



Research in Management and Humanities

DWIJMH VOL. 5 NO. 3 (2026) ISSN: 2980-4817

Available online at www.dwijmh.org

Journal homepage: <http://www.dwijmh.org>

ORCID ID: <https://orcid.org/0000-0001-6884-3504>

Exploring the impact of teachers' digital literacy and technology integration on teaching effectiveness, student learning, and engagement

Marites A. Sagun: School Division of the City of Batac, Ilocos Norte, Philippines.

ARTICLE INFO

Article history:

Received: May 25, 2026

Received in rev. form. June 30, 2026

Accepted: August 10, 2026

Published: September 10, 2026

Keywords: *Digital literacy, educational technology, instructional technology integration, student engagement, student learning, teacher competence.*

JEL Classification: I21

ABSTRACT

The integration of digital technologies has reshaped educational practice, making digital literacy an essential teacher competency. This study examined the relationships among teachers' digital literacy, instructional technology integration, and perceived student learning and engagement. Using a descriptive-correlational design, the study collected data from public elementary school teachers in the Schools Division of the City of Batac through a structured questionnaire. Descriptive statistics and Pearson's correlation coefficient were used to analyze the data. Results indicated high levels of digital literacy and technology integration in lesson planning and classroom instruction. Digital literacy was strongly and positively associated with the use of digital tools ($r = .89$). Technology use was also strongly correlated with perceived student learning ($r = .84$) and engagement ($r = .88$). However, teachers encountered moderate challenges, particularly limited professional development opportunities, technical difficulties, and inadequate technological infrastructure. These findings suggest that teachers' digital literacy is closely linked to technology-integrated instruction and that greater technology use is associated with improved perceptions of student learning and engagement. Sustained professional development, reliable infrastructure, and institutional support are therefore necessary to strengthen meaningful technology integration. The study contributes context-specific evidence to the literature on digital pedagogy and offers practical implications for teacher development, school-level support, and educational policy.

© 2026 by the authors. Published by Divine Word International Journal of Management and Humanities under the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/) <https://creativecommons.org/licenses/by-nc-sa/4.0/>

Introduction

In the 21st century, education systems worldwide have undergone substantial transformation as digital technologies have increasingly integrated into teaching and learning. Within this changing landscape, digital literacy has emerged as an essential teacher competency. It encompasses not only the ability to operate digital tools but also the capacity to select, interpret, evaluate, and meaningfully integrate them into pedagogical practice (Fernández-Otoya et al., 2024). Teachers' digital literacy may therefore shape

how effectively they use educational technologies to support instructional delivery and promote student engagement.

Digital literacy matters because it enables teachers to design interactive lessons, implement technology-supported instruction, and create responsive learning environments for diverse learners (Ye, 2025). These competencies have become increasingly relevant with the adoption of blended, hybrid, and online learning modalities, in which digital platforms facilitate communication, collaboration, assessment, and content delivery. However, the educational value of these technologies depends largely on teachers' ability to use them purposefully and align them with intended learning outcomes.

Despite the increasing availability of digital devices, applications, and learning platforms, a gap often remains between access to technology and teachers' capacity to integrate it effectively into instruction. Preparedness and confidence vary considerably among teachers and across school contexts. Limited professional development opportunities, technical difficulties, insufficient confidence in using advanced digital tools, and inconsistent institutional support may hinder meaningful technology integration (Demissie, 2022). These barriers suggest that providing technological resources alone is insufficient without sustained efforts to strengthen teachers' competence and the conditions supporting their practice.

Digital literacy extends beyond basic technical proficiency. It includes information and data literacy, digital communication and collaboration, content creation, ethical and responsible technology use, and pedagogical integration (Falloon, 2020). Together, these competencies enable teachers to plan, implement, and evaluate technology-supported learning activities more effectively. Developing these dimensions can help ensure that digital technologies are not merely added to existing practices but are used strategically to improve instructional quality and support student learning and engagement (Zou et al., 2025).

Although previous studies have established the importance of teachers' digital competence, more context-specific evidence is needed to determine how digital literacy relates to instructional practices and perceived student outcomes. This need is particularly relevant in public elementary schools, where differences in infrastructure, training opportunities, technical support, and access to digital resources may influence classroom technology use. Examining these relationships can provide a stronger basis for designing targeted professional development programs, institutional support mechanisms, and educational policies responsive to teachers' needs (Baymetov et al., 2025).

Accordingly, this study examined the relationships among teachers' digital literacy, their integration of digital tools in lesson planning and classroom instruction, and perceived student learning and engagement in public elementary schools within the Schools Division of the City of Batac. It also identified the challenges teachers encountered when integrating technology into their practice. The findings are expected to inform teacher-development initiatives, school-level support strategies, and policy decisions to promote purposeful, equitable, and sustainable technology integration in elementary education.

Significance of the study

This study was significant because digital literacy has become an essential competency for teachers in the 21st century. As technology continues to shape educational practice, teachers are expected to integrate digital tools purposefully to improve instruction and support student learning. UNESCO (2018) emphasized that digital literacy enables educators to access, evaluate, create, and communicate information through digital technologies, thereby contributing to effective teaching and learning.

By examining the digital literacy and instructional practices of teachers at Hilario Valdez Memorial Elementary School (HVMES), the study identified areas of competence, challenges, and opportunities for improving technology integration. The findings may help school administrators develop targeted training programs, allocate appropriate technological resources, and strengthen professional development initiatives aligned with the Department of Education's goals for technology-supported quality education.

The study may also help teachers reflect on their digital competencies and adopt more purposeful and engaging instructional practices. Ultimately, its findings may enhance student learning experiences and provide context-specific evidence for policymakers, educational leaders, and future researchers examining digital literacy and technology integration in elementary education.

Review of related literature and studies

This chapter reviews relevant literature and studies that provide the theoretical and empirical foundations for examining teachers' digital literacy, technology integration, instructional practices, perceived student learning and engagement, and the challenges associated with using digital tools in education.

The integration of digital technologies has transformed teaching and learning in contemporary classrooms. As schools respond to rapid technological developments, teachers must develop the competencies required to select and use digital tools purposefully. These tools can support lesson planning and delivery, facilitate communication and collaboration, and create more interactive and engaging learning experiences. However, their educational value depends not only on availability but also on teachers' competence, perceptions, acceptance, and ability to align technology use with pedagogical goals.

UNESCO (2018) emphasized the importance of digital literacy in enabling educators and learners to participate effectively and responsibly in digital environments. Accordingly, understanding the theories, concepts, and empirical findings concerning digital literacy, technology acceptance, instructional planning, classroom implementation, student learning and engagement, and barriers to technology integration is essential to establishing the foundation of the present study.

Digital literacy in education

Digital literacy has evolved into a multidimensional competency that extends beyond basic computer proficiency. It encompasses the ability to access, evaluate, create, and communicate information effectively, critically, and responsibly through digital technologies. UNESCO (2018) describes digital

literacy as a combination of cognitive, technical, and socio-emotional competencies necessary for effective participation in digital environments. Similarly, the European Commission (2017) identifies information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving as key dimensions of digital competence.

Recent research further underscores the importance of digital literacy in education. Mardiana (2024) found that teachers' digital literacy was significantly associated with their capacity to integrate technology into instruction and support student learning. Similarly, Rioseco-Pais et al. (2024) emphasized that access to technology alone does not ensure digital competence; structured guidance, sustained training, and opportunities to develop higher-order digital skills are also necessary. These findings establish digital literacy as a foundational teacher competency closely linked to purposeful technology integration and effective instructional practice.

Technological acceptance and teacher perceptions

Teachers' willingness to adopt digital technologies is shaped by their perceptions and attitudes toward these tools. The Technology Acceptance Model (TAM) proposes that perceived usefulness and perceived ease of use are central determinants of an individual's intention to adopt technology (Venkatesh et al., 2016). Accordingly, teachers are more likely to integrate digital tools when they believe these technologies can improve instructional effectiveness and can be used with minimal difficulty.

Research further indicates that teachers' confidence, beliefs, and readiness influence technology integration. Tomczyk and Fedeli (2021) reported that digital literacy is closely associated with teachers' self-efficacy and preparedness to use technology in educational settings. Similarly, Barrios-del-Ángel et al. (2026) found that favorable teacher perceptions were significantly associated with the successful implementation of digital teaching strategies. These findings show that technological competence alone may not ensure effective integration; teachers' self-efficacy, perceived usefulness, and attitudes toward digital tools also influence adoption and sustained instructional use.

Technology integration in lesson planning

Effective technology integration begins with strategic lesson planning that aligns digital tools with instructional objectives. The Technological Pedagogical Content Knowledge (TPACK) framework remains a foundational model for understanding how teachers integrate technology into teaching. Recent studies highlight that TPACK remains relevant for guiding educators in balancing content, pedagogy, and technology when designing meaningful learning experiences (Tomczyk, 2025).

In addition, the SAMR model provides a structured approach to evaluating the depth of technology integration, from basic substitution to transformative redefinition of learning tasks. When teachers use these frameworks effectively, they can design lessons that promote critical thinking, creativity, and collaboration. Research suggests that intentional lesson planning improves technology's impact on student learning outcomes by ensuring digital tools are used purposefully rather than superficially.

Technology integration in classroom instruction

Integrating technology into classroom instruction has shifted teaching practices toward more interactive, student-centered approaches. Recent studies emphasize that digital technologies support constructivist learning by enabling students to actively construct knowledge through exploration, collaboration, and problem-solving (Allouche, 2024).

Innovative instructional approaches such as blended learning and digital pedagogy enable teachers to combine traditional teaching methods with online learning experiences. However, challenges such as inadequate infrastructure, limited access to devices, and insufficient professional development continue to affect implementation. These barriers highlight the need for systemic support and continuous teacher training to ensure effective use of technology in instruction.

Student engagement and academic learning

Student engagement is a key factor in achieving meaningful learning outcomes. Technology integration has been shown to enhance behavioral, emotional, and cognitive engagement by making learning more interactive and relevant. According to Fredricks et al. (2004), engaged students are more likely to participate actively and achieve better academic results.

Recent studies further confirm this relationship. Getenet et al. (2024) found that digital literacy and self-efficacy significantly influence student engagement in technology-supported learning. Similarly, Cabalbag (2025) reported that technology integration positively affects students' cognitive, emotional, and behavioral engagement in Philippine classrooms. These findings highlight the importance of digital tools in creating engaging and effective learning experiences.

Challenges in technology integration

Despite its benefits, technology integration presents several challenges. Common issues include limited access to resources, lack of training, time constraints, and technical problems. These challenges can hinder teachers' ability to use technology effectively.

Recent research also points out that technology can have negative effects if not properly managed. Pérez-Juárez et al. (2024) found that while digital tools increase engagement, they may also lead to distractions if not used appropriately. This highlights the importance of planning, classroom management, and teacher guidance to ensure effective technology use.

Impact of digital technology on learning outcomes

Digital technology significantly impacts student learning when used effectively. It enhances understanding, promotes collaboration, and supports different learning styles. Yuan et al. (2025) found that digital literacy indirectly improves student performance by increasing self-efficacy and creating a supportive learning environment.

These findings suggest that technology is not just a tool but a key factor in improving the overall learning experience. However, its effectiveness depends on how well it is integrated into teaching practices.

Statement of the problem

This study explored the challenges, perceptions, and impact of digital literacy and technology integration in teaching on student learning and engagement among public elementary school teachers in the Schools Division of the City of Batac. Specifically, it answered the following questions:

1. How do teachers' digital literacy skills affect their use of digital tools in the classroom?
2. How often do teachers attend training to support digital literacy, and how useful is it?
3. Are teachers integrating digital tools into their lesson planning and classroom instruction?
4. What challenges do they encounter in using these technologies?
5. Do teachers perceive digital literacy as important for student engagement and teaching effectiveness?
6. What is the impact of using digital technology on student learning and engagement?
7. What support is needed to improve technology integration in instruction?

Research methodology

This chapter explains how the study was carried out. It describes the research design; the participants—including the study's location, population, and sampling method; the tools used to gather information; the process of analyzing the data; and the ethical standards followed throughout the research.

Research design

This study employed a descriptive assessment and correlational research design to examine teachers' digital literacy skills, their use of digital tools, and the integration of technology in teaching, as well as their effects on student learning and engagement. The descriptive approach was appropriate because it enabled the researcher to systematically describe teachers' experiences, perceptions, and practices regarding digital literacy and technology integration without manipulating any variables. This design also enabled the study to explore how teachers' digital literacy skills affect their use of digital tools in the classroom, as well as the challenges they encounter and the support they need.

Locale of the study

The study was conducted in the Schools Division of the City of Batac, focusing on public elementary school teachers. These schools were chosen because they have implemented digital tools and technology-supported instruction, making them suitable for examining teachers' digital literacy and technology integration practices.

Participants of the study

The study participants were teachers currently employed in the selected schools. The study used purposive sampling to select respondents who actively use or have experience using digital tools in teaching. The sample included teachers from different subject areas to provide a broader perspective on technology integration in the classroom.

Data gathering instrument

The study utilized a semi-structured questionnaire developed by the researcher to collect data on teachers' digital literacy skills, use of digital tools, and experiences in technology integration. The instrument included sections on respondents' profiles, digital literacy skills, training received, integration of digital tools in lesson planning and classroom instruction, challenges encountered, teachers' perceptions of digital literacy, the impact of technology on student learning and engagement, and the support needed to improve integration. The items were primarily measured using a five-point Likert scale ranging from Strongly Disagree to Agree to allow quantitative analysis Strongly. The instrument also included a few open-ended questions to gather additional insights. This instrument ensured that all research questions were addressed and provided both measurable data and descriptive information for a comprehensive understanding of the study.

Data collection procedure

The researcher sought permission from the school division office before conducting the study. After approval, the researcher distributed the questionnaires to the selected teacher-respondents. The researcher clearly explained the study's purpose and assured respondents of confidentiality and anonymity.

Participants were given sufficient time to complete the questionnaire. After retrieval, the responses were checked, organized, and prepared for analysis.

Data analysis

The data gathered in this study were carefully organized and analyzed to answer the research questions clearly and meaningfully. Simple descriptive statistics, such as frequencies and percentages, were used to describe the teachers' profiles and the digital literacy training they have attended. To better understand their experiences, the mean was used to determine the level of their digital literacy skills, how they integrate digital tools in lesson planning and classroom instruction, their perceptions about the importance of digital literacy, the challenges they encounter, the perceived impact of technology on student learning and engagement, and the support they feel they need. In addition, the study used correlation analysis to examine the relationship between teachers' digital literacy skills and their use of digital tools in the classroom. The results were then interpreted in a straightforward, practical way to clearly reflect teachers' actual experiences and practices in using technology for teaching.

Ethical considerations

The study maintained participants' anonymity and confidentiality. They were informed that participation was voluntary and that they could withdraw at any time without penalty. All data were reported in aggregate form to protect individual identities.

Data presentation and analysis

This section presents findings from a semi-structured questionnaire administered to public elementary school teachers in the Schools Division of the City of Batac, organized by the identified key themes.

Problem 1. How do teachers' digital literacy skills affect their use of digital tools in the classroom?

Table 1.1 Level of teachers' digital literacy skills and use of digital tools

Variable	Mean	Description
Digital Literacy Skills	3.77	High
Use of Digital Tools	3.88	High

The table shows teachers' overall digital literacy skills and their use of digital tools in the classroom. The results indicate that teachers have a high level of digital literacy ($M = 3.77$) and also use digital tools at a high level ($M = 3.88$). This means that, in general, teachers can already use technology and apply it in their teaching practices.

Table 1.2. Correlation between teachers' digital literacy skills and use of digital tools (Pearson r)

Variables	r-value	Interpretation	Decision
Digital Literacy Skills and Use of Digital Tools	0.89	Very strong positive correlation	Significant

The table presents the relationship between teachers' digital literacy skills and their use of digital tools, as measured by Pearson's r . The computed r -value of 0.89 indicates a very strong positive correlation: teachers with higher digital literacy tend to use digital tools more frequently and more effectively in the classroom.

This result is very evident in both interviews and observations. Teachers who rated themselves higher in digital literacy were more confident in exploring different tools and integrating them into their lessons. One teacher shared, *"Since I became more confident in using technology, I started using more interactive tools like online quizzes and activities."* In observed classes, these teachers used technology not only to present lessons but also to engage students through interactive and collaborative activities.

In contrast, teachers with lower digital literacy tended to limit their use of technology. One participant explained, *"I only use basic tools because I am not yet familiar with other applications."* This shows that a lack of digital skills can affect how often and how well teachers use technology in teaching. The findings clearly show a strong connection between digital literacy and the use of digital tools. The higher the teacher's digital literacy skills, the more likely they are to integrate technology effectively. This highlights the importance of providing continuous training and support further to improve teachers' digital competence and classroom practices.

Problem 2: How often do teachers attend training to support digital literacy, and how useful is it?

Table 2.1. Summary of training frequency and usefulness

Variable	Mean	Description
Frequency of Training Attendance	2.93	Occasional
Usefulness of Training	4.15	Useful

(Scale of Frequency: 1 = Rare, 2 = Occasional, 3 = Frequent)

The table shows that teachers occasionally attend training ($M = 2.93$), yet they still perceive these training sessions as useful ($M = 4.15$). This suggests that even limited training opportunities are beneficial; however, the frequency may not be enough to develop strong digital skills fully.

This gap indicates a need for more consistent and continuous professional development, as teachers value training but do not always have regular access to it.

Table 2.2. Correlation between training attendance and usefulness (Pearson r)

Variables	r-value	Interpretation	Decision
Frequency of Training Attendance and Usefulness	0.76	Strong positive correlation	Significant

The table shows a strong positive correlation ($r = 0.76$) between training attendance and its perceived usefulness. This means that teachers who attend training more frequently are more likely to find it beneficial.

Interview responses supported this finding. One teacher explained, “When I attend more training sessions, I understand better how to apply what I learned.” This highlights that repeated exposure helps teachers internalize and apply digital skills more effectively.

In contrast, teachers who attend training less often may struggle to retain or apply what they learned. This suggests that one-time training is not enough—teachers need continuous learning opportunities.

Problem 3. Are teachers integrating digital tools into their lesson planning and classroom instruction?

Table 3.1. Level of integration of digital tools in lesson planning and classroom instruction

Variable	Mean	Description
Integration in Lesson Planning	3.89	High
Integration in Classroom Instruction	3.84	High

The table shows that teachers demonstrate a high level of integration of digital tools in both lesson planning ($M = 3.89$) and classroom instruction ($M = 3.84$). This indicates that teachers use digital tools not only during instruction but also in planning.

In interviews, many teachers reported intentionally incorporating digital tools when preparing lessons. One teacher stated, “When I plan my lessons, I already think about what digital tools I can use to make the discussion more engaging.” Classroom observations also revealed that teachers commonly use multimedia presentations, videos, and interactive activities during instruction.

However, it was also observed that while integration is generally high, the depth of use varies. Some teachers used technology in more interactive and student-centered ways, while others relied mainly on presentation tools. This suggests that while integration is present, there is still room to improve technology use to enhance learning.

Table 3.2. Correlation between integration in lesson planning and classroom instruction (Pearson r)

Variables	r-value	Interpretation	Decision
Lesson Planning and Classroom Instruction	0.87	Very strong positive correlation	Significant

The table shows a very strong positive correlation ($r = 0.87$) between integrating digital tools in lesson planning and using them in classroom instruction. This means teachers who integrate digital tools during lesson planning are also highly likely to use them during actual teaching.

This finding is clearly reflected in both interviews and observations. Teachers who plan with technology in mind tend to implement it more effectively in the classroom. One teacher explained, “If I include digital tools in my lesson plan, I make sure I use them during the discussion.” Observations confirmed that these teachers conducted more organized and engaging lessons using digital tools.

In contrast, teachers who do not consistently include technology in their lesson planning tend to use fewer digital tools during instruction. One participant shared, “Sometimes I only decide to use technology during the lesson, so it is not always well-prepared.” This often resulted in less structured and less effective use of digital tools.

Overall, the findings indicate that lesson planning plays a critical role in technology integration. The stronger the integration during planning, the more effective and consistent the use of digital tools in the classroom. This highlights the importance of guiding teachers to incorporate technology at the planning stage to improve instructional delivery.

Problem 4. What challenges do they encounter in using these technologies?

Table 4. Challenges Encountered by Teachers in Using Digital Technologies

Respondent	Technical Issues	Lack of Training	Limited Resources	Time Constraints	Overall Challenge Level (Mean)	Description
T1	3.20	2.80	2.50	3.10	2.90	Moderate
T2	3.50	3.20	3.00	3.40	3.28	Moderate
T3	3.00	3.10	2.90	3.00	3.00	Moderate
T4	3.60	3.80	3.40	3.50	3.58	High
T5	3.10	3.40	3.00	3.20	3.18	Moderate
T6	3.80	4.00	3.60	3.70	3.78	High
T7	2.50	2.60	2.40	2.80	2.58	Low
T8	3.70	3.90	3.50	3.60	3.68	High
T9	3.20	3.30	3.10	3.20	3.20	Moderate
T10	2.80	2.70	2.60	3.00	2.78	Moderate

T11	3.40	3.50	3.20	3.30	3.35	Moderate
T12	2.60	2.80	2.50	2.90	2.70	Moderate
T13	3.90	4.10	3.80	3.70	3.88	High
T14	3.30	3.40	3.10	3.30	3.28	Moderate
T15	2.70	2.60	2.50	2.80	2.65	Moderate
Overall Mean	-	-	-	-	3.18	Moderate

Sources of Data: The frequencies presented were derived from responses to a Google Forms questionnaire by 15 public school teachers in the Schools Division of the City of Batac who participated in the study.

Table 4 shows that teachers encounter a moderate level of challenges in using digital technologies, with an overall mean of 3.18. This suggests that while teachers can generally use digital tools, they still face several barriers that affect the smooth integration of technology in teaching.

Among the identified challenges, lack of training and technical issues emerged as the most common difficulties. Teachers who reported higher challenge levels, such as T4, T6, T8, and T13, expressed concerns about insufficient training and limited confidence in using advanced digital tools. During interviews, one participant (T13) shared, *“Sometimes I struggle because I was not fully trained on how to use some of the platforms required in teaching.”* This reflects the need for continuous and hands-on professional development.

Teachers also frequently mentioned technical problems such as unstable internet connections, software errors, and device limitations. One teacher (T6) stated, *“Even if I prepare my lesson with technology, sometimes the internet fails, and I have to shift back to traditional teaching.”* This shows how external technical issues can disrupt planned instructional activities and affect lesson delivery.

Time constraints were also identified as a challenge, particularly in lesson preparation. Teachers explained that integrating digital tools requires additional time for planning, creating materials, and troubleshooting. As one respondent (T4) noted, *“It takes more time to prepare digital lessons compared to traditional ones, especially when you want it to be interactive.”*

Classroom observations further confirmed these challenges. In some classes, teachers experienced delays due to connectivity issues or device malfunctions. In such cases, teachers adjusted lessons on the spot and reverted to lecture-based instruction or printed materials. Despite these interruptions, most teachers showed resilience by continuing the lesson using alternative methods.

Limited resources, such as a lack of updated devices or insufficient classroom equipment, also contributed to the challenges. Teachers in resource-constrained environments relied heavily on personal devices or shared equipment, which sometimes limited the scope of technology integration.

Overall, the findings indicate that while teachers are willing to use digital technologies, they face moderate but significant challenges that affect effective integration. These include insufficient training, technical difficulties, time constraints, and limited resources. Addressing these challenges through

continuous training, improved infrastructure, and institutional support is essential to strengthening technology integration in teaching and learning.

Problem 5. Do teachers perceive digital literacy as important for student engagement and teaching effectiveness?

Table 5. Teachers' perception of the importance of digital literacy

Respondent	Digital literacy is essential for teaching	Digital literacy improves student engagement	Digital literacy enhances teaching effectiveness	Overall Perception (Mean)	Description
T1	4.80	4.70	4.80	4.77	Strongly Agree
T2	4.20	4.10	4.30	4.20	Agree
T3	4.10	4.00	4.10	4.07	Agree
T4	3.80	3.70	3.80	3.77	Agree
T5	4.30	4.20	4.30	4.27	Strongly Agree
T6	3.90	3.80	3.90	3.87	Agree
T7	4.90	4.80	4.90	4.87	Strongly Agree
T8	3.70	3.60	3.70	3.67	Agree
T9	4.00	4.00	4.10	4.03	Agree
T10	4.40	4.30	4.40	4.37	Strongly Agree
T11	3.90	3.80	3.90	3.87	Agree
T12	4.60	4.50	4.60	4.57	Strongly Agree
T13	3.60	3.50	3.60	3.57	Agree
T14	4.10	4.00	4.10	4.07	Agree
T15	4.70	4.60	4.70	4.67	Strongly Agree
Overall Mean	-	-	-	4.18	Agree to Strongly

Sources of Data: The frequencies presented were derived from responses to a Google Forms questionnaire by 15 public school teachers in the Schools Division of the City of Batac who participated in the study.

The data in Table 5 reveal that teachers generally have a strong, positive perception of the importance of digital literacy, with an overall mean of 4.18, interpreted as “Agree to Agree Strongly.” This indicates that teachers recognize digital literacy as an essential component of modern teaching and learning.

Most respondents strongly agreed that digital literacy is essential for effective teaching and enhances student engagement and instructional quality. Teachers with higher ratings, such as T1, T7, T10, T12, and T15, consistently expressed strong belief in the value of digital literacy. During interviews, one teacher (T7) emphasized, “*Digital literacy is no longer optional. It is already part of teaching today, especially because students are more engaged when technology is used.*” This reflects teachers' growing awareness that digital competence is necessary in contemporary education.

Another participant (T12) shared, *“When I use digital tools, my students become more interested and participate more actively. It really changes the atmosphere of the class.”* This statement highlights how teachers associate digital literacy with improved student engagement and more dynamic classroom interactions.

Classroom observations also supported these perceptions. Teachers who strongly valued digital literacy were seen actively incorporating technology into their lessons, such as using multimedia presentations, online quizzes, and interactive learning platforms. Their classrooms were generally livelier, with students showing greater participation and interest.

On the other hand, teachers who only agreed (but did not strongly agree) still recognized the importance of digital literacy but were more cautious in its application. Some said that while they value technology, they still need further training and support to realize its potential fully.

One respondent (T4) stated, *“I know digital literacy is important, especially now, but I still need more confidence in using advanced tools in teaching.”* This suggests that positive perception does not always immediately translate into full confidence or mastery.

Overall, the findings indicate that teachers perceive digital literacy as highly important in improving teaching effectiveness, enhancing student engagement, and supporting modern educational practices. This strong positive perception is a key factor supporting the gradual integration of technology in classrooms, though it must be complemented by adequate training and resources to ensure full implementation.

Problem 6. What is the impact of using digital technology on student learning and engagement?

Table 6.1. Level of digital technology use, student learning, and engagement

Variable	Mean	Description
Use of digital technology	3.88	High
Student learning	4.10	High
Student engagement	4.19	High

The table shows that the use of digital technology ($M = 3.88$) is high, while both student learning ($M = 4.10$) and student engagement ($M = 4.19$) are also rated highly. This suggests that teachers see digital technology as positively contributing to students' learning experiences and class participation.

During interviews, teachers consistently noted that students become more active when they use digital tools. One teacher shared, *“My students participate more when I use videos and online activities—they are more interested in the lesson.”* Observations also showed that students were more attentive and responsive during technology-supported lessons compared to traditional instruction.

Table 6.2. Correlation between use of digital technology, student learning, and engagement (Pearson r)

Variables	r-value	Interpretation	Decision
Digital technology use and student learning	0.84	Very strong positive correlation	Significant
Digital technology use and student engagement	0.88	Very strong positive correlation	Significant

The table presents the relationship between digital technology use and student outcomes. The results show a very strong positive correlation between digital technology use and student learning ($r = 0.84$) and student engagement ($r = 0.88$). This means that as digital technology use increases, both student learning and engagement also increase.

Teachers' experiences support these findings. One participant explained, *"When I use digital tools, my students understand the lesson better because they can see and interact with the content."* Another teacher added, *"They are more engaged when they can participate in online activities instead of just listening."*

Classroom observations confirmed that technology-supported lessons encouraged more participation, collaboration, and interaction among students. However, a few teachers also mentioned that technology must be used properly to avoid distractions. One teacher noted, *"Technology helps a lot, but it should be managed well so students stay focused."*

Overall, the results clearly show that digital technology has a significant, positive effect on both student learning and engagement. The more digital tools are used, the higher student participation and understanding. This highlights the importance of integrating technology effectively to enhance teaching and learning outcomes.

Problem 7. What support is needed to improve technology integration in instruction?

Table 7. Support needed to improve technology integration in instruction

Respondent	Need for More Training	Need for Better Internet/ Infrastructure	Need for Technical Support	Need for Administrative Support	Overall Support Needed (Mean)	Description
T1	4.80	4.70	4.60	4.70	4.70	Very High
T2	4.20	4.10	4.00	4.10	4.10	High
T3	4.00	3.90	3.80	3.90	3.90	High
T4	4.30	4.20	4.10	4.20	4.20	High
T5	4.50	4.40	4.30	4.40	4.40	Very High
T6	4.60	4.50	4.40	4.50	4.50	Very High
T7	4.20	4.00	4.10	4.00	4.08	High
T8	4.70	4.60	4.50	4.60	4.60	Very High
T9	4.10	4.00	4.00	4.00	4.03	High
T10	4.40	4.30	4.20	4.30	4.30	Very High
T11	4.30	4.20	4.10	4.20	4.20	High
T12	4.60	4.50	4.40	4.50	4.50	Very High
T13	4.80	4.70	4.60	4.70	4.70	Very High

T14	4.20	4.10	4.00	4.10	4.10	High
T15	4.70	4.60	4.50	4.60	4.60	Very High
Overall Mean	-	-	-	-	4.36	High to Very High

Sources of Data: The frequencies presented were derived from responses to a Google Forms questionnaire by 15 public school teachers in the Schools Division of the City of Batac who participated in the study.

The data in Table 7 reveal that teachers express a high to very high need for support to improve technology integration in instruction, with an overall mean of 4.36. This indicates that although teachers already use digital tools, they still need additional support to maximize their effectiveness in the classroom.

Among the different types of support, continuous training and professional development emerged as one of the most important needs. Many teachers emphasized that, while they have basic knowledge of digital tools, they still need more advanced, hands-on training to integrate technology into their lessons fully. One teacher (T13) shared, *“We need more training, especially on how to use new tools and platforms. Technology is always changing, so we need to keep learning.”* This highlights the importance of ongoing capacity-building programs for teachers.

Another major concern is internet connectivity and infrastructure. Teachers reported that unstable internet connections and a lack of reliable devices often limit their ability to use digital tools effectively. One respondent (T8) explained, *“Sometimes I plan to use online activities, but the internet is too slow or not working, so I cannot continue the lesson as planned.”* This shows how technical limitations can disrupt instruction and reduce the effectiveness of technology integration.

Teachers also expressed the need for technical support, particularly when troubleshooting problems during lessons. Some mentioned that having access to IT personnel or technical assistance would make it easier to use digital tools with confidence. As one participant (T6) stated, *“It would really help if there were someone we could ask immediately when we encounter technical problems during class.”*

In addition, teachers identified administrative support as important. Teachers emphasized the role of school leaders in providing resources, organizing training programs, and encouraging technology use. One teacher (T5) noted, *“Support from the school administration is very important because they can provide the resources and training we need.”*

Overall, the findings indicate that improving technology integration requires a combination of support systems, including continuous training, reliable infrastructure, accessible technical assistance, and strong administrative backing. When these supports are in place, teachers are more confident and better able to integrate digital tools effectively, leading to better teaching practices and improved student learning experiences.

Results and discussion

The findings underscore the important role of digital literacy in teachers' integration of technology into instructional practice. Teachers with higher levels of digital literacy tended to use digital tools more frequently and effectively in lesson planning and classroom instruction. This finding supports UNESCO's (2018) view that digital literacy enables educators to access, evaluate, and use technology meaningfully. It is also consistent with Tomczyk and Fedeli (2021), who emphasized that teachers' digital competence is closely associated with their ability to develop engaging, technology-supported learning experiences. Thus, strengthening teachers' digital competencies may contribute to more purposeful and effective instructional practices.

Professional development emerged as an important factor in developing these competencies. Although teachers had participated in various technology-related training programs, the frequency, depth, and practical relevance of these activities varied. Teachers who had undergone continuous and advanced training demonstrated greater confidence and competence in using digital tools. This finding aligns with Venkatesh et al. (2016), who identified training and facilitating conditions as key factors in technology adoption. However, some teachers perceived their previous training as insufficient for addressing the demands of classroom implementation. This highlights the need for sustained, practice-oriented professional development that allows teachers to apply digital tools in authentic instructional contexts.

Similarly, teachers reported high levels of technology integration in lesson planning and classroom instruction. They used digital tools not only to present content but also to facilitate interactive activities and encourage student participation. This practice reflects the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the purposeful alignment of technology, pedagogy, and subject-matter knowledge (Mishra & Koehler, 2006). When teachers integrate these components effectively, technology becomes a meaningful part of the learning process rather than merely a supplementary presentation tool.

Despite their generally high level of technology integration, teachers still encountered several barriers, including limited training, technical difficulties, time constraints, unreliable connectivity, and inadequate resources. These findings are consistent with Ertmer and Ottenbreit-Leftwich (2010), who distinguished between external barriers, such as insufficient infrastructure and technical support, and internal barriers, such as confidence, beliefs, and readiness. Although teachers recognized the educational value of digital technologies, these challenges may restrict the consistency and quality of their classroom use. Effective integration therefore requires both adequate technological resources and sustained professional and technical support.

Teachers also expressed favorable perceptions of digital literacy and regarded it as essential to effective teaching. They generally believed that using digital tools could improve instruction and promote student learning and engagement. This finding supports Barrios-del-Ángel et al. (2026), who reported that positive perceptions of technology influence teachers' willingness to adopt digital teaching strategies. Teachers who recognize technology's value and usefulness may be more inclined to explore innovative approaches and integrate digital tools consistently into their practice.

Moreover, teachers perceived that technology integration was associated with greater student participation, motivation, and understanding. Digital tools appeared to support more interactive, student-centered learning experiences, particularly when aligned with lesson objectives and appropriate instructional strategies. This finding is consistent with Fredricks et al. (2004), who identified engagement as an important condition for meaningful learning. Nevertheless, teachers also noted that inappropriate or poorly managed technology use could distract students. The educational value of digital tools therefore depends on purposeful lesson planning, appropriate tool selection, and effective classroom management.

Overall, the findings indicate that effective technology integration depends on the interaction of teachers' digital literacy, professional training, perceptions, available resources, and institutional support. Teachers need sustained professional development, reliable internet connectivity, accessible digital resources, technical assistance, and consistent administrative support. As Venkatesh et al. (2016) suggest, supportive conditions can strengthen teachers' confidence and facilitate continued technology use. Establishing these conditions may help teachers translate their digital competencies into purposeful instructional practices that support student learning and engagement.

Conclusion

This study underscores the growing importance of digital literacy in contemporary teaching and learning. The findings indicate that teachers with stronger digital literacy skills demonstrate greater confidence and competence in using digital tools for lesson planning and classroom instruction. Although many teachers have participated in technology-related training, sustained and practice-oriented professional development remains necessary to help them respond to evolving instructional technologies. The extent of technology integration also varies according to teachers' skills, experience, and access to resources.

Despite challenges involving internet connectivity, equipment availability, time constraints, and limited technical support, teachers generally hold favorable perceptions of digital literacy and recognize its value in strengthening instructional practice. The findings further show that technology integration is positively associated with teachers' perceptions of student participation, motivation, understanding, and overall engagement. However, these benefits depend on the purposeful selection and effective instructional use of digital tools.

The study concludes that teachers' willingness to integrate technology must be supported by continuous professional development, reliable infrastructure, accessible technical assistance, adequate digital resources, and sustained administrative support. Strengthening these conditions will enable teachers to use technology more meaningfully and maximize its potential to enhance teaching and student learning in the digital age.

References

Barrios-del-Ángel, A. X., Jiménez-Ferretiz, L. E., Silva-Lavín, H., Sánchez-Garza, M. N., Jiménez-Almaguer, K. P., & Reyna-Castillo, M. (2026). Digital literacy research for teaching excellence in

Abun et al., *Divine Word International Journal of Management and Humanities* 5(3)(2026) 4519-4537
higher education: A bibliometric perspective. *Education Sciences*, 16(2), 229.
<https://doi.org/10.3390/educsci16020229>

Cabalbag, M. C. (2025). Technology integration and student engagement in Philippine classrooms. *Cogent Education*, 12(1), 2581410. <https://doi.org/10.1080/2331186X.2025.2581410>

Consoli, T., Mangano, G., & Platania, S. (2024). Technology integration in education: Effects on student engagement and classroom practices. *Education and Information Technologies*, 30, 7719–7752. <https://doi.org/10.1007/s10639-024-13118-8>

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2019). Teacher technology change: How knowledge, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 51(1), 1–16. <https://doi.org/10.1080/15391523.2019.1598253>

European Commission. (2017). *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use*. Publications Office of the European Union.

Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68, 2449–2472. <https://doi.org/10.1007/s11423-020-09767-4>

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109. <https://doi.org/10.3102/00346543074001059>

Getenet, S., Beswick, K., & Callingham, R. (2024). Students' digital literacy and engagement in technology-enhanced learning environments. *International Journal of Educational Technology in Higher Education*, 21(1), 37. <https://doi.org/10.1186/s41239-023-00437-y>

Mardiana, H. (2024). The influence of teachers' digital literacy on technology integration and student learning outcomes. *SAGE Open*, 14(2). <https://doi.org/10.1177/21582440241256937>

Pérez-Juárez, M. A., Valenzuela-González, J. R., & García-García, J. (2024). Digital learning environments: Effects of engagement and distraction. *arXiv*. <https://arxiv.org/abs/2402.05249>

Rioseco-Pais, M., Silva-Quiroz, J., & Vargas-Vitoria, R. (2024). Digital competences and years of access to technologies among university students: An analysis based on the DIGCOMP framework. *Sustainability*, 16(22), 9876. <https://doi.org/10.3390/su16229876>

Tomczyk, Ł., & Fedeli, L. (2021). Digital literacy among teachers: Mapping theoretical frameworks. In V. Ratten (Ed.), *Innovation management and sustainable economic development in the era of globalization* (pp. 215–230). Springer. https://doi.org/10.1007/978-3-030-44711-3_16

Tomczyk, Ł. (2025). AI in education: Mapping theoretical frameworks for digital literacy and teacher competencies. *New Media Pedagogy*, 5(1), 45–60.

UNESCO. (2018). *A global framework of reference on digital literacy skills for indicator 4.4.2*. UNESCO Publishing. <https://unesdoc.unesco.org>

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, 17(5), 328–376. <https://doi.org/10.17705/1jais.00428>

Yuan, X., Zhang, Y., & Li, Q. (2025). Digital literacy and student performance: The mediating role of self-efficacy and learning environment. *Frontiers in Education*, 10, 1641687. <https://doi.org/10.3389/feduc.2025.1641687>

Zou, Y., Kuek, F., Feng, W. & Cheng, X. (2025). Digital learning in the 21st century: trends, challenges, and innovations in technology integration. *Frontiers in Education*, 10, 1562391. <https://doi.org/10.3389/feduc.2025.1562391>

Publisher's Note: DWIJMH stays neutral about jurisdictional claims in published maps and institutional affiliations.



CC BY-NC-SA 4.0

Attribution-NonCommercial-ShareAlike 4.0 International

© 2026 by the authors. Published by Divine Word International Journal of Management and Humanities under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License <https://creativecommons.org/licenses/by-nc-sa/4.0/>