Gendered Perspectives on Generative Artificial Intelligence: Technology Acceptance in Future Educator Culture

Fhadzralyn Aidil-Karanain[1]

Western Mindanao State University, Zamboanga City, 7000 Philippines , fhadzralyn.karanain@wmsu.edu.ph, https://orcid.org/0000-0002-9797-6338

Abstract

The increasing integration of generative artificial intelligence (GenAI) into education has transformed teaching and learning by offering innovative opportunities to support instruction, enrich learning experiences, and enhance academic productivity. As future educators are expected to integrate these technologies into professional practice, understanding their acceptance of GenAI has become critical. This need is particularly salient in the Philippines, where teacher preparation is deeply shaped by values of equity, communal responsibility (kapwa), trust, and respect for human agency within resource-constrained and culturally diverse contexts. Drawing on this axiological lens, this study examined the level of GenAI acceptance among pre-service teachers and investigated gender differences in acceptance. A quantitative, comparative, cross-sectional research design was employed involving 350 pre-service teachers enrolled at a state university in the Zamboanga Peninsula, Philippines. Participants were selected using stratified random sampling and completed the Acceptance of Artificial Intelligence Scale. Descriptive statistics and independent-samples t-tests were used to analyze the data. Findings revealed a high level of GenAI acceptance among pre-service teachers ($M = 3.55$, $SD = 0.65$). A statistically significant gender difference was observed, with male pre-service teachers reporting significantly higher GenAI acceptance ($M = 3.81$, $SD = 0.62$) than female pre-service teachers ($M = 3.40$, $SD = 0.62$), $t(348) = 5.96$, $p < .001$, $d = 0.66$, when male is compared to female. The direction of the difference indicates higher acceptance among male students. These findings suggest that while pre-service teachers generally exhibit favorable acceptance of GenAI, meaningful gender differences persist. Framed through values of equity, responsibility, trust, and human agency, the study underscores the need for teacher education institutions in the Philippines to promote inclusive, ethically grounded, and pedagogically meaningful integration of GenAI. This includes strengthening AI-related training, fostering critical trust and responsible use, safeguarding teacher autonomy and professional judgment, and designing gender-responsive interventions that ensure equitable access and participation. The study contributes empirical evidence from a Global South context and advances interdisciplinary dialogue on the cultural and axiological dimensions of AI in teacher education..

Keywords: generative artificial intelligence; GenAI acceptance; pre-service teachers; teacher education; gender differences; artificial intelligence in education; equity; trust; human agency; Philippines

1. INTRODUCTION

The emergence of generative artificial intelligence (GenAI), particularly large language models (LLMs), marks a significant turning point in education, creating unprecedented opportunities to transform teaching, learning, assessment, and educational decision-making. Recent advances have accelerated the digital transformation of educational systems by enabling more interactive, personalized, and intelligent learning environments while reshaping instructional practices and institutional approaches (1–3). GenAI is increasingly recognized not merely as a technological innovation but as an educational resource capable of augmenting human capabilities, supporting learner-centered instruction, and enhancing teaching effectiveness.

Systematic reviews indicate that AI-powered technologies support adaptive learning, intelligent tutoring, learner profiling, automated assessment, educational management, and instructional decision-making (2,4). GenAI, in particular, facilitates academic writing, content generation, personalized feedback, instructional innovation, and professional development, while simultaneously presenting ethical, pedagogical, and institutional challenges (5–8). These developments suggest that GenAI is redefining educational practices by expanding opportunities for innovation and requiring educators to rethink traditional approaches.

Within teacher education, GenAI offers considerable potential to strengthen the preparation of future educators. AI-supported approaches can enhance instructional design skills, learning performance, attitudes, motivation, and theoretical understanding through timely, individualized support (9). Large language models such as ChatGPT can support higher-order cognitive processes, including mathematical reasoning and proof construction, while highlighting the need for future teachers to develop effective prompting strategies and critically evaluate AI outputs (10). Rather than functioning solely as productivity tools, these technologies increasingly serve as pedagogical partners supporting reflective practice and professional learning.

Realizing these benefits, however, depends on more than technological availability. Reviews consistently emphasize responsible pedagogical implementation, continuous professional development, ethical awareness, and institutional support (3,5-8). In the Philippine context, this responsibility is deeply axiological. Teacher preparation is embedded in a cultural fabric that values pakikipagkapwa (shared humanity), malasakit (compassionate responsibility), and collective accountability. Acceptance of GenAI therefore cannot be reduced to perceived usefulness alone; it must be understood in relation to core values: equity—whether AI expands or narrows participation across gender and socio-economic lines; responsibility—whether future teachers are prepared to use GenAI with integrity, academic honesty, and care for learners; trust—whether teachers trust the reliability, transparency, and data privacy of AI systems; and human agency—whether GenAI is seen as augmenting rather than displacing teachers' professional judgment and relational work. In a developing-country system characterized by uneven connectivity, limited infrastructure, and strong community-oriented norms of teaching, these values become decisive for sustainable adoption.

Accordingly, understanding the competencies that enable teachers to integrate AI effectively has become central. The Technological Pedagogical Content Knowledge (TPACK) framework has evolved toward AI-TPACK, recognizing specialized knowledge that integrates AI with pedagogy and content (11). Yet many teachers experience substantial gaps in AI-related technological and content knowledge, which are closely associated with attitudes toward AI education (12). AI literacy has emerged as fundamental to professional readiness, significantly predicting ethical AI use, creation, problem-solving, and responsible engagement (13). Studies grounded in the Theory of Planned Behavior show that intentions to learn AI are influenced by foundational knowledge, subjective norms, and beliefs regarding AI for social good (14), while perceived usefulness and ease of use remain important, though insufficient when trust and facilitating conditions are lacking (15).

Technology acceptance research demonstrates that adoption is influenced by cognitive, motivational, technological, and contextual factors. Perceived usefulness, performance expectancy, effort expectancy, attitudes, and trust consistently predict behavioral intention and use across AI applications (16,17). These perceptions interact with technological self-efficacy and learning motivation (18). More recent extensions of the Technology Acceptance Model, particularly the Unified Theory of Acceptance and Use of Technology (UTAUT2), show that performance expectancy, effort expectancy, facilitating conditions, social influence, and self-efficacy shape adoption, while institutional environment and prior experience moderate these relationships (19-21). Crucially, trust has emerged as a critical mechanism through which users evaluate reliability, transparency, safety, and ethical implications. Distrust, concerns about accuracy, privacy, and diminished human agency inhibit acceptance, whereas AI knowledge fosters trust and stronger acceptance (22-24).

Despite progress, important gaps remain. Existing studies have primarily examined university students, in-service teachers, or general users, with limited attention to pre-service teachers. Most evidence originates

from developed countries, limiting applicability to teacher education systems in the Global South, including the Philippines. While determinants of AI acceptance have been examined broadly, few studies focus specifically on GenAI acceptance in teacher education through an axiological and gender-sensitive lens. Pre-service teachers represent the next generation who will negotiate equity, responsibility, and human agency in AI-mediated classrooms. Understanding their acceptance during formation is therefore essential for designing curricula, professional learning, and institutional policies that promote responsible integration.

Guided by contemporary technology acceptance theories and an explicit concern for values-based integration, the present study investigates GenAI acceptance among pre-service teachers in the Philippines. Specifically, it (a) examines the level of GenAI acceptance and (b) explores gender differences in acceptance, interpreting findings in relation to equity, trust, responsibility, and human agency in culturally situated teacher preparation.

Literature Review

Artificial intelligence has become one of the most transformative innovations in education. Although studied for decades, recent advances in GenAI, particularly LLMs, have expanded educational capabilities beyond routine automation to content generation, personalized instruction, intelligent tutoring, adaptive learning, automated assessment, and data-driven decision-making (1,2,5,9,26,27).

Early systematic evidence showed AI supporting learner profiling, assessment, adaptive systems, and intelligent tutoring in higher education (26). Recent reviews confirm its integration across learning, teaching, assessment, and administration, enabling personalized learning, automated feedback, learner analytics, and intelligent management (2,4,27). GenAI accelerates this transformation by generating materials, facilitating writing, summarizing information, and supporting collaborative knowledge construction, thereby enhancing efficiency and learner engagement (1,3,5-8). In language teaching, for example, GenAI supports writing development, practice, and individualized feedback (8).

Yet successful integration depends on educator preparedness. AI assists teachers in planning, implementation, feedback, monitoring, and assessment, but teachers must validate outputs and contribute to continuous improvement of AI-supported systems (27). Thus educators are essential collaborators, not passive users. Empirical work shows that higher technological competence and access are associated with more favorable attitudes toward technology-enhanced instruction (28). Pre-service teachers in the Philippines generally report substantial perceived digital literacy, particularly regarding ethical use and confidence in integrating technology (29). Positive attitudes are linked to perceived ease of use, IT self-efficacy, relative advantage, compatibility, technology adoption, and institutional support, while anxiety exerts limited influence (30). Prospective teachers also show positive attitudes toward other emerging technologies, such as digital game-based learning, irrespective of gender (31).

Despite positive foundations, institutional support remains critical. Educators report needs for professional development, pedagogical guidance, and organizational policies for ethical and effective AI use (1,27,28,30). Institutional readiness thus involves infrastructure plus sustained learning opportunities, curriculum development, and clear implementation guidelines.

Technology acceptance provides a theoretical lens to explain these dynamics. Acceptance is influenced by perceived usefulness, effort expectancy, social influence, facilitating conditions, self-efficacy, trust, and attitudes (17,18). These determinants are robust predictors of intention and use. In the Philippine teacher education milieu, these factors intersect with cultural values. Equity concerns whether GenAI is accessible and empowering for both male and female pre-service teachers given documented gendered patterns in technology confidence. Responsibility concerns whether acceptance includes commitment to academic integrity, data privacy, and learner well-being—values central to Filipino educators' professional identity. Trust concerns confidence in the system's reliability and institutional safeguards. Human agency concerns whether GenAI is accepted as a partner that preserves teachers' relational and moral authority rather than automating it away. Understanding acceptance therefore requires linking instrumental perceptions with these axiological dimensions.

Research gaps persist. Earlier work emphasized technological development over pedagogical perspectives (26,27). Recent work examines competencies and attitudes (28-31) but few studies explore GenAI acceptance specifically among pre-service teachers in developing systems. Given their future role as stewards of equitable and responsible AI use, examining their acceptance—including gender differences—through a culturally and values-informed perspective is timely.

METHOD

Research Design

This study employed a quantitative, comparative, cross-sectional research design to examine gender differences in pre-service teachers' acceptance of generative artificial intelligence (GenAI). The design is descriptive-comparative in that it describes the level of acceptance and compares groups based on gender. The term 'comparative' is used intentionally; while correlational questions about relationships among variables are relevant to the broader research program, the principal inferential analysis reported here focuses on group differences tested via independent-samples t-test. Data were collected at a single point in time through a structured survey questionnaire.

Respondents of the Study

The participants comprised 350 pre-service teachers enrolled in teacher education programs at a state university in the Zamboanga Peninsula, Philippines. A stratified random sampling technique was employed to ensure proportional representation across teacher education programs and year levels, thereby enhancing representativeness.

Of the 350 participants, 222 (63.4%) were female, whereas 128 (36.6%) were male. This distribution reflects the female predominance commonly observed in teacher education programs in the Philippines and provides an appropriate basis for examining gender-related differences. Inclusion criteria required participants to be officially enrolled as pre-service teachers during data collection and to provide voluntary informed consent. Confidentiality and anonymity were assured throughout the process, consistent with principles of responsible research conduct.

Research Instrument

This study employed a standardized self-report questionnaire to assess pre-service teachers' acceptance of generative artificial intelligence.

GenAI acceptance was measured using the Acceptance of Artificial Intelligence Scale (AAIS) developed and validated by Zhang et al. (32). The instrument consists of 25 items measured using a five-point Likert scale, with response options ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). [Correction: the original manuscript listed both endpoints as 'Strongly Disagree' due to a typographical error]. Higher scores indicate greater acceptance of GenAI.

The AAIS was selected because it was specifically developed and validated to assess AI acceptance among pre-service teachers, making it conceptually aligned with the study's objectives and population. Its demonstrated validity and reliability support its suitability for teacher education contexts (32). In the present study, reliability analysis indicated acceptable internal consistency (Cronbach's alpha > .80), confirming its suitability for use among participants. Items capture dimensions relevant to equity (e.g., perceived access and confidence), responsibility (e.g., ethical use), trust (e.g., reliability and transparency of AI), and human agency (e.g., perceived augmentation of teaching), allowing axiological interpretation beyond instrumental acceptance.

Data Analysis Procedure

Data were analyzed using descriptive and inferential statistics. Means and standard deviations were computed to describe levels of GenAI acceptance. Independent-samples t-tests were conducted to examine gender differences. Statistical significance was set at $\alpha = .05$, two-tailed. Effect sizes were calculated using Cohen's d. To ensure consistency, t-values are reported as positive when the male group mean is higher than the female group mean, with explicit indication of group ordering (male vs. female). Absolute values and direction are interpreted together. All analyses were performed using IBM SPSS Statistics Version 28.

RESULTS AND DISCUSSION

GenAI Acceptance among Pre-service Teachers

Overall, pre-service teachers demonstrated a high level of GenAI acceptance (M = 3.55, SD = 0.65).

Table 1 summarizes this result.

Variable	Mean	SD
GenAI Acceptance	3.55	0.65

This level of acceptance aligns with Zhang et al. (32), who reported positive behavioral intentions to use AI-based applications among pre-service teachers, with perceived usefulness and ease of use as primary determinants. Similarly, Du and Lv (20) found that performance expectancy, effort expectancy, and social influence significantly influenced intention to use GenAI, while facilitating conditions strongly influenced actual use. Systematic reviews (19) also identify performance expectancy and hedonic motivation, together with ease of use, social influence, experience, and self-efficacy, as predictors of AI acceptance in higher education, while trust and distrust regulate acceptance across contexts (16,25).

From an axiological perspective, high acceptance is encouraging but must be interrogated. In the Philippine context, acceptance that is high yet uncritical may undermine responsibility and human agency if pre-service teachers adopt GenAI without ethical evaluation or pedagogical intentionality. The present mean suggests openness, which provides a foundation for teacher education to cultivate critical trust—trust that is informed by understanding of limitations, biases, and data privacy—rather than blind adoption. It also signals an opportunity to anchor acceptance in equity: ensuring that openness translates into inclusive practices that benefit diverse learners, not only those with privileged access.

Gender Differences in GenAI Acceptance

Table 2 presents the results of the independent-samples t-test examining gender differences.

Variable	Gender	N	Mean	SD	t	df	p value	d / Interpretation
GenAI Acceptance	Female	222	3.40	0.62	5.96	348	< .001	0.66 (Medium) - Significant
GenAI Acceptance	Male	128	3.81	0.62				

Note: t = 5.96 reflects male (M = 3.81) minus female (M = 3.40). Earlier drafts reported t = -5.96 when female was entered as Group 1; absolute magnitude and significance are identical. For consistency across abstract, tables, and narrative, positive t is reported for male > female throughout this final version.
Findings revealed a statistically significant difference, $t(348) = 5.96$, $p < .001$, $d = 0.66$, indicating higher acceptance among male pre-service teachers (M = 3.81, SD = 0.62) compared to female pre-service teachers (M = 3.40, SD = 0.62). The medium effect size indicates practical meaningfulness beyond statistical significance.

This result is consistent with Zhang et al. (32), who found significant gender differences in AI anxiety and perceived enjoyment, and gender moderation of paths from AI anxiety to perceived ease of use and from ease of use to perceived usefulness. More broadly, technology acceptance meta-analyses show that acceptance is influenced by multiple interacting technological and contextual factors (16,19,25), suggesting gender may operate through differential self-efficacy, trust, and experience rather than gender per se.

When interpreted through equity and trust, the gender gap warrants careful attention. Previous Philippine studies found no gender differences in general technological competence and attitudes toward online teaching (28), and prospective teachers generally report positive technology attitudes linked to ease of use, self-efficacy, and institutional support (30), as well as considerable digital literacy and confidence (29). That a gender gap emerges specifically for GenAI may reflect gendered socialization around emerging, autonomous technologies where concerns about accuracy, ethics, privacy, and deprofessionalization weigh differently. Female pre-service teachers, who constitute the majority of the teaching workforce, may exercise more cautious, responsibility-oriented evaluation—prioritizing learner welfare, relational pedagogy, and integrity—resulting in lower but potentially more critical acceptance. This aligns with findings that AI literacy predicts ethical use and problem-solving (13), and that basic AI knowledge and subjective norms shape intentions to learn AI (14), while insufficient AI-TPACK and content knowledge remain barriers (15).

Thus the difference should not be framed as deficit but as a call for gender-responsive, values-based pedagogy. Interventions should foster equitable confidence without eroding responsible caution: (a) providing hands-on, low-stakes experimentation with GenAI to build self-efficacy, (b) explicitly addressing trust through transparency about model limitations, data use, and bias, (c) reinforcing human agency by modeling GenAI as a co-planner that requires teacher validation, and (d) embedding ethics and equity discussions that resonate with Filipino cultural values of malasakit and shared responsibility. Such approaches ensure that efforts to close the gap promote both acceptance and critical responsibility.

CONCLUSIONS

This study examined the level of GenAI acceptance among pre-service teachers in a Philippine state university and tested for gender differences. Pre-service teachers exhibited a high level of acceptance, indicating general openness to GenAI in education. A statistically significant gender difference was found, with male pre-service teachers reporting higher acceptance than female peers, with a medium effect size.

The study contributes empirical evidence from the Global South and advances the literature by integrating an explicit axiological framing. It argues that GenAI acceptance in teacher education must be understood not only through usefulness and ease of use but through equity—ensuring all genders and backgrounds can access, benefit from, and shape GenAI use; responsibility—preparing teachers to use GenAI with integrity, care for learners, and accountability; trust—building informed confidence in reliability, transparency, and institutional safeguards; and human agency—preserving teachers' professional judgment, creativity, and relational presence.

Practically, teacher education institutions should: (1) strengthen structured, curriculum-embedded AI literacy that links technical skills with ethical reasoning and Filipino values; (2) provide practical, guided experiences with GenAI for lesson planning, assessment, and reflection, coupled with critical evaluation tasks; (3) establish institutional guidance on responsible use, data privacy, and academic integrity; and (4) implement gender-responsive mentoring and communities of practice that support female pre-service teachers' confidence while valuing their ethically grounded caution.

Future research should examine factors underlying acceptance, including AI literacy, self-efficacy, trust, prior experience, and institutional support, and how these interact with gender and cultural values. Multi-institutional samples, longitudinal designs, and mixed-methods approaches will illuminate how acceptance develops and translates into classroom practice over time. Qualitative inquiry into how pre-service teachers negotiate trust, responsibility, and agency in their own words will further enrich culturally situated understandings of GenAI in teacher formation.

REFERENCES

1. Lee D, Arnold M, Srivastava A, Plastow K, Strelan P, Ploeckl F, Lekkas D, Palmer E. The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. Comput Educ Artif Intell. 2024;6:100221. https://doi.org/10.1016/j.caeai.2024.100221
2. Wang S, Wang F, Zhu Z, Wang J, Tran T, Du Z. Artificial intelligence in education: A systematic literature review. Expert Syst Appl. 2024;252:124167. https://doi.org/10.1016/j.eswa.2024.124167
3. Wong LH, Looi CK. Advancing the generative AI in education research agenda: Insights from the Asia-Pacific region. Asia Pac J Educ. 2024;44(1):1–7. https://doi.org/10.1080/02188791.2024.2315704
4. Chiu TKF, Xia Q, Zhou X, Chai CS, Cheng M. Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. Comput Educ Artif Intell. 2023;4:100118. https://doi.org/10.1016/j.caeai.2022.100118
5. Saúde S, Barros JP, Almeida I. Impacts of generative artificial intelligence in higher education: Research trends and students' perceptions. Soc Sci. 2024;13(8):410. https://doi.org/10.3390/socsci13080410
6. Wood D, Moss SH. Evaluating the impact of students' generative AI use in educational contexts. J Res Innov Teach Learn. 2024;17(2):152–167. https://doi.org/10.1108/JRIT-06-2024-0151
7. Yusuf A, Pervin N, Román-González M, Noor NM. Generative AI in education and research: A systematic mapping review. Rev Educ. 2024;12(2):e3489. https://doi.org/10.1002/rev3.3489
8. Law L. Application of generative artificial intelligence (GenAI) in language teaching and learning: A scoping literature review. Comput Educ Open. 2024;6:100174. https://doi.org/10.1016/j.caeo.2024.100174
9. Liu CC, Wang HJ, Wang D, Tu YF, Hwang GJ, Wang Y. An interactive technological solution to foster preservice teachers' theoretical knowledge and instructional design skills: A chatbot-based 5E learning

approach. Interact Learn Environ. 2024;32(10):6698–6716. https://doi.org/10.1080/10494820.2023.2277761
10. Dilling F, Herrmann M. Using large language models to support pre-service teachers' mathematical reasoning: An exploratory study on ChatGPT as an instrument for creating mathematical proofs in geometry. Front Artif Intell. 2024;7:1460337. https://doi.org/10.3389/frai.2024.1460337
11. Choudhury S, Deb JP, Pradhan P, Mishra A. Validation of the Teachers AI-TPACK Scale for the Indian educational setting. Int J Exp Res Rev. 2024;43(Suppl):119–133. https://doi.org/10.52756/ijerr.2024.v43spl.009
12. Yue M, Jong MSY, Ng DTK. Understanding K–12 teachers' technological pedagogical content knowledge readiness and attitudes toward artificial intelligence education. Educ Inf Technol. 2024;29:19505–19536. https://doi.org/10.1007/s10639-024-12621-2
13. Ayanwale MA, Adelana OP, Molefi RR, Adeeko O, Ishola AM. Examining artificial intelligence literacy among pre-service teachers for future classrooms. Comput Educ Open. 2024;6:100179. https://doi.org/10.1016/j.caeo.2024.100179
14. Sanusi IT, Ayanwale MA, Tolorunleke AE. Investigating pre-service teachers' artificial intelligence perception from the perspective of planned behavior theory. Comput Educ Artif Intell. 2024;6:100202. https://doi.org/10.1016/j.caeai.2024.100202
15. Yim IHY, Wegerif R. Teachers' perceptions, attitudes, and acceptance of artificial intelligence educational learning tools: An exploratory study on artificial intelligence literacy for young students. Future Educ Res. 2024;2(4):318–345. https://doi.org/10.1002/fer3.65
16. Kelly S, Kaye SA, Oviedo-Trespalacios O. What factors contribute to the acceptance of artificial intelligence? A systematic review. Telemat Inform. 2023;77:101925. https://doi.org/10.1016/j.tele.2022.101925
17. Marikyan D, Papagiannidis S, Stewart G. Technology acceptance research: Meta-analysis. J Inf Sci. 2026;52(2):1–22. https://doi.org/10.1177/01655515231191177
18. Pan X. Technology acceptance, technological self-efficacy, and attitude toward technology-based self-directed learning: Learning motivation as a mediator. Front Psychol. 2020;11:564294. https://doi.org/10.3389/fpsyg.2020.564294
19. Acosta-Enriquez BG, et al. Acceptance of artificial intelligence in university contexts: A conceptual analysis based on UTAUT2 theory. Heliyon. 2024;10(19):e38315. https://doi.org/10.1016/j.heliyon.2024.e38315
20. Du L, Lv B. Factors influencing students' acceptance and use of generative artificial intelligence in elementary education: An expansion of the UTAUT model. Educ Inf Technol. 2024;29:24715–24734. https://doi.org/10.1007/s10639-024-12835-4
21. Hermita N, et al. Extending unified theory of acceptance and use of technology to understand the acceptance of digital textbook for elementary school in Indonesia. Front Educ. 2023;8:958800. https://doi.org/10.3389/feduc.2023.958800
22. Afroogh S, et al. Trust in AI: Progress, challenges, and future directions. Humanit Soc Sci Commun. 2024;11:1568. https://doi.org/10.1057/s41599-024-04044-8
23. Lucas M, Zhang Y, Bem-haja P, et al. The interplay between teachers' trust in artificial intelligence and digital competence. Educ Inf Technol. 2024;29:22991–23010. https://doi.org/10.1007/s10639-024-12772-2
24. Choi Y. A study of employee acceptance of artificial intelligence technology. Eur J Manag Bus Econ. 2021;30(3):318–330. https://doi.org/10.1108/EJMBE-06-2020-0158
25. Kurt AG, et al. What are the factors that drive AI acceptance: A meta-analysis approach. In: HCI International 2022 – Late Breaking Papers. Cham: Springer; 2022. p. 329–337.
26. Zawacki-Richter O, Marín VI, Bond M. Systematic review of research on artificial intelligence applications in higher education—Where are the educators? Int J Educ Technol High Educ. 2019;16:39.
27. Celik I, Dindar M, Muukkonen H, Jarvela S. The promises and challenges of artificial intelligence for teachers: A systematic review of research. TechTrends. 2022;66:616–630.
28. Alieto EO, et al. Teaching inside a digital classroom: A quantitative analysis of attitude, technological competence and access among teachers across subject disciplines. Heliyon. 2024;10(2):e24282.
29. Berganio ME, et al. Preservice teachers' perceived level of digital literacy: A quantitative study from a developing country. ICDTA 2024. Springer; 2024. p. 158–167.
30. Fernandez MA, et al. Technology in education: An attitudinal investigation among prospective teachers from a country of emerging economy. ICAISE 2023. Springer; 2023. p. 248–255.
31. Flores B, et al. Bachelor of Culture and Arts students' attitude toward using digital games for learning. Sci

Int (Lahore). 2023;35(3):357–361.
32. Zhang C, Schierl J, Plorl L, Hofmann F, Gläser-Zikuda M. Acceptance of artificial intelligence among pre-service teachers: A multigroup analysis. Int J Educ Technol High Educ. 2023;20:49.