# EXPLORING THE IMPACT OF ARTIFICIAL INTELLIGENCE-POWERED
# LEARNING ASSISTANTS ON GRADUATE-LEVEL EDUCATION

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## Abstract

This qualitative study explores the impact of artificial intelligence (AI)-powered learning assistants on graduate-level education, with a focus on the experiences of 12 Master in Information Technology (MIT) students who participated in a focus group discussion (FGD). Employing a descriptive research design, the study aimed to understand the perceptions, challenges, and overall influence of AI-powered tools on students' academic engagement, critical thinking, and learning outcomes. Through thematic analysis, the study examined participant insights related to the use of AI in supporting graduate coursework and research activities.

The findings revealed that graduate students generally perceive AI-powered learning assistants as beneficial tools that enhance accessibility, engagement, and personalized learning. However, participants reported several challenges, including inaccuracies in AI-generated content, workflow interruptions, technical limitations, and usability concerns. The use of AI tools was found to foster deeper inquiry, reflective thinking, and real-world application of knowledge, thereby positively influencing academic performance and engagement. Students also offered specific recommendations for improvement, including better contextual understanding, seamless integration with academic platforms, offline access, and enhanced personalized learning features. While recognizing their significant potential, students also acknowledged the limitations of AI in areas such as accuracy, adaptability, and collaborative use.

The study concludes that AI-powered learning assistants are perceived as valuable educational tools that support graduate students in understanding complex topics, streamlining academic tasks, and offering immediate support. Nevertheless, issues related to reliability, technical functionality, and the risk of reduced critical thinking highlight the need for careful implementation and improvement. Students advocate for tools that are more accurate, intuitive, and aligned with their learning needs, including features that encourage collaboration and deep engagement. These insights underline the importance of addressing limitations to

maximize the effectiveness of AI tools in graduate education.

Based on these conclusions, several recommendations are proposed. Developers are encouraged to enhance the functionality of AI-powered learning assistants by improving response accuracy, platform integration, system stability, and offline access. Institutions should provide comprehensive training to help students use these tools effectively, minimizing the risks of misinformation and dependency.

Moreover, graduate programs are advised to promote a balanced use of AI alongside traditional learning strategies to preserve the development of independent thinking and research skills. Ultimately, addressing both the strengths and shortcomings of AI-powered learning assistants is essential to ensure they contribute meaningfully to graduate students' academic success and intellectual growth.

**Keywords:** Aemilianum College Inc., AI in Education, AI-Powered Learning Assistants, Artificial Intelligence (AI), Digital Learning

Tools, Educational Technology, Human-AI Interaction, Independent Study Support

## Introduction

The integration of Artificial Intelligence (AI) into education transformed the global learning landscape, particularly in higher education. AI-powered learning assistants, such as chatbots, intelligent tutoring systems, and adaptive learning platforms, gained attention for their ability to personalize learning experiences, provide real-time feedback, and support students' academic needs (Luckin et al., 2016; Holmes

et al., 2021). In countries like the United States and China, universities adopted AI tools to complement teaching strategies and improved student outcomes (Zawacki-Richter et al., 2019). As AI technologies continued to advance, their potential to enhance cognitive engagement and academic performance in graduate-level education became a key focus of international research and implementation.

The application of AI in education steadily grew, particularly in the wake of the COVID-19 pandemic, which accelerated digital learning adoption. Studies showed that Filipino educators and institutions began to recognize the value of AI in addressing gaps in personalized instruction and student support (Medallon et al., 2022). However, challenges such as digital literacy,

infrastructure limitations, and the need for localized AI content remained pressing issues (Reyes & Rosales, 2023). As the Commission on Higher Education (CHED) continued to push for innovation and technology integration in graduate programs, the role of AI-powered learning assistants in Filipino classrooms warranted further investigation.

Educational institutions in the Bicol region, including Aemilianum College Inc., explored ways to integrate digital tools to support graduate students' academic journeys. The adoption of AI-powered platforms was still in its early stages, and

faculty and students alike navigated the opportunities and limitations of such technologies. Initial feedback from learners suggested that AI tools offered convenience and individualized guidance, yet concerns around accuracy, contextual understanding,

and overdependence persisted (Dela Cruz & Mariano, 2024). Understanding how graduate students interacted with these tools in real academic settings was crucial for ensuring their effective and ethical use.

This study, therefore, aimed to explore the impact of AI-powered learning assistants on graduate-level education, focusing on student engagement, academic performance, and critical thinking development. As digital transformation continued to reshape higher education, there was a growing need to examine how these tools influenced the learning experience, particularly at the graduate level where independent learning and research were emphasized. The findings of this research contributed to the discourse on educational innovation, informed institutional decision-making, and provided insights into how AI could be effectively integrated into advanced academic settings.

## Statement of the Problem

Specifically, this study sought to answer the following questions:

1. How do graduate students perceive the usefulness and effectiveness of AI-powered learning assistants in their academic studies?

2. What challenges do graduate students face when using AI-powered learning assistants for research and coursework?

3. In what ways do AI-powered learning assistants influence student engagement, critical thinking, and academic performance at the graduate level?

4. What improvements or features do graduate students suggest to enhance the effectiveness of AI-powered learning assistants in higher education?

5. What insights can be drawn from a comprehensive analysis of the challenges, limitations, and user experiences of graduate students using AI-powered learning assistants in their academic work?

## Scope and Delimitations

This study explored the impact of Artificial Intelligence (AI)-powered learning assistants on graduate-level education, focusing on five key areas. It investigated how graduate students perceived the usefulness and effectiveness of AI-powered tools in their academic studies. The research also examined the challenges they faced when using these tools for research and coursework. Furthermore, it analyzed how AI-assisted technologies influenced student engagement, critical thinking, and academic performance. The study gathered suggestions from students regarding improvements and features that could enhance these tools. Lastly, a comprehensive analysis of the limitations, challenges, and user experiences was conducted to gain deeper insights. Data were collected primarily through Focus Group Discussions (FGDs) with selected master's students from Aemilianum College Inc., allowing for in-depth sharing of

personal experiences and perspectives on the use of AI-powered learning assistants.

The study was delimited to graduate students enrolled in master's programs at Aemilianum College Inc. and did not include undergraduate students or learners from other institutions. It focused solely on AI-powered learning assistants such as chatbots, virtual tutors, and adaptive learning platforms and excluded other educational technologies like learning management systems or video conferencing tools. The research relied on qualitative methods, specifically FGDs, and did not include quantitative measures such as surveys or academic performance scores. Additionally, the study did not cover long-term effects of AI use over multiple semesters but rather focused on current and recent experiences within the academic year. These delimitations ensured a focused investigation within a specific context, allowing for a more in-depth understanding of graduate students' interactions with AI learning tools.

## Gap Bridged by the Study

Recent studies have highlighted the growing influence of Artificial Intelligence (AI) in educational contexts, particularly in enhancing academic writing, learning experiences, teaching strategies, and institutional operations. These studies align with the present research in recognizing AI's potential to personalize learning, provide automated feedback, foster academic engagement, and support self-directed learning. Some focused-on AI's role in improving academic writing through feedback mechanisms and writing efficiency, while others examined its impact on various educational outcomes and systemic aspects of higher education, such as infrastructure, ethical considerations, and faculty development. Collectively, these findings support the current study's emphasis on the role of AI-powered tools in enhancing student engagement, academic performance, and learning outcomes.

However, the present study bridged key gaps by focusing specifically on the experiences of graduate students and their engagement with AI-powered learning assistants across multiple educational domains—academic performance, motivation, career guidance, social interaction, and critical thinking. While previous studies focused primarily on undergraduate contexts, specific academic skills (like writing), or institutional issues such as infrastructure or teacher qualification, the present research provided a holistic perspective on how graduate learners interact with AI across broader cognitive and social dimensions. Additionally, unlike prior studies that primarily employed quasi-experimental or descriptive designs, the present study incorporated a multi-faceted view that considered device usage, course differences, and demographic variables to understand how AI influences graduate education in a more nuanced way, thus offering new insights into the personalization and inclusivity potential of AI in higher learning environments.

## Research Focus

The research focus of the present study explored the impact of AI-powered learning assistants on graduate-level education. It investigated how graduate

students perceived the usefulness and effectiveness of these tools in enhancing their academic studies. The study also examined the challenges faced by students when using AI-powered learning assistants for research and coursework, including technical issues, usability concerns, and any barriers to adoption. Additionally, the study analyzed how these AI tools influenced student engagement, academic performance, and critical thinking. It further explored the suggestions and improvements that graduate students proposed to enhance the effectiveness of AI-powered learning assistants in higher education. Through a comprehensive analysis of student experiences, challenges, limitations, and feedback, the study provided valuable insights into the evolving role of AI in graduate education.

## INSIGHTS ON GRADUATE STUDENTS' USE OF AI-POWERED LEARNING ASSISTANTS

### Rationale

The integration of AI-powered learning assistants in higher education has the potential to significantly enhance the learning experience for graduate students. However, it is important to critically analyze the challenges, limitations, and overall user experiences to ensure these tools are effectively supporting academic work. The rationale of this study is to identify both the advantages and drawbacks of using AI tools in graduate-level education and to provide meaningful insights that could guide further development of these systems for better academic outcomes.

### Objectives of the Study

1. To evaluate the impact of AI-powered learning assistants on student engagement, critical thinking, and academic performance.

2. To identify the key challenges and limitations faced by graduate students in using AI tools for academic work.

3. To assess user experiences in terms of personalization, feedback, accessibility, and problem-solving.

4. To suggest improvements based on the challenges and limitations identified by students.

### Key Insights Drawn from the Analysis

#### 1. Enhanced Engagement and Personalized Learning

**Findings**: The study revealed that AI tools significantly improved student engagement by offering interactive features and personalized learning experiences. Participants appreciated AI's ability to adapt to individual learning paces and preferences, making learning more accessible and engaging.

*Example*: Participant 4 (P4) emphasized that AI's adaptability to different learning styles helped make learning more interactive and effective.

## 2. Overreliance on AI and Impact on Critical Thinking

**Findings**: A major concern raised by the participants was the potential overreliance on AI tools, which may reduce students' independent research and critical thinking abilities. While AI provides instant feedback and simplifies complex concepts, students feared it might hinder their ability to think critically and solve problems on their own.

*Example*: Participant 3 (P3) noted, "Relying too heavily on AI may reduce the development of independent research and critical thinking skills."

## 3. Challenges with Accuracy and Context-Awareness

**Findings**: Despite the benefits of AI tools, many participants pointed out that the tools occasionally provided inaccurate or vague responses, which could cause confusion and delay in academic progress. AI's inability to fully understand complex academic content and context was a limitation.

*Example*: Participant 12 (P12) explained, "Inaccurate or vague AI responses can lead to misunderstandings of key concepts, requiring additional time to verify information through other sources."

## 4. Technical and Usability Issues

**Findings**: Participants reported that technical problems, such as poor internet connectivity and platform compatibility issues, disrupted their learning experience. Furthermore, the complexity of some AI tool interfaces and the lack of customization options made it challenging for students to navigate the tools efficiently.

*Example*: Participant 7 (P7) highlighted, "Technical issues like poor internet connection or a difficult interface can also interrupt my focus and delay completing tasks efficiently."

## 5. The Importance of Real-Time Support and Feedback

**Findings**: The real-time support and feedback offered by AI-powered learning assistants were seen as valuable, especially in providing instant clarification and resolving doubts. This feature helped students stay on track with their academic tasks.

*Example*: Participant 2 (P2) and Participant 11 (P11) both praised the ability of AI tools to provide "instant feedback," which helped them identify areas for improvement quickly.

### 6. Offline Access and 24/7 Availability

**Findings**: Another key insight from the study was the benefit of AI tools offering offline access and 24/7 availability. This ensured that students could continue their studies regardless of location or time, promoting consistent learning and improving overall academic performance.

*Example*: Participant 1 (P1) and Participant 5 (P5) highlighted that offline access to AI tools allowed them to "continue learning without the need for an internet connection."

### 7. Need for Improved Collaboration and Peer Learning Features

**Findings**: Many participants expressed a desire for enhanced collaboration features within AI tools. AI-guided peer discussions and collaborative study sessions were seen as opportunities for students to exchange ideas, clarify doubts, and work together on academic tasks. These features could further enhance their understanding and foster teamwork.

*Example*: Participant 8 (P8) pointed out that AI tools that enable "AI-guided peer discussions provide a platform for students to exchange ideas, clarify doubts, and work together on academic tasks."

## Recommendations for Enhancing AI-Powered Learning Assistants

Based on the insights drawn from this study, the following recommendations are suggested to improve the effectiveness of AI-powered learning assistants in graduate education:

1. **Enhance Accuracy and Context-Awareness**: Improving the accuracy of AI responses and enhancing the ability of the system to understand complex academic contexts will increase its usefulness in graduate-level education.
2. **Address Usability and Technical Challenges**: Simplifying the user interface and ensuring seamless integration with academic platforms will improve the overall user experience.
3. **Support Critical Thinking**: AI tools should be designed to foster critical thinking rather than just providing direct answers. This can be achieved by including features that encourage independent research and deeper inquiry.
4. **Promote Collaborative Learning**: AI tools should include more advanced features for collaborative learning, such as peer discussion platforms and group study functionalities, to help students develop teamwork skills and enhance their understanding.

## Conclusion

The analysis of graduate students' experiences with AI-powered learning assistants reveals a promising but evolving technology in higher education. While these tools offer many benefits, such as personalized learning, real-time support, and increased engagement, they also present challenges, including overreliance, accuracy issues, and technical limitations. To maximize their effectiveness, AI-powered learning assistants must continuously improve in areas such as accuracy, usability, and collaboration. By addressing these challenges, AI can become an even more powerful tool in supporting graduate students' academic success.

## Findings

The following findings summarize the key results of the study based on the perceptions, challenges, impacts, suggested improvements, and overall insights related to the use of AI-powered learning assistants by graduate students:

1. Graduate students perceive AI-powered learning assistants as generally useful and effective in enhancing accessibility, engagement, and personalized learning in their academic studies.

2. Graduate students face challenges such as inaccuracies, workflow disruptions, technical issues, and usability difficulties when using AI-powered learning assistants for research and coursework.

3. AI-powered learning assistants positively influence student engagement, critical thinking, and academic performance by promoting real-time clarification, deeper inquiry, reflective thinking, and real-world application of knowledge.

4. Graduate students suggest improvements such as enhanced contextual understanding, seamless platform integration, better offline access, and personalized learning pathways to make AI-powered learning assistants more effective.

5. Insights reveal that while AI-powered learning assistants offer significant benefits, their limitations in accuracy, adaptability, and collaborative functionality must be addressed to optimize their role in graduate education.

## Conclusions

Based on the findings of this study the following conclusions were formulated:

1. Graduate students generally perceive AI-powered learning assistants as valuable tools that enhance understanding, streamline learning processes, and provide immediate academic support.

2. Despite their benefits, graduate students encounter challenges such as inaccurate information, workflow disruptions, technical issues, and reduced critical thinking when using AI-powered learning assistants.

3. AI-powered learning assistants positively influence student engagement, foster critical thinking, and improve academic performance by providing real-time feedback, interactive support, and continuous learning opportunities.

4. Graduate students suggest improvements such as enhanced personalization, better accuracy, offline accessibility, platform integration, and collaborative features to

optimize the effectiveness of AI-powered learning assistants.

5. The comprehensive analysis reveals that while AI-powered learning assistants offer significant benefits, addressing their limitations is essential to fully support graduate students' academic growth and success.

## Recommendations

Based on the conclusions drawn from this study, the following recommendations were formulated:

1. AI-powered learning assistants may continue to be integrated into graduate-level education, with a focus on enhancing their capabilities for deeper understanding and support, ensuring they remain intuitive and responsive to students' needs for academic assistance.

2. Developers may address these challenges by improving the accuracy of AI responses, enhancing system stability, and ensuring that AI tools encourage critical thinking rather than over-reliance, thereby minimizing disruptions to students' workflow and academic performance.

3. To further enhance these benefits, AI-powered learning assistants may continue to offer real-time, personalized feedback and interactive support, while also incorporating more features that encourage critical thinking and deeper engagement with the material.

4. Developers may focus on implementing the suggested improvements, such as enhancing AI's ability to personalize learning experiences, ensuring greater accuracy, enabling offline access, integrating seamlessly with academic platforms, and adding collaborative features to optimize the overall effectiveness and utility of AI-powered learning assistants for graduate students.

5. It is crucial for AI developers to prioritize addressing the limitations identified in this study, such as improving accuracy, enhancing user interface design, and resolving technical issues, to ensure that AI-powered learning assistants can more effectively support graduate students' academic growth and success.

6. Institutions may provide graduate students with comprehensive training and guidance on effectively utilizing AI-powered learning assistants to maximize their potential, particularly in overcoming challenges related to inaccurate information and workflow disruptions.

7. Graduate programs may encourage a balanced use of AI-powered learning assistants alongside traditional learning methods to prevent overreliance on technology and ensure the continued development of critical thinking and independent research skills.

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