connectivity, and access to appropriate digital learning materials may affect the implementation of technology-aided instruction, particularly in public elementary schools (DepEd, 2023).

Despite the emphasis on effective teaching practices and technology integration, the relationship of these factors with pupils' academic performance may vary across educational contexts. Thus, this study determined the levels of teachers' best practices, technology-aided instruction, and pupils' academic performance among public elementary school teachers in Districts 3A and 3B of the Division in the Negros Island Region during School Year 2024–2025. Specifically, it examined the level of teachers' best practices and technology-aided instruction, determined pupils' academic performance, and investigated whether teachers' best practices and technology-aided instruction were significantly related to pupils' academic performance. The findings may provide evidence for understanding the role of instructional practices and technology integration in the context of public elementary education and may inform efforts to strengthen teaching practices and support pupils' learning outcom

LITERATURE REVIEW

Teachers' Professional Characteristics

Teachers' professional characteristics, including length of service, educational attainment, and participation in relevant ICT training, provide important context for understanding instructional practices and technology use. Teaching experience allows teachers to encounter diverse classroom situations, develop instructional routines, manage learner behavior, and refine strategies according to learners' needs. However, years of service alone do not necessarily guarantee higher teaching effectiveness, as experience is more likely to contribute to professional competence when accompanied by reflection and continuing professional development.

Bacus et al. (2024), in a study involving 2,680 beginning teachers in the Philippine Department of Education, examined professional characteristics as predictors of teaching performance and found that length of service, together with other characteristics, was relevant to teaching performance. In contrast, Antiquina and Caliba (2024), who examined 161 teachers in Naawan District, found no significant relationship between demographic characteristics and teaching performance. These findings indicate that teaching experience is relevant for describing teachers' professional backgrounds, although its association with teaching performance may vary across contexts.

Educational attainment is another characteristic that may contribute to teachers' professional knowledge and competence. Graduate education may provide opportunities to deepen pedagogical knowledge, subject-matter expertise, research skills, and understanding of contemporary educational practices. Balanquit et al. (2023) found that the proportion of faculty members with doctoral degrees was significantly associated with higher institutional performance in the Licensure Examination for Teachers. Abenir and Abenir (2023) likewise examined educational attainment and instructional competencies among Grade 6 teachers in Capiz, demonstrating the relevance of academic qualifications in understanding teachers' professional characteristics. Nevertheless,

educational attainment should be considered alongside experience, professional development, school support, and other factors rather than as an independent guarantee of teaching effectiveness.

Relevant ICT training is particularly important as technology becomes increasingly integrated into classroom instruction. UNESCO (2023) emphasized that teachers require appropriate preparation and continuing professional development to use educational technology meaningfully. ICT training can strengthen teachers' technical skills while helping them understand how digital tools can be aligned with instructional objectives and learners' needs. Sasota et al. (2021), examining ICT integration among science and mathematics teachers in the Philippines, found that teachers' attitudes toward ICT, ICT skills, and technological resources were important factors in technology integration. Similarly, Magtoltol and Oropa (2025) reported that ICT-related training was associated with teachers' digital literacy, while inadequate training, limited equipment, unstable connectivity, and insufficient technical support remained barriers to technology integration.

These findings support the inclusion of length of service, educational attainment, and relevant ICT training as profile variables in the present study. They provide contextual information for understanding the professional backgrounds of the teacher-respondents and their possible differences in instructional practices and technology-aided instruction.

Teachers' Best Practices

Teachers' best practices encompass purposeful and learner-centered instructional practices such as lesson planning, classroom management, learner engagement, assessment, feedback, differentiated instruction, classroom interaction, and professional reflection. Effective teaching involves more than content delivery; it requires teachers to organize meaningful learning experiences, monitor learner progress, and respond to diverse learning needs.

Alp Christ et al. (2022), in a systematic review of teaching quality, identified dimensions such as cognitive activation, formative assessment, classroom management, socio-emotional support, active engagement, differentiation, and adaptation as important aspects of teaching quality. Their findings demonstrated that the relationship between teaching quality and student achievement is complex and may operate through learning processes. Similarly, Tao and Chen (2024), in a meta-analysis of K–12 classrooms, found that dialogic teacher talk was positively associated with student achievement and that student engagement mediated this relationship. These findings highlight the importance of instructional practices that actively involve learners in classroom interaction.

Pedagogical content knowledge is likewise an important component of effective teaching. Fukaya et al. (2025) found associations between pedagogical content knowledge, teaching quality, and student achievement in mathematics and science education. López-Martín et al. (2023), through a meta-analysis of teacher characteristics and competencies, further reported that professional competencies such as instructional planning, learning-environment creation, evaluation, feedback, professional development, and reflective attitudes were associated with student achievement.

Philippine studies also demonstrate the relevance of instructional practices in examining teacher performance. Antiquina and Caliba (2024) reported consistent use of various teaching strategies among teachers in Naawan District, while Escanda (2024) examined research-based instructional strategies, professional competence, and pedagogical approaches among elementary teachers in Iloilo. Collectively, these studies establish that teachers' best practices are multidimensional and involve the integration of instructional planning, classroom management, learner engagement, assessment, feedback, and pedagogical knowledge.

Technology-Aided Instruction

Technology-aided instruction involves the purposeful integration of digital tools, multimedia resources, educational applications, online platforms, and other ICT resources into teaching and learning. Technology can support the presentation of content, classroom interaction, assessment, access to learning resources, and differentiated learning. However, technology does not automatically improve learning; its value depends on appropriate pedagogical integration and alignment with instructional objectives.

UNESCO (2023) emphasized that technology can provide opportunities for interaction, collaboration, practice, personalized learning, and access to educational resources, but also stressed that technology should complement sound pedagogy and meaningful teacher–learner interaction. Akram et al. (2022) similarly reported generally positive teacher perceptions of technology integration while emphasizing the importance of teachers' technological knowledge, skills, and attitudes.

In the Philippine context, Sasota et al. (2021) found that teachers' ICT skills, attitudes, and availability of technological resources were important conditions for technology integration. Gardoque and Israel (2025) further found positive relationships between professional development and teacher technology integration among public elementary school teachers, highlighting the role of continuing professional development and school leadership. Magtoltol and Oropa (2025) likewise identified ICT training as an important factor associated with teachers' digital literacy and noted that inadequate training, limited equipment, connectivity problems, and insufficient technical support can constrain technology integration.

These findings indicate that technology-aided instruction is a multidimensional practice influenced by teacher competence, professional development, technological resources, and the instructional context. Thus, the extent to which teachers use technology should be examined together with the conditions that support its meaningful integration into classroom instruction.

Pupils' Academic Performance

Pupils' academic performance represents the extent to which learners demonstrate expected knowledge, skills, competencies, and learning outcomes. It is commonly reflected in grades, assessment results, examinations, and other school-based measures. Academic performance is influenced by multiple learner, instructional, family, and contextual factors and therefore should not be attributed to a single educational variable.

Research indicates that learner outcomes may be associated with the quality of classroom instruction and learner engagement. Tao and Chen (2024) found that dialogic teacher talk was positively associated with student achievement, with student engagement serving as an important mechanism. Similarly, Fukaya et al. (2025) reported associations between pedagogical content knowledge, teaching quality, and student achievement. These findings suggest that the quality of instructional experiences may contribute to academic outcomes, although the relationship may be influenced by other factors.

Parental and contextual factors may also affect academic performance. Wang and Wei (2024), through a meta-analysis, found a positive relationship between parental involvement and students' mathematics performance, although the strength of the relationship varied according to the type and context of parental involvement. In the Philippine setting, Pantao-o and Baldonado (2025) found generally high levels of parental involvement but no significant overall relationship between parental involvement and learners' academic performance, illustrating that learner outcomes are shaped by complex and context-dependent factors.

Technology may likewise contribute to learning when appropriately integrated. UNESCO (2023) noted that digital technologies can support access to learning resources, interaction, practice, and personalized learning, but emphasized that technology alone does not guarantee improved learning outcomes. The OECD (2023) also reported continuing challenges in Philippine student performance in mathematics, reading, and science, highlighting the broader importance of examining factors associated with learning outcomes.

Teachers' Best Practices and Pupils' Academic Performance

The literature generally recognizes teachers' instructional practices as an important component of the learning environment. Effective classroom interaction, pedagogical content knowledge, assessment, feedback, learner engagement, and appropriate instructional planning can provide pupils with meaningful opportunities to develop knowledge and skills. Tao and Chen (2024) found a positive association between dialogic teacher talk and student achievement, while Fukaya et al. (2025) identified relationships between pedagogical content knowledge, teaching quality, and student achievement.

Professional development may also strengthen teaching practices and indirectly support learner outcomes. Visscher et al. (2025), in a meta-analysis of in-service teacher professional development interventions, reported a positive average effect on student achievement. These findings provide a basis for examining whether teachers' best practices are associated with pupils' academic performance.

However, the literature also suggests that the relationship between teaching practices and academic achievement is not necessarily direct or uniform. Alp Christ et al. (2022) found that learning processes may mediate the relationship between teaching quality and achievement, while other learner and contextual factors may influence academic outcomes. Therefore, although teachers' best practices are important components of effective instruction, their association with pupils' academic performance requires empirical examination within specific educational contexts.

Technology-Aided Instruction and Pupils' Academic Performance

Technology has the potential to support pupils' learning by providing interactive content, multimedia representations, digital resources, opportunities for practice, and alternative forms of classroom participation. However, its contribution to academic performance depends on the quality and purpose of its integration.

UNESCO (2023) emphasized that digital technology can support teaching and learning but should be aligned with educational objectives and implemented through sound pedagogical practices. Sasota et al. (2021) similarly demonstrated that effective technology integration depends on teacher ICT skills, attitudes, and access to technological resources. These findings suggest that technology use should be examined not merely in terms of its presence but in relation to how teachers employ it in actual instruction.

Philippine studies further emphasize the role of teacher competence and professional development in technology integration. Gardoque and Israel (2025) found positive relationships between professional development and technology integration among public elementary school teachers, while Magtoltol and Oropa (2025) identified ICT training as an important factor associated with digital literacy. Such findings indicate that the educational contribution of technology may depend on teachers' preparedness and the conditions under which digital tools are used.

Although technology-aided instruction may provide meaningful opportunities for learning, its relationship with academic performance cannot be assumed to be automatic. Learner characteristics, teacher competence, instructional design, access to resources, parental support, and school conditions may also influence academic outcomes. Thus, empirical investigation is necessary to determine whether the level of technology-aided instruction is significantly associated with pupils' academic performance in the context of the present study.

Synthesis of the Literature

The reviewed literature establishes that teachers' professional characteristics, instructional practices, technology use, and pupils' academic performance are interconnected components of the educational process. Length of service and educational attainment provide information about teachers' professional backgrounds, while ICT training may contribute to their readiness to integrate technology into instruction. Teachers' best practices encompass multiple dimensions of effective teaching, including classroom management, learner engagement, assessment, feedback, instructional planning, and pedagogical knowledge. Technology-aided instruction provides additional opportunities for teaching and learning but requires appropriate teacher competence, professional development, resources, and pedagogical alignment.

Although previous studies have generally identified positive associations between teaching quality, professional development, technology integration, and learner outcomes, the relationships are not always consistent across contexts. Much of the literature emphasizes that academic performance is influenced by multiple factors and that instructional practices or technology use alone may not explain differences in learner achievement. This variation provides a basis for examining these relationships in specific school contexts.

Accordingly, the present study addresses this contextual gap by examining teachers' best practices, technology-aided instruction, and pupils' academic performance among public elementary school teachers in Districts III-A and III-B of the Schools Division in the Negros Island Region during School Year 2024–2025. It specifically determines the levels of the variables and empirically examines whether teachers' best practices and technology-aided instruction are significantly related to pupils' academic performance.

METHODOLOGY

The study employed a quantitative descriptive-correlational research design. The descriptive component was used to determine the levels of teachers' best practices, technology-aided instruction, and pupils' academic performance as they naturally occurred in the study setting. The correlational component was used to examine the relationships between teachers' best practices and pupils' academic performance and between technology-aided instruction and pupils' academic performance. The design was appropriate because it allowed the researcher to collect quantitative data and examine relationships among the variables without manipulating the study conditions.

The participants were 123 public elementary school teachers from eight schools in Districts III-A and III-B of the Schools Division in the Negros Island Region during School Year 2024–2025. Total enumeration was employed, whereby all qualified teachers in the identified schools were invited to participate. Inclusion criteria required participants to be currently employed as elementary school teachers during the conduct of the study and willing to provide informed consent. The respondents' profile was described in terms of length of service, educational attainment, and number of relevant ICT training programs attended.

Data were collected using a standardized questionnaire adapted from established educational frameworks, including Danielson's Framework for Teaching for teachers' instructional best practices and the Technological Pedagogical Content Knowledge (TPACK) framework of Mishra and Koehler for technology-aided instruction. The questionnaire consisted of sections covering the respondents' profile, teachers' best practices, and technology-aided instruction. Items measuring teachers' best practices and technology-aided instruction were rated using a five-point Likert scale ranging from 5 (Strongly Agree) to 1 (Strongly Disagree).

Pupils' academic performance was determined using documentary data on class performance obtained through the research instrument and the corresponding school records, as applicable.

Permission to conduct the study was secured from the Schools Division Superintendent and the school heads of the eight participating elementary schools. After approval was obtained, the researcher coordinated with the school administrators regarding the administration of the questionnaire. The purpose of the study was explained to the participants, and informed consent was secured before data collection. Participation was voluntary, and confidentiality of the information provided was maintained throughout the research process.

The questionnaires were distributed to the teacher-participants and retrieved after completion. The collected data were checked, organized, encoded, tabulated, and prepared for statistical analysis.

Descriptive and inferential statistical procedures were used to analyze the data. Frequency counts and percentages were used to summarize the respondents' profile. Means and standard deviations were used to determine the levels of teachers' best practices and technology-aided instruction and to summarize pupils' academic performance, as appropriate to the measurement of each variable.

For teachers' best practices and technology-aided instruction, mean scores were interpreted using a five-point scale: 4.21–5.00, Very High; 3.41–4.20, High; 2.61–3.40, Moderate; 1.81–2.60, Low; and 1.00–1.80, Very Low.

Pupils' academic performance was interpreted according to the applicable grading scale, wherein 90–100 was classified as Outstanding, 85–89 as Very Satisfactory, 80–84 as Satisfactory, 75–79 as Fairly Satisfactory, and below 75 as Did Not Meet Expectations.

Spearman's rank-order correlation coefficient was used to determine the relationships between teachers' best practices and pupils' academic performance and between technology-aided instruction and pupils' academic performance.

RESULTS AND DISCUSSIONS

Demographic Profile of Respondents

Table 1. Frequency and Percentage Distribution of the Demographic Profile of Respondents.

Profile	Category	f	%
Length in Service			
	0-5 years	35	28.46
	5-10 years	50	40.65
	11 years and above	38	30.89
	Total	123	100.00
Educational Attainment			
	Bachelor's Degree	72	58.54
	Master's Degree	42	34.15

	Doctorate Degree	9	7.32
	Total	123	100.00
Relevant ICT Trainings Attended			
	0-5	71	57.72
	6-10	40	32.52
	11 and above	12	9.76
	Total	123	100.00

The 123 teacher-respondents were described according to length of service, educational attainment, and number of relevant ICT training programs attended. In terms of length of service, the largest group consisted of teachers with 5–10 years of experience (50, 40.65%), followed by those with 11 years and above (38, 30.89%) and those with 0–5 years of service (35, 28.46%). This distribution indicates that a substantial proportion of the respondents had several years of teaching experience.

Regarding educational attainment, most respondents held a bachelor's degree (72, 58.54%), followed by those with a master's degree (42, 34.15%) and a doctorate degree (9, 7.32%). The distribution indicates that while the majority had attained a bachelor's degree, a considerable proportion had pursued graduate-level education.

In terms of relevant ICT training, 71 respondents (57.72%) had attended 0–5 training programs, 40 (32.52%) had attended 6–10 training programs, and 12 (9.76%) had attended 11 or more training programs. The findings show that most respondents had participated in a relatively limited number of ICT-related training programs.

Level of Teachers' Best Practices

Table 2. Level of Teachers' Best Practices.

Statements	Mean	SD	Interpretation
1. I align my daily lesson objectives with national curriculum standards	3.36	.79	Moderate
2. I design activities that explicitly cater to diverse student learning styles (visual, auditory, kinesthetic).	3.32	.75	Moderate
3. I prepare all my instructional materials and lesson components well before class begins	3.38	.79	Moderate
4. I establish clear classroom rules, routines, and behavioral expectations at the start of the term	3.32	.91	Moderate
5. I maximize actual instructional time by minimizing transition periods and classroom disruptions.	3.33	.78	Moderate
6. I cultivate a safe, positive, and inclusive learning environment that encourages participation.	3.59	2.80	High
7. I implement differentiated instruction to support both struggling learners and advanced students	3.35	.79	Moderate
8. I incorporate collaborative learning structures and group activities into my weekly lessons	3.37	.84	Moderate
9. I use data from regular formative assessments to adjust the pace and direction of my teaching.	3.46	.80	High
10. I provide constructive, timely, and specific feedback on student work to guide their improvement.	3.39	.82	Moderate

11. I integrate real-world examples and practical applications into abstract lesson concepts.	3.39	.77	Moderate
12. I utilize higher-order thinking skills (HOTS) questions during classroom discussions.	3.16	.71	Moderate
13. I reflect regularly on my teaching methods to identify personal areas for professional growth.	3.26	.65	Moderate
14. I maintain consistent communication with parents regarding student progress and behavior.	3.40	.74	Moderate
15. I collaborate actively with grade-level peers to share effective lesson plans and teaching tips.	3.32	.77	Moderate
Teachers' Best Practices as a Whole	**3.36**	**.50**	**Moderate**

Legend:(4.21-5.0)-Very High;(3.41 – 4.20)-High;(2.61-3.40) Moderate (1.81 – 2.60)-Low;(1.00 – 1.80)-Very Low

Level of Technology-Aided Instruction

Table 3. Level of Technology-Aided Instruction.

Statements	Mean	SD	Interpretation
1. I integrate multimedia presentations (videos, slides) to explain complex topics	3.39	.79	Moderate
2. I use educational software, applications, c online games to reinforce lessons.	3.37	.80	Moderate
3. I utilize digital platforms (LMS, Google Classroom) to distribute and collect assignments.	3.28	.77	Moderate
4. I encourage pupils to use technology for research and independent learning.	3.24	.78	Moderate
5. I attend professional development sessions to improve my digital teaching skills.	3.33	.75	Moderate
6. I use digital interactive whiteboards or projection systems during live delivery.	3.49	.73	High
2. I employ online assessment tools (e.g., Kahoot, Google Forms) for real-time quizzes.	3.41	.72	High
3. I select technological tools that directly align with my specific lesson objectives.	3.32	.75	Moderate
4. I use digital simulation tools to visualize abstract theories or experiments.	3.37	.73	Moderate
5. I offer digital learning materials (e-books, PDFs) that pupils can access at home.	3.33	.73	Moderate
6. I teach pupils proper digital citizenship and safe internet practices.	3.28	.62	Moderate
7. I utilize technology to communicate instructional updates to pupils and parents.	3.24	.74	Moderate
8. I use automated data tools or electronic spreadsheets to track student grades.	3.46	.81	High

9. I adapt my technology use to resolve sudden technical glitches in the classroom.	3.27	.75	Moderate
10. I design projects that require the creation of digital artifacts (e.g., slides, videos).	3.24	.73	Moderate
Technology-Aided Instruction as a Whole	**3.33**	**.43**	**Moderate**

Legend:(4.21-5.0)-Very High;(3.41 – 4.20)-High;(2.61-3.40) Moderate (1.81 – 2.60)-Low;(1.00 – 1.80)-Very Low

practices in areas such as HOTS questioning, differentiated instruction, and professional reflection.

Table 3 shows that the highest mean was obtained for statement 6, "I use digital interactive whiteboards or projection systems during live delivery," with a mean of 3.49 (M = 3.49, SD = 0.73), interpreted as high. This indicates that the use of digital interactive whiteboards or projection systems was the most commonly practiced form of technology-aided instruction among the teachers. The mean suggests that teachers generally integrate visual and presentation technologies into their classroom instruction to support lesson delivery. The SD of 0.73 indicates a relatively low variation in the responses, suggesting that the teachers had generally similar perceptions regarding their use of these technologies.

This finding is consistent with Lingatong et al. (2025), who noted that teachers' instructional practices are influenced by the availability and use of resources within the context of curriculum reform. The use of technology for classroom instruction can provide teachers with additional means of presenting information and facilitating learning. Similarly, technology-supported instruction has been recognized as an important component of contemporary teaching, particularly when digital tools are appropriately integrated into classroom activities.

The lowest means were both 3.24, obtained by statement 4, "I encourage pupils to use technology for research and independent learning," and statement 7, "I utilize technology to communicate instructional updates to pupils and parents," as well as statement 10, "I design projects that require the creation of digital artifacts (e.g., slides, videos),". These were all interpreted as moderate. Their standard deviations were 0.78, 0.74, and 0.73, respectively, indicating relatively limited variation in the teachers' responses.

The results suggest that although teachers use technology for direct classroom presentation, they may be less likely to extend technology use toward pupil-centered, independent, communicative, and creative activities. In particular, encouraging pupils to conduct research independently, communicating instructional updates through technology, and requiring pupils to create digital outputs involve a more active role for learners in using digital technologies. The moderate ratings may therefore indicate that technology is used more frequently as a teacher-support tool than as a medium for pupils to independently create, communicate, and explore.

This finding contrasts with the emphasis of Liu and Dacanay (2025) on developing higher-order thinking through instructional strategies that encourage more active learner engagement. When pupils are asked to research, create digital products, or independently use technology, technology can move beyond presentation and become a tool for active learning and knowledge construction.

As a whole, technology-aided instruction obtained a mean of 3.33 and SD of 0.43, interpreted as moderate. This indicates that teachers moderately practice technology-aided instruction in their teaching. The overall result suggests that technology is incorporated into classroom instruction, but its application varies across different instructional purposes. Teachers demonstrate relatively

stronger use of technology for live lesson delivery, online assessment, and electronic grade monitoring, while practices involving independent pupil learning, digital communication, and creation of digital artifacts remain at a moderate level. The SD of 0.43 indicates low variability in the overall responses. This means that the teachers' ratings were relatively close to one another, suggesting a generally consistent perception of their level of technology-aided instruction.

The finding is generally consistent with Lingatong et al. (2025), whose study emphasized that teachers' practices vary according to instructional demands and the resources available to them. However, the present finding also highlights a distinction between simply using technology in teaching and using technology to promote active and independent pupil engagement. Thus, the moderate overall rating suggests that while technology has become part of teachers' instructional practices, its integration may still be more concentrated on teacher-led activities than on learner-centered digital learning experiences.

Overall, the results indicate that teachers demonstrate a moderate level of technology-aided instruction, with the strongest practice involving the use of digital interactive whiteboards or projection systems (M = 3.49, SD = 0.73), while the lowest-rated practices (M = 3.24) involve pupils' independent use of technology, technology-supported communication, and creation of digital artifacts. The overall mean of 3.33 (SD = 0.43) confirms that technology is utilized in instruction at a moderate level, with relatively consistent responses among the teachers.

Level of Pupil's Academic Performance

Table 4. Level of Pupils' Academic Performance.

Level of Academic Performance	N	Mean	SD	Interpretation
Outstanding	0	85.25	1.05	Very Satisfactory
Very Satisfactory	95			
Satisfactory	28			
Fairly Satisfactory	0			
Did Not Meet Expectations	0			

Legend:(90-100)-Outstanding; (85-89)-Very Satisfactory; (80-84)-Satisfactory; (75-79)-Fairly Satisfactory; (75 below)-Did Not Meet Expectations

The table shows that the pupils generally demonstrated a very satisfactory level of academic performance, with a mean of 85.25 (M = 85.25, SD = 1.05). The majority of the pupils, 95, were classified as very satisfactory, while 28 pupils were classified as satisfactory. No pupils were classified as outstanding, fairly satisfactory, or did not meet expectations. This indicates that the academic performance of the pupils was generally favorable, with most learners achieving grades within the very satisfactory category. The standard deviation of 1.05 indicates a relatively small variation in the pupils' academic performance. This suggests that the grades of the pupils were relatively close to the mean, indicating a fairly consistent level of academic achievement across the group. The absence of pupils in the outstanding and lower performance categories further suggests that the learners' academic results were concentrated within the very satisfactory and satisfactory levels.

The finding is consistent with Peradillo and Martin (2025), who reported that primary learners in a Philippine elementary school obtained a satisfactory academic performance, with a mean grade of 84.36%. Similarly, Lagrimas (2025) examined educational practices and academic performance among Grade 6 pupils in Northern Samar and specifically assessed pupils' academic performance alongside different educational practices. These findings support the observation that elementary pupils in Philippine public-school settings can demonstrate generally satisfactory to very satisfactory academic outcomes.

The present result is also comparable with Callao and Uy (2023), who reported that Grade 5 learners exposed to technology-based instruction achieved a very satisfactory level of performance, with 63% of learners obtaining a very satisfactory rating. This provides further support for the present finding that pupils' academic performance can be concentrated within the satisfactory and very satisfactory categories.

However, the present result contrasts with studies reporting greater variation or challenges in pupils' achievement. For example, Lumba and Dioso (2025) investigated technology integration among multigrade learners and examined changes in numeracy and literacy achievement, indicating that academic outcomes can vary depending on the learning context and instructional approach. Likewise, Molde and Ducot (2025) examined the relationship between teachers' classroom management practices and learners' academic achievement in Araling Panlipunan, highlighting the role of instructional and classroom factors in learner outcomes.

Overall, the findings indicate that the pupils in the present study were performing at a generally favorable academic level, with most achieving very satisfactory grades and relatively little variation in their performance. The result provides a positive baseline for examining whether teachers' best practices and technology-aided instruction are associated with pupils' academic performance.

Relationship Between Teachers' Best Practices and Pupil's Performance

Table 5. Relationship Between Teachers' Best Practices and Pupil's Performance.

Variable	Test Statistics (r_s)	p-value	Decision for Ho	Interpretation
Teachers Best Practices vs. Pupil's Performance	.002	.979	Failed to Reject Ho	Not Significant

The results showed no statistically significant relationship between teachers' best practices and pupils' academic performance (r_s = .002, p = .979). Since the p-value exceeded the 0.05 level of significance, the null hypothesis was not rejected. The correlation coefficient indicates an almost zero positive association, suggesting that variations in teachers' reported best practices were not meaningfully associated with variations in pupils' academic performance in the present study.

This finding may reflect the multifaceted nature of pupils' academic performance, which can be influenced by factors beyond teachers' reported instructional practices, including learners' prior knowledge, motivation, attendance, parental support, learning environment, socioeconomic circumstances, and access to educational resources. Thus, the moderate level of teachers' best practices observed in the study did not correspond to a statistically significant association with pupils' academic performance.

The finding differs from Lingatong et al. (2025), who highlighted the importance of instructional practices, including assessment, feedback, and collaboration, in teaching effectiveness. The

difference may be attributed to variations in educational contexts, measures of instructional practices, and factors affecting learner outcomes. Overall, the present finding indicates that teachers' best practices, while important components of classroom instruction, were not significantly associated with pupils' academic performance within the context of this study.

Relationship Between Technology-Aided Instruction and Pupil's Performance

Table 6. Relationship Between Technology-Aided Instruction and Academic Performance

Variable	Test Statistics (r_s)	p-value	Decision for Ho	Interpretation
Technology-Aided Instruction vs. Academic Performance.	.056	.540	Failed to Reject Ho	Not Significant

The results revealed no statistically significant relationship between technology-aided instruction and pupils' academic performance (r_s = .056, p = .540). Since the p-value was greater than the 0.05 level of significance, the null hypothesis was not rejected. The correlation coefficient indicates a very weak positive association, suggesting that differences in the level of technology-aided instruction were associated with only minimal differences in pupils' academic performance.

The finding suggests that the presence of technology in instruction alone may not necessarily be associated with higher academic performance. The contribution of technology to learning may depend on how appropriately it is integrated with instructional objectives, learning activities, assessment practices, and pupils' learning needs. Other learner- and context-related factors may likewise influence academic performance.

The finding differs from Callao and Uy (2023), who reported very satisfactory learner performance following technology-based instruction, and Gonzales and Gonzales (2024), who found technology-aided instruction through Microsoft Teams to be effective in teaching arts. These studies indicate that technology may support learning when deliberately integrated into the teaching-learning process. However, the present study did not find a statistically significant association between technology-aided instruction and pupils' academic performance.

Consistent with Lingatong et al. (2025), the finding further highlights the importance of considering the broader instructional context, including curriculum demands, available resources, and other factors affecting teaching and learning. Overall, technology-aided instruction demonstrated only a very weak association with pupils' academic performance in the present study.

CONCLUSIONS

Based on the findings of the study, the following conclusions were formulated:

The teacher-respondents were predominantly moderately experienced, bachelor's degree holders, and had limited participation in relevant ICT training programs.

Teachers demonstrated a moderate level of best practices, indicating that the identified instructional, classroom management, assessment, and professional practices were generally implemented but not consistently at a high level.

Technology-aided instruction was practiced at a moderate level, indicating that teachers utilized digital technologies in the teaching-learning process, although their integration was not consistently extensive.

Pupils demonstrated very satisfactory academic performance, indicating that they generally attained the expected level of academic achievement.

Teachers' best practices were not significantly associated with pupils' academic performance, indicating that variations in the reported level of best practices did not correspond to meaningful differences in pupils' academic outcomes.

Technology-aided instruction was not significantly associated with pupils' academic performance, indicating that differences in the extent of technology use did not correspond to meaningful differences in pupils' academic outcomes.

REFERENCES

1) 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, 920317. https://doi.org/10.3389/fpsyg.2022.920317
2) Antiquina, M. A., & Caliba, I. G. (2024). Teaching strategies and performance of teachers in Naawan District. Psychology and Education: A Multidisciplinary Journal, 19(6), 648–665. https://doi.org/10.5281/zenodo.11111511
3) Balanquit, E. P., Ladia, M. A. P., & Nool, N. R. (2023). The influence of faculty members' educational attainment on the performance in the Licensure Examination for Teachers (LET) among state universities and colleges in the Philippines. Journal of Curriculum and Teaching, 12(1), 247–258. https://doi.org/10.5430/jct.v12n1p247
4) Bacus, R. C., Picardal, M. T., Perez, N. B., & Balo, V. T. M. (2024). Predictors of beginning teachers' teaching performance. Frontiers in Education, 9, 1375726. https://doi.org/10.3389/feduc.2024.1375726
5) Cabansag, M. O. (2025). Teachers' competency of ICT integration in teaching elementary teachers in Flora District. Asian Journal of Education and Social Studies, 51(2), 281–293. https://doi.org/10.9734/ajess/2025/v51i21785
6) Fernández-Sánchez, M. R., Garrido-Arroyo, M. C., & Porras-Masero, I. (2022). Curricular integration of digital technologies in teaching processes. Frontiers in Education, 7, 1005499. https://doi.org/10.3389/feduc.2022.1005499
7) Fukaya, T., Nakamura, D., Kitayama, Y., & Nakagoshi, T. (2025). A systematic review and meta-analysis of research on mathematics and science pedagogical content knowledge: Exploring its associations with teacher and student variables. Teaching and Teacher Education, 155, 104881. https://doi.org/10.1016/j.tate.2024.104881
8) Gardoque, L. C., & Israel, G. F. G. (2025). 21st century school administrators' skills and teacher technology integration: The mediating role of teacher professional development. International Journal of Multidisciplinary Educational Research and Innovation, 3(2), 387–405. https://doi.org/10.17613/4h4yw-d7063
9) López-Martín, E., Gutiérrez-de-Rozas, B., González-Benito, A. M., & Expósito-Casas, E. (2023). Why do teachers matter? A meta-analytic review of how teacher characteristics and competencies affect students' academic achievement. International Journal of Educational Research, 120, 102199. https://doi.org/10.1016/j.ijer.2023.102199
10) Magtoltol, R., & Oropa, J. (2025). ICT landscape and digital literacy skills of basic education teachers. Journal of Interdisciplinary Perspectives, 3(6), 145–153. https://doi.org/10.69569/jip.2025.173
11) OECD. (2023). PISA 2022 results (Volume I): The state of learning and equity in education. OECD Publishing. https://doi.org/10.1787/53f23881-en

12) Philipsen, B., Tondeur, J., Blieck, Y., & Vanslambrouck, S. (2023). Teacher professional development for online teaching: An update of insights stemming from contemporary research. In M. J. Spector, B. B. Lockee, & M. D. Childress (Eds.), Learning, design, and technology. Springer. https://doi.org/10.1007/978-3-319-17461-7_167
13) Sasota, R. S., Cristobal, R. R., Sario, I. S., Biyo, J. T., & Magadia, J. C. (2021). Will–skill–tool (WST) model of technology integration in teaching science and mathematics in the Philippines. Journal of Computers in Education, 8, 443–464. https://doi.org/10.1007/s40692-021-00185-w
14) Tao, Y., & Chen, G. (2024). The relationship between teacher talk and students' academic achievement: A meta-analysis. Educational Research Review, 45, 100638. https://doi.org/10.1016/j.edurev.2024.100638
15) Tondeur, J., Howard, S., Van Zanten, M., Gorissen, P., Van der Neut, I., Uerz, D., & Kral, M. (2023). The HeDiCom framework: Higher Education teachers' digital competencies for the future. Educational Technology Research and Development, 71, 33–53. https://doi.org/10.1007/s11423-023-10193-5
16) UNESCO. (2023). Global education monitoring report 2023: Technology in education—A tool on whose terms? UNESCO. https://doi.org/10.54676/UZQV8501
17) Visscher, A. J., Dmoshinskaia, N., Pellegrini, M., & Rey-Naizaque, A. (2025). (When) do teacher professional development interventions improve student achievement? A meta-analysis of 128 high-quality studies. Educational Research Review, 49, 100742. https://doi.org/10.1016/j.edurev.2025.100742
18) Wang, X., & Wei, Y. (2024). The influence of parental involvement on students' math performance: A meta-analysis. Frontiers in Psychology, 15, 1463359. https://doi.org/10.3389/fpsyg.2024.1463359