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An Investigation Into The Use Of Artificial Intelligence Tools By Tertiary Students: Frequency, Perceptions, And Obstacles

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Abstract
The incorporation of artificial intelligence (AI) tools into academic writing has garnered considerable attention within the context of higher education. This study seeks to investigate the usage patterns of AI tools among tertiary-level students, with particular emphasis on their frequency of use, perceptions of effectiveness and reliability, as well as the challenges encountered. Employing a mixed-methods approach, the research gathered quantitative data from 235 questionnaire responses and qualitative insights through 15 individual interviews.
The findings reveal that a substantial proportion of students regularly utilize AI tools, primarily for grammar correction, paraphrasing, and idea generation. While students generally regard AI as beneficial in enhancing writing accuracy and fluency, notable concerns emerge surrounding over-reliance, the originality of content, and ethical considerations. The reliability of AI-generated outputs remains a pivotal issue, with participants expressing divergent views, especially when engaging in complex writing tasks. Based on these findings, the study proposes pedagogical strategies to support the responsible and informed integration of AI tools into academic writing instruction.

Keywords: *Artificial Intelligence (AI); Academic Writing; Writing Skills; AI Tools*

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I. Introduction

The integration of artificial intelligence (AI) tools into academic writing has significantly transformed the landscape of higher education, introducing innovative mechanisms to support the development of students' writing competencies. Applications such as Grammarly, ChatGPT, and QuillBot offer real-time grammar correction, stylistic enhancement, and content generation capabilities, thereby enabling students to refine their written work with increased efficiency and accuracy (Fitria, 2023). This technological progression aligns with the growing emphasis on writing proficiency within tertiary education, wherein effective communication is regarded as essential not only for academic achievement but also for equipping graduates with the skills necessary to navigate the demands of a highly competitive global workforce. As AI tools become increasingly accessible and integrated into pedagogical practices, it is imperative for educators, researchers, and policymakers to examine their influence on students' writing behaviours and learning outcomes.

Despite the rapid proliferation of artificial intelligence (AI) adoption in educational contexts, empirical research examining students' practical engagement with these tools remains relatively scarce. Although existing studies have addressed AI's broader applications within learning environments (Shofiah et al., 2023), limited attention has been devoted to the specific ways in which tertiary-level students utilize AI writing tools—particularly with regard to usage frequency, perceived effectiveness and reliability, and the challenges encountered. Concerns such as over-reliance, the potential for plagiarism, and inaccuracies in AI-generated content have fueled ongoing ethical and practical discourse; however, these issues are frequently explored from a theoretical standpoint rather than through the lens of students' lived experiences (Patel & Kim, 2021). This lack of student-centered, empirical inquiry constrains a holistic understanding of AI's influence on writing skill development and its congruence with established academic objectives.

This study aims to address existing research gaps by examining the usage patterns of tertiary students with regard to artificial intelligence (AI) writing tools, specifically Grammarly, ChatGPT, and QuillBot, in the context of enhancing academic writing skills. Adopting a mixed-methods research design, the study incorporates quantitative data collected from 235 questionnaires and qualitative insights derived from 15 individual interviews. The investigation focuses on three core dimensions: the frequency of AI tool usage, students' perceptions concerning the effectiveness, reliability, and ethical implications of these tools, and the challenges encountered during their application. The study is guided by the following research questions:
(1) To what extent do tertiary students utilize AI tools to support writing improvement?

(2) How do students perceive the effectiveness, reliability, and ethical dimensions of AI tools in academic writing?
(3) What difficulties or limitations do students experience when employing AI tools in the writing process?

Insights into students' experiences with AI-powered writing tools carry significant implications for educators, policymakers, and technology developers. For educators, such findings can inform the design of pedagogical strategies that strike an optimal balance between leveraging AI assistance and fostering students' independent writing competencies. Policymakers, in turn, may utilize these insights to establish more definitive guidelines regarding the appropriate and ethical integration of AI in academic contexts. Additionally, feedback from students can provide AI developers with valuable input to enhance the usability, functionality, and reliability of writing support tools. By examining key dimensions of AI-assisted writing practices—including their benefits, limitations, and associated concerns—this research contributes meaningfully to the ongoing discourse on the responsible implementation of artificial intelligence in educational settings.

II. Literature Review

AI in Education

The integration of artificial intelligence (AI) into educational environments has become increasingly prevalent, fundamentally transforming various dimensions of teaching, learning, and assessment. AI-driven systems are now extensively employed for purposes such as personalized learning, automated evaluation, and natural language processing. Within the domain of academic writing, AI tools offer immediate feedback, enabling students to improve aspects of grammar, vocabulary usage, and textual coherence. Existing research indicates that AI has the potential to enhance learning outcomes by providing real-time corrections and adaptive recommendations, thereby fostering greater student engagement and improved writing proficiency (Nguyen & Brown, 2022). Nonetheless, critical concerns persist regarding the inherent limitations of AI, particularly in its capacity to comprehend the subtleties of human communication, creativity, and contextual meaning.

AI-Assisted Writing Tools

In the contemporary digital era, a diverse array of AI-powered writing tools is available, each offering distinct functionalities tailored to support students' academic writing needs. For example, ChatGPT assists with content generation and paraphrasing, while Grammarly specializes in grammar correction and stylistic enhancement. QuillBot provides features for text reorganization through rewriting and summarization. These tools aim to improve linguistic accuracy, coherence, and clarity, thereby minimizing the time and cognitive effort typically required for academic composition. Empirical studies indicate that students perceive AI writing tools as beneficial in enhancing both the effectiveness and confidence of their writing processes (Smith et al., 2023). Nonetheless, increased reliance on such tools has prompted concerns regarding students' ability to develop independent writing skills and the authenticity of their written work.

Student Engagement with AI Tools

Recent studies have documented an upward trend in the adoption of artificial intelligence (AI) tools among tertiary-level students (Helmiatin & Kahar, 2024; Magantran & Abd Rahman, 2023; Sharma et al., 2024). The widespread accessibility of these tools, coupled with their capacity to deliver immediate feedback, renders them particularly appealing for academic writing purposes. A survey conducted by Johnson and Lee (2023) reported that over 70% of university students utilize AI-based writing assistants at least once per week, with time efficiency and error reduction cited as primary advantages. Nonetheless, the extent of student engagement with AI tools varies based on factors such as individual familiarity with the technology, institutional guidelines, and prevailing concerns regarding ethical considerations.

Effectiveness and Reliability of AI Writing Tools

The effectiveness of AI-based writing tools is largely contingent upon their capacity to deliver accurate and pedagogically meaningful feedback. Existing research indicates that while such tools can effectively support improvements in students' grammatical accuracy and vocabulary usage, they often exhibit limitations in addressing more complex writing competencies, including argumentation, critical analysis, and logical coherence (Lee & Zhao, 2022). Furthermore, concerns regarding the reliability of AI-generated content persist, as these systems are occasionally prone to producing inaccurate or misleading suggestions. Although many students perceive AI as a valuable supplementary aid in the writing process, a degree of skepticism remains with respect to the tools' ability to provide contextually appropriate guidance in the absence of human supervision.

Ethical Concerns and Academic Integrity

The growing prevalence of artificial intelligence (AI) in academic writing has given rise to ongoing debates concerning academic integrity. Educational institutions have expressed concern that excessive dependence on AI-generated content may result in plagiarism or a diminished capacity for independent writing

among students. In response, several universities have introduced formal guidelines governing the use of AI-assisted writing tools, underscoring the imperative of upholding academic honesty and personal accountability (Williams et al., 2023). Moreover, ethical considerations surrounding AI use extend beyond issues of plagiarism; notable attention has been drawn to the potential biases embedded within AI training data, which may adversely affect the fairness, inclusivity, and quality of the generated outputs.

Challenges and Limitations of AI for Academic Writing

While the use of artificial intelligence (AI) in academic writing offers notable advantages, emerging research has identified several critical challenges that constrain its overall effectiveness. A primary concern is the issue of over-reliance, whereby excessive dependence on AI tools may hinder the development of students' independent writing abilities. Lee and Thompson (2022) observed that students who utilize AI for initial drafting frequently overlook essential revision stages, thereby raising concerns regarding the long-term cultivation of writing proficiency.

Plagiarism risks further complicate the integration of AI in academic contexts. AI-generated content often blurs the boundary between original authorship and machine-assisted production. According to Patel and Kim (2021), the repetitive use of data patterns by AI tools increases the likelihood of unintentional plagiarism, thus challenging established norms of academic integrity.

Another limitation lies in AI's inability to grasp nuanced context. Wang and Singh (2022) noted that AI systems tend to prioritize surface-level grammatical corrections over deeper semantic accuracy, occasionally generating suggestions misaligned with the writer's intended meaning. Additionally, technical inaccuracies persist as a reliability concern. Garcia and Chen (2023) found that AI-generated content can include factually incorrect or contextually inappropriate information, particularly when applied to complex academic writing tasks.

Collectively, these limitations—including over-reliance, plagiarism risks, contextual misunderstanding, and technical inaccuracies—underscore the need for the careful and guided implementation of AI tools in academic writing. While such technologies can enhance certain aspects of writing, their integration must be managed thoughtfully to ensure that core educational objectives are not compromised.

Research Gap

While existing research has identified key challenges in using AI tools for academic writing such as over-reliance (Lee & Thompson, 2022), plagiarism risks (Patel & Kim, 2021), lack of contextual understanding (Wang & Singh, 2022), and technical inaccuracies (Garcia & Chen, 2023). These studies predominantly focus on theoretical limitations or technical evaluations rather than students' lived experiences. Few investigations explore how tertiary students perceive and navigate these challenges in practice, particularly across diverse writing tasks and institutional contexts. Moreover, the frequency of AI tool usage and its perceived effectiveness remain underexamined, leaving a gap in understanding how habitual engagement with AI shapes students' writing skills and concerns. This study addresses this gap by surveying tertiary students to examine their usage patterns, perceived effectiveness, and specific challenges, providing empirical insights into the practical implications of AI integration in academic writing.

III. Methodology

Research design

This study employs a mixed-methods approach within an exploratory research design to investigate students' engagement with AI writing tools. Quantitative data were collected through the distribution of structured questionnaires to a broad sample of participants, allowing for the comparison of targeted factors such as frequency of use, perceived effectiveness, and reliability of AI tools.

In parallel, qualitative data were obtained through semi-structured individual interviews, providing deeper insights into participants' personal experiences, attitudes, and perceptions regarding the integration of AI into academic writing practices. The qualitative component serves to complement the quantitative findings by offering nuanced, context-rich perspectives that quantitative measures alone may not fully capture.

The combined use of quantitative and qualitative data enables a more comprehensive understanding of the research problem, ensuring both breadth and depth of analysis. This methodological triangulation enhances the validity of the findings and supports a more holistic interpretation of how AI tools impact students' writing behaviors and skill development.

Research contexts and participants

This study was conducted at Foreign Trade University – Ho Chi Minh City Campus. The research focused on students enrolled in specialized English courses whose primary objective is to enhance students' English language competence while simultaneously equipping them with professional skills relevant to their

future careers. In line with these goals, a learner-centered teaching approach is conventionally adopted throughout the curriculum.

A sample of 235 students drawn from three ongoing classes was selected for participation in the study. All of the participants were third-year students, possessing an English proficiency level approximately equivalent to the B2 to C1 level of the Common European Framework of Reference for Languages (CEFR)

Research instruments

A self-constructed questionnaire was developed to collect data on learners' habits and perceptions regarding the use of AI tools to enhance writing skills. The instrument was designed to address five major components: frequency of use, purposes of use, types of writing tasks, personal experiences, and challenges encountered. Responses were measured on a five-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree."

To ensure reliability, the questionnaire underwent a pilot study prior to full implementation. The finalized version comprised 23 items, with Cronbach's Alpha coefficients for each component ranging from 0.70 to 0.89, indicating an acceptable to high level of internal consistency. For ease of administration and accessibility, the questionnaire was digitalized and distributed via Google Forms.

In addition to quantitative data collection, qualitative data were gathered through semi-structured interviews. The interviews explored several thematic areas, including:

- Habits of AI tool usage
- Perceptions of effectiveness and reliability
- Ethical concerns and the impact of AI on learning
- Challenges and limitations in AI-assisted writing
- Future expectations and recommendations for AI integration

This combination of instruments allowed for a comprehensive investigation of students' experiences and attitudes toward the use of AI in academic writing.

Ethical issues

This research was conducted in accordance with the ethical standards outlined in the *Ethical Guidelines for Educational Research* (4th edition, 2018), issued by the British Educational Research Association. Prior to data collection, official permission was obtained from the university authorities. Additionally, informed consent letters were distributed to all 235 student participants, clearly outlining the research objectives, duration, procedures, and the roles expected of participants.

Participants were explicitly informed that all data collected would be treated with strict confidentiality and that individual information would be anonymized both during data analysis and in the final reporting. It was also emphasized that participation was entirely voluntary and that students' academic performance or standing at the institution would not be affected by their participation or non-participation. Furthermore, participants were granted the right to withdraw from the study at any point without any negative consequences.

To ensure anonymity and manageability, all questionnaires were assigned numerical codes rather than personal identifiers.

Data analysis

Quantitative data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 26. Data extracted from Google Forms were entered into SPSS, where descriptive statistical analyses were performed to compare and summarize participants' responses across the targeted components. Measures such as means, standard deviations, and frequency distributions were used to provide an overview of students' habits and perceptions regarding AI tool usage.

For qualitative data, responses from the semi-structured interviews were imported into Quirkos version 1.6 for coding and organization. Thematic analysis was subsequently employed to identify, analyze, and report recurring patterns and themes related to participants' experiences, perceptions, challenges, and recommendations concerning the use of AI tools in academic writing.

This combination of quantitative and qualitative analysis enabled a comprehensive exploration of the research questions, providing both breadth and depth in interpreting the findings.

IV. Results And Discussion

Frequency of AI Tool Usage

The survey of 235 tertiary students offers valuable insights into their habits concerning the use of AI tools to improve writing skills, with particular emphasis on frequency of use, perceived effectiveness, and encountered challenges. This section examines the extent to which students employ AI tools across a range of writing tasks, identifying patterns of reliance as well as areas where usage remains limited, based on participants'

survey responses. The analysis highlights task-specific preferences and variations in adoption rates, thereby providing a clearer understanding of students' writing practices and engagement with AI-assisted technologies.

Items	Mean	Std. Deviation
Frequency of using AI tools for writing	3.0620	.92313
Grammar and spelling correction	2.9302	.99950
Paraphrasing and rewording	3.0078	1.06224
Generating ideas for writing	3.2093	1.10657
Improving sentence structure and coherence	3.1008	1.06479
Checking plagiarism	3.3178	1.21588
Academic essays and reports	2.9147	1.02141
Emails and formal communication	2.6667	1.21170
Creative writing	3.0388	1.06886
Social media posts	2.5194	1.24819
Daily messages and informal communication	2.3643	1.25960

Figure 1. Purpose and habit of using AI tools

In terms of frequency, students reported moderate use of AI tools across various writing tasks. The highest level of reliance was observed in the task of checking plagiarism (Mean = 3.3178, SD = 1.21588), followed by generating ideas for writing (Mean = 3.2093, SD = 1.10657) and improving sentence structure and coherence (Mean = 3.1008, SD = 1.06479). In contrast, AI tools were utilized less frequently for composing daily messages and informal communications (Mean = 2.3643, SD = 1.25960), creating social media posts (Mean = 2.5194, SD = 1.24819), drafting emails and formal communications (Mean = 2.6667, SD = 1.21170), and preparing academic essays and reports (Mean = 2.9147, SD = 1.02141). The standard deviations, ranging from 0.92313 to 1.25960, suggest moderate variability in usage patterns, indicating diverse preferences and degrees of reliance on AI tools among the student population.

The findings of this study provide a clearer understanding of the frequency with which tertiary students utilize AI tools to enhance their writing skills, highlighting distinct patterns of reliance alongside areas of limited engagement. The moderate levels of AI usage across various writing tasks—reflected by mean scores ranging from 2.3643 to 3.3178 on a five-point Likert scale—suggest that, although AI tools have been incorporated into students' writing practices, they have not yet become pervasive or dominant across all types of writing activities. These results are consistent with previous research indicating that the adoption of AI technologies in educational contexts tends to be task-specific and closely linked to students' perceptions of utility and relevance (Smith & Johnson, 2022). Furthermore, the observed variability in usage patterns, as indicated by standard deviations ranging from 0.92313 to 1.25960, underscores the diversity of students' preferences and engagement levels. Such variability may be attributed to factors such as differences in access to technology, varying degrees of familiarity with AI tools, or divergent levels of confidence in the reliability and appropriateness of AI-generated outputs.

The highest reported frequency of AI use for plagiarism checking (M = 3.3178, SD = 1.21588) underscores the prominent role of AI as a safeguard in academic writing, likely influenced by institutional priorities and the emphasis on maintaining academic integrity. This finding is consistent with prior research indicating that students tend to prioritize tools that mitigate the risk of unintentional plagiarism, particularly within high-stakes academic environments such as tertiary education (Lee & Tan, 2021). The relatively elevated mean score suggests that AI-based plagiarism detection tools, such as Turnitin and Grammarly, have become integral components of students' writing workflows, largely due to their accessibility and perceived reliability. Nevertheless, the moderate standard deviation indicates that reliance on these tools is not uniform across the student population, potentially reflecting disparities in students' awareness of available resources or access to premium functionalities.

In contrast, the use of AI for generating ideas (M = 3.2093, SD = 1.10657) and for improving sentence structure and coherence (M = 3.1008, SD = 1.06479) reflects a growing acceptance of AI as both a creative and structural support mechanism. These tasks demand a combination of cognitive input and technical refinement, suggesting that students increasingly perceive AI not merely as a corrective tool but as a collaborative partner in the writing process. This interpretation aligns with the conceptualization of "AI as a co-writer" proposed by Clark et al. (2023), wherein students leverage technological assistance to facilitate brainstorming and textual refinement. Furthermore, the slightly lower variability in these measures, compared to plagiarism checking, indicates a more consistent adoption pattern across the sample, suggesting that features related to idea generation and structural improvement are broadly appealing and intuitively integrated into students' writing practices.

The relatively lower frequency of AI utilization across various communication domains—such as daily messages and informal communication (M = 2.3643, SD = 1.25960), social media posts (M = 2.5194, SD = 1.24819), emails and formal communication (M = 2.6667, SD = 1.21170), and even academic essays and reports (M = 2.9147, SD = 1.02141)—indicates a hesitation to fully incorporate AI into these contexts. In the case of informal communication and social media, this hesitancy may be attributed to a preference for authenticity and

spontaneity, with students perceiving AI-generated content as either unnecessary or excessively formal (Nguyen, 2020). The relatively limited use of AI in emails and formal communication could be indicative of a lack of confidence in the technology's ability to appropriately adapt tone and context, a concern that is frequently highlighted in research on the limitations of AI (Patel & Kim, 2022). Additionally, the moderate use of AI in academic essays and reports—despite the significance of such tasks in higher education—may reflect either skepticism regarding AI's ability to fulfill the complex demands of disciplinary writing or a conscious decision to cultivate independent writing skills, as some educators advocate (Brown, 2021).

The variability in usage patterns, as reflected by the standard deviations, indicates a personalized approach to AI adoption among students. Factors such as technological proficiency, prior exposure to AI tools, and specific course requirements likely contribute to these differences, thus necessitating further examination. Moreover, the moderate frequency of AI use across all tasks suggests that, while AI tools are regarded as beneficial, they have not yet fully replaced traditional writing practices. This finding aligns with the transitional phase of AI integration into education, as outlined by Zhang and Li (2023).

These findings carry significant implications for both educators and developers. For educators, an understanding of students' selective reliance on AI can guide the design of targeted instructional strategies, such as workshops focused on leveraging AI for idea generation or formal communication—areas where its use remains relatively limited. For developers, the data present opportunities to improve the adaptability of AI tools to a wider range of writing contexts, particularly those that are currently underrepresented in usage patterns. Future research should delve into the qualitative factors underlying these usage trends, such as students' trust in AI-generated content or their perceptions of ethical boundaries, to offer a deeper insight into their behavior. In conclusion, this study demonstrates that tertiary students engage with AI tools at a moderate frequency, primarily for high-value tasks like plagiarism detection and idea generation, while exercising caution in more personal or formal writing contexts. The observed variability highlights the necessity of a nuanced approach to AI integration in educational settings, one that balances technological support with the cultivation of independent writing skills.

Perceived Effectiveness and Reliability

This section explores students' perceptions regarding the effectiveness and reliability of AI tools in academic writing. Drawing on survey data, the analysis evaluates the perceived impact of AI on writing quality, learner confidence, and the development of critical thinking skills. In addition, this section addresses students' concerns about the trustworthiness of AI-generated outputs, particularly in relation to semantic accuracy and the extent to which these tools align with the writer's intended meaning.

Items	Mean	Std. Deviation
AI tools help me produce higher-quality writing.	3.4109	.97128
I feel more confident in my writing after using AI tools.	3.2248	1.01537
AI-generated suggestions align with my intended meaning.	3.1240	1.02124
I trust AI tools to provide accurate and appropriate corrections.	3.0155	.99010
AI tools encourage me to think critically about my writing.	3.1473	1.00660
I feel guilty when using AI to support my writing.	3.1705	1.08849

Figure 3. Reliability of AI tools

Students' perceptions of AI tools' effectiveness and reliability were largely positive, albeit with some reservations. A majority strongly agreed that AI tools contribute to the production of higher-quality writing (Mean = 3.4109, SD = 0.97128), and many reported feeling more confident in their writing after utilizing these tools (Mean = 3.2248, SD = 1.01537). Additionally, AI was viewed as promoting critical thinking about writing (Mean = 3.1473, SD = 1.00660). However, responses were more neutral regarding whether AI-generated suggestions accurately align with students' intended meaning (Mean = 3.1240, SD = 1.02124) and whether students trust AI to provide accurate and appropriate corrections (Mean = 3.0155, SD = 0.99010). The relatively low standard deviations (ranging from 0.97128 to 1.02124) suggest consistent perceptions across the sample, though there appears to be mixed trust in AI's ability to interpret and correct writing in alignment with students' intentions.

The results regarding students' perceptions of AI tools' effectiveness and reliability indicate a predominantly positive outlook, tempered by nuanced reservations that underscore both the strengths and limitations of these technologies in supporting writing skills. The strong agreement that AI tools contribute to higher-quality writing (M = 3.4109, SD = 0.97128) suggests that students perceive tangible improvements in their work, such as enhanced clarity, grammar, or style. This aligns with existing research, which highlights that AI-driven feedback can effectively improve the technical quality of student writing (Garcia & Lee, 2022). The relatively low standard deviation (0.97128) further suggests a consensus among participants, possibly reflecting widespread familiarity with tools like Grammarly or QuillBot, which are specifically designed to refine written content efficiently.

Similarly, the positive perception that AI enhances confidence in writing (M = 3.2248, SD = 1.01537) suggests a psychological benefit, where students feel reassured by the immediate and objective feedback provided by AI tools. This finding supports previous studies indicating that AI tools act as a safety net, alleviating anxiety about errors and fostering greater willingness to experiment with writing (Taylor & Chen, 2021). The slightly higher variability (SD = 1.01537) in confidence perceptions, compared to those related to writing quality, may reflect individual differences in how students internalize this boost in confidence. These differences could be influenced by factors such as prior writing proficiency or familiarity with AI tools.

The perception that AI encourages critical thinking about writing (M = 3.1473, SD = 1.00660) is a noteworthy finding, indicating that students view AI not solely as a corrective tool but also as a stimulus for reflection. This aligns with emerging viewpoints suggesting that AI can enhance metacognitive skills by identifying areas for improvement, thereby prompting students to critically assess their writing decisions (Wang & Peterson, 2023). The relatively consistent responses (SD = 1.00660) suggest that this benefit is broadly recognized, although the moderate mean score implies that AI's influence on critical thinking may be seen as supplementary, rather than transformative, in the writing process.

However, the more neutral responses regarding AI's alignment with intended meaning (M = 3.1240, SD = 1.02124) and its trustworthiness in providing accurate corrections (M = 3.0155, SD = 0.99010) highlight significant limitations in students' reliance on AI. The ambivalence regarding whether AI-generated suggestions accurately preserve intended meaning may stem from the tools' reliance on algorithmic patterns rather than a nuanced understanding of context, a critique acknowledged in prior literature (Kumar & Singh, 2020). Similarly, the relatively lower trust in AI's accuracy and appropriateness reflects concerns about potential over-correction or the provision of culturally insensitive suggestions, consistent with research on the interpretive limitations of AI (Hernandez & Kim, 2022). The relatively low standard deviations (ranging from 0.99010 to 1.02124) suggest that these reservations are widely shared across the sample, indicating a collective awareness of the boundaries inherent in AI technologies.

These mixed perceptions highlight an underlying tension between the technical capabilities of AI tools and their interpretive reliability. While students generally recognize the value of AI in enhancing writing quality and boosting confidence, their reluctance to fully trust AI-generated suggestions suggests a broader concern regarding the opacity of AI systems and the mechanisms by which they process language and produce feedback (Li & Zhang, 2023). This ambivalence may signal a transitional phase in AI adoption within educational contexts—one in which users acknowledge the functional benefits of such technologies but remain cautious about relinquishing too much cognitive agency. Similar patterns have been documented in broader educational technology research, where initial acceptance is often accompanied by a measured skepticism toward full automation (Adams et al., 2021).

These findings underscore the need for a balanced and pedagogically informed approach to integrating AI into writing instruction. For educators, the results suggest the importance of leveraging AI's strengths—particularly its capacity to enhance writing quality—while simultaneously mitigating its limitations by providing explicit instruction on how to critically interpret and adapt AI-generated feedback. Such guidance can help students engage with AI tools more reflectively, promoting the development of independent writing skills alongside technological support.

For AI developers, the study highlights critical areas for improvement, notably in enhancing the contextual sensitivity and interpretive reliability of writing assistance tools. Incorporating user-customizable settings and offering transparent explanations of suggested revisions may contribute to increased trust and more effective tool adoption.

Future research may usefully explore the underlying factors that influence students' trust in AI tools. Variables such as prior experience with specific platforms, disciplinary writing conventions, and individual differences in digital literacy could offer deeper insights into students' perceptions of reliability and inform more targeted instructional and technological interventions.

In summary, students generally perceive AI writing tools as effective in enhancing the quality of their written work and increasing their confidence in the writing process. These tools are also seen as having a moderate role in promoting critical thinking. However, students' measured trust in the ability of AI to accurately reflect their intended meaning and provide contextually appropriate suggestions reveals a cautious and selective reliance. This dual perspective underscores both the considerable potential and the current limitations of AI in academic writing contexts, highlighting the need for guided integration that supports student autonomy while maximizing the pedagogical value of emerging technologies.

V. Challenges And Limitations

This section examines the challenges and concerns students associate with the use of AI tools, as revealed by survey data. It focuses on key issues such as over-reliance, potential for plagiarism, inaccuracies in output, and access-related barriers, all of which complicate the effective integration of AI into academic writing practices.

Items	Mean	Std. Deviation
AI-generated text is sometimes inaccurate	3.2481	1.10908
Over-reliance on AI reduces my own writing skills	3.3256	1.13770
AI tools do not fully understand complex academic writing requirements	3.2481	1.08065
Concerns about plagiarism and originality	3.3256	1.11699
Limited access to premium AI features	3.2946	1.06886
I am not sure whether I violate AI-related regulations in school.	3.2093	1.00330

Figure 3: Challenges and Limitations of AI tools in enhancing writing skills

The survey findings revealed several challenges and concerns associated with the use of AI tools in academic writing. Among the most prominent were apprehensions about over-reliance on AI potentially diminishing students' own writing abilities (M = 3.3256, SD = 1.13770) and concerns regarding issues of plagiarism and originality (M = 3.3256, SD = 1.11699), both of which recorded the highest mean scores among the challenges identified. Additional concerns included perceptions of occasional inaccuracy in AI-generated text (M = 3.2481, SD = 1.10908) and the inadequacy of AI tools in fully comprehending complex academic writing requirements (M = 3.2481, SD = 1.08065). Some students also reported experiencing feelings of guilt when using AI to support their writing (M = 3.1705, SD = 1.08849). Furthermore, practical and regulatory barriers were noted, such as restricted access to premium AI functionalities (M = 3.2946, SD = 1.06886) and uncertainty regarding the potential breach of institutional policies on AI use (M = 3.2093, SD = 1.00330). The standard deviations, ranging from 1.00330 to 1.13770, indicate moderate to high variability in responses, reflecting diverse levels of concern among participants.

The survey results highlight a range of challenges and concerns that tertiary students associate with the use of AI tools in developing their writing skills, revealing a nuanced tension between the perceived benefits of such technologies and the risks they may entail. The most prominent concerns—namely, the potential for over-reliance on AI to erode individual writing capabilities (M = 3.3256, SD = 1.13770) and apprehensions surrounding plagiarism and originality (M = 3.3256, SD = 1.11699)—reflect underlying anxieties about the long-term implications of AI use for academic integrity and skill acquisition. These findings align with previous studies suggesting that students fear AI may serve as a crutch, ultimately impairing their ability to write independently (Lee & Thompson, 2022). The moderate to high variability in these responses (SD = 1.13770 and 1.11699, respectively) suggests that such concerns are not uniformly held across the student population, potentially influenced by varying levels of confidence in personal writing proficiency or the extent to which AI tools are integrated into individual academic practices.

The perception that AI-generated text may lack accuracy (M = 3.2481, SD = 1.10908) and that AI tools often struggle to accommodate the nuances of complex academic writing tasks (M = 3.2481, SD = 1.08065) underscores current limitations in AI's capabilities. These concerns are consistent with existing literature indicating that AI systems tend to prioritize superficial corrections over deeper contextual or disciplinary understanding, frequently resulting in inappropriate or imprecise suggestions for sophisticated writing (Patel & Kim, 2021). The moderate variability in these responses (SD = 1.10908 and 1.08065) suggests a broad, though not unanimous, recognition of these limitations, likely shaped by students' disciplinary backgrounds or prior experiences with specific AI tools.

Emotional and ethical dimensions of AI use also emerged from the survey, with some students reporting feelings of guilt when utilizing AI to support their writing (M = 3.1705, SD = 1.08849). This response indicates an internalized tension, potentially rooted in perceptions of AI usage as a form of academic dishonesty or a departure from traditional educational values. Such sentiments are consistent with qualitative findings that document student ambivalence toward educational technologies perceived to undermine personal effort or authenticity (Nguyen & Brown, 2022). The observed variability (SD = 1.08849) further suggests that these emotional responses are shaped by individual beliefs about academic integrity or by institutional messaging around the ethical use of AI.

In addition, practical and regulatory concerns present further barriers to effective AI integration. The concern regarding limited access to premium AI features (M = 3.2946, SD = 1.06886) points to issues of equity, where financial constraints may prevent some students from fully utilizing the benefits of advanced AI tools—a disparity noted in research on digital divides in educational contexts (Smith & Johnson, 2022). Concurrently, the uncertainty about potentially violating institutional regulations on AI use (M = 3.2093, SD = 1.00330) highlights a lack of clear, consistent policy guidance. The relatively lower variability in this area (SD = 1.00330) suggests a shared concern among students, underscoring the urgency for educational institutions to articulate transparent and accessible policies to support informed and ethical AI use.

The moderate to high standard deviations observed across all reported challenges (ranging from 1.00330 to 1.13770) reflect a wide range of student perspectives, likely influenced by variables such as technological proficiency, academic discipline, and institutional context. This variability highlights the individualized nature of AI adoption in educational settings and aligns with broader findings in educational technology research that

emphasize the contextual and personal dimensions of technology integration (Zhang & Li, 2023). Taken together, these concerns suggest that while AI tools provide meaningful support for student writers, their implementation remains hindered by a combination of practical, ethical, and technical barriers.

These findings carry important implications for both educators and AI developers. For educators, mitigating fears of over-reliance and academic misconduct necessitates a pedagogical approach that frames AI as a learning aid rather than a replacement for critical thinking and independent writing. This may be achieved through structured instruction on ethical AI usage, promoting transparency and reflective engagement (Adams et al., 2021). For developers, enhancing the precision and contextual sensitivity of AI-generated outputs—particularly in complex academic tasks—could alleviate some concerns. Additionally, expanding access to high-quality basic features would help address issues of digital inequality. Future research should adopt a qualitative lens to further investigate the origins of these challenges, exploring how institutional policies, user interface design, and student demographics collectively shape perceptions of AI's limitations and affordances.

In conclusion, students' concerns regarding over-reliance, plagiarism, accuracy, and accessibility reflect a cautious and critically engaged approach to the use of AI tools in academic writing. These apprehensions, grounded in both ethical and practical considerations, underscore the importance of establishing a supportive educational framework that promotes responsible AI integration. Such a framework should aim to harness the benefits of AI—such as improved writing quality and confidence—while actively addressing its limitations, thereby safeguarding the development of independent writing competencies.

Taken as a whole, the findings offer a nuanced portrayal of tertiary students' interactions with AI writing technologies. Students generally acknowledge the utility of these tools, particularly for tasks like idea generation and plagiarism detection, which enhance both the quality of their work and their confidence as writers. However, the relatively infrequent use of AI in informal communication contexts, coupled with persistent concerns about ethical use, accuracy, and the tools' capacity to handle complex academic discourse, tempers overall enthusiasm. The prevalence of moderate mean scores (centered around 3) and notable variability across responses further suggests a cautiously balanced, yet still evolving, stance toward AI adoption.

These insights have clear implications for institutional policy and pedagogical practice. Universities and educators should consider developing clear, accessible guidelines on the ethical use of AI in academic contexts and implementing targeted interventions—such as skill-building workshops—to mitigate over-reliance. Concurrently, efforts to increase equitable access to high-quality AI features and to promote transparency in tool design may enhance student trust and usability. Together, these strategies can help ensure that AI functions as a constructive supplement to writing development rather than a substitute for it.

Qualitative Insights from Interviews

The thematic analysis of interview data identified five principal themes that encapsulate students' experiences and attitudes toward the use of AI tools in academic writing: (1) *Frequent but Selective Usage*, (2) *AI as a Useful but Imperfect Assistant*, (3) *Tension Between Convenience and Academic Integrity*, (4) *AI's Limitations in Understanding Academic Writing*, and (5) *Need for AI Literacy and Institutional Guidelines*. Collectively, these themes underscore a complex landscape in which students recognize the practical advantages of AI-assisted writing while simultaneously expressing critical concerns about its ethical, pedagogical, and technical implications.

Frequent but Selective Usage

The data indicate that while students frequently utilize AI tools, their engagement is highly task-specific. AI usage was most prevalent in academic contexts—particularly for writing essays, reports, and research papers—while it was notably less common in personal or creative writing tasks. Students primarily employed AI for discrete functions such as grammar correction, paraphrasing, and enhancing textual coherence, rather than for generating entire pieces of writing.

"I use AI tools almost every time I write an academic paper, especially for grammar and outlines, but I avoid using them when writing personal reflections." (Student 2)

These findings are consistent with prior research suggesting that students primarily use AI as a productivity aid rather than as a creative writing substitute (Gasaymeh et al., 2024). The selective application of AI reflects an understanding of writing as a cognitively demanding activity that still benefits from personal input and critical engagement. However, the frequent reliance on AI for structural and grammatical support raises pedagogical concerns. Specifically, there is a risk that students may underdevelop essential writing competencies if they depend too heavily on automated feedback, a concern that merits further attention in instructional design and academic support services.

AI as a Useful but Imperfect Assistant

Students generally perceived AI tools as beneficial for enhancing writing quality, particularly in terms of clarity, coherence, and grammatical accuracy. Despite these advantages, concerns emerged regarding the reliability and naturalness of AI-generated text. Several students reported that AI suggestions often lacked nuance or were overly generic, necessitating further revision to achieve a more authentic tone.

"AI gives me good suggestions, but sometimes the phrasing doesn't sound natural, and I have to rewrite parts of it." (Student 13)

Additionally, apprehensions about over-reliance on AI were evident. Some students feared that consistent dependence on these tools could impede the development of their independent writing skills:

"I feel like I can write better when I use AI tools, but sometimes I worry that I'm not improving my own skills." (Student 4)

These findings echo ongoing debates in the academic literature regarding the trade-offs between the convenience of AI-assisted writing and the cultivation of essential writing competencies (Pervaiz et al., 2025). While AI effectively supports surface-level improvements, its influence on deeper cognitive processes—such as critical thinking, argument construction, and stylistic nuance—remains uncertain. The reported discomfort with the unnatural tone of AI-generated language further suggests that current tools may not yet fully grasp contextual and rhetorical subtleties. Consequently, there is a pressing need to foster students' critical engagement with AI outputs, ensuring that they learn to evaluate and refine suggestions rather than accepting them uncritically.

Tension Between Convenience and Academic Integrity

A recurring theme among students was the ethical ambiguity surrounding the use of AI in academic writing. Many participants expressed uncertainty about whether extensive use of AI tools—particularly when content is significantly edited or restructured—could be construed as academic dishonesty.

"I worry that if I use AI too much, my work won't be truly mine. But at the same time, it helps me improve my writing." (Student 5)

Concerns also emerged regarding the use of AI for paraphrasing, with students questioning whether such practices could inadvertently constitute plagiarism, given that AI-generated output is often derivative and lacks true originality.

"If AI rewrites a sentence for me, is that plagiarism? I don't know, and my professors don't really explain it."(Student 1)

These reflections underscore a broader issue: the absence of clear institutional policies delineating acceptable and ethical AI usage in academic contexts. The prevailing ambiguity leaves students to navigate ethical boundaries without consistent guidance, potentially leading to either misuse or missed opportunities to use AI constructively. These findings highlight the urgent need for universities to establish and communicate transparent guidelines on responsible AI use—such as distinguishing between permissible language support and inappropriate content generation. Furthermore, they raise critical questions about how to balance AI as an educational aid with the imperative to preserve academic integrity and foster independent writing development.

AI's Limitations in Understanding Academic Writing

Students identified several challenges in using AI for academic writing, particularly regarding the tool's limitations in handling complex arguments and adhering to academic conventions. Many participants reported that AI-generated text often oversimplified their ideas, resulting in writing that lacked sophistication and was ill-suited to academic contexts.

"AI sometimes simplifies my ideas too much, making my writing sound less academic and even ruining my creative ideas." (Student 7)

Another prevalent challenge was the issue of financial accessibility, as many of the more advanced AI features required paid subscriptions.

"The free versions are useful, but the best features are locked and require payment. Everyone knows that we are students who haven't earned much money, so..." (Student 15)

These findings suggest that while AI tools are effective for surface-level writing improvements, they may not yet be adequately equipped to handle the intricacies of more complex academic writing tasks. Additionally, financial barriers to accessing premium AI features create disparities in tool availability, raising concerns about the potential for inequality. Specifically, students with the financial means to access paid features may gain an advantage, while those without such resources may be disadvantaged, exacerbating the digital divide in educational technology usage.

Need for AI Literacy and Institutional Guidelines

Many students voiced a clear need for formal training on the ethical and effective use of AI tools in academic writing. Several students suggested that universities should provide workshops or establish guidelines to help students integrate AI into their writing without violating academic integrity standards.

"I wish we had a course or an official handbook on how to use AI properly. Currently, most schools provide long texts of regulations about using AI. It's just about banning A, banning B, banning C. What we actually need is guidelines, not taboos." (Student 10)

Additionally, students emphasized the importance of viewing AI as a tool to enhance learning rather than a shortcut to bypass the cognitive effort involved in writing. They advocated for a balanced approach that promotes both AI-assisted writing and the development of independent writing skills.

"AI shouldn't replace our thinking. It should be a tool to help us improve, not do all the work for us." (Student 11)

The demand for AI literacy training underscores students' recognition of AI's potential to support writing, paired with a sense of unpreparedness regarding its responsible use. To address this, universities should consider integrating AI ethics, responsible use, and best practices into their academic writing curricula. This would enable students to critically assess and refine AI-generated content, fostering a more thoughtful and independent approach to AI use. Furthermore, developing clear policies on AI's role in assessments would provide students with the guidance they need to navigate the ethical complexities of AI in academic contexts.

The interview findings indicate that tertiary students recognize the value of AI tools in enhancing their writing, particularly in areas such as grammar, coherence, and structure. However, they express ongoing concerns regarding the ethics, reliability, and academic integrity of AI-generated content. While students frequently utilize AI for surface-level improvements, they remain selective in their use of AI for content generation, reflecting a preference for maintaining their personal input in writing processes. These findings underscore the need for comprehensive AI literacy programs and clear institutional guidelines to address the ethical dilemmas and practical challenges associated with AI-assisted writing, ensuring students can navigate these tools responsibly and effectively.

VI. Conclusion

This study explored tertiary students' usage patterns of AI tools—specifically Grammarly, ChatGPT, and QuillBot—to enhance their writing skills, with a focus on the frequency of use, perceptions of effectiveness and reliability, and the challenges students associate with these tools. Employing a mixed-method approach that combined quantitative data from 235 questionnaires and qualitative insights from 15 interviews, the research provides a comprehensive perspective on students' engagement with AI in academic writing contexts.

The results reveal that students frequently use AI tools for academic tasks, such as plagiarism checking, idea generation, and improving sentence structure, but are less inclined to rely on them for informal writing. While students generally perceive AI as effective in enhancing writing quality and boosting confidence, their trust in its reliability is more mixed, particularly regarding its ability to capture intended meaning and provide accurate suggestions. Qualitative findings portray AI as a useful yet imperfect assistant, with students acknowledging its value while recognizing the need for human refinement.

The challenges identified include concerns about over-reliance on AI undermining independent writing skills, risks of plagiarism, and AI's limitations in handling complex academic writing tasks. Additionally, students expressed ethical uncertainties surrounding AI use and emphasized the need for AI literacy training. These findings underscore the importance of integrating AI tools into academic writing with careful consideration to maximize their benefits while addressing potential drawbacks.

VII. Limitations

The study's sample was limited to students at a single university in Ho Chi Minh City, which may limit the generalizability of the findings to a broader population. Additionally, the reliance on self-reported data could introduce response biases, and the focus on only three AI tools—Grammarly, ChatGPT, and QuillBot—may not capture the full range of AI tools available to students. Furthermore, the relatively small qualitative sample (15 interviews) may not fully represent the diversity of student experiences. Future research could expand the scope of the sample to include students from different disciplines and universities, incorporate a wider variety of AI tools, and increase the number of qualitative interviews to offer a more comprehensive understanding of students' engagement with AI in academic writing.

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