

Navigating the Use of Artificial Intelligence Tools in Academic-Research Writing: Challenges, Opportunities, and Ethical Concerns among ESL Pre-Service Teachers

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ABSTRACT:

This study examined the utilization of artificial intelligence (AI) tools in academic-research writing among ESL pre-service teachers, focusing on the commonly used platforms, purposes of use, challenges, opportunities, and ethical concerns associated with AI integration. A descriptive quantitative research design was employed, involving ESL pre-service teachers who regularly engage in academic writing tasks. Data were gathered through a structured survey questionnaire and analyzed using frequency, percentage, weighted mean, and ranking to determine patterns of AI tool usage and perceived effectiveness.

Findings revealed that ChatGPT, Grammarly, and QuillBot were the most commonly used AI tools, indicating a strong reliance on generative and language-support technologies in academic writing. The respondents reported that AI tools significantly assist in improving grammar, enhancing sentence construction, supporting paraphrasing, generating ideas, and organizing research content. Overall, AI tools were perceived as highly beneficial in improving writing efficiency, productivity, and learner confidence. However, despite these advantages, respondents also identified notable challenges, including concerns about the accuracy of AI-generated information, the potential decline in critical thinking skills, issues of originality, and the reliability of automated citations. In addition, ethical concerns regarding overdependence and academic integrity were emphasized, highlighting the need for responsible AI use in

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academic contexts.

The study concludes that AI tools serve as valuable academic support systems for ESL pre-service teachers, particularly in addressing linguistic barriers in research writing. However, their use must be guided by ethical awareness and critical engagement to ensure that independent thinking, academic integrity, and authentic scholarly writing are maintained. The findings underscore the importance of integrating AI literacy into teacher education programs to promote balanced and responsible use of emerging technologies in academic writing.

Keywords: Artificial Intelligence, ESL Pre-service Teachers, Academic Writing, Generative AI, Academic Integrity.

1. Introduction

Artificial Intelligence (AI) has significantly transformed various sectors of society, including education and academic research. In recent years, AI-powered tools such as grammar checkers, paraphrasing applications, citation generators, and generative AI platforms have become increasingly accessible to students and educators. These technologies have introduced new possibilities in academic-research writing by assisting users in generating ideas, improving language accuracy, organizing content, and enhancing overall writing efficiency. For learners of English as a Second Language (ESL), AI tools may provide valuable support in overcoming linguistic and academic writing challenges (UNESCO, 2023). However, despite the growing integration of AI in education, concerns regarding academic integrity, overreliance on technology, plagiarism, and ethical misuse continue to emerge (Zawacki-Richter et al., 2019).

Academic-research writing is considered one of the most challenging tasks among pre-service teachers, particularly those studying in ESL contexts. Research writing requires critical thinking, academic vocabulary, organization of ideas, proper citation practices, and mastery of scholarly conventions. Many ESL pre-service teachers experience difficulties in grammar, coherence, paraphrasing, and synthesis of related literature, which may affect the quality of their

academic outputs (Hyland, 2019). Consequently, AI tools are increasingly being utilized as supplementary resources to address these difficulties. Applications such as ChatGPT, Grammarly, QuillBot, and other AI-assisted writing technologies are now commonly used in drafting, editing, and refining research papers (O'Neill & Russell, 2023).

Several studies have explored the effectiveness of AI in language learning and academic writing. According to Kasneci et al. (2023), generative AI technologies can enhance students' productivity and learning experiences when used responsibly and critically. Likewise, Tlili et al. (2023) emphasized that AI has the potential to support personalized learning and improve students' writing performance through immediate feedback and language assistance. In the Philippine educational context, the increasing adoption of digital learning tools after the COVID-19 pandemic has further accelerated the use of AI technologies among higher education students (Department of Education-Philippines, 2022). Nevertheless, existing literature also highlights the risks associated with AI-assisted writing, including misinformation, diminished critical thinking, dependency on automated systems, and ethical concerns related to originality and authorship (Cotton, D. R. E., Cotton, P. A., & Shipway, 2023).

Despite the growing body of literature on AI in education, limited studies have specifically

focused on ESL pre-service teachers in Philippine state universities. Most existing research primarily examines general student populations or focuses on the technical capabilities of AI tools rather than the lived experiences, challenges, and ethical considerations encountered by future educators. Since pre-service teachers are expected to become models of academic integrity and effective communication, it is essential to investigate how they navigate the use of AI tools in academic-research writing. Understanding their experiences may provide valuable insights for educational institutions in developing policies, instructional strategies, and ethical guidelines regarding AI integration in higher education.

This study aimed to examine the use of Artificial Intelligence tools in academic-research writing among ESL pre-service teachers. Specifically, it sought to identify the AI tools commonly used by ESL pre-service teachers, determine the challenges and opportunities they had encountered in utilizing AI for academic writing, and explore the ethical concerns associated with its use. Through this investigation, the study intended to contribute to the growing discourse on responsible AI integration in academic and teacher education contexts.

Analysis of the Problem

The integration of Artificial Intelligence (AI) tools in academic-research writing has rapidly increased in higher education institutions, particularly among students who use English as a Second Language (ESL). While AI technologies provide convenience and writing assistance, their growing use also introduces several academic, pedagogical, and ethical concerns. Among ESL pre-service teachers, the use of AI tools in research writing presents a complex issue that requires careful examination.

One major problem involves students' overreliance on AI-generated content. AI-powered applications such as ChatGPT, Grammarly, and paraphrasing tools can assist

students in generating ideas, correcting grammar, and improving sentence structure. However, excessive dependence on these tools may reduce learners' ability to develop critical thinking, independent writing skills, and academic creativity. Instead of strengthening their research-writing competence, some students may rely heavily on AI systems to perform essential academic tasks, which can negatively affect their long-term learning development.

Another significant issue is the challenge of maintaining academic integrity. AI-generated outputs may blur the boundaries between original student work and machine-generated content. Since AI tools can produce highly coherent essays, summaries, and paraphrased texts, students may unintentionally or intentionally submit outputs without proper acknowledgment or verification. This raises concerns regarding plagiarism, authorship, and ethical research practices. Educational institutions continue to face difficulties in establishing clear policies and guidelines for the ethical use of AI in academic writing.

Furthermore, ESL pre-service teachers may encounter difficulties in evaluating the accuracy and reliability of AI-generated information. Although AI systems can provide immediate responses and writing suggestions, they may also generate misleading, biased, or inaccurate content. Students who lack strong research and information-literacy skills may struggle to distinguish credible academic sources from fabricated or unsupported information. As future educators, pre-service teachers must develop the ability to critically assess information before incorporating it into academic and professional work.

Despite these concerns, AI tools also provide opportunities that cannot be ignored. For many ESL learners, AI applications offer language support that enhances grammar, vocabulary, coherence, and organization in academic writing. These technologies may increase learners' confidence and productivity, especially for students who experience difficulties in expressing

ideas in English. AI tools can also serve as supplementary learning resources that promote self-directed learning and immediate feedback.

However, there remains limited research focusing specifically on the experiences of ESL pre-service teachers in Philippine state universities regarding AI-assisted academic-research writing. Existing studies often emphasize the technical benefits of AI or examine broader student populations without addressing the unique linguistic and ethical challenges faced by future ESL educators. This gap in the literature highlights the need to investigate how ESL pre-service teachers navigate the opportunities and challenges associated with AI use in academic writing.

Given these issues, this study sought to analyze the challenges, opportunities, and ethical concerns surrounding the use of Artificial Intelligence tools in academic-research writing among ESL pre-service teachers. By understanding these concerns, the study may contribute to the development of responsible AI practices, academic policies, and instructional strategies that support ethical and effective research-writing practices in higher education.

2. Methodology

Research Design

This study employed a descriptive-quantitative research design to examine the use of Artificial Intelligence (AI) tools in academic-research writing among ESL pre-service teachers. This method was deemed appropriate because the study aimed to identify the AI tools commonly used by the respondents, determine the challenges and opportunities that they had encountered in utilizing AI for academic writing, and explore the ethical concerns associated with its use. So, this approach enabled the researchers to systematically gather measurable data through survey questionnaires and statistically analyze the responses of the participants.

Participants of the Study

The participants of the study consisted of ESL pre-service teachers enrolled in teacher education

programs at Batangas State University during the Academic Year 2025–2026. They were selected using a purposive sampling technique as they had prior exposure to and experience in using Artificial Intelligence tools for academic and research writing tasks. They were users of various AI-powered writing platforms such as ChatGPT, Grammarly, and other similar AI-assisted writing applications. Besides, they represent future educators who are expected to integrate emerging technologies responsibly in academic and professional contexts.

Research Instrument

The primary instrument used in this study was a researcher-made questionnaire designed to gather data relevant to the objectives of the study. It consisted of four major parts: demographic profile of the participants; AI tools commonly used in academic-research writing; challenges and opportunities encountered in utilizing AI tools; and ethical concerns related to the use of AI in academic-research writing. It employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) to measure the perceptions and experiences of the respondents. It was also subjected to content validation by experts in research, educational technology, and language education to ensure clarity, relevance, and reliability of the items. Suggestions from the validators were incorporated prior to the administration of the survey instrument.

Data Gathering Procedure

Prior to the conduct of the study, the researchers secured approval and permission from the concerned academic authorities. After obtaining authorization, they distributed the survey questionnaires to the identified ESL pre-service teachers through printed forms and online survey platforms. They informed them about the purpose and significance of the study. They likewise assured them that their participation was voluntary and that all information gathered would be treated with utmost confidentiality. They gave them adequate time to accomplish the questionnaire. After retrieval, they checked,

organized, tabulated, and prepared the data for statistical analysis.

Statistical Treatment of Data

The data collected from the respondents were analyzed using appropriate statistical tools. Frequency count and percentage were utilized to determine the AI tools commonly used by ESL pre-service teachers. Weighted mean was employed to assess the respondents' perceptions regarding the challenges, opportunities, and ethical concerns associated with the use of AI tools in academic-research writing. The interpretation of the mean was based on the established Likert scale ranges to determine the degree of agreement of the respondents on each indicator.

Ethical Considerations

The researchers strictly observed ethical principles throughout the conduct of the study. They secured informed consent all participants before administering the questionnaire. They ensured that their participants' participation in the study was entirely voluntary, and they gave them the right to withdraw at any point without any consequences.

To ensure confidentiality and anonymity, they would not disclose the identities of their participants in any part of the study. They would use all gathered data solely for academic and research purposes. Furthermore, in this study, they promoted responsible and ethical discussions regarding the integration of Artificial Intelligence technologies in academic and teacher education settings.

3. Results and Discussion

Artificial Intelligence Tools Commonly Used by ESL Pre-Service Teachers in Academic-Research Writing

This section presents the Artificial Intelligence (AI) tools commonly used by ESL pre-service teachers in academic-research writing. The findings identify the platforms most frequently utilized by the participants and determine the perceived usefulness of these tools in accomplishing academic writing tasks.

Table 1 presents the AI tools commonly used by ESL pre-service teachers in academic-research writing.

Table 1. AI Tools Commonly Used by ESL Pre-Service Teachers in Academic-Research Writing

AI Tools	Frequency	Percentage	Rank
ChatGPT	68	90.67	1
Grammarly	63	84.00	2
QuillBot	58	77.33	3
Google Gemini	41	54.67	4
Microsoft Copilot	35	46.67	5
Other AI tools	19	25.33	6

The findings presented in this table indicate that ChatGPT is the most frequently utilized AI tool among ESL pre-service teachers, with 68 respondents (90.67%) reporting its use in

academic and research writing tasks. Grammarly ranked second, with an utilization rate of 84.00%, followed by QuillBot at 77.33%. The widespread use of these AI-powered platforms suggests that

ESL pre-service teachers increasingly rely on digital writing assistants to support grammar checking, paraphrasing, idea generation, content organization, and the drafting of academic outputs.

These findings imply that AI technologies have become integral academic support tools for pre-service teachers, particularly in improving language accuracy, writing quality, and overall writing efficiency. As ESL learners, the participants may view AI-assisted writing applications as accessible and practical learning resources that help address linguistic limitations and challenges associated with academic writing.

Likewise, the results corroborate the findings of Mahapatra (2024), who reported that AI-assisted writing tools positively influenced ESL students’ writing performance through improvements in organization, grammatical accuracy, and feedback provision. Similarly, Balatero, Cruz, and Dela Rosa (2024) found that ESL pre-service teachers exhibited high levels of acceptance and digital literacy regarding the use of ChatGPT for writing-related tasks. Collectively, these studies suggest that AI technologies are increasingly recognized as valuable educational resources that support language learning and academic writing development in ESL contexts (E-Palli Publishing, 2024). Table 2 presents the purposes of using AI tools in academic-research writing.

Table 2. Purposes of Using AI Tools in Academic-Research Writing

Indicators	Mean Verbal Interpretation	
AI tools help improve grammar and sentence construction.	4.62	Strongly Agree
AI tools assist in paraphrasing academic texts.	4.55	Strongly Agree
AI tools provide ideas for research writing.	4.48	Agree
AI tools help summarize lengthy readings and references.	4.41	Agree
AI tools assist in organizing research content.	4.37	Agree
Composite Mean	4.49	Agree

The results reveal that the participants strongly agreed that AI tools help improve grammar and sentence construction (M = 4.62) and assist in paraphrasing academic texts (M = 4.55). The composite mean of 4.49 indicates that respondents generally perceived AI-powered applications as highly beneficial in supporting various academic writing tasks.

These findings suggest that AI technologies function as effective language support systems for ESL pre-service teachers. Given that academic writing demands linguistic accuracy, coherence, and clarity, respondents may rely on AI-assisted platforms to refine sentence structure, enhance vocabulary use, organize ideas more effectively, and improve the overall

quality of their written outputs. The positive perception of AI tools further reflects their growing role in facilitating the writing process and reducing language-related challenges commonly encountered by ESL learners.

Furthermore, these findings are consistent with recent studies on AI-assisted writing, which highlight the capacity of AI technologies to improve writing efficiency, learner motivation, and self-regulated learning among ESL and EFL students. AI tools have also been shown to support brainstorming, provide linguistic scaffolding, and generate timely feedback, thereby contributing to more effective academic writing practices (Lim, Yunus, & Wong, 2026). Such evidence

underscores the increasing value of AI-powered applications as pedagogical resources that enhance language development and writing performance in second-language learning contexts.

Challenges and Opportunities Encountered by ESL Pre-Service Teachers in Utilizing AI for Academic-Research Writing

This section presents the challenges and opportunities encountered by ESL pre-service teachers in utilizing AI tools for academic-research writing.

Table 3 presents the challenges encountered by ESL Pre-service teachers in using AI tools.

Table 3. Challenges Encountered by ESL Pre-Service Teachers in Using AI Tools

Indicators	Mean Verbal Interpretation	
AI-generated information is sometimes inaccurate.	4.58	Strongly Agree
Dependence on AI tools may weaken critical thinking skills.	4.46	Agree
AI-generated outputs may lack originality and authenticity.	4.43	Agree
Some AI tools provide unreliable references and citations.	4.39	Agree
Excessive use of AI may reduce independent writing skills.	4.35	Agree
Composite Mean	4.44	Agree

The findings presented in this table indicate that the participants strongly agreed that AI-generated information is sometimes inaccurate (M = 4.58). They also agreed that excessive dependence on AI tools may weaken critical thinking skills (M = 4.46) and diminish originality in writing outputs (M = 4.43). These results suggest that while respondents recognize the benefits of AI-assisted technologies, they remain aware of the potential limitations and risks associated with their use in academic writing.

These findings imply that ESL pre-service teachers adopt a balanced perspective toward AI technologies, acknowledging both their advantages and shortcomings. Although AI tools can facilitate writing tasks and enhance productivity, concerns regarding the accuracy, reliability, and authenticity of AI-generated content persist. Because generative AI systems produce responses based on predictive algorithms and large language datasets, they may occasionally generate inaccurate information, fabricated references, or contextually

inappropriate content, which can compromise the credibility and academic integrity of written work. Furthermore, excessive reliance on AI-assisted writing applications may reduce opportunities for learners to engage in critical analysis, independent reasoning, and the development of original ideas.

In addition, these findings support the study of Gustilo, Ong, and Lapinid (2024), which highlighted the academic integrity and authenticity challenges associated with algorithmically driven writing technologies in educational settings. Similarly, Buriak, Dehouche, Kim, Roe, and Cotton (2024) identified overreliance on AI systems as a significant concern, noting that excessive dependence on such technologies may impede the development of critical thinking, creativity, and independent writing skills among students. Taken together, these studies underscore the importance of promoting the responsible and ethical use of AI tools, ensuring that they serve as complementary learning resources rather than substitutes for

students’ cognitive engagement and academic effort.

Table 4 presents the opportunities provided by AI tools in academic-research writing.

Table 4. Opportunities Provided by AI Tools in Academic-Research Writing

Indicators	Mean Verbal Interpretation	
AI tools improve writing efficiency and productivity.	4.71	Strongly Agree
AI tools enhance confidence in academic writing.	4.56	Strongly Agree
AI tools support language learning among ESL students.	4.52	Strongly Agree
AI tools help generate ideas and research topics.	4.47	Agree
AI tools encourage technological literacy.	4.44	Agree
Composite Mean	4.54	Strongly Agree

The findings presented in this table reveal that the participants strongly agreed that AI tools improve writing efficiency and productivity (M = 4.71) and enhance confidence in academic writing (M = 4.56). These results indicate that respondents perceive AI technologies as valuable resources that support the writing process and contribute to improved academic performance. The high mean scores suggest that AI-assisted applications are viewed not only as tools for completing writing tasks more efficiently but also as mechanisms that foster greater confidence in producing academic texts.

These findings imply that AI technologies function as effective academic support systems that facilitate language learning and writing development among ESL pre-service teachers. Through features such as automated feedback, grammar correction, content suggestions, and writing assistance, AI tools may help learners overcome linguistic barriers, refine their writing skills, and accomplish academic tasks more effectively. The increased confidence reported by the participants further suggests that AI-assisted platforms can reduce writing anxiety and encourage greater engagement in academic writing activities.

Additionally, the findings are consistent with the intervention study of Mahapatra (2024), which demonstrated that ChatGPT positively influenced ESL students’ writing skills by providing formative feedback, language support, and opportunities for revision. Similarly, Schmid and Petko (2024) reported that pre-service teachers generally exhibited favorable attitudes toward AI integration due to its perceived usefulness, accessibility, and potential to enhance learning outcomes. Collectively, these studies highlight the growing role of AI technologies in supporting writing development and fostering positive learning experiences among future educators.

Ethical Concerns Associated with the Use of Artificial Intelligence Tools in Academic-Research Writing

This section presents the ethical concerns associated with the use of AI tools in academic-research writing among ESL pre-service teachers.

Table 5 presents the ethical concerns associated with AI tool utilization in academic-research writing.

Table 5. Ethical Concerns Associated with AI Tool Utilization

Indicators	Mean Verbal Interpretation	
AI use may contribute to academic dishonesty and plagiarism.	4.67	Strongly Agree
Students may submit AI-generated outputs as their own work.	4.59	Strongly Agree
There is limited institutional guidance regarding AI use.	4.41	Agree
AI-generated content may compromise originality in research writing.	4.54	Strongly Agree
Responsible AI usage should be integrated into academic policies.	4.73	Strongly Agree
Composite Mean	4.59	Strongly Agree

The findings presented in this table reveal that the participants strongly agreed that the use of AI tools may contribute to academic dishonesty and plagiarism ($M = 4.67$). They likewise expressed strong support for the establishment of responsible AI usage policies within academic institutions ($M = 4.73$). These results indicate a heightened awareness among ESL pre-service teachers of the ethical challenges associated with the increasing use of generative AI technologies in educational contexts.

These findings suggest that while respondents recognize the academic benefits of AI-assisted tools, they remain concerned about issues related to authorship, originality, accountability, and the potential misuse of AI-generated content. The strong endorsement of institutional policies further reflects the participants' recognition of the need for clear ethical standards and guidelines to govern the responsible use of AI in academic work. Such concerns are particularly relevant in higher education, where intellectual integrity and independent learning are fundamental to academic success.

Moreover, these findings align with contemporary discussions on academic integrity in the era of artificial intelligence. Eaton (2024) emphasized that educational institutions continue to face challenges in distinguishing legitimate AI-assisted learning from unethical academic practices, thereby highlighting the need for comprehensive policies, ethical frameworks, and instructional guidelines for AI integration in higher education. The respondents' support for

responsible AI governance reflects growing recognition of these institutional challenges.

Furthermore, the findings resonate with emerging educational perspectives that advocate for the ethical and balanced integration of AI technologies in teaching and learning. Rather than replacing human cognition and creativity, AI tools should function as learning companions that complement students' intellectual efforts and support skill development. In this regard, educators and policymakers continue to emphasize the importance of fostering critical thinking, originality, academic integrity, and responsible digital literacy as essential competencies in AI-enhanced learning environments (UNESCO, 2024). Collectively, these perspectives underscore the need to harness the benefits of AI while safeguarding the core educational values of authenticity, accountability, and independent scholarship.

4. Conclusion

The study reveals that ESL pre-service teachers extensively utilize artificial intelligence tools in academic-research writing, with ChatGPT, Grammarly, and QuillBot emerging as the most frequently used platforms. These tools are primarily employed to enhance grammar accuracy, improve sentence construction, assist in paraphrasing, generate ideas, and support the organization of academic content. The overall findings indicate that AI technologies have become integral academic support systems that contribute significantly to writing efficiency, productivity, and learner confidence. Participants

generally perceive AI tools as highly beneficial in addressing linguistic challenges commonly encountered in second-language academic writing contexts. However, despite their widespread use and perceived advantages, several challenges remain evident. These include concerns about the accuracy of AI-generated information, the potential weakening of critical thinking skills, issues of originality and authenticity, and the reliability of automated citations and references. Such concerns highlight the risk of overdependence on AI tools, which may inadvertently affect the development of independent writing competencies among pre-service teachers. At the same time, the

opportunities presented by AI integration are substantial, particularly in promoting technological literacy, facilitating language learning, and improving overall writing confidence and efficiency. Taken together, the findings suggest a dual impact of AI tools, offering both pedagogical advantages and ethical considerations that must be carefully addressed. Therefore, while AI-assisted writing tools are valuable educational resources in ESL contexts, their use should be guided by responsible and critical engagement to ensure that academic integrity, originality, and essential writing skills are maintained in the process of academic development.

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