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Graduate Students' Self-Efficacy in Using ChatGPT for Academic Tasks

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Index Terms:

ChatGPT, self-efficacy, graduate students, artificial intelligence in education, academic confidence

Abstract. Artificial intelligence (AI) continues to transform higher education, particularly through generative tools such as ChatGPT, which support academic writing, research development, and data analysis. This study examined graduate students' self-efficacy in using ChatGPT for academic tasks at a private higher education institution. A quantitative descriptive–comparative research design was employed, and data were collected from 54 graduate students using a structured questionnaire measuring five domains: academic writing, research skills, data analysis and interpretation, critical thinking and responsible use, and overall academic confidence. The results revealed a high level of self-efficacy across all domains, with an overall mean of 3.13. Among the domains, academic writing self-efficacy obtained the highest mean score, indicating strong confidence in utilizing ChatGPT for writing-related tasks in academic settings. An independent samples t-test showed no significant difference in self-efficacy when grouped by sex. However, a one-way analysis of variance (ANOVA) revealed a significant difference based on the frequency of ChatGPT use, with students who reported always using the tool demonstrating higher self-efficacy than those who rarely used it. Effect size analysis indicated a small practical effect for sex and a moderate effect for frequency of use. These findings suggest that experiential engagement with AI tools plays a more substantial role in shaping academic confidence than demographic characteristics. This study underscores the importance of structured exposure, institutional guidelines, and ethical training to promote responsible and effective AI integration in graduate education.

Introduction

Artificial Intelligence (AI) is making big waves in higher education worldwide. It boosts academic productivity, makes research more efficient, and changes how knowledge is built (Mahrishi et al., 2025; Peng and Li, 2025). One of the standout innovations is generative AI tools, such as ChatGPT. These tools are proving to be great academic allies, helping students with writing, synthesizing literature, developing research skills, and analyzing data. They also support personalized learning and better time management (Abbasnejad et al. 2025; Andrade-Girón et al. 2024). Owing to these benefits, universities are updating their policies to integrate AI into their operations. They aim to balance academic advantages with concerns about academic integrity, overreliance, and potential decline in critical thinking skills (Deroncele-Acosta et al., 2025; Mahrishi et al., 2025). In this changing environment, Bandura's Self-Efficacy Theory offers a useful perspective on technology adoption. This highlights how individuals' confidence in their abilities can greatly affect their performance, responsible use, and acceptance of technology (Al-Zahrani & Alasmari, 2024). Therefore, bringing AI into higher education calls for a strategic and ethically sound approach to maximize its benefits while addressing its risks (Abulibdeh et al., 2025).

In the context of higher education in the Philippines, particularly in private colleges in areas such as Isabela, there is an increasing use of AI tools in academic work. Graduate students are now expected to produce high-quality scholarly work while mastering digital technologies that impact academic writing, research design, literature synthesis, and statistical analysis. On a global scale, studies have shown that tools such as ChatGPT are becoming popular for thesis writing, paraphrasing, and research development (Ali et al., 2024; Andrade-Girón et al., 2024). However, the rules regarding the use of AI are still changing and can be unclear, making it difficult to know how to use these tools properly and ethically in research (Theoharakis et al., 2025). Faculty members also have different views on this issue. Some are in favor of integrating AI to boost learning, while others are concerned about relying too much on it, which might affect academic integrity and critical thinking (Benuyenah & Dewnarain, 2024; Mumtaz et al., 2024). Moreover, there is not much structured training on how to use AI responsibly, which might explain why graduate students use these tools differently and with varying effectiveness (Theoharakis et al., 2025; Verghese et al., 2025).

Despite the widespread adoption of ChatGPT among graduate students, there is limited empirical evidence regarding their confidence in effectively and responsibly utilizing this AI tool. Patterns of use varied considerably, with some students employing ChatGPT primarily for surface-level tasks, such as editing and grammar correction, whereas others relied on it for more complex functions, including research design, literature synthesis, and data interpretation. Such variations may be influenced by demographic and academic factors, including age, program affiliation, and prior experience with research methods. Furthermore, the extent to which graduate students critically evaluate and verify AI-generated outputs remains unclear. The current literature does not clearly determine whether ChatGPT strengthens students' academic self-efficacy or enhances their task efficiency. This uncertainty underscores the need for a systematic and quantitative assessment of graduate students' self-efficacy in using the ChatGPT in key academic fields. Examining this dimension will provide deeper insights into whether confidence in AI integration contributes to meaningful research competence and responsible academic practices in graduate education.

Literature Review

AI Integration and ChatGPT Use in Higher Education

The integration of generative AI tools, such as ChatGPT, into higher education remains uneven, shaped by institutional infrastructure, technological readiness, and evolving policy frameworks. Empirical evidence suggests that urban universities are more likely to leverage ChatGPT to enhance instructional efficiency and research productivity, whereas rural institutions often encounter access limitations that may exacerbate existing educational inequalities (Espartinez, 2025). Within academic settings, ChatGPT is increasingly utilized for writing support, research development, and data analysis, assisting students in constructing coherent arguments, synthesizing complex literature, and developing preliminary research frameworks (Raptopoulou, 2025). Its contribution to research efficiency and personalized learning is widely recognized, although concerns regarding ethical implications and potential declines in critical thinking persist (Kostas et al., 2025). Beyond AI-specific applications, broader research on digital technology integration demonstrates that mobile and emerging technologies significantly enhance student engagement and learning outcomes when aligned with pedagogical objectives (Anselmo et al., 2026). AI-assisted learning offers similar benefits, such as improved productivity, creativity, and academic literacy development. However, risks such as academic dishonesty, plagiarism, factual inaccuracies, and overreliance on AI-generated outputs continue to raise institutional concerns (Michel-Villarreal et al., 2023; Ortiz-Bonnin & Blahopoulou, 2025). Both educators and students acknowledge that effective technology integration requires pedagogical innovation and structured guidance to maximize learning benefits (Ellorin et al., 2024). From an institutional perspective, the absence of comprehensive governance structures complicates sustainable AI adoption, underscoring the need for clear policies, structured training programs, and transparent ethical guidelines (Acosta-Enriquez et al., 2024; Isiaku et al., 2024). Studies further emphasize that educators' awareness and readiness to implement artificial intelligence policies are essential for the successful integration of AI initiatives within educational systems (Anselmo et al., 2026). As AI adoption accelerates, institutions must balance technological advancement with equitable access, academic integrity, and the preservation of higher-order thinking skills. Current scholarship emphasizes culturally responsive implementation strategies, AI literacy initiatives, and responsible-use frameworks that align innovation with human-centered educational values (Espartinez, 2025; Kostas et al., 2025; Shabbir et al., 2024). Collectively, this body of literature positions ChatGPT as a transformative yet complex tool in contemporary graduate and higher education contexts.

Self-Efficacy Theory and Technology Use in Education

Bandura's self-efficacy theory suggests that self-efficacy, or the belief in one's ability to organize and carry out actions needed to handle future situations, is influenced by four main factors: mastery experiences, vicarious learning, social persuasion, and reduced anxiety. Among these, mastery experiences, which involve successfully completing tasks, are the most significant in developing strong self-efficacy. Observing others succeed (vicarious learning) and receiving

encouragement (social persuasion) also bolster confidence, while reduced anxiety helps overcome performance obstacles(Graham, 2022). This theoretical framework is foundational for educational research. Self-efficacy is crucial for academic performance. Research has shown a positive link between academic self-efficacy and achievement, with higher self-efficacy directly leading to better academic results and indirectly affecting them through increased academic engagement, which includes cognitive, emotional, and behavioral aspects(Meng & Zhang, 2023; Miao et al., 2025). Engagement behaviors, such as persistence and focus, mediate this connection, promoting ongoing participation and mastery experiences that are essential for learning success(Zhang & Qian, 2024). Additionally, sustained engagement driven by academic self-efficacy boosts long-term academic success(Jian, 2022). In higher education, technology self-efficacy, or students' confidence in their ability to use educational technologies effectively, is also linked to academic competence and success. Research indicates that students' self-efficacy in using technology platforms, such as Blackboard, enhances engagement, motivation, and academic outcomes, showing strong positive effects on language proficiency and academic success(Al-Khresheh & Alkursheh, 2024). Moreover, the connection between confidence and academic competence is strengthened through self-regulation and critical thinking, both of which are nurtured by self-efficacy beliefs(Stavropoulou et al., 2025). Behavioral engagement, marked by active participation and effort in learning tasks, is greatly influenced by mastery experiences that boost self-efficacy, which in turn encourages persistence and academic success(Bedi, 2023; Miao et al., 2025). Overall, Bandura's theory offers a solid theoretical basis for understanding how self-efficacy, particularly technology-related self-efficacy, supports academic performance and behavioral engagement in educational contexts.

Factors Influencing AI-Related Self-Efficacy Among Students

The extent to which students utilize AI tools is closely associated with their perceived competence and confidence in using these technologies. Research indicates that students who engage more frequently and consistently with generative AI tools report higher levels of confidence and skill, which, in turn, strengthens their perception of AI's usefulness in academic contexts (Prosen & Ličen, 2025). Therefore, self-assessed competence and sustained interaction are critical predictors of AI-related self-efficacy and perceived value. Gender differences have also been observed in technology self-efficacy, with male students often perceiving AI as more useful and expressing fewer ethical concerns than female students, highlighting the need for gender-responsive support strategies to promote inclusive AI literacy (Prosen & Ličen, 2025). In AI-enhanced learning environments, graduate students' engagement with digital tools has been linked to improved academic performance and strengthened critical thinking, particularly when AI capabilities reinforce self-efficacy and learning motivation (Jia & Tu, 2024). However, while AI can enhance cognitive engagement, its direct impact on critical thinking awareness requires careful instructional design that fosters independent analysis alongside AI integration (Jia & Tu, 2024). Studies further suggest that artificial intelligence can enhance students' critical thinking skills when supported by guided pedagogical strategies (Anselmo et al., 2025).Despite these benefits, the responsible and ethical use of AI remains a significant concern. Scholars emphasize the importance of ethical guidelines, digital literacy, and equitable access to mitigate risks such as algorithmic bias, data privacy breaches, and academic dishonesty (Holmes et al., 2021; Li & Huang, 2025; Prosen & Ličen, 2025). Embedding ethics education within AI-supported curricula encourages critical engagement rather than uncritical reliance on AI-generated outputs (Tammeleht & Löfstöm, 2025). Thus, AI integration in education is increasingly framed not merely as a technological enhancement but as a catalyst for higher-order thinking, requiring intentional design to balance innovation with responsible academic practice (Walter, 2024).

Conceptual- Theoretical Mapping

The integrated conceptual–theoretical framework underpinning this study centers on graduate students' self-efficacy in using ChatGPT for academic tasks. The model is anchored in Bandura's self-efficacy theory, which asserts that efficacy beliefs are shaped primarily through mastery experiences, vicarious learning, social persuasion, and reduced anxiety (Graham, 2022). Among these, mastery experiences are considered the most influential source of efficacy development. Within AI-supported academic contexts, repeated and structured engagement with ChatGPT functions as a mastery mechanism, enabling students to refine their writing, research design, and analytical processes, thereby strengthening their perceived competence in these areas.

The framework integrates this theoretical lens with contextual variables relevant to AI adoption in higher education settings. Demographic factors (age, gender, academic program, and year level) were positioned as background variables to examine potential structural differences in perceived competence among the participants. However, consistent with prior research suggesting diminishing gender-based disparities in postgraduate technology self-efficacy (Corsi et al., 2021; Elshaer et al., 2024), the model conceptualizes these variables as secondary influences on the dependent variables. In contrast, the frequency of ChatGPT use was the primary behavioral predictor. Empirical studies indicate that sustained interaction with AI tools enhances familiarity, perceived usefulness, and confidence in their applications (Aksakallı & Daşer,

2025; Valova et al., 2024). Thus, behavioral engagement operates as a dynamic mechanism that translates theoretical efficacy into measurable academic confidence.

The model further links self-efficacy to five interrelated academic domains: academic writing, research skills, data analysis and interpretation, critical thinking and responsible use, and overall academic confidence. This multidimensional structure aligns with the evidence that technology-related self-efficacy predicts engagement, persistence, and academic performance (Meng & Zhang, 2023; Miao et al., 2025). Figure 1 synthesizes the theoretical and empirical dimensions, proposing that experiential engagement with generative AI, rather than demographic characteristics, serves as the primary driver of graduate students' academic self-efficacy and responsible AI integration.

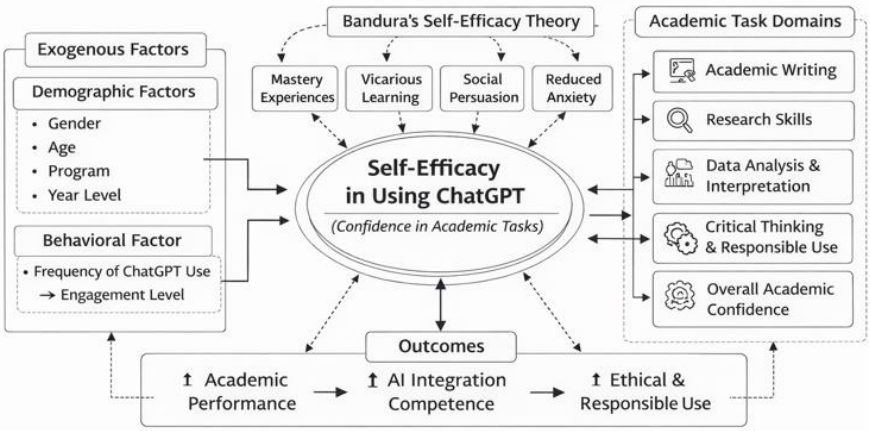

Figure 1 integrated Conceptual- Theoretical Mapping

Methodology

Research Design

This study employed a quantitative descriptive–comparative research design to examine graduate students' self-efficacy in using ChatGPT for academic tasks. The descriptive component measured the level of self-efficacy across the identified domains, whereas the comparative component examined whether significant differences existed when respondents were grouped according to demographic variables, such as age, gender, program, year level, and frequency of ChatGPT use. A quantitative approach was appropriate because this study aimed to generate numerical data and apply statistical procedures to objectively determine patterns, differences, and effect sizes.

Respondents of the Study

The respondents comprised 54 graduate students enrolled in master's and doctoral programs at a private higher education institution during the 2025–2026 academic year. Participants were selected using purposive sampling to ensure that all respondents had prior experience using ChatGPT for academic purposes. The inclusion criteria required that participants be currently enrolled graduate students, have used ChatGPT at least once for academic-related tasks, and voluntarily consented to participate. This sampling approach ensured that the responses were relevant to the study objectives.

Research Instrument

Data were gathered using a researcher-developed questionnaire based on Bandura's (1997) self-efficacy theory and guided by the teachers' sense of efficacy framework of Tschannen-Moran and Woolfolk Hoy (2001), as well as recent studies on AI in higher education (Al-Zahrani & Alasmari, 2024). The structure of the Teachers' Sense of Efficacy Scale was adapted to measure graduate students' self-efficacy in using ChatGPT for academic tasks. The instrument consisted of two parts: demographic information and 28 self-efficacy statements covering academic writing, research skills, data analysis, responsible AI use, and overall academic confidence. Items were rated on a four-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree), with mean scores interpreted from Very Low to Very High. Content validity was established through an expert review, and reliability was confirmed through pilot testing using Cronbach's alpha (≥ 0.70), indicating satisfactory internal consistency.

Data Gathering Procedure

Prior to data collection, formal approval was obtained from the relevant authority. The questionnaire was administered through an online survey platform to facilitate accessibility and ensure an efficient data collection process. Participants were informed of the study's purpose, assured of confidentiality and anonymity, and advised that participation was voluntary. Data were collected over a two-week period, after which the responses were compiled for statistical analysis.

Statistical Treatment of Data

The collected data were encoded and analyzed using statistical software. Frequency and percentage distributions were computed to describe the respondents' demographic profiles. Means and standard deviations were used to determine the level of self-efficacy in each domain. An independent samples t-test was conducted to examine differences in self-efficacy between two groups (e.g., gender), while a one-way analysis of variance (ANOVA) was applied to determine differences among three or more groups (e.g., frequency of use). Effect sizes were computed using Cohen's *d* for the t-test and eta squared (η^2) for the ANOVA to determine the magnitude of the observed differences. The level of significance was set at $P < 0.05$.

Ethical Considerations

This study adhered to the established ethical standards for research involving human subjects. Informed consent was obtained prior to participation, and the respondents were informed of their right to withdraw at any time without penalty. All data were treated with strict confidentiality and used only for academic purposes. No personally identifiable information was collected, ensuring participant anonymity throughout the study period.

Results

Respondents profile graduate students' self-efficacy in using ChatGPT for academic tasks

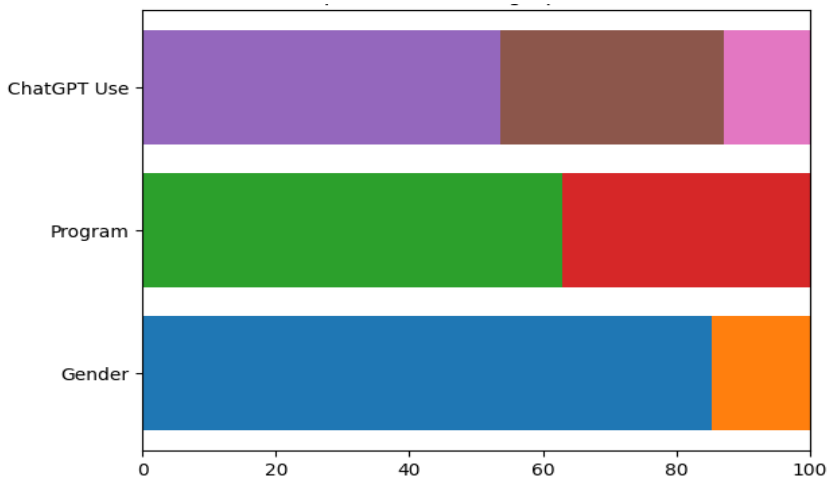

Figure 2. Demographic Profile of Graduate Student Respondents by Gender, Program, and Frequency of ChatGPT

Figure 2 presents the respondents' profiles in terms of gender, program, and frequency of use of ChatGPT (N = 54). Regarding gender, most respondents were female (85.2%), while males comprised 14.8%. Regarding academic programs, most participants were enrolled in Master's programs (63.0%), whereas 37.0% were PhD students. Regarding ChatGPT usage, the largest proportion of respondents reported sometimes using ChatGPT (53.7%), followed by those who always used it (33.3%), and a smaller group who rarely used it (13.0%). Overall, the data indicate that the sample is predominantly female master's students who engage with ChatGPT on a moderate-to-frequent basis.

Level of graduate students' self-efficacy in using ChatGPT across the following domains: Academic writing, Research skills, Data analysis and interpretation, Critical thinking and responsible use, Overall academic confidence

Indicators	Composite Mean	SD	Interpretation
Level of Academic Writing Self-Efficacy in Using ChatGPT	3.23	0.48	High
Level of Academic Confidence with ChatGPT	3.18	0.59	High
Level of Data Analysis and Interpretation Self-Efficacy in Using ChatGPT	3.11	0.58	High
Level of Research Skills Self-Efficacy in Using ChatGPT	3.08	0.51	High
Level of Critical Thinking and Responsible Use in Using ChatGPT	3.06	0.61	High
Overall Mean	3.13	.55	High

Table 1 level of self-efficacy of graduate students in using ChatGPT for ACADEMIC TASKS

Graduate students' self-efficacy in using ChatGPT for academic tasks was notably high across various indicators, reflecting positive acceptance and confidence in applying this AI tool in academic settings. Graduate students reported a high level of academic writing self-efficacy when using ChatGPT, which aligns with the findings that ChatGPT can effectively support academic writing by refining content and detecting errors, thereby boosting students' writing confidence (Naznin et al., 2025). Similarly, academic confidence using ChatGPT is reinforced by its recognized ability to streamline research communication, which has been linked to enhanced writing self-efficacy among graduate researchers (Khaw, 2025).

Self-efficacy in data analysis and interpretation using ChatGPT is also high, as AI tools assist in processing complex academic data and facilitate interpretation and understanding, positively impacting students' analytical skills (Rababah et al., 2024). Research skills self-efficacy benefits from ChatGPT's capability to generate ideas and provide literature summaries, accelerating research progress and improving research quality (Bin-Nashwan et al., 2023; Dai et al., 2023). Additionally, a high level of critical thinking and responsible use is supported by the emphasis in the literature on the ethical integration of ChatGPT, encouraging students to engage critically with AI-generated content and uphold academic integrity (Bikanga Ada, 2024; Ortiz-Bonnin & Blahopoulou, 2025). These findings highlight that graduate students are not only confident in utilizing ChatGPT but are also increasingly aware of the importance of responsible use in academic tasks.

Independent Samples t-test on Overall Self-Efficacy When Grouped by Gender

GENDER	N	MEAN	SD
MALE	8	3.14	0.33
FEMALE	46	3.17	0.30
T (52)	0.30		
P-VALUE	0.769		
DECISION (A = 0.05)	Not Significant		

Table 2. Independent Samples t-test on Overall Self-Efficacy When Grouped by Gender

The results of an independent samples t-test revealed no statistically significant difference in overall self-efficacy between male and female graduate students using ChatGPT for academic tasks (t (52) = 0.30, p =.769). Male (M = 3.14, SD = 0.33) and female respondents (M = 3.17, SD = 0.30) demonstrated comparable levels of confidence, both within the "High" interpretation range. The small effect size (Cohen's *d* = 0.13) further indicates that sex accounts for minimal practical variation in perceived self-efficacy. This finding is consistent with prior research suggesting that sex differences in technology-related self-efficacy tend to diminish at higher levels of education, particularly in postgraduate contexts where academic experience and technological exposure are more uniform (Corsi et al., 2021; Elshaer et al., 2024). The similarity in the mean scores suggests that confidence in using ChatGPT for academic purposes is shaped less by sex and more by experiential or behavioral factors.

One-Way ANOVA Comparing Overall Self-Efficacy by Frequency of ChatGPT Use

FREQUENCY OF CHATGPT USE	N	MEAN	SD
RARELY	7	2.96	0.29
SOMETIMES	29	3.14	0.27
ALWAYS	18	3.29	0.29
ANOVA RESULT			

F (2, 51)	3.86		
P-VALUE	0.028		
DECISION (A = 0.05)	Significant		

Table 3 One-Way ANOVA on Overall Self-Efficacy When Grouped by Frequency of ChatGPT Use

A one-way analysis of variance (ANOVA) revealed a statistically significant difference in overall self-efficacy when graduate students were grouped according to the frequency of ChatGPT use (F (2, 51) = 3.86, p =.028). Respondents who reported always using ChatGPT obtained the highest mean self-efficacy score (M = 3.29, SD = 0.29), followed by those who sometimes used it (M = 3.14, SD = 0.27), while those who rarely used the tool reported the lowest mean score (M = 2.96, SD = 0.29). The effect size was moderate (η^2 = .13), indicating that approximately 13% of the variance in self-efficacy was explained by the differences in usage frequency.

The results indicate that more frequent engagement with ChatGPT is associated with higher levels of perceived competence in applying the tool to academic tasks. Students who consistently use ChatGPT demonstrate greater confidence, suggesting that sustained interaction strengthens familiarity, perceived usefulness, and overall technological efficacy. This finding is consistent with prior research showing that increased exposure to AI technologies enhances confidence and perceived competence through repeated practice and adaptive engagement (Aksakallı & Daşer, 2025; Valova et al., 2024). Moreover, evidence suggests that confidence in navigating unfamiliar or technology-mediated tasks develops through experiential learning and continuous interaction (Anselmo & Anselmo, 2024). Collectively, these findings underscore the importance of practical engagement in shaping graduate students' academic self-efficacy in AI-assisted learning environments.

Effect Sizes for Differences in Overall Self-Efficacy by Gender and Frequency of Use

Statistical Test	Effect Size	Value	Interpretation
Independent Samples t-test (Gender)	Cohen's d	0.13	Small Effect
One-Way ANOVA (Frequency of Use)	Eta Squared (η^2)	0.13	Medium Effect

Table 4 Effect Sizes for Differences in Overall Self-Efficacy

Effect size analysis further clarified the magnitude of the observed differences in overall self-efficacy. The independent samples t-test yielded a small effect size for gender (Cohen's *d* = 0.13), indicating that although minor differences in mean scores were observed, the practical impact of gender on self-efficacy in using ChatGPT was minimal. This suggests that male and female graduate students demonstrated comparable confidence levels when using ChatGPT for academic tasks. In contrast, the one-way ANOVA examining the frequency of ChatGPT use produced a moderate effect size (η^2 = .13). This indicates that usage frequency accounted for approximately 13% of the variance in overall self-efficacy. Compared to gender, frequency of use represented a more meaningful factor associated with variations in confidence. Prior research similarly reports that greater engagement with AI tools is linked to increased perceived competence and usability (Aksakallı & Daşer, 2025; Valova et al., 2024)

Discussion

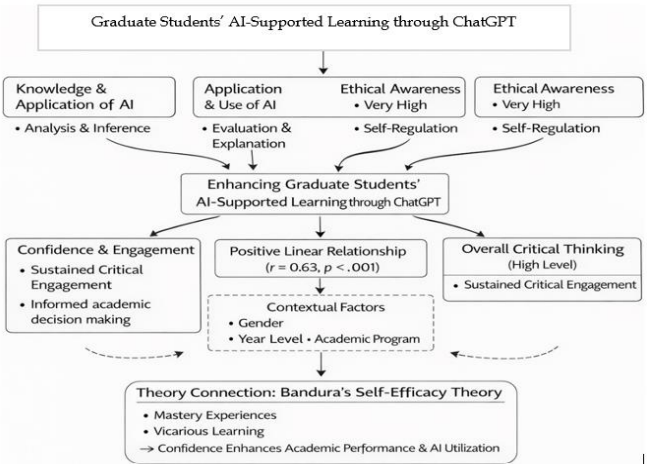

Figure 3 Structural Mapping of Factors Influencing Graduate Students' Self-Efficacy in ChatGPT Use

As illustrated in Figure 3, the mapping framework positions graduate students' self-efficacy in using ChatGPT for academic tasks as a central construct influenced by domain-specific competencies and behavioral engagement factors. The overall mean (M = 3.13) indicates a high level of perceived self-efficacy, suggesting that the respondents generally felt confident in integrating ChatGPT into their academic workflows. Figure 3 shows that academic writing self-efficacy serves as the strongest contributing domain. This aligns with prior studies demonstrating that ChatGPT enhances writing clarity, idea development, and research communication among postgraduate students (Khaw, 2025; Naznin et al., 2025). Research skills and data analysis competencies are similarly mapped as reinforcing domains, reflecting the role of AI tools in facilitating conceptual understanding and thesis development (Dai et al., 2023; Rababah et al., 2024). Together, these domains contribute to broader academic confidence, illustrating how task-specific competence strengthens self-efficacy in academic settings.

Although critical thinking and responsible use also registered within the high range, Figure 3 indicates that this domain was comparatively lower than writing-related competencies. This pattern aligns with ongoing scholarly concerns regarding ethical AI integration, academic integrity, and the potential risks of overreliance on generative tools (Bin-Nashwan et al., 2023; Ortiz-Bonnin & Blahopoulou, 2025). While students demonstrate confidence in using ChatGPT, the comparatively lower mean suggests that critical evaluation and responsible application require sustained pedagogical support. Prior research further emphasizes that cultivating critical thinking as a core 21st-century skill remains essential across higher education disciplines, particularly in technology-mediated learning environments (Anselmo et al., 2025). Thus, the mapping underscores the need to balance technological confidence with ethical awareness and reflective judgment to ensure responsible academic engagement with AI tools.

Figure 3 also differentiates between demographic and behavioral influences. Sex did not significantly affect overall self-efficacy, and the small effect size (d = 0.13) indicates minimal practical variation between male and female respondents. This finding suggests that demographic characteristics exert a limited influence on AI-related confidence at the graduate level, consistent with evidence that sex disparities in technology self-efficacy tend to diminish within postgraduate populations (Corsi et al., 2021; Elshaer et al., 2024). Collectively, the mapping reinforces the conclusion that behavioral engagement, rather than demographic background, plays a more substantial role in shaping graduate students' confidence in AI-assisted academic tasks.

In contrast, the frequency of ChatGPT use emerged as a significant predictor of self-efficacy ($\eta^2 = .13$). Figure 3 depicts this as a primary driving factor, indicating that consistent engagement strengthens perceived competence. Students who always used ChatGPT reported higher self-efficacy than those who rarely used it. This pattern aligns with Bandura's Self-Efficacy Theory, which identifies mastery experiences as the most influential source of efficacy beliefs. Repeated exposure enhances familiarity, reduces uncertainty, and increases perceived capability (Aksakallı & Daşer, 2025; Valova et al., 2024). Overall, Figure 2 synthesizes these findings by illustrating that graduate students' confidence in using ChatGPT is shaped predominantly by experiential engagement rather than demographic variables. Academic writing, research facilitation, and analytical support positively contributed to self-efficacy, whereas ethical awareness moderated responsible application. The mapping highlights that the structured, guided, and frequent use of AI tools may be central to strengthening academic self-efficacy in graduate education.

Conclusion and Implications

This study examined graduate students' self-efficacy in using ChatGPT for academic tasks and explored differences based on gender and frequency of use. The findings indicate that graduate students demonstrate a high level of self-efficacy in academic writing, research skills, data analysis, critical thinking, and overall academic confidence. These results suggest that ChatGPT is perceived not merely as a supplementary tool but as a meaningful academic support tool that can be integrated into graduate-level tasks. No significant differences were found in self-efficacy when grouped by gender, indicating that confidence in using ChatGPT was not substantially influenced by demographic characteristics within the postgraduate context. However, the frequency of use significantly influenced self-efficacy, with consistent users reporting higher confidence levels. This highlights the importance of experiential engagement in shaping perceived competence, consistent with Bandura's self-efficacy theory, which emphasizes mastery experiences as central to efficacy development.

The findings imply that structured exposure to AI tools may strengthen graduate students' academic confidence and performance. Although students exhibited high levels of competence, slightly lower scores in critical thinking and responsible use suggest the need for sustained institutional emphasis on ethical AI integration into the curriculum. Universities, particularly private higher education institutions in provincial contexts, may benefit from developing clear policies, training programs, and guided frameworks that promote effective and responsible AI use. Overall, this study contributes empirical evidence to the growing body of literature on AI integration in higher education by demonstrating

that behavioral engagement, rather than demographic characteristics, plays a more substantial role in shaping graduate students' self-efficacy in using chatbots.

Recommendation

Based on the findings of this study, higher education institutions should develop clear institutional guidelines to ensure the ethical and responsible use of ChatGPT in academic work. Structured training programs and workshops should be implemented to provide graduate students with hands-on experience in effectively integrating AI tools into academic writing, research design, and data analysis, while emphasizing verification practices and academic integrity. Research methodology and thesis writing courses may incorporate guided AI-assisted activities to strengthen students' competencies through supervised engagement. Faculty members should also promote the reflective and responsible use of ChatGPT, ensuring that it functions as a supplementary tool rather than a substitute for independent critical thinking. Future research should examine the longitudinal impact of AI use on academic performance and explore additional contextual or behavioral factors that influence self-efficacy in AI-supported learning environments.

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Competing Interests Statement

The authors declare that they have no financial conflicts of interest or personal relationships that could have influenced the work reported in this article.

Data Availability Statement

Access to the data used in this study can be obtained by submitting a formal request to the study author.

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Appendices

No appendices are included in this article