

SCRUTINIZING ENGLISH ACADEMIC WRITING SKILLS: INDONESIAN POSTGRADUATE STUDENTS' CHALLENGES AND STRATEGIES IN AN AI-EMPOWERED ERA

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| Article Info | Abstract |
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| Article History Received: September 2024 Revised: January 2025 Published: April 2025 | <i>Indonesian postgraduate students encounter significant challenges in academic writing, particularly in areas such as clarity, coherence, organization, grammar, and plagiarism prevention. This study investigates these challenges and explores the potential of AI-driven strategies to enhance writing skills. Utilizing a mixed-methods approach, including quantitative surveys of 50 participants and qualitative interviews with six postgraduates, the research identified key obstacles such as difficulty in formulating clear research questions, using precise academic vocabulary, maintaining logical flow, and mastering citation practices. To address the issues, they employed several effective strategies including seeking feedback, attending workshops, outlining, varying sentence structures, and thorough proofreading. AI tools like Grammarly, QuillBot, ChatGPT, and Mendeley are widely used for grammar checks, paraphrasing, citation management, and enhancing coherence, demonstrating their value in supporting academic writing. However, the study underscores the importance of human oversight to ensure originality and foster critical thinking. These findings have implications for both theoretical advancement and educational practice, particularly in the integration of AI tools in higher education. The findings hold significant implications for educational practice, suggesting that AI integration in higher education can serve as an effective support tool, provided it is accompanied by guidance on responsible usage.</i> |
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INTRODUCTION

Mastering writing skills is essential for academic and professional success, especially in English as a Foreign Language (EFL) learning. Brown (2001) defines writing as generating ideas, organizing them logically, following literary styles, ensuring clarity, and revising content. Improving writing skills is vital for students as it encompasses sentence structure, vocabulary, spelling, clarity, cohesion, and grammar (Carter et al, 2020; Shinta, 2021). Furthermore, strong writing skills increase communication, critical thinking, organization, and self-expression (Munajah et al, 2022). The skill correlates with improved reading comprehension, academic performance, and effective communication (Graham et al., 2018). In higher education, incorporating writing projects such as essays and research papers as academic writing helps students develop language proficiency and critical thinking skills (Nation, 2009; Rudolph et al., 2023). These skills are crucial for both academic success and future employment, improving communication, academic performance, and employability (Politton & Hadiyanti, 2019). Therefore, academic writing skills have become a concern for students in

higher education to effectively communicate ideas within the academic community and emphasize formal language, style, and critical analysis (Islamiyah & Fajri, 2020).

Academic writing is vital in advancing knowledge across various fields in higher education settings. It is a formal way to communicate ideas and research findings (Hartley, 2022), fostering critical thinking and contributing to collective understanding (Suparsa et al., 2023). Theoretically, its diverse forms include research papers, dissertations, and scholarly articles, all requiring stylistic principles. Coherence, ensuring logical flow (Hinkel, 2017), and cohesion, using language to connect ideas (Halliday & Hasan, 2020), are crucial for clarity. This academic writing also involves clear and concise language, as well as ethical citations and references (Cotton et al., 2024). Attention to grammar, punctuation, and syntax is integral (Ferris & Hedgcock, 2022). Hyland & Sancho Guinda (2022) highlight the need for an appropriate tone and stance in academic writing, aligning with disciplinary norms and audience expectations. Practically, university students struggle to prepare and encounter several steps in academic writing papers (outlining, drafting, paraphrasing, revising, and publishing (Wingate, 2018). However, postgraduate students frequently face linguistic and organizational issues that require assistance in producing high-quality academic papers (Ariyanti & Fitriana, 2017; Leki, 2017, Xie 2020).

Numerous studies have explored the challenges they face in writing academic papers. These challenges include logically organizing texts, effectively analyzing literature, following academic style and guidelines, and articulating complex ideas with clarity and accuracy (Akhtar et al., 2019; Paltridge and Starfield, 2019). These issues often arise from insufficient prior writing guidance, disparities in language and culture, and the rigorous demands of academic writing assignments (Coffin et al., 2003; Gupta et al., 2022). In addition, other challenges identified in academic writing include coherence, cohesion, citation, and referencing. Alsariera et al. (2023) highlight difficulties in organizing information and using appropriate language due to limited vocabulary in maintaining coherence. Faradhibah (2017) highlights challenges in maintaining idea cohesion and using appropriate signals, whereas Thao (2020) focuses more on issues with organization, sequence, and grammar rather than unity and coherence. To address these challenges, postgraduate students often employ various strategies. These include seeking guidance from supervisors, participating in writing workshops, forming peer reviews, and using AI tools to improve their writing (Almarwani, 2020).

To overcome the crucial challenges, several common strategy processes are seeking feedback and support from supervisors, peers, and writing centers (Okuda et al., 2018). Engaging in peer review activities and utilizing writing center resources can provide valuable feedback and guidance for improving academic writing skills (Aydawati et al., 2019). Another strategy employed by postgraduate students is attending academic writing workshops and courses (Wischgoll, 2017). These resources offer structured instruction on various aspects of academic writing, such as literature synthesis, critical analysis, and adherence to academic conventions (Cargill et al., 2019). On the other hand, strategies utilizing AI are found by many students. To overcome difficulties in academic writing, especially for EFL higher education students dealing with clarity, coherence, cohesion, paraphrasing, and plagiarism, using AI strategies is very helpful. AI-assisted writing tools play crucial roles in improving grammar, vocabulary, and sentence structure, and handling references to avoid plagiarism risks.

The rapid advancement of artificial intelligence (AI) technologies has introduced numerous tools to assist students in academic writing. AI, described as intelligent programs that collaborate with humans to perform various tasks (Aldosari, 2020), can make decisions in educational settings comparable to those made by humans. Meanwhile, AI tools can enhance students' language proficiency, particularly English academic writing skills (Nazari et al., 2021). AI-powered writing assistants like Grammarly and Quillbot help students improve grammar, syntax, and style by providing real-time feedback and suggestions (Amanda et al.,

2023; Tambunan et al., 2022). Moreover, AI research tools such as Semantic Scholar and Lit.Rev assistants streamline the process of identifying relevant literature, synthesizing key findings, and structuring literature reviews efficiently (Orel et al., 2023). These tools significantly reduce the time and effort needed for thorough literature reviews, which is crucial for postgraduate research. Furthermore, AI-powered citation managers and reference generators ensure proper citation practices and adherence to citation styles, automating citation formatting and reference list generation to reduce errors and inconsistencies (Alharbi, 2023). AI tools offering functionalities such as grammar checking, plagiarism detection, and content generation have emerged as promising aids (Sethy, 2022). While these tools enhance efficiency and quality in academic writing, their integration into postgraduate studies raises questions about appropriate usage, ethical considerations, and the potential impact on students' academic writing skills (Perkins, 2023).

Several studies have explored the challenges postgraduate students face in academic writing (Bram & Angelina, 2022; Malik et al., 2023) and the potential of AI-powered tools to improve writing (Khalifa & Albadawy, 2024). However, the research on how postgraduate students specifically navigate these challenges in the context of AI-powered writing tools remains underexplored. While an existing study from Selim (2024) acknowledged the transformative impact of AI-powered tools on writing, particularly for EFL students, they focused on general writing skills. Hence, academic writing skills in higher education have not been scrutinized. Similarly, Chauke et al. (2024) investigated students' perceptions of AI writing tools for success, yet they did not scrutinize the specific challenges and strategic developments for postgraduate students. This study, therefore, aims to bridge this gap by exploring postgraduate students' experiences employed to navigate academic writing skills in this AI-empowered era. To address these intentions, the study aims to investigate the difficulties encountered by postgraduate students in academic writing and the actionable strategies they employ to improve their writing skills. By achieving the objectives, the study will contribute to a deeper understanding of the academic writing experiences of postgraduate students and inform the development of tailored support mechanisms and pedagogical approaches to address their specific experiences. Specifically, the research questions of this study are as follows:

1. What are the challenges faced by postgraduate students in the process of academic writing skills?
2. What are the actionable strategies as well as strategies involving the use of artificial intelligence (AI) employed by these students to improve their academic writing skills?

RESEARCH METHOD

Research Design

This study employed an explanatory mixed methods design. Creswell (2014) defines mixed methods as combining quantitative and qualitative methodologies in a study or series to provide a thorough understanding of a research subject. It entails employing quantitative data first for broad insights into a phenomenon, followed by qualitative data to extend and deepen the quantitative conclusions. First, it employed a quantitative survey to investigate the challenges and strategies related to academic writing skills among postgraduate students. The data were collected through a closed-ended questionnaire consisting of Likert-scale items. This method was chosen as it enabled the quantitative data to provide a general understanding of writing challenges and strategies. At the same time, the subsequent qualitative phase explained and elaborated on those statistical results by exploring their views in greater depth. In addition, mixed methods were valuable when one data source might be insufficient to explain the research problem fully, thereby allowing the qualitative data to refine and demonstrate the statistical results by exploring the views thoroughly. To ensure the relevance and appropriateness of the respondents, specific criteria were established for their selection. After

collecting the quantitative data through survey, semi-structured interviews were conducted to give freedom for respondents to share their thoughts, stories, or reflections that might not have been anticipated in the questionnaire.

Research Subjects

The study employed purposive sampling to include participants who could provide in-depth information and experiences into academic writing challenges and strategies. Fifty respondents were required to be currently enrolled as postgraduate students (master's program) in the English Education program at three universities in Yogyakarta, Indonesia. In addition, they needed to undergo active engagements and experiences in writing academic writing tasks, such as research papers, theses, or other scholarly works, within one year of study as part of their postgraduate studies. This criterion ensured that the respondents possessed first-hand experience with the challenges and strategies associated with academic writing (Li, 2023; Sadeghi et al., 2020). Second, it employed semi-structured interviews in forum group discussions purposively selected with six participants as the representatives of the whole. It is to strengthen the frequent answers to the questionnaire validated by participants' perspectives and experiences represented by ten participants after filling out the questionnaires.

Instruments

The questionnaire items were developed by adapting and modifying items from previous studies that explored challenges and strategies related to academic writing skills such as clarity, cohesion, coherence, grammar, formal language, referencing, paraphrasing, and adding citations (Bram & Angelina, 2022). Other than that, items related to challenges in expressing ideas clearly, organizing writing effectively, and incorporating sources were adapted from Sadeghi et al. (2020). Similarly, items concerning alternative strategies, such as seeking support, participating in writing workshops, and practicing regularly, were drawn from various sources, including Chen and Gao (2022) and Nurkamto et al., (2024). The semi-structured interviews were developed based on the key findings that emerged from the quantitative survey data. Open-ended questions were formulated to probe further into the challenges and strategies identified in the survey responses. The interview protocol allowed for flexibility in exploring new avenues of inquiry based on the participants' responses (Creswell & Park, 2018). The acceptable instruments were validated by a lecturer at Yogyakarta State University who has expertise in higher education studies.

Data Collection Techniques

The study employed structured and sequential procedures. First, the quantitative survey was administered to a sample of postgraduate students in the master's program. There were thirty-five students from different graduate programs such as English Education and Applied Linguistics at three universities in Yogyakarta, Indonesia. The survey data were analyzed using descriptive and inferential statistics to identify significant challenges and strategies. Subsequently, a subset of survey participants was purposefully selected for follow-up semi-structured interviews based on their survey responses and willingness to participate. Afterward, the study conducted interviews with six participants representing the whole respondents in the survey. The interviews were about the themes of challenges and strategies that have been generated from the survey. To maintain ethical considerations, the researcher obtained the informed consent of the respondents in both quantitative surveys and semi-structured interviews by ensuring their voluntary participation and confidentiality.

Data Analysis

Quantitative survey data were analysed using statistical software to calculate descriptive statistics (means, modes) using SPSS, while qualitative interview data underwent thematic analysis such as familiarizing the data, generating initial codes, searching and reviewing

themes, deciding the themes, then reporting. The researcher used the result of the quantitative survey to design follow-up interview questions that explored how respondents felt about the specific points. After processing the result of the interview, the coding of transcripts revealed recurring patterns and themes, providing deeper insights into reported challenges and strategies. Validity and trustworthiness were ensured through techniques such as expert review for questionnaire content validity, member checking for qualitative data, and researcher triangulation with two coders. Triangulation of methods and corroborating evidence from different sources enhanced overall validity (Creswell, 2014).

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The findings of this research respond to the two questions regarding postgraduate challenges and strategies while processing academic writing. The first is their challenges in academic writing skills. Second, the findings will present their common strategies as well as strategies utilizing AI to improve their academic writing skills. Finally, the findings will sum up the overall benefits and challenges which will be discussed with relevant supporting theories or other previous findings of the research articles.

Postgraduate Students' Challenges in Academic Writing

To answer the first research question, the findings were gathered and resulted in several aspects that the postgraduate students undergo while they deal with the process of writing academic articles. The following are the detailed challenges:

Challenges of Clarity Aspect

Postgraduate students face significant challenges in achieving clarity in academic writing. These challenges impact their ability to communicate research writing academically and effectively. The survey results below outline specific difficulties encountered by students in various aspects of writing clarity.

Table 1
Survey results of clarity aspect

| Question | SD (%) | DA (%) | N (%) | A (%) | SA (%) | Mean | Mode |
|--|--------|--------|--------|--------|--------|------|------|
| Difficulty defining research question/thesis | 5.26% | 15.79% | 23.68% | 44.74% | 10.53% | 3.39 | 4 |
| Unsure if arguments are well-supported with references | 2.63% | 15.79% | 21.05% | 55.26% | 5.26% | 3.45 | 4 |
| Difficulty choosing appropriate vocabulary | 2.63% | 18.42% | 7.89% | 60.53% | 10.53% | 3.58 | 4 |
| Uses unclear/ambiguous sentence structures | 18.42% | 39.47% | 23.68% | 15.79% | 2.63% | 2.45 | 2 |
| Difficulty in avoiding unnecessary details | 5.26% | 18.42% | 26.32% | 42.11% | 7.89% | 3.29 | 4 |
| Unsure if writing is concise | 2.63% | 21.05% | 31.58% | 36.84% | 7.89% | 3.26 | 3 |
| Unsure if my conclusion summarizes main points | 7.89% | 18.42% | 28.95% | 39.47% | 5.26% | 3.16 | 4 |

The questionnaire results highlight significant challenges faced by postgraduate students in academic writing (see Table 1). The majority of respondents, with around 56% either agreeing or strongly agreeing, found it difficult to clearly define their research question or thesis statement, indicating a fundamental issue in the early stages of writing. In addition, over 60% were unsure if their arguments were well-supported with references. Vocabulary selection also posed a significant challenge, with 71% finding it difficult to choose appropriate academic terms. Most respondents recognized the importance of clarity, as indicated by the majority disagreeing with the use of unclear sentence structures. However, there were varied levels of agreement regarding the ability to avoid unnecessary details, indicating inconsistent skills in

concise writing. Finally, around 45% of respondents were unsure if their conclusions effectively summarized their main points. In conclusion, the top-tier and essential challenges identified were the difficulties in defining the research question or thesis, supporting arguments with references, and choosing appropriate vocabulary.

Challenges of Coherence Aspect

Coherence is another critical aspect of academic writing that postgraduate students often find challenging. Maintaining a logical flow of ideas and ensuring that each part of the writing connects seamlessly is essential for clear communication. The survey results below highlight the specific coherence-related challenges.

Table 2
Survey results of coherence aspect

| Challenges | SD | DA | N | A | SA | Mean | Mode |
|--|--------|--------|--------|--------|--------|------|------|
| Difficulty connecting ideas for a logical argument | 10.53% | 15.79% | 18.42% | 44.74% | 10.53% | 3.29 | 4 |
| Moving between topics without clear transitions | 5.26% | 15.79% | 28.95% | 39.47% | 10.53% | 3.34 | 4 |
| Struggles ensuring each paragraph has a clear main point and supporting detail | 2.63% | 18.42% | 23.68% | 47.37% | 7.89% | 3.39 | 4 |
| Struggles to stay focused on research question/thesis statement | 7.89% | 21.05% | 26.32% | 36.84% | 7.89% | 3.16 | 4 |
| Includes irrelevant information disrupting flow | 5.26% | 26.32% | 18.42% | 42.11% | 7.89% | 3.21 | 4 |
| Unsure if conclusion logically follows arguments | 13.16% | 15.79% | 21.05% | 42.11% | 7.89% | 3.16 | 4 |

Over half of the respondents (55.27%) reported difficulties in logically connecting their ideas, highlighting a need for better guidance on structuring arguments (see Table 2). In addition, nearly half of the students (50%) acknowledged that their writing sometimes lacks clear transitions between topics, indicating an issue with smooth progression in their work. Ensuring that each paragraph has a clear main point and supporting details is another major challenge, with 55.26% of students agreeing that this aspect is challenging. Furthermore, 44.73% of respondents struggle to stay focused on their research question or thesis statement, often losing track of their central idea. The inclusion of irrelevant information is also a problem, as noted by 50% of students, which disrupts the overall flow of their writing. Incorporating evidence and citing references effectively is a concern for nearly 50% of students who express uncertainty about the relevance and integration of their references. Around 50% of students are also unsure if their conclusions logically follow from the arguments they present.

Challenges of Cohesion Aspect

For postgraduate students, mastering cohesion can be particularly challenging, as it involves the effective use of transition words, varied sentence structures, and logical connections between ideas. The results below outline specific challenges in maintaining cohesion.

Table 3
Survey results of cohesion aspect

| Challenges | SD | DA | N | A | SA | Mean | Mode |
|---|--------|--------|--------|--------|-------|------|------|
| Difficulty using transition words/phrases | 5.41% | 18.92% | 32.43% | 35.14% | 8.11% | 3.22 | 3 |
| Unsure about pronoun reference usage | 13.51% | 24.32% | 24.32% | 35.14% | 2.70% | 2.89 | 4 |

| | | | | | | | |
|--|-------|--------|--------|--------|--------|------|---|
| Struggles with parallel and cohesive structure | 2.70% | 18.92% | 35.14% | 37.84% | 5.41% | 3.24 | 4 |
| Repetitive sentence structures | 2.70% | 18.92% | 32.43% | 37.84% | 8.11% | 3.30 | 4 |
| Unsure how to combine short sentences to have the logical flow | 0% | 8.11% | 24.32% | 56.76% | 10.81% | 3.70 | 4 |

The most challenging issue appears to be uncertainty about effectively combining short sentences for a smoother logical flow (see Table 3), with a significant majority (56.76%) indicating struggles in this area, pointing to a widespread problem with coherence and fluency. Moreover, a notable portion of respondents (46%) reported that repetitive sentence structures make their writing sound monotonous. Around 43% expressed difficulties with using parallel structures to create clear and cohesive sentences, underscoring the importance of additional support and instruction in this aspect. In terms of transition words and phrases, while 43% found their usage challenging for connecting ideas smoothly, there was a more varied proficiency level indicated by 32% remaining neutral. The area with the lowest level of agreement (38%) was related to uncertainty about pronoun usage for referencing previously mentioned ideas. These findings collectively highlight a range of abilities and awareness among respondents regarding cohesive writing techniques. Based on the top-tier results, the most essential challenges appear to be combining short sentences for logical flow, varying sentence structures to avoid monotony, and effectively using parallel constructions for coherence.

Challenges of Grammar and Referencing Aspects

Mastering grammar and reference writing is crucial for producing high-quality, coherent, and credible academic work. The results below highlight specific difficulties in grammar and referencing.

Table 4
Survey results of grammar and referencing aspects

| Challenges | SD | DA | N | A | SA | Mean | Mode |
|--|--------|--------|--------|--------|--------|------|------|
| Difficulty identifying/correcting grammatical errors | 10.81% | 10.81% | 24.32% | 43.24% | 10.81% | 3.32 | 4 |
| Challenging to avoid typos/spelling errors | 5.41% | 10.81% | 18.92% | 51.35% | 13.51% | 3.57 | 4 |
| Mistakes with subject-verb agreement | 8.11% | 24.32% | 21.62% | 37.84% | 8.11% | 3.14 | 4 |
| Unsure about correct verb tenses agreement | 8.11% | 21.62% | 27.03% | 37.84% | 5.41% | 3.11 | 4 |
| Struggles with commas, dots, citation placement | 5.41% | 18.92% | 24.32% | 40.54% | 10.81% | 3.32 | 4 |
| Difficulty avoiding informal language | 8.11% | 24.32% | 21.62% | 35.14% | 10.81% | 3.16 | 4 |
| Struggles with sentence structure complexity | 5.41% | 16.22% | 29.73% | 37.84% | 10.81% | 3.32 | 4 |
| Unsure if references are relevant and supportive | 5.26% | 21.05% | 23.68% | 44.74% | 5.26% | 3.24 | 4 |
| Difficulty integrating references seamlessly | 5.26% | 23.68% | 21.05% | 42.11% | 7.89% | 3.24 | 4 |
| Unsure about proper citation and referencing | 10.53% | 18.42% | 21.05% | 39.47% | 10.53% | 3.21 | 4 |

A significant majority (64.86%) struggle with ensuring their writing is free of typos and spelling errors, highlighting a need for proofreading and editing support (see Table 4). About 54% have difficulty identifying and correcting grammatical errors, indicating challenges in mastering grammar rules and self-editing skills. Around 51% face punctuation and citation conventions issues, showing broader challenges in adhering to formal writing standards. Additionally, 49% find sentence structure complexity a concern in formal academic writing.

Nearly 46% of respondents have problems with subject-verb agreement, a fundamental grammar issue. Around 43% are uncertain about using the correct verb tenses. Approximately 46% struggle to avoid informal language, while about 32% do not, suggesting various proficiency levels. This also indicates significant challenges in reference management. About 50% of respondents find it difficult to determine if their references are relevant and supportive. Similarly, integrating references into their writing is a notable challenge for about 50% of students. Around 50% also express uncertainty about proper citation and referencing techniques. In conclusion, the most essential challenges for postgraduate students in academic writing include ensuring writing is free of typos and spelling errors, identifying and correcting grammatical errors, and managing references effectively.

Challenges of Paraphrasing and Plagiarism Aspects

Paraphrasing and avoiding plagiarism are critical skills in academic writing that postgraduate students find challenging. Properly rephrasing source material and understanding plagiarism is essential for maintaining academic integrity and producing original work. The survey results below highlight specific difficulties in these aspects.

Table 5
Survey results of paraphrasing and plagiarism aspects

| Challenges | SD | DA | N | A | SA | Mean | Mode |
|--|-----------|-----------|----------|----------|-----------|-------------|-------------|
| Difficulty rephrasing source material | 2.86% | 17.14% | 14.29% | 51.43% | 14.29% | 3.57 | 4 |
| Unsure about identifying key points to paraphrase | 2.86% | 20.00% | 22.86% | 45.71% | 8.57% | 3.37 | 4 |
| Unsure types of plagiarism | 5.71% | 11.43% | 25.71% | 48.57% | 8.57% | 3.43 | 4 |
| Worried about accidental plagiarism and not using proper citation methods (APA, MLA) | 2.86% | 11.43% | 17.14% | 51.43% | 17.14% | 3.69 | 4 |

The questionnaire results on postgraduate challenges in academic writing, particularly concerning paraphrasing and avoiding plagiarism, reveal several key observations (see Table 5). The highest level of agreement (68.57%) was related to concerns about accidentally plagiarizing due to improper citation methods like APA or MLA. 65.72% of respondents find it challenging to rephrase source material while preserving the original meaning. Furthermore, approximately 54.28% expressed uncertainty about how to identify key points in the source material for effective paraphrasing. Interestingly, the lowest level of agreement (57.14%) was related to uncertainty about the different types of plagiarism, such as direct copying versus paraphrasing without proper citation. While this indicates some students may better understand the various forms of plagiarism, there is still room for enhancing awareness and knowledge in this area for all students.

Postgraduate Students' Strategies for Academic Writing

To answer the second research question, the findings below show the responses and supported arguments by the postgraduates while they are writing academic tasks and articles.

Actionable Strategies to Improve Academic Writing

Effective academic writing requires the implementation of various strategies to enhance clarity, coherence, and overall quality. The survey results highlight the preferred strategies among postgraduate students for improving their academic writing skills.

Table 6
Survey results of actionable strategies

| Strategy | SD | D | N | A | SA | Mean | Mode |
|-----------------------------------|-----------|----------|----------|----------|-----------|-------------|-------------|
| Use outlining or mind mapping | 0% | 2.5% | 7.5% | 47.5% | 17.5% | 4.03 | 4 |
| Ask peers/tutors to review work | 0% | 5% | 12.5% | 42.5% | 15% | 3.9 | 4 |
| Re-read work to check the writing | 0% | 7.5% | 17.5% | 32.5% | 17.5% | 3.78 | 4 |

| | | | | | | | |
|--------------------------------|------|------|-------|-------|-------|------|---|
| Use transition words/phrases | 0% | 0% | 7.5% | 47.5% | 20% | 4.1 | 4 |
| Use pronouns strategically | 0% | 7.5% | 17.5% | 37.5% | 12.5% | 3.75 | 4 |
| Vary sentence structure | 0% | 2.5% | 12.5% | 47.5% | 12.5% | 3.93 | 4 |
| Check references/citations | 0% | 0% | 12.5% | 42.5% | 20% | 4.05 | 4 |
| Proofread | 0% | 0% | 5% | 47.5% | 22.5% | 4.15 | 4 |
| Rephrase ideas from sources | 2.5% | 2.5% | 12.5% | 42.5% | 15% | 3.88 | 4 |
| Seek feedback from instructors | 0% | 2.5% | 17.5% | 37.5% | 17.5% | 3.93 | 4 |

Proofreading work carefully and asking a friend or peer to proofread for typos and clarity was highly favored, with 47.5% agreeing and 22.5% strongly agreeing. A participant emphasized, *“Having someone else read my work helps catch errors I might miss and improves the overall quality.”* (S6) Similarly, varying sentence structure to avoid monotony and improve readability was well-liked, with 47.5% agreeing and 12.5% strongly agreeing. As another respondent explained, *“I try to mix short and long sentences to keep the reader engaged.”* (S5). Another participant concurred, saying, *“I ask a friend to proofread my work because they can provide a fresh perspective and catch mistakes I overlook.”* (S2).

In addition, seeking feedback from peers, tutors, or classmates to review work for clarity and logical flow was popular, with 42.5% agreeing and 15% strongly agreeing. One respondent remarked, *“Feedback from classmates gives me new perspectives and helps me refine my arguments.”* (S2). Furthermore, double-checking references and ensuring consistency between in-text citations and the bibliography was another widely accepted strategy, with 42.5% agreeing and 20% strongly agreeing.

Strategies Using Technology and AI to Improve Academic Writing

Incorporating technology and AI tools into academic writing processes is becoming increasingly popular among postgraduate students. The following table presents the preferred strategies and their respective levels of agreement:

Table 7.
Survey results of strategies using technology and AI tools

| Strategy | SD | D | N | A | SA | Mean | Mode |
|---|------|------|------|-------|-------|------|------|
| Use technology for reference and citation | 2.5% | 2.5% | 5% | 35% | 30% | 4.15 | 4 |
| Use AI tools for idea generation and brainstorming | 0% | 2.5% | 15% | 57.5% | 25% | 4.05 | 4 |
| Use AI tools for grammar, punctuation, and spelling | 0% | 2.5% | 5% | 40% | 27.5% | 4.25 | 4 |
| Use AI tools for paraphrasing to avoid plagiarism | 2.5% | 5% | 7.5% | 37.5% | 22.5% | 3.95 | 4 |
| Use AI tools for clarity, coherence, and cohesion | 0% | 7.5% | 10% | 35% | 22.5% | 3.98 | 4 |

A majority of respondents supported using technology for reference and citation management, with 37.5% agreeing and 30% strongly agreeing (see Table 7). Only a small percentage (5%) disagreed or strongly disagreed, while 2.5% remained neutral. This demonstrates a clear preference for technological assistance in managing references and citations.

Mendeley for Reference and Citation

The majority of students expressed strong support for utilizing technology in managing references and citations. All participants reported using the Mendeley reference manager software on their PCs, highlighting its appropriate tools to streamline the citation and referencing process.

Mendeley simplifies these tasks by eliminating the need for manual input, thereby saving time. For instance, one student noted,

I use the Mendeley reference manager application, which simplifies the creation of citations and references, speeding up the process and allowing for accurate formatting according to APA 7th style. (S3)

The participant emphasized the tool's capability to import and edit citations to ensure accuracy according to specific referencing styles like APA 7th edition.

ChatGPT, Gemini, Bing AI, and Perplexity for Idea Generation and Brainstorming

Similarly, the use of AI tools for idea generation and brainstorming topics for academic writing was widely accepted. A significant 57.5% agreed and 25% strongly agreed with this strategy. However, 15% of respondents remained neutral, and a small minority of 2.5% disagreed. One student (S2) mentioned, *"ChatGPT is instrumental in generating ideas and providing inspiration when I'm stuck, helping me overcome writer's block."* This sentiment was echoed by others who appreciated the tool's ability to spark new concepts and organize their thoughts effectively. Another participant highlighted the practical utility of AI tools in enhancing the coherence and flow of academic writing.

Using AI tools like ChatGPT helps in structuring paragraphs and improving clarity. It is like having a writing assistant who can offer suggestions and refine my arguments. (S4)

ChatGPT and Gemini are particularly useful when I need to rephrase complex sentences or find the right words to express my ideas clearly. (S1)

This reflects the tools' capability to assist with language precision and readability, which is crucial for academic writing.

Grammarly and Quillbot for Grammar, Punctuation, and Spelling

The strategy of using AI tools to improve grammar, punctuation, and spelling received overwhelming approval. An impressive 52.5% strongly agreed and 42.5% agreed. This highlights a strong consensus on the efficacy of AI in those areas.

Emphasizing the role of AI tools like Grammarly and QuillBot in refining writing quality is faced and widely utilized.

Grammarly is extremely helpful in catching grammatical errors and suggesting corrections, which improves the overall quality of my essays. (S3)

This demonstrates the tool's capacity to identify and rectify common writing mistakes, thereby ensuring that academic papers meet high standards of accuracy and professionalism. Another student shared,

QuillBot is great for paraphrasing and rephrasing sentences to make them clearer and more concise. It helps me avoid repetition and enhances the readability of my work. (S1)

This highlights the tool's usefulness in improving sentence structure and coherence, which are crucial for effective academic writing.

Quillbot and ChatGPT for Paraphrasing to Avoid Plagiarism

When it comes to using AI tools for paraphrasing sentences to avoid plagiarism and enhance writing style, a significant portion of respondents agreed (42.5%) or strongly agreed (37.5%). Interview responses supported these survey findings, emphasizing the role of AI tools like QuillBot and ChatGPT in helping students paraphrase content effectively and enhance their writing style. One student (S2) shared, *"QuillBot helps me a lot in avoiding plagiarism. It rephrases my sentences in a way that keeps the original meaning but uses different words and structure."* This demonstrates QuillBot's ability to aid students in maintaining academic integrity by providing a reliable paraphrasing tool.

ChatGPT is very useful for rephrasing sentences and suggesting better ways to express my ideas. It not only helps in avoiding plagiarism but also improves the overall style and readability of my writing. (S4)

This highlights the dual benefit of using ChatGPT for both plagiarism prevention and writing enhancement. The student emphasized the ease of using these tools, stating,

QuillBot is excellent for quickly paraphrasing large chunks of text. It saves me a lot of time and effort compared to manually rewording sentences. (S6)

This feedback underscores the efficiency that AI tools bring to the writing process, making it easier for students to produce original content without extensive manual rewriting.

Gemini, ChatGPT, Quillbot, and Grammarly for Clarity, Coherence, and Cohesion

Using AI tools to improve clarity, coherence, and cohesion in academic writing was also widely endorsed, with 47.5% agreeing and 35% strongly agreeing. It indicated that they find AI helpful in making their writing more comprehensible and well-organized. Participants expressed positive perspectives on using AI tools like DeepL, ChatGPT, Quillbot, Gemini, and Grammarly for academic writing. One student noted, *Quillbot is also useful for paraphrasing and improving flow when I get stuck rewriting awkward sentences. (S4)*

ChatGPT and Gemini are used to generate ideas and create outlines for essays or research papers. It understands the context and provides relevant suggestions tailored to my topic. (S1)

A participant highlighted the importance of coherence in writing, stating,

I find Quillbot invaluable. Reordering and rephrasing sentences using this tool really tightens up the logical flow. Grammarly also enhances readability by suggesting better word choices and highlighting areas that need more clarity. (S6)

Discussion

Postgraduate students face critical challenges in academic writing, particularly in defining research questions, supporting arguments with references, and selecting appropriate vocabulary. Many students struggle to narrow down research questions, echoing Wakerka et al.'s (2019) findings that this is a common difficulty in research article writing. Additionally, Hairul (2023) found that EFL students often struggle with incorporating references, while Thuy et al. (2022) noted difficulties in choosing suitable academic vocabulary. Targeted support, such as training in research question formulation, reference use, and vocabulary-building activities, could significantly improve clarity in academic writing (Gyuris, 2018). Coherence also presents significant challenges, including logical connection of ideas, clear paragraph structure, and maintaining a main argument. Students often describe their writing as "jumping from one point to another," aligning with Karjono's (2020) assertion that coherence is crucial for effective academic writing. Setiawan & Taiman (2021) also emphasize the importance of cohesion devices for fluidity. Targeted instruction in these areas can enhance the coherence and clarity of postgraduate students' writing.

In terms of cohesion, challenges include combining short sentences for logical flow, varying sentence structures, and using parallel constructions effectively. Hyland (2019) stresses the importance of connecting ideas seamlessly, while Larsson (2017) highlights the need for varied sentence structures to maintain reader engagement. Mammadova (2023) emphasizes the role of parallelism in creating readable and balanced texts. Addressing these issues through instruction on sentence combining, structure variation, and parallel construction can improve overall writing quality. Students also struggle with proofreading, grammar, and reference management. Murray (2018) highlights the importance of self-editing skills, while Hyland (2019) underscores the need for grammatical proficiency. Workshops on these topics could significantly enhance writing quality and academic performance. Moreover, paraphrasing and avoiding plagiarism are significant challenges. The importance of mastering citation techniques is to ensure academic integrity, while Pecorari (2018) highlights the complexity of paraphrasing. Bailey (2018) stresses the importance of identifying and synthesizing critical information. Providing targeted support in citation practices, paraphrasing, and understanding plagiarism can help students improve their writing proficiency.

Postgraduate students use various strategies to enhance their academic writing as the second research question result, focusing on transition words, outlining, proofreading, and seeking feedback. These strategies emphasize organization and coherence, aligning with Swales and Feak (2012) on the need for transitions and Bailey (2018) on pre-writing strategies like mind-mapping. Proofreading is preferred for error identification and quality improvement, consistent with Zhang et al. (2021), who highlight peer feedback's importance in refining academic work. Hyland's (2019) recommendations support varying sentence structures to enhance readability and avoid monotony. Collaborative learning is emphasized through feedback from peers, tutors, and instructors, as Nicol (2020) suggests that feedback significantly improves writing abilities. Ensuring academic integrity through precise referencing aligns with Pecorari's (2018) emphasis on preventing plagiarism. These strategies reflect a multifaceted approach to improving academic writing, focusing on adherence to conventions, continuous improvement, and resourcefulness.

Meanwhile, postgraduates increasingly use AI tools to assist with academic writing. Many advocates use technology to manage references and citations, particularly through Mendeley, echoing Bailey (2018) and Pecorari (2018) on the importance of precise referencing. AI tools like ChatGPT and QuillBot are popular for idea generation, coherence, and overcoming writer's block, consistent with Swales and Feak (2020). Grammarly is widely used for grammar, punctuation, and spelling, with Fitria (2021) noting its educational benefits. AI tools like QuillBot and ChatGPT are also effective for paraphrasing to prevent plagiarism, as Younis et al. (2023) found.

However, some concerns about over-reliance on these tools mirror Nicol and Macfarlane-Dick's (2020) emphasis on balanced usage. Cardon et al. (2023) found that lecturers expressed concerns about AI use in writing, as it could potentially make students less critical in their thinking. This concern reflects the worry that reliance on AI tools diminishes students' skills in analysis and independent reasoning, as they are too dependent on AI for generating content. To overcome this pitfall, it is essential to balance AI use with activities that actively engage students in critical and independent thought. The lecturers' mediation helps students be well-informed users of AI in writing (Godwin-Jones, 2022).

Marzuki et al. (2023) observed that AI use in writing often exposes students to overly complex language, leading them to adopt formal and sophisticated vocabulary without fully understanding it. As a result, students' writing can appear excessively formal or disconnected from their authentic voice and comprehension. In another case, Huang and Tan (2023) explained that the over-reliance on AI writing tools harms the capability of students to autonomously assess the quality of writing. To mitigate such challenges, lecturers need to provide side-by-side comparisons of original and modified AI text so that students can get takeaways on how to maintain their authentic voice (Chan, 2023).

On the one hand, AI tools such as DeepL, ChatGPT, QuillBot, Gemini, and Grammarly are recognized for enhancing clarity, coherence, and cohesion in academic writing, improving efficiency, accuracy, and quality. On the other hand, the use of AI in academic writing must be appropriately integrated with pedagogical strategies. These findings align with current literature on the integration of technology into academic writing.

CONCLUSION

This study scrutinized the challenges faced by English Education postgraduate students in academic writing and the strategies they employ, including the use of AI tools, to improve their skills. The research objectives were to identify the significant challenges that the students face in areas such as clarity, coherence, cohesion, grammar, formal language, referencing, and plagiarism avoidance, as well as to investigate the general and AI-specific strategies they use to improve their academic writing skills. The findings revealed that defining research questions or thesis statements, supporting arguments with relevant references, and selecting appropriate

academic vocabulary to clearly express ideas were their challenges. Maintaining logical connections and flow between paragraphs while avoiding repetitive sentence structures was another major obstacle. Ensuring a clear paragraph structure with a focused main point was problematic. Properly formatting citations and references according to styles like APA was an area of confusion that risked accidental plagiarism. Effectively paraphrasing source material while preserving meaning also proved challenging. Nevertheless, a variety of practical general strategies were requesting feedback from supervisors and peers, participating in writing workshops, utilizing transition words, outlining ideas, various sentence structures, and employing meticulous proofreading. Notably, AI tools such as Grammarly, QuillBot, ChatGPT, DeepL, Mendeley, and others were extensively utilized for grammar checking, paraphrasing, citation management, and the improvement of clarity, coherence, and writing style.

The implications of the findings indicate that postgraduate students require more specific support and training from peers or lecturers to address specific academic writing challenges, as well as the careful integration of AI writing assistants into higher education curricula. Also, it underscores the significance of integration to ensure that AI enhances rather than supplants students' critical thinking and original writing abilities, although AI provides potent capabilities. The study's scope, which is limited to English Education postgraduates, is a significant limitation of the small sample size. Future research could encompass the use of specific AI tools to enhance academic writing ethically integrated with appropriate use, academic integrity, and its long-term effects. Further, longitudinal studies monitor the development of students' writing by seeing lecturers' actions and guidance in implementing AI tools in higher education. Last, this study will recommend the university declare a regulation to prevent over-reliance of AI.

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