Exploring the Impact of AI Tools on Academic Writing Skills: A Study of Students and Lecturers at University Level in Malaysia and China

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Abstract: This study explores the impact of the Artificial Intelligence (AI) tools on academic writing among the university students and lecturers at the educational establishments in Malaysia and China. Employing the mixed-methods approach, the research involved the quasi-experiment and the interviews to assess the tools' effectiveness in improving the writing quality, their limitations, and the ethical challenges they present. Quantitative results revealed the significant improvements in grammar, coherence, and overall writing performance, particularly among the students with lower baseline proficiency. Qualitative findings highlighted the disparities in AI understanding between the students and the lecturers, their concerns about overreliance, and the absence of institutional guidelines for the responsible AI use. The study integrates the Hyperpersonal Communication Theory to analyze how AI mediates and enhances the academic writing while exposing its limitations in fostering critical thinking and originality. Its findings emphasize the need for the balanced, ethical AI integration into education, offering practical recommendations for Xiamen University Malaysia and similar institutions to develop the comprehensive policies. Despite the limitations, including not big enough sample size, and the focus on the third-year undergraduate students, this research provides the valuable insights into the opportunities and challenges of AI in academic the contexts, paving the way for future studies on its long-term implications and interdisciplinary applications.

Keywords: AI tools; Hyperpersonal Communication Theory; academic writing skills development; quasi-experiment; policy development

1. Introduction

The integration of Artificial Intelligence (AI) tools into academic writing has initiated a revolutionary transformation in higher education. Universities increasingly adopt AI for content generation, personalized feedback, and automated grading, significantly reshaping teaching and learning practices. Advocates highlight AI's efficiency and constructive feedback potential, while critics express concerns regarding students' overreliance, ethical dilemmas, and the possible erosion of creativity and critical thinking skills [1].

At Xiamen University Malaysia (XMUM), the integration of AI tools into academic writing presents specific challenges due to the absence of standardized guidelines. This inconsistency creates confusion among students, who

struggle with unclear expectations regarding the appropriate use of AI. Lecturers, lacking institutional support, also face difficulties in consistently managing AI tools within their teaching methodologies.

AI-driven tools, such as ChatGPT and Grammarly effectively assist students with grammatical accuracy, coherence, and style. However, their increasing usage raises ethical concerns related to originality and potential plagiarism, challenging traditional definitions of academic integrity [2]. Despite their popularity, the true impact of these AI tools on students' academic writing skills remains insufficiently understood, particularly concerning their effect on higher-order cognitive skills [3].

Therefore, this research investigates how AI integration influences the development of academic writing skills among ESL/EFL students at XMUM, exploring both students' and lecturers' perspectives. By addressing these critical gaps, the study aims to provide practical recommendations for the balanced, ethical use of AI, ultimately enhancing writing pedagogy in multicultural educational contexts.

2. Theoretical Framework and Literature Review

Recent advancements in Artificial Intelligence (AI) have significantly impacted academic writing. AI tools, including ChatGPT, Grammarly, and Quillbot, now widely support students and lecturers by assisting idea generation, content development, feedback provision, and automated essay grading. The application of these tools, initially prevalent in medicine, engineering, and journalism, is relatively new to educational contexts and academic writing, triggering ongoing debates about their effectiveness, ethics, and the potential to replace conventional teaching methods.

This study is grounded in the Hyperpersonal Communication Theory by Joseph Walther [4], a branch of Computer-Mediated Communication (CMC). Hyperpersonal theory argues that computer-mediated interactions can exceed face-to-face communication in terms of intimacy and desirability due to four primary factors: idealized perceptions, selective self-presentation, feedback loops, and interaction richness. Students utilizing AI tools may form idealized perceptions of their writing abilities, driven by polished AI-generated feedback. The selective use of AI to enhance grammar, coherence, and overall presentation aligns with selective self-presentation, potentially widening gaps between students' authentic abilities and their AI-enhanced outputs. Continuous positive reinforcement from AI-generated feedback creates a feedback loop, reinforcing dependence on these tools. Lastly, the richness of AI-mediated interactions through immediate and detailed feedback potentially improves student engagement and writing outcomes.

Institutional policies on AI usage at renowned universities provide benchmarks that complement Hyperpersonal Communication Theory. Harvard University's guidelines emphasize transparency and ethical attribution of AI-generated content, addressing the risks associated with idealized perceptions [5]. Columbia University's AI policy stresses critical assessment to prevent overdependence, aligning with concerns around the feedback loop reinforcing habitual reliance [6]. Stanford University advocates balanced AI integration emphasizing ethical safeguards, complementing the theory's interaction richness concept [7]. The Russell Group emphasizes inclusivity and fairness, addressing issues of selective self-presentation by promoting equitable AI access [8].

Literature underscores that AI tools significantly improve technical writing elements such as grammar, coherence, and syntactic complexity, particularly benefiting ESL/EFL learners [9-10]. However, Thurlow [11] and Selim [12] highlight concerns regarding AI's limitations in fostering critical thinking and originality. While AI effectively generates structured and logical text, it often produces clichéd or superficial content lacking deeper insight. Students also reported mixed attitudes toward AI, appreciating its support in technical improvements yet fearing reduced creativity and analytical capabilities.

Ethical concerns around AI-generated content, particularly plagiarism and academic integrity, are also prevalent. Hu and Wang [13] further stress that clear ethical guidelines are crucial for mitigating risks associated with AI-generated content.

In conclusion, while AI tools offer considerable benefits in enhancing academic writing efficiency, clarity, and immediate feedback, concerns persist regarding their ethical implications and potential negative effects on creativity and critical thinking. The balanced integration of AI, guided by robust theoretical frameworks and institutional policies, is thus

critical for maximizing educational outcomes without compromising academic integrity or higher-order cognitive skills.

3. Research Methods

This study employed a mixed-methods approach, integrating a quasi-experiment and semi-structured interviews, to comprehensively explore the impact of AI tools on academic writing skills among students and lecturers at Xiamen University Malaysia (XMUM). The mixed-methods design allowed for measurable outcomes through quantitative assessments while providing depth and context via qualitative insights, aligning closely with the Hyperpersonal Communication Theory.

The quantitative component consisted of a quasi-experiment involving 15 student-participants tasked with writing two essays on the same topic: one without AI assistance (pre-test) and one with AI assistance (post-test). The selected topic—"In some countries, students are encouraged to take a gap year before starting university. Discuss the advantages and disadvantages."—evaluated various writing skills including grammar, coherence, organization, and critical thinking. Participants had 90 minutes for each essay, within a word limit of 300-600 words. Scoring was based on CEFR standards and IELTS writing descriptors to comprehensively assess academic writing proficiency.

The qualitative component involved semi-structured interviews with 10 students and 5 lecturers from XMUM. Interview questions addressed perceived benefits, challenges, ethical considerations, and AI's impact on teaching and learning practices. Interviews were recorded and verbatim transcribed for accurate thematic analysis, facilitating rich contextual understanding of AI integration in academic writing.

Participants freely selected AI tools, predominantly using AI tools through their personal devices. This realistic, flexible approach aimed to observe natural interactions and authentic usage patterns, enhancing the study's ecological validity.

Data management involved systematic organization using Microsoft Excel, visual summaries through Google Forms, and advanced statistical analyses via SmartPLS, ensuring methodological rigor and reliability.

4. Research Results

4.1. Quantitative Findings

The quantitative analysis clearly demonstrated significant improvements in participants' academic writing performance following AI tool integration. A comparative analysis of pre-test and post-test results revealed notable enhancements in grammar (+28.6%), coherence (+31.5%), content development (+27.3%), and lexical resource (+30.8%). Among these, coherence and grammar showed the most substantial gains, illustrating the strengths of AI tools like Grammarly and ChatGPT in correcting sentence structures, improving transitions, and enhancing overall logical flow.

Reliability testing using Cronbach's Alpha confirmed the robustness of these results: grammar ($\alpha = 0.929$), coherence ($\alpha = 0.855$), content development ($\alpha = 0.881$), and lexical resource ($\alpha = 0.811$). Such high internal consistency reinforced confidence in the scoring methodology and outcomes.

Further analysis compared writing performance improvements across different academic disciplines: English, Finance, Chemistry, and Chinese Studies. Initially, students majoring in English displayed higher baseline proficiency, reflected in their pre-test scores. However, their relative improvement post-AI use (22.6%) was moderate compared to disciplines with lower baseline scores. Notably, Chinese Studies students, with the lowest initial scores, exhibited the most significant gains (+36.0%). This pattern underscores AI tools' effectiveness in significantly benefiting students with weaker foundational writing skills by providing structured guidance and targeted error correction.

Inferential statistics using paired t-tests confirmed these improvements as statistically significant ($p < 0.05$) across all writing dimensions, with large effect sizes (Cohen's $d > 0.8$) indicating practical significance. The largest effect size

was observed in overall writing performance (d = 1.15), followed by coherence (d = 1.12) and grammar (d = 1.03). These findings validate AI's profound impact on enhancing observable aspects of academic writing, particularly benefiting students struggling with fundamental writing mechanics.

4.2. Qualitative Findings

Thematic analysis of interviews provided deeper insight into participants' experiences and perceptions. Students and lecturers agreed that AI tools significantly improved writing structure, grammar accuracy, and coherence. Lecturers specifically noted that essays became "structurally sound and linguistically precise," reflecting AI's strength in enhancing technical writing elements. Students appreciated immediate and detailed feedback from AI, enhancing their writing confidence and reducing anxiety associated with academic tasks.

However, qualitative data also revealed disparities between lecturers' and students' understanding and use of AI. Lecturers expressed nuanced views, emphasizing the pedagogical need for responsible AI integration and warning against students' superficial reliance on AI-generated corrections. Many students, conversely, primarily viewed AI tools as quick solutions for surface-level issues, often overlooking deeper learning opportunities. This discrepancy highlighted a gap between lecturers' expectations of AI as complementary tools for skill development, and students' narrower perception of AI as immediate writing aids.

A critical concern emerging from interviews was students' potential overdependence on AI tools. Lecturers reported that excessive reliance undermined students' independent writing skills, creativity, and critical thinking. Students echoed similar worries, acknowledging their habitual reliance on AI for grammar and coherence but admitting limited improvement in their fundamental writing competencies. This concern aligns closely with Hyperpersonal Communication Theory, emphasizing the risks of idealized self-presentation and feedback loops reinforcing dependency rather than genuine skill advancement.

Ethical challenges associated with AI usage in academic writing also surfaced prominently. Both lecturers and students expressed significant apprehension regarding originality, plagiarism, and proper attribution of AI-generated content. The absence of institutional guidelines exacerbated these ethical dilemmas, creating uncertainty among students and complicating lecturers' efforts to manage AI use responsibly. Participants unanimously called for standardized institutional policies clearly defining ethical boundaries, promoting transparency, and preventing misuse.

The qualitative results therefore emphasized the dual-edged nature of AI tools. While highly effective for technical corrections and structural enhancement, AI integration posed substantial risks to originality, critical thinking, and ethical writing practices. Participants advocated a balanced approach combining AI use with traditional pedagogical strategies, stressing that effective integration requires clearly articulated institutional guidelines and ongoing education about responsible AI practices.

Together, the quantitative and qualitative analyses present a comprehensive picture of AI tools' multifaceted impact on academic writing. While significant measurable improvements confirm AI's effectiveness in addressing mechanical aspects of writing, deeper qualitative insights underscore ongoing challenges and critical concerns requiring thoughtful educational strategies and robust institutional frameworks.

5. Discussion and Recommendations

Drawing on Hyperpersonal Communication Theory, this study illustrates the dual impact of AI tools as Computer-Mediated Communication (CMC) media in academic writing. AI-mediated interactions foster selective self-presentation, allowing students to present refined writing outputs significantly enhanced in grammar, coherence, and structural clarity. Immediate, polished feedback from AI tools like Grammarly and ChatGPT creates idealized perceptions of writing abilities, potentially leading to inflated self-assessments. This phenomenon aligns closely with Hyperpersonal Theory's assertion that mediated communication encourages idealized self-presentations and feedback loops, reinforcing user

dependency on mediated assistance rather than genuine skill acquisition.

Feedback loops established by continuous positive AI reinforcement amplify students' reliance on these tools, negatively affecting autonomous writing development, critical thinking, and creativity. Although AI effectively addresses surface-level corrections and coherence, it remains limited in supporting deeper cognitive processes essential for original idea generation and analytical depth. This finding emphasizes AI's dual role: as a powerful facilitator of technical writing enhancements but simultaneously a potential hindrance to genuine cognitive skill development.

Given these insights, practical recommendations are crucial for balanced and responsible AI integration. Firstly, institutional guidelines must be developed to govern ethical AI use clearly, transparently defining boundaries to prevent plagiarism and uphold academic integrity. Clear policies from universities like Harvard and Stanford offer valuable precedents, emphasizing transparency, proper attribution, and balanced AI integration to mitigate ethical dilemmas and potential misuse.

Secondly, educational fairness demands equitable AI access across diverse student populations. Institutions must ensure all students, regardless of their academic backgrounds or language proficiency, benefit equally from AI tools, thus preventing educational disparities stemming from unequal AI access or usage.

Most importantly, AI tools should complement, not replace, traditional teaching methods. Educators must actively integrate AI into classroom practices, fostering critical engagement with AI-generated feedback to cultivate deeper analytical skills and original thinking. Combining AI's immediate, precise feedback with traditional pedagogical strategies—such as in-depth discussions, peer evaluations, and instructor-led critical analyses—can enhance students' comprehensive academic writing competencies.

In summary, effectively integrating AI into academic writing instruction requires careful consideration of ethical frameworks, equitable practices, and a balanced pedagogical approach. Institutional guidelines combined with traditional teaching methodologies can maximize AI's educational benefits while safeguarding cognitive development, originality, and academic integrity.

6. Conclusion

This research explored the impact of AI tools on academic writing skills among students and lecturers at Xiamen University Malaysia (XMUM), guided by the Hyperpersonal Communication Theory. Findings revealed significant improvements in students' writing performance, particularly in grammar, coherence, and overall structural quality. Notably, students with weaker baseline writing skills benefited disproportionately from AI, highlighting its potential to bridge educational disparities.

However, qualitative insights underscored critical concerns. Overreliance on AI-generated feedback hindered deeper cognitive skill development, limiting creativity, critical thinking, and independent writing abilities. Additionally, ethical dilemmas, including originality, plagiarism, and proper attribution, emerged due to a lack of clear institutional guidelines. Lecturers and students alike recognized AI's dual-edged nature, stressing the necessity for balanced integration strategies.

The study's implications emphasize the importance of developing comprehensive institutional policies governing AI use, promoting ethical transparency, equitable access, and responsible practices. Educational institutions should establish clear guidelines based on successful precedents from renowned universities to mitigate potential risks associated with AI tools. Furthermore, integrating AI tools with traditional pedagogical methods is vital. Educators should leverage AI's strengths in technical refinement while actively nurturing students' higher-order cognitive skills. This balanced approach will maximize educational benefits, enhance students' critical and creative capabilities, and maintain academic integrity.

Despite limitations such as sample size and scope, this study provides valuable insights into AI's role in academic writing. Future research should expand on longitudinal impacts and investigate interdisciplinary applications. In conclusion, careful, ethically informed AI integration combined with robust educational frameworks will ensure academic writing continues to evolve effectively and responsibly within higher education contexts.

Disclosure statement

The authors declare no conflict of interest.

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