AG EDITOR

Factors Influencing ChatGPT Usage, AI Anxiety, and Learning Satisfaction: An Investigation of Teacher Aspirants' Understanding of AI Anxiety and Ethical Concerns in Research-Based Education

Factores que influyen en el uso de ChatGPT, la ansiedad ante la IA y la satisfacción con el aprendizaje: una investigación sobre la comprensión de los aspirantes a docentes acerca de la ansiedad ante la IA y las preocupaciones éticas en la educación basada en la investigación

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ABSTRACT

Artificial intelligence (AI) has increasingly transformed education, with ChatGPT emerging as a widely used tool that supports student learning, collaboration, and research. Despite its promise, concerns remain regarding its usefulness, ethical implications, and potential for AI-related anxiety among learners. This study aimed to investigate the factors influencing ChatGPT use, AI anxiety, and learning satisfaction among preservice teachers. Specifically, it examined perceived ease of use, perceived usefulness, interaction with ChatGPT, information quality, interaction quality, collaborative learning, and learning motivation and their relationships with ChatGPT use, AI anxiety, and satisfaction. A descriptive-quantitative design was employed, utilizing survey questionnaires administered to 169 preservice teachers across five teacher education programs. The data were analyzed via descriptive statistics and Pearson correlation. The findings revealed that most constructs were rated at moderate levels, except for learning motivation, which was high, and perceived usefulness, which was weak. ChatGPT use was strongly positively correlated with learning motivation, whereas learning satisfaction was significantly related to information quality, collaborative learning, and motivation. AI anxiety was generally low but influenced how preservice teachers engaged with ChatGPT, often with caution and validation of outputs. The study concludes that while AI anxiety does not prevent ChatGPT adoption, it shapes how preservice teachers evaluate and engage with the tool. Structured training, clear guidelines, and collaborative learning opportunities are recommended to enhance perceptions of usefulness, promote responsible adoption, and strengthen learning satisfaction in teacher education.

Keywords: ChatGPT; AI in Education; Preservice Teachers.

RESUMEN

La inteligencia artificial (IA) ha transformado cada vez más la educación, y ChatGPT ha surgido como una herramienta ampliamente utilizada que apoya el aprendizaje, la colaboración y la investigación de los estudiantes. A pesar de su potencial, persisten preocupaciones sobre su utilidad, implicaciones éticas y la posibilidad de ansiedad relacionada con la IA entre los estudiantes. Este estudio tuvo como objetivo investigar los factores que influyen en el uso de ChatGPT, la ansiedad hacia la IA y la satisfacción con el aprendizaje entre futuros docentes. In particular, se examinaron la facilidad de uso percibida, la utilidad percibida, la interacción

con ChatGPT, la calidad de la información, la calidad de la interacción, el aprendizaje colaborativo y la motivación de aprendizaje, así como su relación con el uso de ChatGPT, la ansiedad hacia la IA y la satisfacción. Se empleó un diseño descriptivo–cuantitativo, utilizando cuestionarios aplicados a 169 futuros docentes de cinco programas de formación del profesorado. Los datos se analizaron mediante estadísticas descriptivas y correlación de Pearson. Los resultados revelaron que la mayoría de los constructos fueron valorados en niveles moderados, excepto la motivación de aprendizaje, que fue alta, y la utilidad percibida, que fue débil. El uso de ChatGPT mostró una fuerte correlación positiva con la motivación de aprendizaje, mientras que la satisfacción con el aprendizaje se relacionó significativamente con la calidad de la información, el aprendizaje colaborativo y la motivación. La ansiedad hacia la IA fue generalmente baja, aunque influyó en cómo los futuros docentes interactuaban con ChatGPT, a menudo con cautela y validación de los resultados. El estudio concluye que, aunque la ansiedad hacia la IA no impide la adopción de ChatGPT, sí condiciona cómo los futuros docentes lo evalúan y utilizan. Se recomienda implementar formación estructurada, directrices claras y oportunidades de aprendizaje colaborativo para mejorar las percepciones de utilidad, fomentar una adopción responsable y fortalecer la satisfacción con el aprendizaje en la formación docente.

Palabras clave: ChatGPT; Inteligencia Artificial en la Educación; Docentes en Formación.

INTRODUCTION

Artificial intelligence (AI) has increasingly permeated daily human life, providing practical solutions that simplify complex tasks and enhance human capacities across various domains.[1,2,3,4,5] Defined as the advancement of systems capable of performing tasks requiring human intelligence, such as learning, reasoning, decision-making, and linguistic awareness, AI employs deep neural networks, machine learning, and natural language processing to analyze vast amounts of data and generate predictions or outputs.[6,7] In education, these affordances have fostered adaptive, accessible, and student-centered learning environments, positioning AI as a transformative force in higher education globally and in the Philippines.[8,9,10,11]

Within this educational landscape, ChatGPT has emerged as the most widely adopted generative AI tool recognized for producing human-like responses and facilitating interactive learning.[12,13,14] Studies have demonstrated its capacity to support academic tasks such as assignments, brainstorming, project development, and research-related activities, thereby enhancing language proficiency, confidence, and knowledge acquisition among learners.[15,16,17] Beyond content generation, ChatGPT has been identified as a valuable educational assistant capable of offering immediate feedback, summarization, and guidance, underscoring its potential to complement instructional practices in teacher education.[18,19,20]

Despite its promise, challenges have surfaced regarding students' reliance on ChatGPT, including risks of plagiarism, misinformation, weakened critical thinking, and overdependence on AI-generated outputs.[21,22,23] These issues have given rise to concerns over AI anxiety, which is defined as feelings of restlessness or agitation in response to AI use in academic contexts. Research has shown that AI anxiety is related to students' academic behaviors, particularly when AI literacy remains underdeveloped and strategies for responsible use are limited.[24,25,26,27] Recent findings from Maghanoy et al.[28] further highlight sociotechnical dimensions of AI anxiety among Filipino teachers, where gender and educational attainment influence perceptions, underscoring the need for deeper understanding in teacher education.

In parallel, empirical studies demonstrate generally positive attitudes toward ChatGPT in educational settings. Francisco et al.[29] reported favorable affective, cognitive, and behavioral responses among senior high school students in the Philippines, particularly with respect to their willingness to adopt ChatGPT for learning. Similarly, Gapol et al.[30] revealed that preservice teachers expressed high knowledge of generative AI alongside a general willingness for integration, although variations emerged by year level, gender, and willingness to adopt. These findings reflect broader global perspectives. For example, Lee et al.[14] emphasized both enthusiasm and concern among higher education educators, citing issues of academic integrity, preparedness, and the need for institutional support. Similarly, Jauhiainen and Guerra [31] highlighted the potential of ChatGPT in dynamically personalizing school learning materials, whereas Barrett and Pack[32] and Yusuf et al.[33] cautioned that cultural perspectives, ethical guidelines, and explicit policies are critical to its sustainable adoption in higher education.

Recent scholarly discourse underscores both the promise and challenges of generative AI in education. Giannakos et al.[34] stressed that while generative AI enhances content delivery, assessment, and student engagement, it also raises ethical and pedagogical concerns if hastily adopted without robust frameworks. Saúde et al.[35] reinforced these insights, noting that although generative AI can enhance academic performance and learning feedback, effective implementation requires pedagogical scaffolding to develop critical, ethical, and digital literacy skills among students. Collectively, these perspectives affirm that AI tools such as ChatGPT are reshaping higher education but highlight the urgent need to address their pedagogical, ethical, and affective

implications.

In contrast, the Philippine context, particularly teacher education, offers a unique vantage point. As future educators, preservice teachers are central to the successful integration of AI in classrooms, given their role in modeling responsible use and shaping learning environments for the next generation. However, few studies have systematically explored preservice teachers' engagement with ChatGPT in relation to key constructs such as perceived ease of use, perceived usefulness, actual use, information and interaction quality, collaborative learning, learning motivation, learning satisfaction, and AI anxiety. Thus, this study investigates preservice teachers' utilization of ChatGPT in research-based learning, examining its perceived benefits, limitations, and affective dimensions to better understand its role in teacher education in the Philippines.

Literature review
AI adoption and usability in education

Artificial intelligence (AI) has increasingly been integrated into education, reshaping teaching and learning practices across diverse contexts. The Technology Acceptance Model (TAM) identifies perceived ease of use (PEU) and perceived usefulness (PU) as central determinants of technology adoption.[36] When students and teachers find AI tools such as ChatGPT easy to navigate and beneficial for academic tasks, they are more likely to integrate them into daily practice.[37,38,39] Actual usage (GPTU) reflects these perceptions, where the frequency and purpose of engagement are influenced by accessibility and functionality.[37,40]

Philippine studies provide 0various insights into AI adoption among teacher aspirants. Dumagay et al.[41] reported that preservice teachers from BCAED and BSED programs demonstrated moderate to high acceptance of AI across dimensions such as perceived usefulness, ease of use, self-efficacy, and behavioral intention, suggesting readiness to integrate AI regardless of demographic characteristics. Similarly, Alieto et al.[18] revealed generally neutral attitudes toward AI among teacher aspirants, with no significant gender differences, underscoring the gradual but cautious adoption of AI technologies. Gapol et al.[30] extended this analysis, showing that preservice teachers possessed high levels of knowledge and willingness to adopt AI, with older students demonstrating greater knowledge and younger ones expressing stronger willingness. Serdenia et al.[42] highlighted the interconnectedness of acceptance, attitudes, and perceived effectiveness, where older preservice teachers reported greater acceptance, whereas all respondents demonstrated favorable attitudes toward AI in education. Complementing these findings, Balasa et al.[43] reported that male teacher aspirants and adults displayed significantly more positive attitudes toward AI integration, suggesting that demographic variables influence adoption patterns.

At the professional level, Cabato[44] investigated the knowledge, attitudes, and practices of ESL teachers in Zamboanga city, revealing moderate knowledge, positive attitudes, and high engagement with the ChatGPT, although uneven awareness of ethical implications persisted. Similarly, Asio and Soriano[45] emphasized that higher education institutions in the Philippines must carefully weigh benefits and risks before institutionalizing AI policies, particularly in light of postpandemic transitions. Globally, Lee et al.[14] and Yusuf et al.[33] reported similar patterns, where educators expressed both enthusiasm and concerns about AI integration, particularly with respect to preparedness and ethical safeguards.

Other strands of the Philippine literature enrich the understanding of AI adoption. Flores et al.[46] examined attitudes toward digital game-based learning among BCAED students and reported no significant gender differences, thus affirming that technological adoption may be independent of gender. Berganio et al.[47] assessed digital literacy among preservice teachers, reporting high levels of competence across multiple dimensions, particularly integrity and responsibility in technology use. Gonzales et al.[48] focused on digital reading habits, showing satisfactory proficiency among preservice elementary language educators, further contextualizing AI readiness within broader digital adoption. Similarly, Alieto et al.[49] explored educators' attitudes toward online teaching, highlighting moderately favorable dispositions and strong technological competence, with minimal gender differences in proficiency or access. Their findings underscore the importance of enhancing technological competence and equitable access as key enablers of sustained online and AI-driven teaching practices, particularly in the postpandemic educational landscape.

Together, these findings indicate that preservice teachers and educators in the Philippines are increasingly receptive to AI, although variations in adoption are influenced by demographic and institutional factors. This aligns with global studies[13,34] which emphasize both the potential of AI for dynamic personalization and the risks of unstructured adoption without proper training and policy support.

Quality, Interaction, and Learning Outcomes

In addition to usability, the effectiveness of AI in education depends on information quality (INQ), interaction quality (IQ), and collaborative engagement. The INQ captures the accuracy, reliability, and relevance of AI-generated content, which directly affects trust and learning outcomes.[50,51] IQ, in turn, reflects the responsiveness and human-likeness of AI exchanges, sustaining student engagement and fostering confidence in AI-supported

learning.[52] Almulla[53] emphasized that learning satisfaction (LS) with AI tools such as ChatGPT is shaped by a constellation of constructs, including GPTU, PEU, PU, INL, INQ, IQ, CL, and LM.

Empirical studies highlight these relationships. Francisco et al.[29] reported generally positive attitudes among senior high school students toward ChatGPT, particularly in behavioral dimensions, underscoring their strong willingness to use it for learning. Torrato et al.[54] similarly reported that both teachers and students in a basic education institution demonstrated positive attitudes and practices toward ChatGPT, with demographic factors influencing teachers' perspectives more than students' perspectives. Robledo et al.[55] developed and validated the KAP-CQ39 instrument, confirming its reliability in assessing knowledge, attitudes, and practices regarding ChatGPT, thus providing a foundation for analyzing information and interaction quality in educational contexts.

At the classroom level, Clorion et al.[56] explored prospective English teachers' perceptions of mobile-assisted language learning (MALL), reporting strong endorsement of mobile learning applications to support effective instruction. This finding resonates with that of Jauhiainen and Guerra[13] who demonstrated that generative AI can dynamically personalize classroom content, improving motivation and cognitive performance. Saúde et al.[35] further stressed that while generative AI enhances academic performance and feedback, its sustained benefits depend on pedagogical scaffolding to build critical, ethical, and digital literacy.

Learning motivation (LM) and collaborative learning (CL) further strengthen the link between quality and satisfaction. Al-Rahmi and Zeki[37] and Chiu[57] emphasized that motivated learners are more likely to embrace technology and sustain satisfaction. Alalwan et al.[58] reported that collaborative AI use fosters analytical thinking and social engagement, whereas Barrett and Pack[32] reported that both students and teachers viewed ChatGPTs as valuable for brainstorming and revision but highlighted institutional unpreparedness and the urgent need for guidelines.

Collectively, these findings demonstrate that the quality of AI outputs, the depth of student interaction, and sociocognitive factors such as collaboration and motivation converge to shape learning satisfaction. These findings support the conclusion that the educational impact of ChatGPT is maximized when it is paired with quality assurance, guided interaction, and motivational support.

Challenges, ethical issues, and AI anxiety

Despite the growing acceptance of ChatGPT in education, several challenges hinder its seamless integration. Overreliance on AI-generated resources risks undermining analytical skills and critical engagement.[59,60] Ethical concerns such as plagiarism, misinformation, and academic dishonesty remain pressing.[61,62,63] Domingo et al.[64] added that students' use of AI-based paraphrasing tools raises critical issues of originality, academic integrity, and reliance on AI, highlighting both perceived benefits and risks.

AI anxiety (AIA) has emerged as a psychological barrier characterized by nervousness and agitation in response to AI use in academic contexts.[27] Wang and Wang[25] reported that AI anxiety influences student behaviors, particularly when AI literacy is underdeveloped. In the Philippines, Maghanoy et al.[28] revealed higher anxiety levels among female teachers and those with lower educational attainment, particularly with respect to sociotechnical concerns such as confusion between humans and machines and the marginalization of human roles. Santos et al.[65] echoed these concerns, showing that negative attitudes among secondary teachers were shaped by social influences and fears of AI dominance, even as they reported confidence in situational interaction with AI.

Global studies confirm these concerns. Giannakos et al. [34] reported that adopting generative AI without ethical safeguards could disrupt assessment and feedback practices, whereas Yusuf et al.[33] reported that multicultural perspectives significantly shape attitudes toward academic dishonesty and ethical use, necessitating context-specific guidelines.

Taken together, these studies demonstrate that while AI anxiety and ethical concerns rarely prevent adoption outright, they shape how preservice teachers and educators use ChatGPT—often with caution and critical reflection. Addressing these barriers requires institutional policies, ethical frameworks, and teacher guidance to balance the benefits of AI with safeguards against its risks.

METHOD
Research Design

This study employed a quantitative correlational research design to examine the relationships among learning satisfaction (LS), perceived ease of use (PEU), perceived usefulness (PU), ChatGPT use (GPTU), interaction with ChatGPT (INL), information quality (INQ), interaction quality (IQ), collaborative learning (CL), learning motivation (LM), and AI anxiety (AIA). A cross-sectional approach was used, and data were collected at a single point in time to determine associations among the constructs.[66,67] Descriptive statistics, including the computation of the mean (M) and standard deviation (SD), were employed to summarize participants' responses and provide an overview of their perceptions across the measured variables.

Respondents of the Study

The respondents of this study consisted of 169 undergraduate teacher aspirants enrolled in a state university and were drawn from five teacher education programs, namely, Bachelor of Culture and Arts Education (BCAED), Bachelor of Early Childhood Education (BECED), Bachelor of Elementary Education (BEED), Bachelor of Secondary Education (BSED), and Bachelor of Special Needs Education (BSNED). Specifically, 34 were from BCAED (20,12 %), 30 from BECED (17,75 %), 31 from BEED (18,34 %), 42 from BSED (24,85 %), and 32 from BSNED (18,94 %).

In terms of sex, the participants included 51 males (30,0 %), 115 females (68,3 %), and 3 who identified as others (1,7 %). This distribution reflects the broader reality that teacher education is a female-dominated field, which is consistent with national and global trends in the profession.[68,69,70]

With respect to age, the majority of respondents were under 20 years old (38,9 %), followed by 21 years (29,4 %), 19 years (13,3 %), 22 years (7,8 %), and 15 years (8,9 %). In terms of year level, most were in their third year (52,07 %), followed by first-year (18,93 %), second-year (18,93 %), and fourth-year (10,06 %) students.

Research tool

Two validated survey questionnaires comprising 63 items were adapted from Almulla[53] and Wang and Wang[25] both of which demonstrated high reliability (α = 0,92 and α = 0,964, respectively). The constructs measured were PEU, PU, GPTU, INL, INQ, IQ, CL, LM, LS, and AIA. The items were rated on 5-point and 7-point Likert scales. The survey was distributed digitally via Google Forms.

Data collection procedure

The study utilized a digital survey distributed through Google Forms to collect responses from preservice teachers across the five education programs. Recruitment was facilitated through online communication channels, ensuring voluntary participation and informed consent. The respondents were encouraged to use their preferred language to enhance clarity and comfort. The survey included demographic information, followed by items measuring the study constructs.

Data Analysis Procedure and Statistical Treatment

The responses obtained through Google Forms were exported to Microsoft Excel and analyzed via SPSS version 22. Demographic variables such as sex, program, year, and age were coded for statistical processing. Descriptive statistics were used to summarize the demographic profile and construct-level results. Pearson product–moment correlation was employed to examine the relationships among perceived ease of use (PEU), perceived usefulness (PU), interaction with ChatGPT (INL), information quality (INQ), interaction quality (IQ), collaborative learning (CL), and learning motivation (LM) in relation to ChatGPT use (GPTU), AI anxiety (AIA), and learning satisfaction (LS).

RESULTS AND DISCUSSION

ChatGPT-Related Constructs among Preservice Teachers in Teacher Education Programs

The results show that preservice teachers across the five education programs generally reported moderate levels of most constructs, with the exception of learning motivation, which was rated high, and perceived usefulness, which was rated weak. ChatGPT use had an overall mean of 3,47 (SD = 1,09), indicating moderate engagement. BEED students had the highest usage (M = 3,81), followed by BECED (M = 3,73) and BSED (M = 3,60), whereas BSNED students reported the lowest usage (M = 3,05). Perceived ease of use was also rated moderate, with an overall mean of 3,42 (SD = 1,02). BEED students again reported the highest ease (M = 3,74), whereas BSNED reported the lowest (M = 3,14).

Perceived usefulness, however, was weaker overall, with a mean of 2,89 (SD = 1,00). BEED students rated ChatGPT as moderately useful (M = 3,22), whereas BSNED students rated it the lowest (M = 2,55). Information quality was rated moderately, with an overall mean of 3,21 (SD = 1,02). BEED students perceived it highest (M = 3,60), whereas BSNED reported the weakest perception (M = 2,82). Similarly, interaction quality was rated moderate overall (M = 3,17, SD = 1,00), with BEED students reporting the highest (M = 3,46) and BSNED the lowest (M = 2,95).

Interaction learning with ChatGPT was moderately rated at 3,52 (SD = 0,96). BEED students reported the highest mean score (M = 3,81), whereas BSNED students reported the lowest score (M = 3,18). Collaborative learning also yielded a moderate overall mean of 3,08 (SD = 0,98), with BEED students reporting the highest (M = 3,60) and BSNED reporting the lowest (M = 3,17). Learning motivation emerged as the strongest construct, with an overall high mean score of 4,13 (SD = 1,95). BEED students reported the highest level of motivation (M = 4,53), followed closely by BCAED (M = 4,38) and BSNED (M = 4,31), whereas BSED students recorded the lowest but still positive motivation (M = 3,83). Finally, learning satisfaction was rated moderate overall (M = 3,21, SD = 1,06). BEED students reported the highest level of satisfaction (M = 3,59), whereas BSNED students reported the lowest level of satisfaction (M = 2,85).

Table 1. Descriptive Statistics of ChatGPT-Related Constructs across Teacher Education Programs					
Constructs	Program	N	Mean	SD	Interpretation
ChatGPT Use (GPTU)	BCAED	34	3,30	1,20	Moderate Usage
	BECED	30	3,73	0,90	Moderate Usage
	BEED	31	3,81	0,83	Moderate Usage
	BSED	42	3,60	1,21	Moderate Usage
	BSNED	32	3,05	0,95	Moderate Usage
Overall		169	3,47	1,09	Moderate Usage
Perceived Ease of Use (PEU)	BCAED	34	3,40	1,09	Moderate Ease
	BECED	30	3,37	0,90	Moderate Ease
	BEED	31	3,74	0,78	Moderate Ease
	BSED	42	3,43	1,15	Moderate Ease
	BSNED	32	3,14	0,96	Moderate Ease
Overall		169	3,42	1,02	Moderate Ease
Perceived Usefulness (PU)	BCAED	34	2,98	1,03	Weak Perception
	BECED	30	2,90	0,89	Weak Perception
	BEED	31	3,22	0,82	Moderate Perception
	BSED	42	2,85	1,09	Weak Perception
	BSNED	32	2,55	0,96	Weak Perception
Overall		169	2,89	1,00	Weak Perception
Information Quality (INQ)	BCAED	34	3,13	1,10	Moderate
	BECED	30	3,39	0,94	Moderate
	BEED	31	3,60	0,94	Moderate
	BSED	42	3,18	1,06	Moderate
	BSNED	32	2,82	0,84	Weak
Overall		169	3,21	1,02	Moderate
Interaction Quality (IQ)	BCAED	34	3,13	1,09	Moderate
	BECED	30	3,23	0,90	Moderate
	BEED	31	3,46	0,85	Moderate
	BSED	42	3,16	1,08	Moderate
	BSNED	32	2,95	0,89	Weak
Overall		169	3,17	1,00	Moderate
Interaction Learning (INL)	BCAED	34	3,51	0,96	Moderate
	BECED	30	3,60	0,80	Moderate
	BEED	31	3,81	0,68	Moderate
	BSED	42	3,53	1,08	Moderate
	BSNED	32	3,18	0,99	Moderate
Overall		169	3,52	0,96	Moderate
Collaborative Learning (CL)	BCAED	34	3,22	1,05	Moderate
	BECED	30	3,45	0,81	Moderate
	BEED	31	3,60	0,83	Moderate
	BSED	42	3,28	1,11	Moderate
	BSNED	32	3,17	0,86	Moderate
Overall		169	3,08	0,98	Moderate
Learning Motivation (LM)	BCAED	34	4,38	1,92	High Motivation
	BECED	30	3,57	1,85	High Motivation
	BEED	31	4,53	1,82	High Motivation
	BSED	42	3,83	2,05	Moderate Motivation

	BSNED	32	4,31	1,87	High Motivation
Overall		169	4,13	1,95	High Motivation
Learning Satisfaction (LS)	BCAED	34	3,08	1,07	Moderate Satisfaction
	BECED	30	3,24	0,99	Moderate Satisfaction
	BEED	31	3,59	0,85	Moderate Satisfaction
	BSED	42	3,30	1,18	Moderate Satisfaction
	BSNED	32	2,85	1,01	Low Satisfaction
Overall		169	3,21	1,06	Moderate Satisfaction

The findings suggest that while preservice teachers are beginning to adopt ChatGPT as a research support tool, its integration remains at a moderate level across programs. The greater usage and ease of use reported by BEED, BECED, and BSED students may reflect these programs' emphasis on interactive and innovative pedagogical approaches, where ChatGPT's generative capacity proves more useful. Conversely, the consistently lower usage, ease, and satisfaction reported by BSNED students highlight the limitations of ChatGPT in contexts such as special education, where human interaction and highly personalized learning are essential. Despite moderate ease of use, perceived usefulness was weak, suggesting that while students find ChatGPT accessible, they are not convinced of its substantial impact on academic performance. Both information quality and interaction quality were moderately rated, indicating that while ChatGPT is considered reliable for generating ideas and providing engagement, students remain cautious about its accuracy and depth. Collaborative learning with ChatGPT was also rated moderate, underscoring its limited role in supporting authentic peer collaboration. In contrast, learning motivation stood out as high, suggesting that the novelty and accessibility of ChatGPT enhance student engagement and curiosity. Learning satisfaction, while moderate, further reflects this cautious adoption, pointing to the need for structured training and critical guidance in teacher education.

Preservice Teachers' Artificial Intelligence Anxiety

Table 2. Descriptive statistics of AI anxiety across teacher education programs					
Construct	**Program**	**N**	**Mean**	**SD**	**Interpretation**
AI Anxiety (AIA)	BCAED	34	2,69	1,15	Low Anxiety
	BECED	30	2,90	1,14	Low Anxiety
	BEED	31	3,19	0,98	Moderate Anxiety
	BSED	42	2,95	1,24	Low Anxiety
	BSNED	32	2,45	0,93	Low Anxiety
Overall		169	2,84	1,12	Low Anxiety

The findings show that preservice teachers reported an overall low level of AI anxiety (M = 2,84, SD = 1,12). Among the programs, BEED students registered the highest level (M = 3,19), interpreted as moderate, whereas BSNED students recorded the lowest (M = 2,45), indicating a low level. BECED (M = 2,90), BSED (M = 2,95), and BCAED (M = 2,69) also reported low levels of anxiety. These results suggest that, overall, teacher aspirants are not overly apprehensive about AI in education.

The generally low level of AI anxiety contrasts with broader societal concerns, where professionals in other sectors report significant apprehension over ethical, trust, and displacement issues.[59,60,70,71] For preservice teachers, however, familiarity with digital technologies and receptiveness to educational innovations may explain their lower anxiety. The moderate level observed among BEED students may reflect greater exposure to AI in their academic training, raising concerns about risks such as reliability, academic dishonesty, or overreliance. Nevertheless, this moderate score remained on the lower end, underscoring that anxiety is not a major barrier to ChatGPT adoption. Overall, the findings indicate that preservice teachers approach AI with openness tempered by caution, a perspective favorable to technology integration in teacher education.

Relationships among ChatGPT Use, AI Anxiety, and the Learning Satisfaction of Preservice Teachers

The correlation analysis revealed significant positive relationships among the key constructs. ChatGPT use was positively correlated with information quality (r = 0,45, p < 0,05), interaction quality (r = 0,42, p < 0,05), collaborative learning (r = 0,51, p < 0,05), and learning motivation (r = 0,59, p < 0,05). Learning satisfaction also showed strong positive correlations with information quality (r = 0,65, p < 0,05), collaborative learning (r = 0,59, p < 0,05), and learning motivation (r = 0,66, p < 0,05). In contrast, AI anxiety displayed weak negative

correlations with ChatGPT use (r = –0,24) and learning satisfaction (r = –0,20), although these correlations were not statistically significant.

These results underscore the central role of quality perceptions, collaboration, and motivation in shaping both ChatGPT use and learning satisfaction. The strongest relationship was observed between learning satisfaction and learning motivation, indicating that motivation is a primary driver of satisfaction in AI-supported environments, which is consistent with Almulla.[53] The significant correlations with information and interaction quality further highlight that favorable perceptions of the reliability and responsiveness of ChatGPT contribute to stronger adoption and satisfaction. Conversely, the weak and nonsignificant negative correlations involving AI anxiety suggest that apprehension does not serve as a major barrier to ChatGPT use in teacher education.

Table 3. Relationships among ChatGPT-Related Constructs across Teacher Education Programs

Relationships	r	Sig.
Use of ChatGPT and Learning Motivation	0,59*	p < ,05
Use of ChatGPT and Interaction Learning	0,55*	p < ,05
Learning Satisfaction and Information Quality	0,65*	p < ,05
Learning Satisfaction and Learning Motivation	0,66*	p < ,05
Artificial Intelligence Anxiety and Use of ChatGPT	-0,24	not significant
Artificial Intelligence Anxiety and Learning Satisfaction	-0,20	not significant

CONCLUSION

This study revealed that preservice teachers generally reported moderate levels across most ChatGPT-related constructs, with learning motivation rated high and perceived usefulness rated weak. ChatGPT use was significantly associated with greater learning motivation, suggesting that its integration can enhance student engagement and curiosity. Collaborative learning was also strongly linked to learning satisfaction, highlighting the value of incorporating ChatGPT into group-based academic tasks. AI anxiety was observed at a low overall level, although it still influenced how preservice teachers approached ChatGPT use, often with caution, hesitation, and the need for validation. These findings indicate that while ChatGPT adoption in teacher education is promising, it is shaped by both motivational drivers and concerns about accuracy, usefulness, and ethics.

RECOMMENDATIONS

These findings suggest that teacher education institutions provide structured training to enhance preservice teachers' understanding of ChatGPT's applications in academic work, particularly to improve perceptions of its usefulness while promoting its responsible and ethical use. Faculty should consider designing collaborative and inquiry-based learning activities that integrate ChatGPT, as these activities can maximize motivational benefits, encourage critical thinking, and reduce overreliance on AI-generated outputs. Future research should pursue longitudinal and comparative investigations across various educational levels and contexts to capture evolving usage patterns and the role of AI anxiety.

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