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Reflective Thinking and Attitudes Toward Academic Requirements In AI-Supported Graduate Education

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Index Terms:

artificial intelligence in education, reflective thinking, academic integrity, graduate education, ai engagement, academic attitudes

Abstract. Artificial intelligence (AI) tools are increasingly being integrated into higher education, transforming how graduate students perform academic tasks such as research, writing, and problem solving. While AI enhances efficiency and productivity, concerns remain regarding its influence on reflective thinking, academic rigor and scholarly integrity. This study examined reflective thinking and attitudes toward academic requirements in AI-supported graduate education using a convergent-parallel mixed-methods design. In the quantitative phase, 51 graduate students (30 master's and 21 PhD students) completed a structured survey that measured reflective thinking, attitudes toward academic requirements, and AI engagement. Data were analyzed using descriptive statistics, Pearson's correlation, and independent samples t-tests. In the qualitative phase, semi-structured interviews were conducted with 14 participants to explore their experiences with AI tools in academic tasks. The findings revealed very high levels of reflective thinking, positive attitudes toward academic requirements, and strong engagement with AI among graduate students. Significant positive relationships were found among reflective thinking, attitudes, and AI engagement, indicating that these variables are closely interconnected in AI-supported learning environments. No significant differences were observed between master's and PhD students. Qualitative results showed that students critically evaluated AI-generated responses, verified information using credible academic sources, and maintained awareness of academic integrity when using AI tools. Overall, the study concluded that AI can support graduate learning without diminishing reflective thinking when used responsibly, and highlighted the importance of promoting ethical AI use, critical evaluation skills, and reflective learning practices in graduate education.

Introduction

Artificial intelligence (AI) is making significant waves in higher education, changing how students approach academic writing, research, and problem-solving. New tools, such as generative AI systems, are becoming staples in graduate-level work, helping with everything from summarizing literature to analyzing data (Katsamakas et al., 2024; Peng & Li, 2025). In the realm of Education 4.0, these technologies drive digital innovation, automation, and personalized learning, thereby disrupting traditional teaching methods (Peng & Li, 2025). While AI offers great opportunities to boost efficiency and learning outcomes, it also sparks important discussions about its impact on higher-order thinking skills, particularly reflective thinking (Deroncele-Acosta et al., 2025). Reflective thinking is crucial in graduate education because it supports critical analysis, knowledge building, and scholarly rigor. However, the increasing use of AI tools has led to debates among educators and researchers regarding whether these technologies help or hinder cognitive processes. On one hand, AI can deepen engagement by offering diverse perspectives and assisting in complex problem-solving, with some evidence showing that AI tools can enhance critical thinking and problem-solving skills when used with proper guidance and reflective practices (Anselmo et al., 2026). On the other hand, relying too much on AI-generated outputs might lead to shallow learning, less critical reflection, and potential risks to academic integrity

(Dai et al., 2023; Deep & Chen, 2025). These concerns are heightened by the absence of clear institutional guidelines for the ethical and effective use of AI in academic settings (Deroncele-Acosta et al., 2025; Mahrishi et al., 2025).

Graduate students are increasingly employing AI tools to fulfill academic requirements, including thesis writing, literature review, and analytical tasks. While these tools enhance productivity, they also obscure the distinction between assistance and authorship, raising significant questions regarding originality, academic rigor, and scholarly responsibility (Miao et al., 2023; Rababah et al., 2024). Consequently, there is an urgent need to examine not only how students utilize AI but also how such engagement affects their reflective thinking and attitudes toward academic standards (Bin-Nashwan et al., 2023; Miao et al., 2023). Despite the expanding body of literature on AI in education, most existing studies have predominantly focused on technology adoption, usability, and user acceptance. However, relatively little attention has been devoted to the cognitive and attitudinal dimensions of AI use, particularly in graduate education. Specifically, comprehensive research examining the relationship between AI engagement, reflective thinking, and attitudes toward academic requirements is lacking.

Furthermore, few studies have employed mixed-methods approaches to capture both measurable trends and lived experiences, resulting in fragmented data. Differences between master's and doctoral students—who may differ in their academic expectations and research demands— remain underexplored (Poolkrajang & Papanai, 2024). Addressing these gaps, the present study investigates the interplay between AI engagement, reflective thinking, and attitudes toward academic requirements among graduate students in AI-supported learning environments. By employing a convergent parallel mixed-methods design, this study integrates quantitative measures with qualitative insights to provide a comprehensive understanding of how AI influences cognitive engagement and academic values. Ultimately, this study aims to contribute to the development of informed, ethical, and reflective practices in the integration of AI into graduate education.

Research Questions

This study aimed to examine reflective thinking and attitudes toward academic requirements in AI-supported graduate education. Specifically, it seeks to determine how graduate students engage with artificial intelligence (AI) tools in their academic work and how such engagement relates to their reflective thinking and attitudes toward academic rigor, integrity and scholarly standards.

1. What is the level of reflective thinking among graduate students in AI-supported learning environments?
2. What is the level of attitude toward academic requirements among graduate students in AI-supported graduate education?
3. What is the level of AI engagement among graduate students when using AI tools for academic tasks?
4. Is there a significant relationship between reflective thinking, attitudes toward academic requirements, and AI engagement in AI-assisted graduate education?
5. Is there a significant difference between master's and PhD students in terms of reflective thinking, attitudes toward academic requirements, and AI engagement?
6. How do graduate students describe their reflective thinking experiences when using AI tools for academic problem-solving?
7. How do graduate students perceive the influence of AI on academic rigor, integrity and scholarly standards?

Conceptual-Theoretical Mapping

The conceptual–theoretical framework of this study elucidates the relationship between AI engagement, reflective thinking, and attitudes toward academic requirements in AI-supported graduate education. This framework is anchored in Dewey's theory of reflective thinking, which underscores the significance of critically evaluating information prior to its application in academic learning. In this study, AI engagement pertains to the manner in which graduate students utilize artificial intelligence tools, such as ChatGPT, for academic writing, research preparation, and problem-solving. As students interact with these tools, they engage in reflective thinking, which involves assessing the accuracy, relevance, and reliability of the AI-generated responses. This reflective process enables students to critically analyze information and integrate AI-generated ideas into their own understanding. Reflective thinking subsequently influences students' attitudes toward academic requirements, including their perspectives on academic rigor, originality, scholarly standards and academic integrity. Consequently, the framework posits that AI engagement impacts reflective thinking, which, in turn, shapes students' attitudes toward academic requirements in AI-supported graduate education programs.

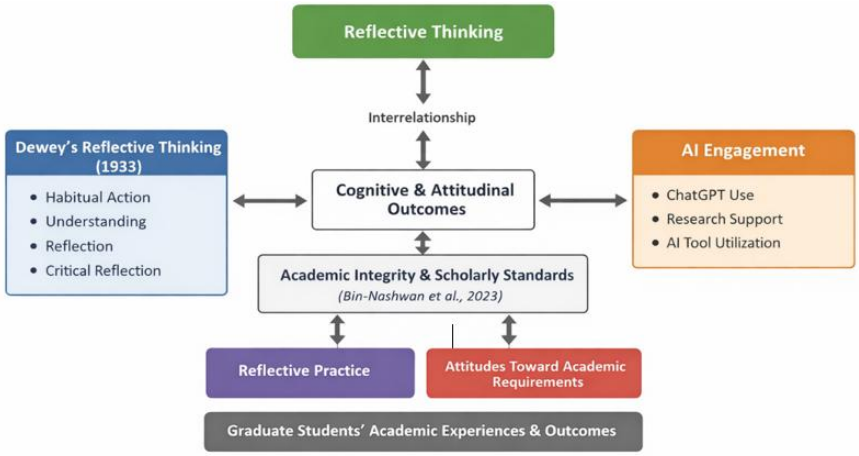

Figure 1 Integrated Conceptual- Theoretical Mapping of the Study

Methodology

Research Design

This study employed a convergent parallel mixed methods research design, in which both quantitative and qualitative data were collected during the same phase of the research process. These data were analyzed separately and then integrated during interpretation. This design was deemed appropriate as the study sought to examine the measurable levels of reflective thinking, attitudes toward academic requirements, and AI engagement among graduate students, while exploring their lived experiences and perceptions regarding the use of artificial intelligence in academic tasks. The quantitative component focused on determining the levels, relationships, and differences among the variables through statistical analysis. The qualitative component provided deeper insights into how graduate students described their experiences of reflective thinking, academic rigor, and integrity while utilizing AI-supported learning tools. By integrating these two forms of data, this study aimed to generate a comprehensive understanding of how artificial intelligence influences reflective thinking and attitudes toward academic requirements in graduate education.

Participants of the Study

The study involved graduate students enrolled in master's and doctoral programs at a private higher education institution in Brazil. In the quantitative phase, 51 participants were included, comprising 30 master's and 21 PhD students. Stratified convenience sampling was used to ensure representation from both graduate program levels while allowing the researcher to collect data from accessible participants. For the qualitative phase, 14 participants were purposively selected from the survey respondents, including seven master's and seven PhD students. The selection criteria included active use of AI tools for academic tasks, willingness to participate in interviews, and variations in reflective thinking levels based on survey results. This purposive sampling ensured that the qualitative data captured diverse experiences and perspectives across the graduate academic levels.

Research Instruments

This study used surveys and interviews to collect data on reflective thinking, attitudes towards academic demands, and the use of AI tools in graduate education. Reflective thinking was measured using a modified Reflective Thinking Questionnaire (RTQ) developed by Kember et al. (2000). The RTQ is a known tool for assessing reflective thinking in higher education based on Dewey's (1933) theory, which stresses the importance of analyzing ideas and experiences in learning. In this study, some RTQ items were adjusted to determine how graduate students reflected on AI-generated responses in their academic work. Attitudes towards academic requirements were measured using a scale based on the literature on academic integrity and ethical AI use in education. This scale includes items on academic rigor, originality, scholarly standards, and

responsible AI use, informed by Bin-Nashwan, Sadallah, and Bouteraa (2023), who studied the impact of AI tools such as ChatGPT on academic integrity. An AI Engagement Survey was used to determine how often students used AI tools for tasks such as writing literature reviews, idea generation, and problem-solving. This survey was developed with the guidance of Rababah, Rababah, and Al-Khawaldeh (2024), who researched graduate students' experiences with AI tools in thesis writing and research. All survey items were rated on a four-point Likert scale ranging from strongly disagree to strongly agree. For the qualitative part, a semi-structured interview guide was used to explore the participants' experiences with AI for academic problem-solving, their views on its impact on reflective thinking, and their opinions on academic rigor and integrity in AI-supported learning environments.

Data Collection Procedure

To maintain uniformity in the participants' academic experiences, the data for this study were gathered within the same academic term. An online survey questionnaire was distributed through a secure digital platform to collect quantitative data. The participants were briefed on the purpose of the study, and informed consent was obtained prior to participation. Following the collection and analysis of quantitative data, selected participants were invited to participate in the qualitative phase of the study. Semi-structured interviews were employed to gather qualitative data, conducted either in person or via online conferencing tools, based on the availability of the participants. Each interview, lasting approximately 30–45 minutes, was audio-recorded with the participants' permission. To ensure confidentiality and adhere to ethical standards, all the responses were anonymized.

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. To assess the level of reflective thinking, attitudes toward academic requirements, and AI engagement among graduate students, descriptive statistics such as the mean and standard deviation were employed. Pearson's correlation analysis was used to explore the relationships between variables. An independent samples t-test was conducted to identify any significant differences between master's and PhD students in terms of reflective thinking, attitudes toward academic requirements, and AI engagement. The threshold for statistical significance was set at $P < 0.05$. Thematic analysis was applied to the interview responses to obtain qualitative data. This process included the following steps: transcribing the interview data, initially coding the responses, identifying categories, developing themes, and comparing themes across participants. The qualitative findings served to clarify and enhance the quantitative results by offering deeper insights into graduate students' experiences in AI-supported learning environments.

Integration of Data

The results of the quantitative and qualitative analyses were integrated during the interpretation stage using a joint-display approach. This process involved comparing the numerical findings with narrative insights to identify convergences, divergences, and complementary patterns between the two data sources. The integration of both datasets allowed the researcher to provide a more comprehensive understanding of how artificial intelligence influences reflective thinking, attitudes toward academic requirements, and academic integrity in graduate education.

Results and Discussion

Respondent Profile by Graduate Program

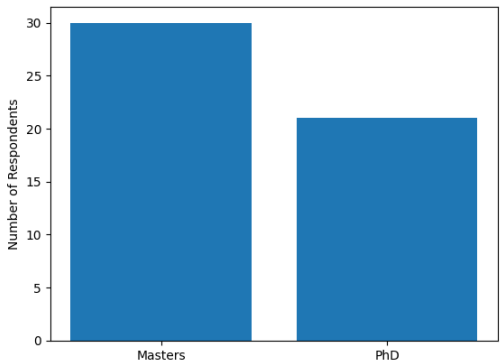

Figure 2 Respondent Profile by Graduate Program

Figure 2 presents the distribution of respondents based on their graduate program. The findings indicate that master's students comprised the majority (30 participants), while PhD students accounted for 21. This suggests that the study sample predominantly consisted of master-level graduate students, representing a larger proportion of the participants. Nonetheless, a significant number of doctoral students were included, contributing to a broader perspective on the utilization of AI-supported learning in graduate education in the study. The inclusion of both master's and PhD students enhanced the study by offering insights from learners at varying levels of advanced academic training, particularly in relation to reflective thinking, academic attitudes, and engagement with AI tools.

Presents the descriptive statistics of reflective thinking, attitudes toward academic requirements, and AI engagement among graduate students in AI-supported learning environments.

Variable	Mean	SD	Interpretation
Reflective Thinking	3.37	0.76	Very High
Attitudes Toward Academic Requirements	3.43	0.72	Very High
AI Engagement	3.39	0.74	Very High

Table 1. Descriptive Statistics of Reflective Thinking, Attitudes Toward Academic Requirements, and AI Engagement

The results in Table 1 clearly show that graduate students actively engage with AI in their learning environments. They showed high levels of reflective thinking (M = 3.37), positive attitudes toward academic requirements (M = 3.43), and AI engagement (M = 3.39). This suggests that students are not only actively using AI tools but also maintaining their academic values and critical thinking skills. A high reflective thinking score indicates that students are carefully evaluating information, which is crucial for deeper learning and academic work (Khoshgoftar & Barkhordari-Sharifabad, 2023). Meanwhile, their positive attitudes toward academic requirements suggest that they still value academic rigor and integrity, even with AI. This finding supports earlier studies showing that positive attitudes can boost learning and motivation (El-Ashry et al., 2025). The strong AI engagement score shows that students are integrating AI tools into their academic tasks, which can enhance efficiency and support learning when used appropriately (Rababah et al., 2024). These findings align with research indicating that mobile and digital technologies can improve student learning outcomes when effectively used in academic settings (Anselmo et al., 2026). Overall, these results suggest that AI can be a valuable support for graduate learning, encouraging both reflective thinking and responsible academic behavior.

Presents the Pearson's correlation coefficients among reflective thinking, attitudes toward academic requirements, and AI engagement in AI-supported graduate education.

Variables	Reflective Thinking	Attitudes	AI Engagement
Reflective Thinking	1.00	0.88**	0.90**
Attitudes	0.88**	1.00	0.88**
AI Engagement	0.90**	0.88**	1.00

$p < 0.01$

Table 2. Pearson Correlation among Reflective Thinking, Attitudes Toward Academic Requirements, and AI Engagement

The results presented in Table 2 indicate a strong and significant positive relationship between reflective thinking, attitudes toward academic requirements, and AI engagement ($p < .01$). Reflective thinking appears to be strongly related to both attitudes ($r = 0.88$) and AI engagement ($r = 0.90$), whereas attitudes also show a strong relationship with AI engagement ($r = 0.88$). These findings suggest that graduate students who exhibit higher levels of reflective thinking tend to possess more positive academic attitudes and are more actively engaged with AI tools in their learning.

This implies that these variables are closely interconnected and mutually supportive in AI-supported learning environments. These results align with those of previous studies, which have shown that reflective thinking enhances academic engagement and openness to learning technologies, whereas positive attitudes encourage the effective use of digital tools (El-Ashry et al., 2025). However, it is important to acknowledge that correlation does not imply causation, and other factors may influence these relationships. Overall, the findings underscore the importance of fostering reflective thinking and positive academic attitudes to support effective and responsible AI use in graduate education settings.

Presents the results of the independent samples t-test comparing master's and PhD students in terms of reflective thinking, attitudes toward academic requirements, and AI engagement.

Variables	Master's Mean	PhD Mean	t-value	p-value	Interpretation
Reflective Thinking	3.35	3.40	-0.52	0.60	Not Significant
Attitudes Toward Academic Requirements	3.41	3.46	-0.48	0.63	Not Significant
AI Engagement	3.37	3.42	-0.55	0.58	Not Significant

Level of Significance: α = 0.05

Table 3. Independent Samples t-Test Comparing Master's and PhD Students

The results presented in Table 3 indicate that there were no significant differences between master's and PhD students in terms of reflective thinking, attitudes toward academic requirements, and AI engagement ($p > .05$). The mean scores for both groups appeared to be quite similar across all variables, suggesting that both master's and PhD students exhibited comparable levels of reflective thinking, positive academic attitudes, and use of AI tools. This observation implies that graduate students, irrespective of their academic level, may share similar learning experiences and approaches when using AI in their academic endeavors. These findings align with those of previous studies, which have shown that graduate students tend to develop similar cognitive and academic behaviors when participating in advanced learning environments (Poolkrajang & Papanai, 2024). Overall, the results suggest that strategies aimed at promoting reflective thinking, academic integrity, and responsible AI use can be effectively applied to both master's and PhD students.

Thematic Analysis Reflective Thinking in AI-Supported Problem Solving

Presents the themes of graduate students' reflective thinking experiences when using AI tools for academic problem-solving.

Theme	Description	Responses
Critical Evaluation of AI-Generated Responses	The respondents critically examined the AI outputs by analyzing their accuracy, logic, clarity, and relevance before applying them to academic tasks. This reflects analytical thinking and a careful evaluation of AI-generated information.	P1: "I examine the logic and coherence of the response to ensure arguments are well-structured and free of contradictions." P2: "When using AI tools for academic problem solving, I reflect on AI-generated responses by carefully checking their accuracy, relevance, and reasoning rather than accepting them at face value." P3: "Analyze the validity, the correctness of the AI generated response before using it." M1: "Critically check AI-generated academic responses for accuracy, clarity, completeness, and relevance against reliable sources." M2: "It helps a lot, but we need also to edit some ideas." M3: "I reflect on my own understanding by asking myself whether I can explain the concept in my own words. If I can, it shows that I have learned from the AI tool rather than simply copying the answer." M4: "I reflect on AI-generated responses by checking whether the information is accurate, relevant, and supported by reliable sources before using it in my academic work. I also evaluate whether the explanation truly helps me understand the problem, not just gives a quick answer."
Verification Using Reliable Sources and Academic Knowledge	Respondents verified AI-generated information by comparing it with textbooks, scholarly materials, reference books, and their academic understanding to ensure credibility and accuracy.	P4: "I treat AI responses as a starting point, rather than a final answer. I critically evaluate the output by cross-referencing it with peer-reviewed literature and my own course materials to ensure the logic is sound and the data is accurate." P5: "I r

Table 4: Reflective Thinking in AI-Supported Problem Solving

The results in Table 4 show that graduate students demonstrated reflective thinking when using AI tools for academic problem-solving. Two main themes emerged: critical evaluation of AI-generated responses and verification using reliable sources and academic knowledge. These findings indicate that students do not simply accept AI-generated information;

instead, they assess its accuracy, relevance, and logic before using it in their academic work. Many participants also reported checking AI outputs against credible sources, such as textbooks and scholarly materials to ensure reliability. This suggests that students actively engage in reflective and analytical thinking when using AI, treating it as a support tool rather than a final authority. These findings are consistent with previous studies showing that AI can support higher-order thinking when users critically evaluate and integrate information into their understanding (Dai et al., 2023; Rababah et al., 2024). Overall, the results indicate that AI use can promote reflective thinking when students apply critical judgment and engage in responsible academic practices.

Presents the themes of how artificial intelligence influences graduate students' thinking and analysis in academic tasks.

Theme	Description	Responses
AI as a Tool for Enhancing Analytical Thinking and Idea Development	Respondents indicated that AI helped them expand their thinking, generate ideas, analyze complex information, and organize their thoughts during academic work. AI serves as a support tool that stimulates deeper analyses and improves academic productivity.	P1: "AI helps me explore different perspectives and organize complex ideas when analyzing academic problems." P2: "AI helps brainstorm research topics, suggest frameworks, and generate ideas that support my academic analysis." P3: "AI expands my thinking by providing additional explanations and perspectives on complex topics." M1: "AI influences graduate-level thinking by expanding ideas and providing suggestions that guide my analysis." M2: "AI helps me organize information and structure my academic work more clearly." M3: "AI tools assist me in understanding difficult concepts, which improves how I analyze academic tasks." M4: "AI provides insights and explanations that help me analyze problems more efficiently."
Awareness of the Limitations of AI and the Need for Independent Thinking	Respondents emphasized that although AI can assist with academic tasks, it should not replace independent thought. They recognized the importance of critically evaluating AI outputs and maintaining their analytical judgment.	P4: "I remain aware that AI should be a support tool rather than a replacement for my own academic thinking." P5: "AI can assist with analysis, but it still requires my own interpretation and critical judgment." P6: "While AI can provide useful suggestions, I ensure that my own reasoning and understanding guide my final conclusions." P7: "AI influences my thinking by offering ideas, but I still analyze the information critically before using it." M5: "Sometimes AI may oversimplify information, so I still evaluate the content carefully." M6: "AI helps with ideas, but I still need to analyze and refine the information myself." M7: "AI is useful in supporting academic work, but it should not replace my own independent thinking."

Table 5 AI Influence on Thinking and Analysis in Graduate-Level Academic Tasks

The results in Table 5 show that artificial intelligence (AI) influences graduate students' thinking and analysis in both positive and reflective ways. Two main themes emerged: AI as a tool for enhancing analytical thinking, idea development, and awareness of the limitations of AI, and the need for independent thinking. These findings indicate that students use AI to generate ideas, organize information, and better understand complex concepts, thereby supporting their academic tasks. These results are consistent with research showing that effective technology integration enhances learning experiences and supports innovative academic practices (Ellorin et al. 2024).

At the same time, students recognized that AI should not replace their own thinking and emphasized the importance of critically evaluating AI-generated content and applying their own judgment in academic work. This suggests that students can maintain a balance between utilizing AI as a support tool and preserving their independent thinking. These findings align with previous studies, indicating that AI can enhance academic productivity and cognitive engagement when used in conjunction with critical evaluation (Dai et al., 2023; Rababah et al., 2024). Overall, the results highlight that responsible AI use can promote deeper thinking while encouraging independent academic analysis.

Presents the themes on graduate students' perceptions of the effects of AI use on academic rigor and scholarly standards.

Theme	Description	Responses
AI as a Tool that Can Strengthen Academic Rigor	Respondents believed that AI could enhance academic rigor if used responsibly. AI can support research, improve efficiency in academic tasks, and assist in analyzing complex information, provided that students maintain critical-thinking skills and adhere to proper academic standards.	P1: "AI use in graduate education can strengthen academic rigor if used critically and responsibly in research and academic tasks." P2: "AI can enhance efficiency in academic work while still maintaining scholarly standards when properly evaluated." P3: "AI supports research processes and helps students analyze complex academic concepts." M1: "AI can help students understand difficult topics and improve their academic work." M2: "AI enhances efficiency in completing academic tasks while supporting learning." M3: "AI tools can support research and help generate academic ideas when used properly." M4: "AI can improve the quality of academic work when students evaluate the information critically."
Potential Risks to Academic Integrity and Originality	Some respondents expressed concerns that excessive reliance on AI might weaken academic rigor, reduce originality, and encourage dependency if students do not critically evaluate AI-generated content.	P4: "AI should not determine scholarly standards; how it is used will determine whether academic rigor is maintained." P5: "There is a risk that students may rely too much on AI and reduce their independent thinking." P6: "AI may affect originality if students simply rely on generated responses." P7: "Graduate students must still apply critical thinking to ensure academic rigor is preserved." M5: "There may be less originality if AI is overused in academic work." M6: "Students might depend too much on AI if it is not used responsibly." M7: "Academic rigor may decline if AI-generated content is used without proper evaluation."

Table 6. AI Use and Its Effects on Academic Rigor and Scholarly Standards

The results presented in Table VI indicate that graduate students hold both positive and cautious perspectives on the application of artificial intelligence (AI) in the context of academic rigor and scholarly standards. Two primary themes have emerged: AI as a tool that can enhance academic rigor and the potential risks to academic integrity and originality. The findings suggest that students perceive AI as a means of supporting academic endeavors by increasing efficiency, aiding research, and facilitating the comprehension of complex concepts when employed responsibly. However, they also acknowledged that an overreliance on AI may diminish originality and weaken independent thinking if not critically assessed. These results imply that while AI provides valuable academic support, its utilization should be guided by critical thinking and ethical practices. This aligns with previous studies that underscore the advantages and risks of AI in education, particularly concerning academic integrity and responsible use (Bin-Nashwan et al., 2023; Dai et al., 2023). Overall, the findings underscore the importance of balanced and responsible AI integration to uphold academic standards in graduate education.

Presents the themes of the practices employed by graduate students to maintain academic integrity while using AI tools.

Theme	Description	Responses
Verification, Proper Use, and Responsible Integration of AI	Respondents maintain academic integrity by verifying AI-generated information, editing and paraphrasing content, and ensuring that AI outputs are used only as support tools and not as the final academic work.	P1: "I align my use of AI with my institution's academic policies and ensure that the content is critically evaluated before including it in my work." P2: "I review and verify AI-generated responses using reliable academic sources before integrating them into my research." P3: "I treat AI as a support tool and make sure to edit, analyze, and improve the generated content." M1: "We should evaluate the content and rephrase our own ideas to maintain originality." M2: "Maintain originality." M3: "I review and revise the information generated by AI to ensure that it reflects my own understanding." M4: "I make sure that the

		AI-generated ideas are carefully evaluated before using them in my academic tasks."
Upholding Academic Honesty and Proper Citation Practices	Respondents emphasized the importance of academic honesty by acknowledging sources, avoiding plagiarism, and ensuring that their ideas and understanding remained central to their work.	P4: "To maintain academic integrity when using AI tools, I ensure that I properly acknowledge sources and avoid relying entirely on AI-generated content." P5: "I make sure that my work reflects my own analysis and understanding rather than copying AI responses directly." P6: "I ensure that AI is used only as a guide and that my final output represents my own academic work." P7: "I check that my work follows academic standards and institutional policies regarding AI use." M5: "I ensure that I do not copy AI responses directly and instead develop my own ideas." M6: "I cite appropriate sources and make sure my work is original." M7: "I use AI responsibly and ensure that my academic work reflects my own understanding."

Table 7: Practices for Maintaining Academic Integrity When Using AI Tools

The results presented in Table 7 indicate that graduate students actively employ strategies to uphold academic integrity when utilizing artificial intelligence (AI) tools. Two primary themes emerged: the verification, proper use, and responsible integration of AI, and the maintenance of academic honesty and proper citation practices. The findings revealed that students diligently reviewed and verified AI-generated information using reliable sources to ensure that the content was revised to reflect their understanding. They also underscore the importance of avoiding direct copying and properly acknowledging sources to preserve the originality. These practices suggest that students are cognizant of the ethical responsibilities associated with AI use in academic work. This aligns with previous studies that emphasize that responsible AI use necessitates critical evaluation, proper citation, and adherence to academic standards (Bin-Nashwan et al., 2023; Miao et al., 2023). Overall, the findings demonstrate that graduate students can utilize AI tools while maintaining academic integrity and scholarly responsibility.

Synthesis of Quantitative and Qualitative Findings

The integration of quantitative and qualitative findings suggests that artificial intelligence (AI) positively influences graduate students' reflective thinking and attitudes toward academic requirements. The results indicate high levels of reflective thinking, positive academic attitudes, and strong AI engagement, suggesting that students actively utilize AI tools while upholding their academic values. The significant relationships among these variables imply that higher reflective thinking may be associated with more positive attitudes and greater AI use, aligning with studies indicating that reflective thinking supports deeper learning (Khoshgoftar & Barkhordari-Sharifabad, 2023) and that positive attitudes toward AI enhance digital learning engagement (El-Ashry et al., 2025). The absence of significant differences between master's and PhD students further suggests that these patterns are consistent across graduate levels (Poolkrajang and Papanai 2024). Qualitative findings support these results by indicating that students critically evaluate AI-generated responses and verify information using reliable sources, thereby demonstrating reflective and analytical thinking. AI is perceived as a useful tool for idea development and academic analysis, supporting research that highlights its role in enhancing learning when used with critical evaluation (Dai et al., 2023; Rababah et al., 2024). However, students also acknowledged the potential risks of overreliance on AI, particularly concerning originality and academic integrity, aligning with concerns about uncritical AI use (Bin-Nashwan et al., 2023; Deep & Chen, 2025). Overall, the findings suggest that AI can support graduate learning without diminishing reflective thinking when used responsibly, supported by research emphasizing that effective AI integration depends on users' awareness and responsible use (Anselmo et al., 2026).

Conclusion and Recommendations

This study concludes by highlighting how artificial intelligence (AI) can be a valuable support tool in graduate education, especially when paired with reflective thinking and responsible practices. The research shows that graduate students are good at reflective thinking, have positive attitudes toward academic requirements, and are highly engaged with AI tools in their learning. This suggests that using AI does not automatically reduce critical thinking or affect academic integrity. Instead, students actively evaluate, verify, and refine AI-generated content, which means that reflective thinking remains a key part of their academic work. The strong positive connections between reflective thinking, attitudes toward academic requirements, and AI engagement suggest that these elements mutually support each other in AI-supported learning environments. Interestingly, there were no significant differences between master's and PhD students, indicating that these patterns hold true across different graduate levels. From an educational standpoint, these findings emphasize the need to

promote ethical AI use, critical evaluation skills, and reflective learning strategies in graduate programmes. Institutions should create clear policies and guidelines to ensure that AI tools enhance rather than replace independent thinking and scholarly work. Educators are also encouraged to include AI literacy in the curriculum, focusing on responsible use, academic integrity, and higher-order thinking skills. Future research should investigate the long-term effects of AI use on cognitive development and explore its impact across various academic disciplines and institutional contexts. Overall, this study highlights that when guided by reflective and ethical practices, AI can complement and strengthen graduate-level learning and academic rigor.

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Competing Interests Statement

The authors declare that they have no competing financial interests or personal relationships that could have influenced the work reported in this article. The authors confirm that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

Data Availability Statement

The data supporting the findings of this study were obtained from semi-structured interviews with the participants. Owing to ethical considerations and the need to protect participant confidentiality, the interview transcripts and related data are not publicly accessible. However, relevant data may be made available by the corresponding author upon reasonable requests.

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Appendices

No appendices are attached to this study.