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TEACHERS' PERCEPTIONS OF ARTIFICIAL INTELLIGENCE, TECHNOLOGICAL PROFICIENCY, AND PERCEIVED IMPACT OF AI ON TEACHING AND LEARNING: A CORRELATIONAL STUDY AMONG PUBLIC ELEMENTARY TEACHERS IN THE CITY OF ILAGAN, ISABELA

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Abstract

Artificial Intelligence (AI) has the potential to enhance teaching and learning. However, effective integration requires teachers to possess adequate technological proficiency and a positive perception of its educational applications. This study examined teachers' perceptions of AI, their level of technological proficiency, and the perceived educational implications of AI in public elementary schools in the City of Ilagan, Isabela. A quantitative descriptive-correlational research design was employed, involving 110 teachers selected through stratified random sampling during School Year 2026–2027. Data were gathered using a structured questionnaire and analyzed using frequency, percentage, weighted mean, and the Pearson Product-Moment Correlation Coefficient. Findings revealed that teachers demonstrated high technological proficiency in basic computer skills, digital literacy, and digital communication and collaboration. Teachers also expressed strong agreement regarding the perceived positive impact of AI on student engagement and learning, teaching and teacher roles, and critical thinking and collaboration. Furthermore, teachers' perceptions of AI were positively and significantly related to all dimensions of technological proficiency and perceived educational implications. The study concludes that effective AI integration requires continuous technological development, responsible AI use, and adequate institutional support.

INTRODUCTION

The integration of technology is increasingly influencing educational practices, with Artificial Intelligence (AI) becoming a prominent development. AI-powered tools, including adaptive learning systems and content-generation applications, are being utilized to enhance teaching and learning. Tan et al. (2025) observed that the continued advancement of technology and more flexible educational policies may encourage the wider adoption of adaptive learning platforms, providing greater opportunities for personalized learning.

The use of AI in education is also consistent with Sustainable Development Goal 4 (SDG 4), which promotes equitable education and lifelong learning. Technology can contribute to this goal by expanding access to learning resources, strengthening teaching practices, and supporting improved educational outcomes. However, its value depends on how effectively and responsibly it is incorporated into educational practice.

Department of Education (DepEd) has established policies supporting technology integration in basic education. DepEd Order No. 42, s. 2017, or the Philippine Professional Standards for Teachers (PPST), recognizes information and communication technology as part of effective teaching practice. Likewise, DepEd Order No. 18, s. 2020 emphasizes the use of digital learning resources to sustain educational delivery. More recently, DepEd Order No. 003, s. 2026, Foundational Guidelines on AI, provides principles for responsible use of AI while emphasizing data privacy, learner protection, inclusivity, human-centered education, and teacher empowerment.

For elementary teachers, AI may support lesson preparation and administrative tasks. It may also provide learners with personalized assistance and immediate feedback. Despite these benefits, AI integration presents concerns related to ethical use, privacy, accessibility, digital competence, teacher preparedness, and dependence on technology. The situation is particularly relevant in public elementary schools, where differences in resources, training opportunities, technical support, and digital skills may affect AI adoption. Examining these factors is essential, as elementary teachers are instrumental in establishing learners' basic knowledge and skills.

In this regard, examining AI integration among public elementary teachers in the City of Ilagan, Isabela can provide evidence for improving technology-related practices. It therefore examines the educational effects of AI integration among public elementary teachers, particularly its influence on instructional delivery, learner engagement, assessment practices, teacher efficiency, and professional development.

Literature Review

I. Level of Teachers' Perceptions Toward Artificial Intelligence

Celik et al. (2022) conducted a systematic review examining how artificial intelligence can support teachers' professional practices and the challenges associated with its integration into education. The findings indicated that AI could assist teachers in planning lessons, understanding learners' needs, providing feedback, and assessing student performance. However, the researchers also highlighted concerns involving teachers' understanding of AI, the appropriate interpretation of AI-generated information, and the implications of AI for teaching responsibilities. Teachers' perceptions of AI are influenced by both its potential usefulness and the difficulties associated with its responsible implementation.

Bower et al. (2024) investigated the perceptions of 318 educators regarding the impact of generative AI on teaching and assessment. Their findings showed that most respondents anticipated a substantial impact from AI, although perceptions differed according to teachers' awareness, professional experience, teaching level, discipline, region, and gender. Participants identified the need to emphasize critical thinking, creativity, ethical reasoning, and learning processes rather than relying exclusively on students' final outputs. Teachers who have limited

familiarity with AI may underestimate its potential influence on their professional responsibilities.

Yim and Wegerif (2024) explored the perceptions and attitudes of 60 teachers toward AI-based educational learning tools intended to support AI literacy among young learners. The findings revealed generally positive perceptions of the tools' usefulness and ease of use, indicating that teachers may be more receptive to AI when its educational purpose is clear. Nevertheless, participants reported difficulties related to their AI content knowledge, teaching experience, technical challenges, school infrastructure, and potential learner distraction.

ElSayary (2024) examined teachers' perceptions of ChatGPT as a tool for supporting teaching and learning. The findings indicated that teachers recognized its potential benefits in lesson planning, generating instructional ideas, developing differentiated learning activities, and supporting students' learning experiences. However, participants expressed concerns about the accuracy and bias of AI-generated information, as well as the possibility of reduced human interaction in educational settings. The study further suggests that teachers need to retain professional judgment when using AI and verify generated information before incorporating it into classroom instruction.

Darayseh (2023).examined AI acceptance among 83 science teachers in Abu Dhabi using the Technology Acceptance Model. The results indicated a high level of acceptance, with perceived benefits, ease of use, self-efficacy, attitudes, and behavioral intentions associated with teachers' willingness to use AI applications. The study also found that perceived benefits, ease of use, and attitudes jointly predicted a substantial proportion of the variation in intended AI use, while anxiety and stress did not significantly influence the other measured factors.

Robledo et al. (2023) developed and validated an instrument for assessing knowledge, attitudes, and practices concerning ChatGPT among preservice teachers in the Philippines. The instrument was evaluated through expert review and empirical testing involving 206 preservice teachers, producing evidence of acceptable validity and reliability. The researchers identified the need for a systematic way to assess how future teachers understand and respond to the educational use of ChatGPT, particularly amid concerns about academic dishonesty, ethical conduct, and dependence on technology.

Espartinez (2024) examined how students and teachers in Philippine higher education institutions perceived the use of ChatGPT, identifying different viewpoints concerning its educational applications. The researchers highlighted the potential of ChatGPT to support teaching and learning while recognizing concerns about ethics, institutional support, access to technology, and the need to balance innovation with established pedagogical practices. Perceptions of AI are not necessarily uniform across educational stakeholders because acceptance depends partly on individual experiences, institutional conditions, and beliefs about appropriate learning practices.

Harmawan and Makmur (2023) investigated secondary school teachers' perceptions of ChatGPT as a learning-support tool. Their findings indicated that teachers recognized its potential to assist with lesson preparation, instructional planning, the development of learning materials, and the expansion of students' knowledge. Despite this favorable orientation, teachers expressed concerns about the trustworthiness of AI-generated information and their

ability to implement the technology appropriately. The study suggests that teachers' perceptions may be positive at the level of expected benefits while remaining cautious about practical application and reliability.

II. Level of Technological Proficiency of Teachers

Claro et al. (2024) systematically reviewed quantitative research published between 2016 and 2021 concerning the digital competencies of in-service school teachers. Their findings revealed a lack of consensus regarding how digital competence should be defined and measured, although frameworks such as DigCompEdu and UNESCO's digital competency framework were frequently used. The review also identified a stronger emphasis on teachers' use of technology for planning and instruction than on their ability to develop students' digital competencies. This suggests that teachers' technological proficiency is multidimensional and cannot be adequately represented by their ability to operate devices or use basic applications alone.

Smestad et al. (2023) reviewed 116 articles to examine how teachers' professional digital competence was conceptualized before and during the COVID-19 pandemic. The findings revealed that existing literature did not consistently explain who benefits from teachers' digital competence, how teachers' roles influence competence requirements, or how digital skills relate to specific subject areas. The researchers also observed that many studies relied on self-reported data, which may not fully capture teachers' actual abilities to use technology in authentic instructional situations.

Yang et al. (2023) reviewed 50 theoretical and empirical studies concerning the digital competence of K–12 preservice and in-service teachers in China. Their review examined how digital competence was conceptualized, investigated, and developed across different educational disciplines and research contexts. By synthesizing this body of literature, the researchers identified the importance of understanding teachers' digital competencies in relation to their professional responsibilities and the conditions under which technology is used.

Basilotta-Gómez-Pablos et al. (2022) reviewed literature on digital competencies among higher education teachers, emphasizing the knowledge, skills, and attitudes needed to use technology effectively in educational settings. Their review situated digital competence within the broader transformation of teaching and learning, where educators are expected to integrate digital tools into instructional design and professional practice. The study underscores that technological proficiency involves more than operational familiarity because teachers must also determine how digital resources can contribute to learning objectives and educational outcomes.

Heine et al. (2023) examined how digital resources were defined and understood within research on teachers' professional digital competence. Their review drew attention to differences in how researchers conceptualize teachers' knowledge and skills in locating, selecting, creating, adapting, and using digital resources. The findings indicate that technological proficiency should be understood as a combination of operational ability, resource evaluation, and pedagogical decision-making rather than simple access to technology.

Masoumi and Noroozi (2025) reviewed 25 publications examining how early-career teachers develop professional digital competence. Their synthesis identified four major themes: actively developing digital competence, taking advantage of development opportunities, mentoring, and the relationship between digital competence and professional identity. These findings indicate that technological proficiency develops through continuing practice, access to learning opportunities, and support from more experienced colleagues rather than through initial teacher preparation alone. The review also highlights the importance of workplace experiences in helping teachers connect digital knowledge with actual instructional demands.

Chiu et al. (2024) investigated how teachers' digital competence could be developed through a framework informed by self-determination theory. Their findings indicated that satisfying teachers' psychological needs for autonomy, competence, and relatedness can support the development of personal-ethical and personal-professional digital competencies. The study emphasizes that proficiency is influenced not only by technical training but also by teachers' motivation, professional agency, and the school environment in which digital learning occurs.

Zhang et al. (2025) conducted a systematic review of 38 studies published over a decade to examine research on preservice teachers' digital competence. Their review analyzed research trends, competency frameworks, major themes, and methodological limitations, highlighting the continuing importance of digital competence in preparing teachers for technology-rich educational environments.

III. Significant Relationship among Teachers' Perceptions Toward Artificial Intelligence (AI), Technological Proficiency, and the Perceived Impact of AI on Teaching and Learning

Galindo-Domínguez et al. (2024) examined the relationship between digital competence and attitudes toward AI among 445 teachers from primary, secondary, and higher education institutions in Spain. The findings revealed that higher digital competence was associated with more positive attitudes toward AI, regardless of teachers' age, sex, educational level, teaching experience, or subject area. Interestingly, although teachers expressed considerable willingness to use AI, their personal experience with the technology remained limited, suggesting a possible gap between acceptance and actual application.

Silagan and Tumapon (2025) investigated the relationships among technological competence, training and support, attitudes toward AI, and AI acceptance among 100 junior and senior high school teachers at a university in the Philippines. The results revealed significant positive correlations between AI acceptance and technological competence, training and support, and teachers' attitudes toward AI. Attitude was the strongest predictor of AI acceptance in their analysis, indicating that teachers' beliefs and evaluations of AI may play a particularly important role in their willingness to use it. However, the study also highlighted concerns involving professional autonomy, privacy, training, and the preservation of meaningful teacher–student interactions.

Wang et al. (2023) examined AI readiness among 3,164 primary school teachers, conceptualizing readiness through four components: cognition, ability, vision, and ethics in educational AI use. Their findings showed that these components positively predicted AI-

enhanced innovation and job satisfaction, while perceived threats from AI were negatively associated with innovation. Teachers with higher AI readiness tended to report lower perceived threats and greater innovation in their professional work.

Yi et al. (2025) investigated how autonomy, competence, and relevance influenced the intention of 562 Chinese preservice language teachers to use AI in teaching. The findings indicated that the satisfaction of these psychological needs positively influenced behavioral intentions, with AI literacy and self-efficacy serving as mediating factors. This suggests that teachers' willingness to integrate AI is connected not only to their technical knowledge but also to their confidence and perception that AI use is relevant to their professional goals.

Sadaf (2025) examined the relationships among perceived AI competencies, affective dispositions, and readiness to use AI among 80 preservice teachers at a university in the southeastern United States. The findings revealed low-to-moderate perceived AI competencies, with technological knowledge and AI ethics identified as weaker areas, while self-efficacy and interest were closely related to readiness to use AI. The researchers also found that ethical awareness and integrated pedagogical-technological knowledge were important in explaining aspects of teachers' preparation for AI integration. These results suggest that teachers' technical capabilities alone may not be sufficient to encourage meaningful adoption unless they are accompanied by confidence, interest, and the ability to connect technology with pedagogical objectives.

Deshen (2026) investigated associations among teachers' AI literacy, AI acceptance, computational thinking, and access to digital technologies. The findings indicated that AI acceptance measures, including willingness to use AI and positive emotions toward it, were positively associated with AI literacy, while AI anxiety and perceived effort were negatively associated with AI literacy. The study also identified a relationship between access to information and communication technologies and AI literacy, suggesting that technological opportunity and personal attitudes may reinforce one another. Teachers' perceptions and technological capabilities should be considered as interconnected dimensions, since greater acceptance may encourage exploration while better literacy may support more informed acceptance.

Jin and Rui (2026) examined the relationship between generative AI literacy and AI acceptance among 305 English as a foreign language teachers in Chinese universities. Their findings showed that AI literacy positively influenced performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention to use AI. The analysis further indicated that these acceptance-related factors mediated the relationship between AI literacy and behavioral intention, demonstrating that knowledge of AI can influence adoption through teachers' perceptions of usefulness, ease of use, and institutional support.

Tan, Cheng, & Ling (2025) investigated the relationship between AI competency, technological pedagogical content knowledge (TPACK), and teaching performance among 247 university teachers using questionnaire data and classroom observations. Its central concern was how teachers' AI-related capabilities connect with the professional knowledge required to translate technological resources into instructional practice. The research highlights the importance of considering pedagogical knowledge when examining the relationship between

AI competency and teaching performance, rather than assuming that technical ability directly guarantees better instruction.

IV. Enhanced Technology Framework for Sustainable AI Integration

Dogan (2026) developed an Intelligent-TPACK-based professional development framework to address the technological, pedagogical, content-related, and ethical knowledge required for AI integration. Drawing on 40 systematic reviews and empirical studies, the framework connected five knowledge domains with four professional learning approaches: active learning, the use of models and examples, coaching and expert support, and feedback and reflection. Its central insight is that teachers need opportunities to practice applying AI to instructional situations rather than relying exclusively on theoretical discussions or demonstrations.

Williams (2026) synthesized 23 peer-reviewed studies to develop an integrated AI literacy framework specifically for higher education teachers. The proposed framework consists of eight dimensions: foundational AI knowledge, pedagogical integration, critical evaluation, innovation, ethics, epistemic responsibility, legal and institutional governance, and emotional and professional well-being. The review identified gaps in ethical understanding, advanced AI use, and institutional support, indicating that narrow approaches to AI training may not sufficiently prepare educators for responsible implementation.

MacCallum et al. (2026) developed the Scaffolded AI Literacy framework through a Delphi study involving education, industry, and cultural experts. Seventeen experts completed all three rounds of the process, contributing to the refinement and validation of a framework designed to support AI literacy across educational contexts. The framework emphasizes progressive competency development rather than assuming that all teachers and learners begin with equivalent levels of AI knowledge or experience.

Daher (2025) introduced the EQUIP framework to support teachers' AI literacy through five interconnected pillars: ethical governance, qualified professional learning, unified collaborative partnerships, implementation readiness, and progressive adaptation. The framework emphasizes that responsible AI integration requires clear policies, relevant training, collaboration among educational stakeholders, and the ability to adapt practices as technologies evolve. It also addresses concerns about privacy, bias, accountability, and the lack of consistent guidance on AI use in education.

Aravantinos et al. (2026) reviewed 43 empirical studies to examine the professional development needs of primary and secondary school teachers integrating AI into education. The findings identified several interconnected areas, including teacher perceptions, AI literacy, professional development, institutional support, and ethical and responsible AI use. The review concluded that technical training alone is insufficient and that successful integration requires pedagogical knowledge, positive attitudes, organizational support, and continuous professional learning. Based on the reviewed evidence, the researchers proposed a four-level, process-oriented professional development framework to connect research findings with educational practice.

Sun (2026) proposed a competency framework designed to help university teachers integrate generative AI into curriculum design, teaching, learning, and assessment. The

framework contains four dimensions: GenAI literacy, curriculum and learning design, teaching and learning, and assessment, with competencies organized into basic, intermediate, and advanced levels. It emphasizes that teachers must develop not only the ability to operate AI tools but also the capacity to design learning experiences that encourage critical thinking, ethical reasoning, and meaningful student engagement.

Pei (2026) conducted a systematic literature review to examine how educators' AI literacy can be developed, using Bloom's Taxonomy to organize the progression of knowledge and competencies. The review covered foundational AI knowledge, educational applications, educators' perspectives, and pedagogical approaches to AI integration. Its approach emphasizes that AI literacy development should progress beyond basic awareness toward increasingly sophisticated understanding and classroom application.

Alyoussef et al. (2026) proposed an ethical competency framework addressing teachers' responsibilities when integrating AI into educational practice. The study emphasizes that responsible implementation requires teachers to consider issues such as privacy, fairness, transparency, accountability, and the potential consequences of AI-generated information.

METHODS

Research Design

The study employed a quantitative descriptive-correlational design. The descriptive component examined respondents' profile and perceived educational implications of AI. The correlational component determined relationships among teachers' perceptions of AI, technological proficiency, and its perceived educational implications.

Respondents and Locale of the Study

The study involved 110 public elementary school teachers from the City of Ilagan, Isabela, during School Year 2026–2027. It utilized stratified random sampling, with teachers grouped according to their school assignment. Respondents were then randomly selected from each school in proportion to its teacher population.

Research Instrument

Data were collected using a structured questionnaire adapted from Mediodia and Ablin (2025), entitled "Perceived Impact of Integrating Artificial Intelligence in Teaching-Learning." The instrument consisted of three parts: Part I gathered the respondents' profile, Part II assessed their perceptions of AI and its perceived educational effects, and Part III measured their technological proficiency.

Data Gathering Procedure and Analysis

The researcher obtained approval from the Graduate School, the Schools Division Superintendent of the City of Ilagan, the Public Schools District Supervisor, and the heads of the participating schools before conducting the study. Upon securing the necessary permissions, the researcher explained the objectives and purpose of the study to the respondents. Informed consent was then obtained from all participants to ensure their voluntary participation and understanding of the research process.

The gathered data were systematically organized, analyzed, and interpreted using appropriate statistical tools. Frequency and Percentage were used to summarize the respondents' demographic profiles. The Weighted Mean was employed to assess teachers' technological proficiency and their perceived effects of artificial intelligence (AI) on teaching and learning. Meanwhile, the Pearson Product-Moment Correlation Coefficient was utilized to determine the strength and direction of the relationship between the study variables.

RESULTS

Table 1. Profile of the Respondents

Profile	Frequency (n=110)	Percent
Sex		
Male	29	26.4
Female	81	73.6
Civil Status		
Single	54	49.1
Married	50	45.5
Widow	5	4.5
Separated	1	.9
Highest Educational Attainment		
Bachelor's Degree	23	20.9
With Master's Units	52	47.3
Master's Degree	31	28.2
With Doctoral Units	3	2.7
Doctoral Degree	1	.9
Years in Service		
1-5 years	64	58.2
6-10 years	16	14.5
11-15 years	19	17.3
16-20 years	5	4.5
21 years and above	6	5.5

Table 1 shows the profile of the teachers from the City of Ilagan, Isabela. The demographic profile of the respondents reveals that female respondents constitute the majority at 73.6%, while male respondents account for 26.4%.

Regarding civil status, single respondents comprise the largest group at 49.1%, closely followed by married respondents at 45.5%. Meanwhile, widowed respondents account for 4.5%, while separated respondents represent the smallest proportion at 0.9%. This distribution indicates that the respondents are almost evenly divided between single and married teachers, with only a small proportion belonging to other civil status categories.

With respect to highest educational attainment, the majority of respondents have earned master's units, representing 47.3% of the total, followed by those who have completed a master's degree at 28.2%. Meanwhile, 20.9% hold a bachelor's degree, while 2.7% have earned doctoral units and 0.9% have completed a doctoral degree. This distribution indicates that most respondents have pursued or completed graduate-level education, suggesting an interest in further academic development and professional advancement.

In terms of years in service, the largest proportion of respondents have served for 1–5 years, accounting for 58.2%, followed by those with 11–15 years of experience at 17.3%. Respondents with 6–10 years of service comprise 14.5%, while those with 21 years and above account for 5.5%. Meanwhile, teachers with 16–20 years of service represent the smallest proportion at 4.5%.

Table 2. Level of Teachers' Perception Toward Artificial Intelligence (AI)

Items	Mean	Qualitative Description
1. AI tools help teachers enhance their content knowledge and subject matter expertise.	3.67	Strongly Agree
2. AI tools enable teachers and students to interact and communicate in more innovative and meaningful ways.	3.62	Strongly Agree
3. AI tools assist teachers in improving students' academic performance and learning outcomes.	3.53	Strongly Agree
4. AI tools make the teaching and learning process more engaging, interactive, and enjoyable.	3.63	Strongly Agree
5. AI tools promote active participation and meaningful engagement during classroom instruction.	3.48	Strongly Agree
6. AI tools help teachers address the diverse learning needs and abilities of students in the classroom.	3.54	Strongly Agree
7. AI tools enhance traditional teaching strategies, such as group discussions, by providing timely information and learning support.	3.50	Strongly Agree
8. Knowledge of AI's ethical issues encourages teachers to use it confidently.	3.44	Strongly Agree
9. AI tools contribute to fair, consistent, and objective assessment of students' learning.	3.27	Strongly Agree
10. AI tools encourage students to become more independent learners while continuing to value the guidance and expertise of their teachers	3.19	Agree
11. The availability of adequate technological facilities and resources motivates teachers to integrate AI tools into instruction.	3.54	Strongly Agree
12. Teachers need adequate training on the appropriate and effective integration of AI tools into the existing curriculum.	3.70	Strongly Agree
Grand Mean	**3.51**	**Strongly Agree**

Table 2 presents the level of teachers' perception toward artificial intelligence (AI). The findings indicate that elementary teachers generally hold a positive view of AI and recognize

its potential to support teaching and learning. The highest mean was observed in the perceived need for adequate training on the appropriate and effective integration of AI into the existing curriculum, suggesting that teachers recognize the importance of developing practical competencies before adopting AI in their classrooms.

This was followed by the belief that AI tools can enhance teachers' content knowledge and subject matter expertise, highlighting the perceived value of AI as a resource for continuous professional learning. Conversely, the lowest mean was recorded for the statement concerning AI encouraging students to become independent learners while continuing to value teachers' guidance and expertise.

This suggests that teachers may have reservations about how AI can promote learner independence without diminishing the essential role of teachers in guiding young learners. Overall, teachers demonstrated a positive perception toward AI, as reflected in the grand mean of 3.51, verbally described as Strongly Agree.

In the study by Yim and Wegerif (2024), it was revealed that teachers generally held positive perceptions of AI, particularly regarding its usefulness and ease of use in teaching. Specifically, most of the respondents agreed that AI educational tools were easy and convenient to use. Teachers also recognized the potential of these tools to enhance students' AI knowledge, save preparation time, and allow them to devote more attention to students' learning.

Table 3. Level of Technological Proficiency of Teachers in terms of Basic Computer Skills

	Items	Mean	Qualitative Description
1.	I am confident in using basic computer applications such as Microsoft Word and Excel.	3.65	Strongly Agree
2.	I can troubleshoot basic computer issues, such as connectivity problems or software installation.	3.40	Strongly Agree
3.	I can navigate and use online platforms effectively (e.g., email, browsers, social media)	3.50	Strongly Agree
4.	I can effectively use a word processor to create and format documents.	3.42	Strongly Agree
5.	I can prepare presentations with multimedia elements (e.g., images, audio).	3.53	Strongly Agree
6.	I know how to use email for sending, receiving, and organizing messages.	3.63	Strongly Agree
7.	I can set up and manage basic system settings, such as language preferences.	3.36	Strongly Agree
8.	I can install and uninstall software on my device.	3.45	Strongly Agree
9.	I am capable of using shortcuts and other time-saving tools to enhance productivity.	3.28	Strongly Agree
10.	I am familiar with basic security practices, such as creating strong passwords.	3.55	Strongly Agree
	Grand Mean	**3.48**	**Strongly Agree**

Table 3 presents the level of teachers' technological proficiency in terms of basic computer skills. The findings suggest that elementary teachers demonstrate confidence in

performing common computer-related tasks needed for their professional responsibilities. The highest mean was recorded for confidence in using basic computer applications such as Microsoft Word and Excel, indicating that teachers are comfortable with familiar digital tools that support lesson preparation and the completion of school-related documents.

This was followed by the ability to use email for sending, receiving, and organizing messages, suggesting that digital communication is another established competency among respondents. In contrast, using shortcuts and other time-saving tools received the lowest mean, while managing basic system settings also obtained relatively lower ratings.

This distinction is important for AI integration because basic computer proficiency provides a foundation for using AI applications, but effective adoption also requires the ability to navigate unfamiliar interfaces, manage technical difficulties, and work efficiently with digital tools. Overall, teachers demonstrated a high level of technological proficiency in basic computer skills, as reflected in the grand mean of 3.48, verbally described as Strongly Agree.

Complementing this, Dwijayanti et al. (2023) also found that teachers demonstrated a very good level of computer self-efficacy, indicating confidence in performing computer-related tasks, including using computers for instruction, understanding computer functions, and evaluating educational software.

Table 4: Level of Technological Proficiency of Teachers in terms of Digital Literacy

Items	Mean	Qualitative Description
1. I can critically evaluate the reliability of online sources.	3.43	Strongly Agree
2. I understand the ethical implications of sharing digital content.	3.49	Strongly Agree
3. I can detect and report cyber threats, such as phishing attempts.	3.34	Strongly Agree
4. I am knowledgeable about copyright laws and fair use policies.	3.42	Strongly Agree
5. I can use digital tools to fact-check and verify information.	3.36	Strongly Agree
6. I can recognize biased or misleading information in digital media.	3.42	Strongly Agree
7. I am familiar with managing my digital footprint and online privacy.	3.34	Strongly Agree
8. I can differentiate between personal and professional digital communication.	3.38	Strongly Agree
9. I understand the importance of balancing screen time and offline activities.	3.49	Strongly Agree
10. I can use digital tools to create original and ethical content.	3.37	Strongly Agree
Grand Mean	**3.40**	**Strongly Agree**

Table 4 presents the level of teachers' technological proficiency in terms of digital literacy. The findings indicate that respondents recognize the importance of responsible and informed participation in digital environments. The highest means were recorded for understanding the ethical implications of sharing digital content and recognizing the importance of balancing screen time with offline activities. These results suggest that teachers

are conscious of responsible technology use and the need to maintain appropriate boundaries in digital engagement.

In contrast, detecting and reporting cyber threats and managing digital footprints and online privacy received the lowest means. This reveals a potential area for improvement since awareness of digital responsibility must be accompanied by practical skills in protecting accounts, safeguarding information, and responding to online risks.

Strengthening digital literacy should therefore extend beyond familiarity with online platforms to include cybersecurity practices, information verification, privacy protection, and ethical content use. Overall, teachers demonstrated a high level of digital literacy, as reflected in the grand mean of 3.40, verbally described as Strongly Agree.

Furthermore, Solo and Larena (2025) found that faculty members demonstrated a very high level of digital citizenship in terms of digital etiquette and digital rights and responsibilities, while digital security was also recognized as an important aspect of responsible technology use.

Table 5: Level of Technological Proficiency of Teachers in terms of Digital Communication and Collaboration

Items	Mean	Qualitative Description
1. I effectively communicate using online tools such as email, messaging apps, or video conferencing platforms.	3.60	Strongly Agree
2. I am comfortable collaborating on projects using digital platforms (e.g., Google Drive, Microsoft Teams).	3.46	Strongly Agree
3. I understand and implement proper online communication etiquette.	3.54	Strongly Agree
4. I am confident in using video conferencing tools to collaborate with others.	3.47	Strongly Agree
5. I can effectively use online platforms to share and discuss ideas with a team.	3.50	Strongly Agree
6. I understand digital etiquette for professional communication.	3.58	Strongly Agree
7. I can manage and organize collaborative projects using tools	3.38	Strongly Agree
8. I am skilled at creating and sharing collaborative documents (e.g., Google Docs).	3.39	Strongly Agree
9. I can effectively communicate ideas using visual storytelling tools (e.g., Canva).	3.45	Strongly Agree
10. I am familiar with accessibility features for inclusive digital communication.	3.35	Strongly Agree
11. I can integrate feedback from collaborators to improve shared projects.	3.38	Strongly Agree
12. . I know how to use social media responsibly to network and share professional content.	3.61	Strongly Agree
13. I can identify and adapt to cultural differences in digital communication.	3.47	Strongly Agree
Grand Mean	**3.48**	**Strongly Agree**

Table 5 presents the level of teachers' technological proficiency in terms of digital communication and collaboration. Teachers are comfortable using digital channels to communicate and maintain professional connections. The highest mean was recorded for the effective use of online tools such as email, messaging applications, and video conferencing platforms, closely followed by the responsible use of social media for professional networking and sharing content. This indicates that teachers are more confident in communicating through familiar online channels than in managing more specialized collaborative tasks.

Managing collaborative projects, creating shared documents, and incorporating feedback also received comparatively lower ratings, indicating opportunities to strengthen teamwork through digital platforms.

Professional development should therefore include collaborative digital activities and accessibility practices that help teachers use AI as part of a coordinated and inclusive learning environment. Overall, teachers demonstrated a high level of technological proficiency in digital communication and collaboration, as reflected in the grand mean of 3.48, verbally described as Strongly Agree.

Similarly, Lagos and Nabos (2023) found that teachers frequently used messaging and social media platforms, while online meeting platforms and digital learning applications were used less frequently. Moreover, teachers demonstrated lower competency in communication and collaboration than in digital content creation.

Table 6: Level of Technological Proficiency of Teachers in terms of Advanced Technological Skills

Items	Mean	Qualitative Description
1. I can use advanced tools like programming languages, data analysis software, or graphic design applications.	3.09	Agree
2. I am confident in using technology to automate tasks and increase efficiency.	3.21	Agree
3. I stay updated with technological trends and integrate new tools into my work.	3.38	Strongly Agree
4. I can analyze data using advanced spreadsheet functions (e.g., pivot tables, charts).	3.19	Agree
5. I am skilled at creating visually appealing and professional presentations.	3.32	Strongly Agree
6. I can use collaborative tools like Google Workspace or Microsoft Teams effectively.	3.43	Strongly Agree
7. I know how to set up and use cloud storage solutions for file sharing and backup.	3.15	Agree
8. I can code or program using basic scripting languages (e.g., Python, HTML).	2.95	Agree
9. I am proficient in using video editing software to create and edit content.	3.17	Agree
10. I can manage and analyze large datasets using software like Tableau or Excel	3.03	Agree
11. I am skilled at troubleshooting complex hardware or software issues.	3.03	Agree

12. I am knowledgeable about optimizing device performance, such as clearing cache or updating drivers.	3.12	Agree
13. I can evaluate and choose appropriate digital tools for specific tasks.	3.23	Agree
Grand Mean	**3.18**	**Agree**

Table 6 presents the level of teachers' technological proficiency in terms of advanced technological skills. The highest mean was obtained for effectively using collaborative tools such as Google Workspace and Microsoft Teams, suggesting that teachers recognize the value of digital platforms for sharing resources and coordinating work. Staying updated with technological trends and integrating new tools into professional tasks also received a relatively high rating, reflecting openness to continuous technological development.

In contrast, coding or programming using basic scripting languages received the lowest mean, indicating that programming remains a less developed area among the respondents. Teachers' technological proficiency is stronger in practical digital collaboration than in specialized skills requiring technical analysis, programming, and problem-solving.

Professional development may therefore prioritize hands-on training in data analysis, automation, troubleshooting, and the purposeful selection of digital tools based on classroom needs. Overall, teachers demonstrated a level of technological proficiency in advanced technological skills described as Agree, with a grand mean of 3.18.

Backing these findings, Wang, Tigelaar, and Admiraal (2021) found that teachers' motivation, attitudes, and confidence influenced their resource-sharing practices. The researchers emphasized that sharing digital educational resources supports professional learning and enables teachers to exchange teaching materials, ideas, and knowledge with colleagues.

Table 7: Perceived Impact of Artificial Intelligence on Teaching and Learning in terms of Student Engagement and Learning

Items	Mean	Qualitative Description
1. I understand how AI-powered tools can personalize learning experiences for my students.	3.42	Strongly Agree
2. I believe AI can help improve student engagement in the classroom.	3.53	Strongly Agree
3. I am aware of AI applications that can support differentiated instruction.	3.43	Strongly Agree
4. I feel confident integrating AI-driven educational tools into my teaching.	3.39	Strongly Agree
5. I believe AI can assist in identifying students' learning gaps more effectively.	3.25	Strongly Agree
6. I understand the ethical considerations of using AI in education.	3.43	Strongly Agree
7. I am familiar with AI-powered assessment tools and their impact on student learning outcomes.	3.42	Strongly Agree
8. I believe AI can reduce the workload of teachers by automating certain tasks.	3.48	Strongly Agree

9.	I think AI can foster creativity and critical thinking among elementary pupils.	3.37	Strongly Agree
10.	I am knowledgeable about AI's potential risks and challenges in education.	3.29	Strongly Agree
	Grand Mean	**3.40**	**Strongly Agree**

Table 7 presents teachers' perceptions of the impact of artificial intelligence on teaching and learning in terms of student engagement and learning. The highest mean was recorded for the belief that AI can improve student engagement in the classroom, suggesting that teachers see opportunities for AI-supported activities to sustain pupils' interest and participation. The perceived capacity of AI to reduce teachers' workload through task automation also received a relatively high rating, highlighting its potential to support instructional preparation and classroom responsibilities.

Meanwhile, the belief that AI can help identify students' learning gaps received the lowest mean among the indicators. Knowledge of AI-related risks and challenges, as well as its potential to foster creativity and critical thinking, also received comparatively lower ratings. It highlights the importance of helping teachers move beyond recognizing AI's benefits toward understanding how to apply it responsibly and assess its actual contribution to pupils' learning.

Training may focus on selecting age-appropriate AI tools, interpreting learning-related outputs, protecting student data, and maintaining teacher oversight when using AI for instructional decisions. Overall, teachers strongly agreed with the perceived impact of artificial intelligence on student engagement and learning, as reflected in the grand mean of 3.40, verbally described as Strongly Agree.

In the same manner, Ablin and Mediodia (2025) revealed that teachers perceived AI as having a positive impact on student engagement and making learning more enjoyable. The study also found that teachers' perceptions of AI and their digital collaboration skills significantly predicted its perceived impact on student engagement.

Table 8: Perceived Impact of Artificial Intelligence on Teaching and Learning in terms of Teaching and Teacher Roles

	Items	**Mean**	**Qualitative Description**
1.	AI tools make learning more engaging for students.	3.50	Strongly Agree
2.	AI helps identify and address individual student needs.	3.24	Agree
3.	AI supports early literacy and numeracy development.	3.24	Agree
4.	AI provides timely feedback to enhance student learning.	3.29	Strongly Agree
5.	AI assists in differentiating instruction for diverse learners.	3.43	Strongly Agree
6.	AI reduces routine tasks, giving me more time for students.	3.45	Strongly Agree
7.	AI enhances but does not replace the teacher's role.	3.65	Strongly Agree
8.	AI supports students with special needs through personalization.	3.27	Strongly Agree
9.	AI improves communication with parents about student progress.	3.25	Strongly Agree
10.	I need professional development to integrate AI effectively.	3.47	Strongly Agree
	Grand Mean	**3.38**	**Strongly Agree**

Table 8 presents teachers' perceptions of the impact of artificial intelligence on teaching and learning in terms of teaching and teacher roles. The highest mean was recorded for the statement that AI enhances but does not replace the teacher's role, indicating that respondents recognize the continuing importance of teachers in guiding learning and making instructional decisions. The perceived need for professional development also received a high rating, suggesting that teachers acknowledge the importance of strengthening their competencies to integrate AI effectively.

In contrast, AI's capacity to identify and address individual student needs and support early literacy and numeracy development received the lowest mean ratings. This suggests that teachers may be less certain about how AI can be applied to foundational learning needs, particularly when pupils require close guidance and individualized support.

AI integration should therefore strengthen teachers' capacity to respond to learners while preserving human judgment, empathy, and accountability in classroom practice. Overall, teachers strongly agreed with the perceived impact of artificial intelligence on teaching and teacher roles, as reflected in the grand mean of 3.38, verbally described as Strongly Agree.

Similarly, Kim and Kwon (2023) revealed that teachers had limited confidence in their knowledge of AI content, technology, and pedagogy, highlighting the need to strengthen their competencies to support effective classroom integration. The researchers identified 22 essential AI-related competencies, including understanding AI technologies, designing instruction, creating meaningful learning environments, and recognizing ethical issues.

Table 9: Perceived Impact of Artificial Intelligence on Teaching and Learning in terms of Critical Thinking and Collaboration

Items	Mean	Qualitative Description
1. I understand how AI tools can enhance pupils' critical thinking skills.	3.34	Strongly Agree
2. I am aware of the ways AI can be integrated into classroom activities to promote problem-solving.	3.33	Strongly Agree
3. I can identify both the benefits and challenges of using AI to develop pupils' reasoning skills.	3.40	Strongly Agree
4. I am knowledgeable about how AI-generated content may affect pupils' ability to think independently.	3.45	Strongly Agree
5. I am familiar with strategies to balance AI assistance with fostering student creativity and analytical thinking.	3.35	Strongly Agree
6. I understand how AI-powered tools can facilitate student collaboration in learning activities.	3.42	Strongly Agree
7. I can explain how AI can be used to promote teamwork among elementary pupils.	3.39	Strongly Agree
8. I am aware of the potential risks of AI in replacing meaningful student-to-student interactions	3.45	Strongly Agree
9. I can implement AI-driven activities that encourage peer discussions and cooperative learning.	3.32	Strongly Agree
10. I am knowledgeable about ethical considerations when using AI in collaborative learning settings.	3.40	Strongly Agree
Grand Mean	**3.38**	**Strongly Agree**

Table 9 presents teachers' perceptions of the impact of artificial intelligence on teaching and learning in terms of critical thinking and collaboration. The highest mean ratings were tied between knowledge of how AI-generated content may affect pupils' independent thinking and awareness of the risks AI poses to meaningful student-to-student interactions.

In comparison, implementing AI-driven activities that encourage peer discussions and cooperative learning received the lowest mean, followed by awareness of how AI can be integrated into classroom activities to promote problem-solving. Teachers may benefit from practical training in designing activities where pupils question AI-generated responses, explain their reasoning, solve problems together, and develop ideas through discussion rather than simply accept automated outputs.

Such approaches can help ensure that AI complements collaborative learning instead of displacing direct interaction and shared inquiry. Overall, teachers strongly agreed with the perceived impact of artificial intelligence on critical thinking and collaboration, as reflected in the grand mean of 3.38, verbally described as Strongly Agree.

Consistently, Miao and Cukurova (2024), in the AI Competency Framework for Teachers published by UNESCO, emphasized the potential of artificial intelligence (AI) to support critical thinking, problem-solving, and collaborative learning when integrated appropriately into educational activities.

Table 10: Perceived Impact of Artificial Intelligence on Teaching and Learning in terms of Support and Resources

	Items	Mean	Qualitative Description
1.	My school provides sufficient access to AI tools and technologies for teaching and learning.	3.31	Strongly Agree
2.	I have access to reliable internet and digital devices necessary for integrating AI into my lessons.	3.33	Strongly Agree
3.	The educational materials and curriculum guidelines I use include information on AI integration.	3.29	Strongly Agree
4.	I receive adequate funding or financial support for AI-related instructional resources.	3.04	Agree
5.	Technical support is available when I encounter challenges in using AI-powered tools in my teaching.	3.12	Agree
6.	I have received sufficient training on how to integrate AI effectively into my teaching practices.	3.07	Agree
7.	My school or educational institution offers professional development opportunities related to AI in education.	3.11	Agree
8.	I feel confident in applying AI-driven strategies in the classroom due to the training and support provided.	3.18	Agree
9.	I have access to a community or network of educators who share best practices for AI integration.	3.03	Agree
10.	My school administration supports and encourages the use of AI in instructional activities.	3.36	Strongly Agree
	Grand Mean	**3.18**	**Agree**

Table 10 presents teachers' perceptions of the impact of artificial intelligence on teaching and learning in terms of support and resources. The highest mean was recorded for

the perception that school administration supports and encourages AI use in instructional activities, indicating that administrative backing may provide a foundation for introducing AI into classroom practice. Access to reliable internet and digital devices also received a relatively high rating, suggesting that teachers generally perceive these basic technological resources as available.

However, access to adequate funding for AI-related instructional resources and participation in educator networks for sharing AI practices received the lowest mean ratings. These results point to potential limitations in the financial and collaborative support needed to sustain AI integration beyond individual classroom efforts.

This gap is important because teachers need more than access to technology; they also require practical guidance, reliable assistance, and opportunities to learn from colleagues when applying AI in instruction. Overall, teachers agreed with the perceived availability of support and resources for AI integration, as reflected in the grand mean of 3.18, verbally described as Agree.

In the same way, Zeng et al. (2025) found that administrative support plays an important role in preparing teachers to adopt AI in classroom instruction. Specifically, school leaders can facilitate AI integration by providing technological resources, organizing professional development activities, establishing collaborative learning communities, and fostering a supportive environment for innovation.

Table 11: Correlational Analysis Among Teachers' Perceptions Toward Artificial Intelligence (AI), Technological Proficiency, and the Perceived Impact of AI On Teaching and Learning

Variables	Teachers' Perceptions Toward Artificial Intelligence (AI)		Interpretation
	r-value	p-value	
Technological Proficiency			
1. Basic Computer Skills	.530*	<.001	Significant
2. Digital Literacy	.537*	<.001	Significant
3. Digital Communication and Collaboration	.557*	<.001	Significant
4. Advanced Technology Skills	.592*	<.001	Significant
Perceived Impact of AI on Teaching and Learning			
1. Student Engagement and Learning	.631*	<.001	Significant
2. Teaching and Teacher Roles	.781*	<.001	Significant
3. Critical Thinking and Collaboration	.660*	<.001	Significant
4. Support and Resources	.658*	<.001	Significant

Table 11 presents the correlational analysis between teachers' perceptions toward artificial intelligence and their technological proficiency and perceived impact of AI on teaching and learning. The results reveal positive and statistically significant relationships across all examined variables. Among the dimensions of technological proficiency, advanced

technological skills demonstrated the strongest relationship with teachers' perceptions toward AI, followed by digital communication and collaboration, digital literacy, and basic computer skills. However, the correlational results do not establish that technological proficiency directly causes more positive perceptions.

For the perceived impact of AI on teaching and learning, teaching and teacher roles showed the strongest relationship with teachers' perceptions toward AI. This was followed by critical thinking and collaboration, support and resources, and student engagement and learning.

Teachers' views of AI are particularly closely associated with how they understand its role in supporting instruction and complementing teachers' professional responsibilities. The positive relationship involving support and resources also highlights the relevance of institutional conditions in shaping how teachers view AI integration, although the analysis does not establish the direction of influence.

Comparably, Galindo-Domínguez et al. (2024) revealed that higher levels of digital competence were associated with more positive attitudes toward AI, regardless of teachers' age, sex, educational level, years of experience, or field of knowledge. The researchers also identified information management, digital content creation, and problem-solving as important areas for developing teachers' digital competence.

CONCLUSION AND FUTURE WORKS

Successful integration of artificial intelligence in elementary education depends on more than teachers' willingness to accept emerging technologies. The respondents' generally favorable perceptions of AI provide a promising foundation for its adoption; however, positive attitudes alone cannot guarantee meaningful classroom application. Teachers must also possess the skills to determine when AI is appropriate, evaluate the reliability of its outputs, and align its use with learning objectives and pupils' developmental needs. The findings further suggest that technological proficiency should be understood as a layered competency rather than a single measure of digital ability. Familiarity with common computer applications and online communication provides teachers with an essential starting point, but effective AI integration demands more advanced capacities in data interpretation, technical problem-solving, and the purposeful selection of digital tools.

For future work, DepEd administrators are encouraged to develop and strengthen policies, guidelines, and programs that promote the responsible, ethical, and effective integration of artificial intelligence (AI) in education. School heads may prioritize the provision of adequate technological resources, reliable internet connectivity, technical assistance, and relevant professional development opportunities to support teachers in using AI effectively. Teachers are likewise encouraged to participate in continuous capability-building activities to enhance their technological competence, deepen their understanding of AI applications, and apply responsible AI practices in lesson preparation, instructional delivery, and assessment. Furthermore, schools may establish professional learning communities, peer mentoring initiatives, and knowledge-sharing sessions where teachers can exchange experiences, practical insights, and effective strategies for integrating AI into classroom instruction. Future researchers are encouraged to expand the scope of this study by examining AI integration across different educational levels, geographical locations, and teacher populations, as well as investigating other factors that may influence the effective use of AI in teaching and learning.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest regarding the publication of this study. This research was conducted objectively, and no financial or personal relationships have influenced the results and interpretations presented in this paper.

DECLARATION OF AI USE

The author acknowledges the use of ChatGPT and QuillBot as tools to assist in the development of this research paper. ChatGPT was used to support the organization and refinement of ideas, while QuillBot was utilized to improve paraphrasing, sentence structure, and grammatical accuracy. The use of these tools was limited to writing assistance and did not replace the author's responsibility for conducting the research, interpreting the findings, and ensuring the credibility of the study.

REFERENCE

Alyoussef et al. (2026). Ethical use of artificial intelligence in education: Proposed ethical competency framework for teachers. Frontiers in Artificial Intelligence. https://doi.org/10.3389/frai.2026.1833043

Aravantinos, S., Lavidas, K., Komis, V., Karalis, T., & Papadakis, S. (2026). Artificial intelligence in K–12 education: A systematic review of teachers' professional development needs for AI integration. Computers, 15(1), Article 49. https://doi.org/10.3390/computers15010049

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L.-A., et al. (2022). Teachers' digital competencies in higher education: A systematic literature review. International Journal of Educational Technology in Higher Education, 19, Article 8. https://doi.org/10.1186/s41239-021-00312-8

Bower, M., Torrington, J., Lai, J. W. M., Petocz, P., & Alfano, M. (2024). How should we change teaching and assessment in response to increasingly powerful generative artificial intelligence? Outcomes of the ChatGPT teacher survey. Education and Information Technologies, 29, 15403–15439. https://doi.org/10.1007/s10639-023-12405-0

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. TechTrends, 66, 616–630. https://doi.org/10.1007/s11528-022-00715-y

Chiu, T. K. F., Falloon, G., Song, Y., Wong, V. W. L., Zhao, L., & Ismailov, M. (2024). A self-determination theory approach to teacher digital competence development. Computers & Education, 214, 105017. https://doi.org/10.1016/j.compedu.2024.105017

Claro, M., Castro-Grau, C., Ochoa, J. M., Hinostroza, J. E., & Cabello, P. (2024). Systematic review of quantitative research on digital competences of in-service school teachers.

Computers & Education, 215, 105030. https://doi.org/10.1016/j.compedu.2024.105030

Daher, R. (2025). Integrating AI literacy into teacher education: A critical perspective paper. Discover Artificial Intelligence, 5(1). https://doi.org/10.1007/s44163-025-00475-7

Darayseh, A. A. (2023). Acceptance of artificial intelligence in teaching science: Science teachers' perspective. Computers and Education: Artificial Intelligence, 4, 100132. https://doi.org/10.1016/j.caeai.2023.100132

Deshen, M., Harari, R., & Aharony, N. (2026). Teachers' artificial intelligence (AI) literacy: An exploratory study. Smart Learning Environments, 13(1). https://doi.org/10.1186/s40561-026-00433-5

Dogan, S. (2026). Designing effective AI professional development: A framework grounded in intelligent-TPACK. Computers and Education Open, 10, Article 100337. https://doi.org/10.1016/j.caeo.2026.100337

Dwijayanti, S., et al. (2023). Profile and predictors of high school teachers' attitude and self-efficacy in utilizing ICT: An investigation from Indonesia.

ElSayary, A. (2024). An investigation of teachers' perceptions of using ChatGPT as a supporting tool for teaching and learning in the digital era. Journal of Computer Assisted Learning, 40(3), 931–945. https://doi.org/10.1111/jcal.12926

Espartinez, A. S. (2024). Exploring student and teacher perceptions of ChatGPT use in higher education: A Q-Methodology study. Computers and Education: Artificial Intelligence, 7, 100264. https://doi.org/10.1016/j.caeai.2024.100264

Galindo-Domínguez, H., Delgado, N., Campo, L., & Losada, D. (2024). Relationship between teachers' digital competence and attitudes towards artificial intelligence in education. International Journal of Educational Research, 126, 102381. https://doi.org/10.1016/j.ijer.2024.102381

Harmawan, T. A., & Makmur, A. (2023). Teacher's perception of the use of the ChatGPT application as a learning-supporting media. Perspektif Ilmu Pendidikan, 37(2), 130–138. https://doi.org/10.21009/PIP.372.6

Heine, S., Krepf, M., & König, J. (2023). Digital resources as an aspect of teacher professional digital competence: One term, different definitions—A systematic review. Education and Information Technologies, 28, 3711–3738. https://doi.org/10.1007/s10639-022-11321-z

Jin, & Rui. (2026). Gen AI literacy and acceptance among EFL teachers: An exploration through the UTAUT model and self-determination theory. European Journal of Education. https://doi.org/10.1111/ejed.70364

Kim, K., & Kwon, K. (2023). Exploring the AI competencies of elementary school teachers in South Korea. Computers and Education: Artificial Intelligence, 4, Article 100137. https://doi.org/10.1016/j.caeai.2023.100137

Lagos, G. P., & Nabos, J. (2023). Digital competencies and experiences in using digital technologies of public school teachers in island municipalities in Quezon, Philippines. Psychology and Education: A Multidisciplinary Journal, 10(1), 16–33. https://doi.org/10.5281/zenodo.8086746

MacCallum, K., Parsons, D., & Mohaghegh, M. (2026). The Scaffolded AI Literacy (SAIL) framework: Results of a Delphi study for equitable AI literacy framework design in education. Computers and Education: Artificial Intelligence, 10, Article 100584. https://doi.org/10.1016/j.caeai.2026.100584

Masoumi, D., & Noroozi, O. (2025). Developing early career teachers' professional digital competence: A systematic literature review. European Journal of Teacher Education, 48(3), 644–666. https://doi.org/10.1080/02619768.2023.2229006

Mediodia, H. B., & Ablin, N. L. (2025). Perceived impact of integrating artificial intelligence in teaching-learning. https://www.ejournals.ph/article.php?id=30474

Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000391104

Pei, B., Lu, J., Zhang, Z., Tuffour, P., & Park, S. (2026). Enhancing AI literacy for educators: Where to start and to what end? Computers and Education: Artificial Intelligence, 10, 100550. https://doi.org/10.1016/j.caeai.2026.100550

Robledo, D. A. R., Zara, C. G., Montalbo, S. M., Gayeta, N. E., Gonzales, A. L., Escarez, M. G. A., & Maalihan, E. D. (2023). Development and validation of a survey instrument on knowledge, attitude, and practices (KAP) regarding the educational use of ChatGPT among preservice teachers in the Philippines. International Journal of Information and Education Technology, 13(10), 1582–1590. https://doi.org/10.18178/ijiet.2023.13.10.1965

Sadaf, A., Maxwell, D., Küplüce, C., & Holz, H. (2025). Relationship between pre-service teachers' perceived competencies, affective dispositions, and readiness to use artificial intelligence: A study informed by the intelligent-TPACK. Computers and Education Open, 9, 100305. https://doi.org/10.1016/j.caeo.2025.100305

Smestad, B., Hatlevik, O. E., Johannesen, M., & Øgrim, L. (2023). Examining dimensions of teachers' digital competence: A systematic review pre- and during COVID-19. Heliyon, 9(6), e16677. https://doi.org/10.1016/j.heliyon.2023.e16677

Solo, A. M., & Larena, C. S. (2025). Digital citizenship behaviors in tertiary education: Perspectives of faculty members on digital security, etiquette, and rights and responsibility. International Social Science Review, 11(1). https://ejournals.ph/article.php?id=29125

Sun, D., Ba, S., Cha, Y., Yu, J., Chiang, F., Dai, H. M., & Lim, C. (2026). Empowering university teachers in higher education: A generative AI-responsive competency framework. Computers and Education: Artificial Intelligence, 10, 100542. https://doi.org/10.1016/j.caeai.2026.100542

Tan, X., Cheng, G., & Ling, M. H. (2025). Investigating the mediating role of TPACK on teachers' AI competency and their teaching performance in higher education. Computers and Education: Artificial Intelligence, 9, 100461. https://doi.org/10.1016/j.caeai.2025.100461

Wang, J., Tigelaar, D. E. H., & Admiraal, W. (2021). Rural teachers' sharing of digital educational resources: From motivation to behavior. Computers & Education, 161, Article 104055. https://doi.org/10.1016/j.compedu.2020.104055

Wang et al. (2023). [Study on teachers' AI readiness, AI-enhanced innovation, and job satisfaction]. https://doi.org/10.1016/j.chb.2023.107798

Williams. (2026). An integrated AI literacy framework for higher-education teachers: A critical review and conceptual synthesis. https://doi.org/10.1080/2331186X.2026.2698137

Yang, L., García-Holgado, A., & Martínez-Abad, F. (2023). Digital competence of K–12 pre-service and in-service teachers in China: A systematic literature review. Asia Pacific Education Review, 24, 679–693. https://doi.org/10.1007/s12564-023-09888-4

Yi et al. (2025). The impact of pre-service language teachers' basic psychological needs on behavioural intentions to utilise AI in teaching: AI literacy and self-efficacy as mediators. European Journal of Education. https://doi.org/10.1111/ejed.70160

Yim, I. H. Y., & Wegerif, R. (2024). Teachers' perceptions, attitudes, and acceptance of artificial intelligence (AI) educational learning tools: An exploratory study on AI literacy for young students. Future in Educational Research, 2(4), 318–345. https://doi.org/10.1002/fer3.65

Yu, & Salimaco. (2026). Factors influencing science teachers' use of artificial intelligence tools in the teaching and learning process: A quantitative study of Philippine public schools. Asian Journal of Education and Social Studies. https://doi.org/10.9734/ajess/2026/v52i73155

Zeng, M. Z., Cheah, K. S. L., & Abdullah, Z. (2025). The influence of school principals' digital leadership on teachers' competency in integrating artificial intelligence: A systematic thematic review. Frontiers in Education. https://doi.org/10.3389/feduc.2025.1655967

Zhang, L., Yang, C., & Zheng, Y. (2025). Digital competence for sustainable education of pre-service teachers: A systematic literature review (2014–2024). Frontiers in Psychology, 16, 1710983. https://doi.org/10.3389/fpsyg.2025.1710983