

Exploring the Influence of Microsoft Copilot on the Writing Proficiency of ESL Learners in Academic Writing

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ABSTRACT

The increasing use of Generative AI in education has transformed academic writing support for ESL learners. This study examines the impact of Microsoft Copilot, an Artificial Intelligence-powered writing assistant, on the academic writing performance of pre-university students preparing for MUET. Using a quasi-experimental mixed-methods approach, the study compares learners who used Microsoft Copilot with those who followed conventional writing practices. Findings indicate that Copilot enhanced learners' academic writing by improving grammar, vocabulary, idea development, and text organization. Participants also reported greater confidence and motivation due to the tool's instant feedback and writing assistance. However, concerns regarding overreliance on AI-generated content and academic integrity were identified. The study highlights the potential of Microsoft Copilot as a supplementary tool for improving ESL academic writing while emphasizing the importance of ethical AI use and responsible pedagogical integration.

Keywords: Microsoft Copilot, Artificial Intelligence, ESL Learners, Academic Writing, Generative AI, Academic Integrity, MUET.

INTRODUCTION

English is an essential component of the Malaysian school curriculum due to its importance in academic and workplace contexts. However, recent SPM examination data show a persistent gap in English proficiency, with fewer students obtaining high grades and a substantial number displaying only moderate mastery of the language (Edu Advisor, 2023). The ability to write academically is a fundamental skill in higher education and is especially important for students learning English as a Second Language (ESL). In Malaysia, proficiency in English writing is emphasized in the national curriculum and is assessed through the Malaysian University English Test (MUET), a key requirement for university admission and graduation. In a similar vein, the Malaysian University English Test (MUET), which measures learners' competencies across the four language skills, points to substantial inequalities in academic writing performance. Data from 2022 indicate that only a marginal percentage of candidates attained the highest proficiency bands, with the majority performing at moderate or basic levels (Majlis Peperiksaan Malaysia, 2022). Nevertheless, academic writing remains a challenge for many pre-university students, who often face issues such as lexical limitations, grammatical inaccuracies, generating ideas, and the logical structuring of their written work (Ponnudurai & De Rycker, 2012). These challenges are further compounded by limited opportunities to practice English in authentic contexts, which may hinder language development and writing proficiency (Lin & Morrison, 2021).

The emergence of Artificial Intelligence (AI) and Generative AI technologies has introduced innovative approaches to language learning and academic writing. AI-powered writing assistants are increasingly being used to provide real-time feedback, language support, and personalized learning experiences. Among these tools, Microsoft Copilot has gained attention as an advanced AI writing assistant that employs Large Language Model (LLM) technology to assist users with idea generation, grammar correction, vocabulary enhancement, and text organization. According to (Seo, 2024), these features have the potential to support

ESL learners in overcoming common writing difficulties while promoting greater learner autonomy and engagement (Seo, 2024).

Existing research indicates that AI-assisted language learning tools can positively influence language acquisition and academic performance. Studies have shown that AI applications contribute to improvements in vocabulary development, language proficiency, and writing quality among English language learners (Junaidi, 2020; Xu et al., 2025; Hsu et al., 2023). Recent findings also suggest that students frequently use AI tools such as Grammarly, ChatGPT, and Quill Bot for grammar correction, paraphrasing, and enhancing clarity in academic writing tasks. These tools help learners produce written work more efficiently while receiving immediate feedback that supports continuous improvement. Despite these advantages, the growing use of AI in education raises concerns regarding overreliance on AI-generated content, originality of student work, and academic integrity. While AI tools can enhance writing productivity, overreliance on such technologies may reduce opportunities for independent thinking and critical writing potential. Therefore, the responsible and ethical integration of AI into educational settings remains paramount.

Although research on AI-assisted language learning continues to expand, limited studies have specifically examined the effectiveness of Microsoft Copilot in enhancing the academic writing proficiency of Malaysian pre-university ESL learners. Therefore, this study investigates the influence of Microsoft Copilot on MUET students' academic writing performance. Specifically, it examines how usage of Copilot contributes to improvements in writing quality and explores its implications for the ethical use of Generative AI in ESL education. The findings are expected to provide valuable insights for educators, learners, and policymakers seeking to integrate AI technologies effectively and responsibly into language learning environments.

Problem Statement and Objectives

Proficiency in academic writing is very challenging for Malaysian pre-university ESL learners, particularly those preparing for the Malaysian University English Test (MUET). Despite the importance of writing as a core academic skill, many learners continue to experience difficulties in vocabulary usage, grammatical accuracy, idea generation, and text organization, which negatively affect the quality of their written work (Ponnudurai & De Rycker, 2012). These challenges are further exacerbated by limited opportunities to use English authentically outside the classroom, restricting learners' ability to develop writing fluency and confidence (Lin & Morrison, 2021).

Recent advancements in Artificial Intelligence (AI) and Generative AI have introduced innovative tools that can support writing development through personalized feedback and language assistance. Microsoft Copilot, an AI-powered writing assistant, offers features such as idea generation, grammar correction, vocabulary enhancement, and text organization that may help learners improve their academic writing skills (Seo, 2024). Although previous studies have reported positive effects of AI-assisted learning tools on language proficiency and writing performance (Junaidi, 2020; Xu et al., 2025; Hsu et al., 2023), most research has focused on general AI applications such as ChatGPT, Grammarly, and QuillBot rather than Microsoft Copilot.

Furthermore, while AI writing tools have demonstrated potential in correcting writing efficiency and quality, concerns regarding overreliance on AI-generated content, reduced originality, and issues of academic integrity remain unresolved. Undue reliance on AI assistance may limit learners' critical thinking, creativity, and independent writing solutions, raising questions about the responsible integration of AI in educational settings. Despite the growing adoption of AI technologies in language learning, there is limited empirical evidence on the effectiveness of Microsoft Copilot in enhancing the academic writing proficiency of Malaysian pre-university ESL learners, particularly within the MUET context. Therefore, a gap exists in understanding how Microsoft Copilot influences learners' academic writing performance and how its use can be balanced with ethical considerations and academic integrity. Addressing this gap is essential for informing educators, policymakers, and institutions about the effective and responsible use of Generative AI in ESL writing instruction.

LITERATURE REVIEW

MUET Scoring Priorities and AES Evidence

MUET Scoring Priorities and AES Evidence: The MUET writing rubric emphasizes accuracy, appropriacy, coherence/cohesion, language functions, and task fulfilment. Wong and Bong's (2021) Intelligent Essay Grader (IEG) provides empirical evidence on which features most strongly predict MUET scores. Positive predictors include vocabulary count, advanced parts of speech, and paragraph length, while grammar and spelling error rates are strong negative predictors. Error rates rather than raw counts are most predictive. Global semantic coherence at the paragraph level is beneficial, whereas excessive sentence-level overlap may reduce scores. These findings imply that Copilot interventions should target lexical richness, syntactic variety, paragraph structure, and error reduction rather than only surface proofreading.

MUET WRITING SCORE PREDICTION AND AI INTERVENTION MODEL (based on Wong & Bong, 2021)

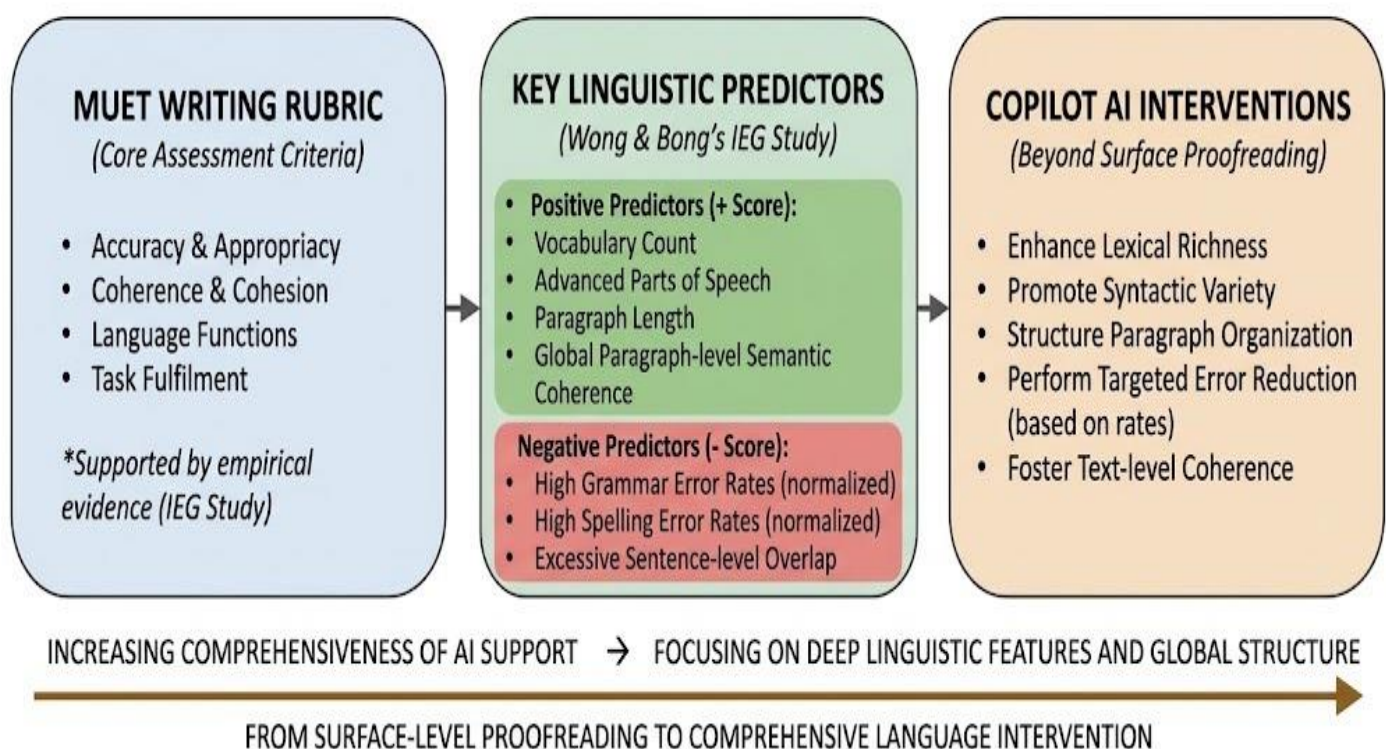


Figure 1. MUET Writing Score Prediction and AI Intervention Model (based on Wong & Bong, 2021)

Use AI in Writing Instruction

Recent studies indicate that Generative AI (GenAI) tools such as ChatGPT and Microsoft Copilot can enhance writing quality, efficiency, and learner autonomy. Noy and Zhang (2023) reported that ChatGPT reduced writing time by 40% and improved writing quality by 18%, while Usdan et al. (2024) found that graduate students using GenAI completed writing tasks more efficiently and achieved higher academic performance. For ESL learners, AI-assisted writing tools have been shown to improve grammar, vocabulary, organization, and overall writing quality (Mahapatra, 2024; Jaramillo et al., 2025).

Studies by Hsu et al. (2023), Xu et al. (2025), and Junaidi (2020) further demonstrated that AI-supported language learning enhances vocabulary acquisition, language proficiency, and writing performance. Similarly, Alm (2024) and Aljuaid (2024) highlighted the role of AI in promoting learner autonomy, revision skills, and writing development when supported by appropriate instructional guidance. Taskiran and Goksel (2023) also found that AI-driven feedback systems effectively improved grammar and vocabulary outcomes in large ESL classes.

The growing adoption of AI tools is evident among students, who frequently use applications such as Grammarly, ChatGPT, and QuillBot for grammar correction, paraphrasing, and improving clarity in academic writing. These tools enable learners to produce higher-quality written work while receiving immediate feedback that supports continuous improvement.

The effectiveness of AI tools also aligns with MUET writing assessment criteria. Research indicates that AI-assisted writing can improve language accuracy, vocabulary use, coherence, organization, and task fulfillment, all of which are key components of MUET scoring (Jaramillo et al., 2025; Zhao, 2025). Furthermore, AI tools support self-regulated learning and efficient revision, enabling students to manage writing tasks more effectively.

Overall, the literature suggests that Microsoft Copilot and other Generative AI tools have significant potential to enhance academic writing proficiency for ESL learners, particularly in grammar, vocabulary, organization, and writing productivity. However, their effectiveness depends on responsible use and appropriate pedagogical guidance to ensure the development of independent writing skills and academic integrity.

Implications of GenAI Studies for MUET Students

Evidence from both global and local studies suggests that Generative AI (GenAI) tools such as Microsoft Copilot can positively support MUET writing performance. Research indicates that AI can improve writing productivity by reducing drafting time and allowing students to focus more on revision and exam preparation (Noy & Zhang, 2023; Usdan et al., 2024). AI-assisted writing tools also enhance grammatical accuracy, vocabulary usage, and sentence construction, helping ESL learners produce higher-quality academic writing (Mahapatra, 2024; Jaramillo et al., 2025).

In addition, GenAI supports better organization and coherence by helping learners structure ideas logically and improve the flow of their essays. These benefits are particularly valuable for lower-proficiency learners, as AI tools can provide scaffolding that narrows performance gaps in mixed-ability classrooms (Choi & Schwarcz, 2023). Many students also perceive AI as a supportive learning companion, which increases confidence, motivation, and willingness to engage in writing tasks (Kim et al., 2024).

To fully leverage the benefits of AI, users must cultivate both AI literacy and ethical awareness. The risks of overdependence on AI-generated content, the dissemination of inaccurate information, and potential violations of academic integrity underscore the necessity for students to critically assess and refine AI-generated outputs (Kasneci et al., 2023). Consequently, educators play a vital role in fostering the responsible and autonomous use of AI among learners. Overall, Microsoft Copilot aligns closely with MUET assessment criteria, including language accuracy, organization, mechanics, and task fulfilment. When integrated responsibly, it has the potential to enhance writing quality, improve learner confidence, and support academic writing progress among MUET candidates.

Pedagogical Implications

The literature indicates that generative AI tools such as Microsoft Copilot can improve MUET students' writing proficiency, accuracy, and confidence when implemented in teacher-guided, scaffolded learning environments. In this study, Copilot is aligned with MUET assessment criteria by supporting key writing dimensions, including grammatical accuracy, vocabulary use, coherence, cohesion, and task fulfilment. A structured drafting and revision process is emphasized, involving initial independent writing, AI-assisted feedback, student revision, peer review, and teacher evaluation. This approach maintains learner autonomy while enhancing writing quality. Previous studies have shown that digital and AI-supported learning environments increase student engagement, writing output, revision practices, and confidence. Research further highlights the importance of teacher mediation, learner autonomy, and instructional scaffolding in maximizing AI's educational benefits. However, scholars also emphasize the need for AI literacy and ethical awareness to prevent overreliance on AI-generated content and to uphold academic integrity in high-stakes assessments such as MUET.

Model of Educational Factors for MUET-style Writing Engagement and AI Integration



Figure 2. Model Writing of educational Factors for MUET-style writing engagement and AI Integration

THEORETICAL UNDERPINNINGS

Second Language Acquisition (SLA) Theory

This study is grounded in Second Language Acquisition (SLA) Theory, which explains how learners acquire a second language through exposure, interaction, feedback, and meaningful practice. According to Krashen (1992), language acquisition occurs when learners are provided with comprehensible input that is slightly above their current proficiency level. In writing instruction, timely feedback and opportunities for revision play a critical role in facilitating language development.

Microsoft Copilot supports SLA by providing immediate feedback on grammar, vocabulary, sentence structure, and idea development. Through AI-generated suggestions, learners receive comprehensible language input and corrective feedback that can help them identify and address weaknesses in their writing. This continuous interaction enables learners to refine their language use, improve accuracy, and develop greater confidence in academic writing.

Furthermore, Long's (1996) Interaction Hypothesis highlights the importance of interaction and negotiation of meaning in language learning. Although Copilot is not a human tutor, it creates an interactive learning environment where learners can engage in iterative writing, receive feedback, and revise their work. This process encourages active learning and supports the development of writing proficiency among ESL learners.

ECAM Model

Consequently, a comprehensive understanding of human thinking and learning necessitates examining the environments and contexts in which these activities occur, with reference to the ECAM model of mediation (Abdul Rahim, 2007). The study is further supported by the ECAM Model, which consists of four interconnected stages: Exploration, Construction, Application, and Metacognition. The model promotes student-centered learning by encouraging learners to actively generate and apply knowledge while engaging in continuous reflection on their learning experiences.

Exploration

During the exploration stage, learners investigate and generate ideas for writing tasks. Microsoft Copilot facilitates this process by assisting students in brainstorming topics, generating outlines, and exploring

different perspectives related to essay questions. This support is particularly beneficial for ESL learners who struggle with idea generation and content development.

Construction

The construction stage involves developing understanding and creating written content. Copilot assists learners in constructing sentences, improving vocabulary usage, correcting grammatical errors, and organizing ideas coherently. Through guided support, learners can build stronger academic writing skills while maintaining ownership of their work.

Application

Application refers to the use of acquired knowledge in authentic learning contexts. In this study, students apply language skills to complete MUET writing tasks using Copilot as a writing aid. By practicing academic writing in a structured environment, learners strengthen their ability to communicate ideas effectively and meet assessment requirements.

Metacognition

Metacognition involves reflection, self-monitoring, and self-regulation of learning. Microsoft Copilot supports metacognitive development by enabling students to review feedback, evaluate AI-generated suggestions, and revise their writing accordingly. This process promotes learner autonomy and encourages students to become more aware of their writing strengths and weaknesses.

Generative AI in Learning

The integration of Generative Artificial Intelligence (GenAI) is also informed by constructivist learning principles, which emphasize active knowledge construction through interaction and reflection. AI-powered tools, namely Microsoft Copilot, are learning aids that provide personalized support and instant feedback. Rather than replacing the learner, Copilot serves as a scaffold that helps students improve writing quality, enhance language proficiency, and develop self-regulated learning skills.

However, the use of GenAI must be balanced with ethical considerations. Issues related to overreliance on AI-generated content, originality, and academic integrity highlight the importance of responsible AI use. Therefore, this study views Copilot as a supplementary educational tool that should support, rather than replace, learners' critical thinking and independent writing abilities.

Conceptual Link to Study

Drawing on Second Language Acquisition (SLA) Theory and the ECAM Model, the theoretical framework posits that integrating Microsoft Copilot (Generative AI) into ESL instruction can facilitate language acquisition by providing immediate feedback, language scaffolding, and opportunities for reflection and metacognitive regulation. These affordances are expected to support ESL learners in developing academic writing proficiency, particularly in grammatical accuracy, vocabulary use, idea generation, coherence and organization, and overall writing quality. However, the framework also emphasizes that the effective integration of Generative AI must be accompanied by strategies that uphold academic integrity and learner autonomy, ensuring that Microsoft Copilot functions as a supportive learning tool rather than a substitute for learners' critical thinking, originality, and independent learning.

The Proposed Conceptual Model: SLA Theory, ECAM, and Generative AI in Learning

Drawing on the reviewed literature and theoretical underpinnings, the proposed **SLA-ECAM-Generative AI Model** conceptualises the academic writing process among ESL learners as a collaborative interaction between language learning processes, pedagogical practices, and AI-assisted support. Grounded in **Second Language Acquisition (SLA) Theory** and guided by the **ECAM framework**, the model posits that learners develop writing proficiency through active exploration, knowledge construction, practical application, and

metacognitive reflection. The integration of Microsoft Copilot is hypothesised to enhance this process by providing immediate feedback, linguistic support, and content-generation assistance that foster improvements in grammar, vocabulary, coherence, and overall text quality. Central to the model is the premise that AI functions as a complementary learning tool rather than a replacement for human cognition, emphasising learner agency, critical evaluation, and responsible AI use. The proposed conceptual framework is illustrated in **Figure 2**, followed by a discussion of its key variables and proposed relationships.

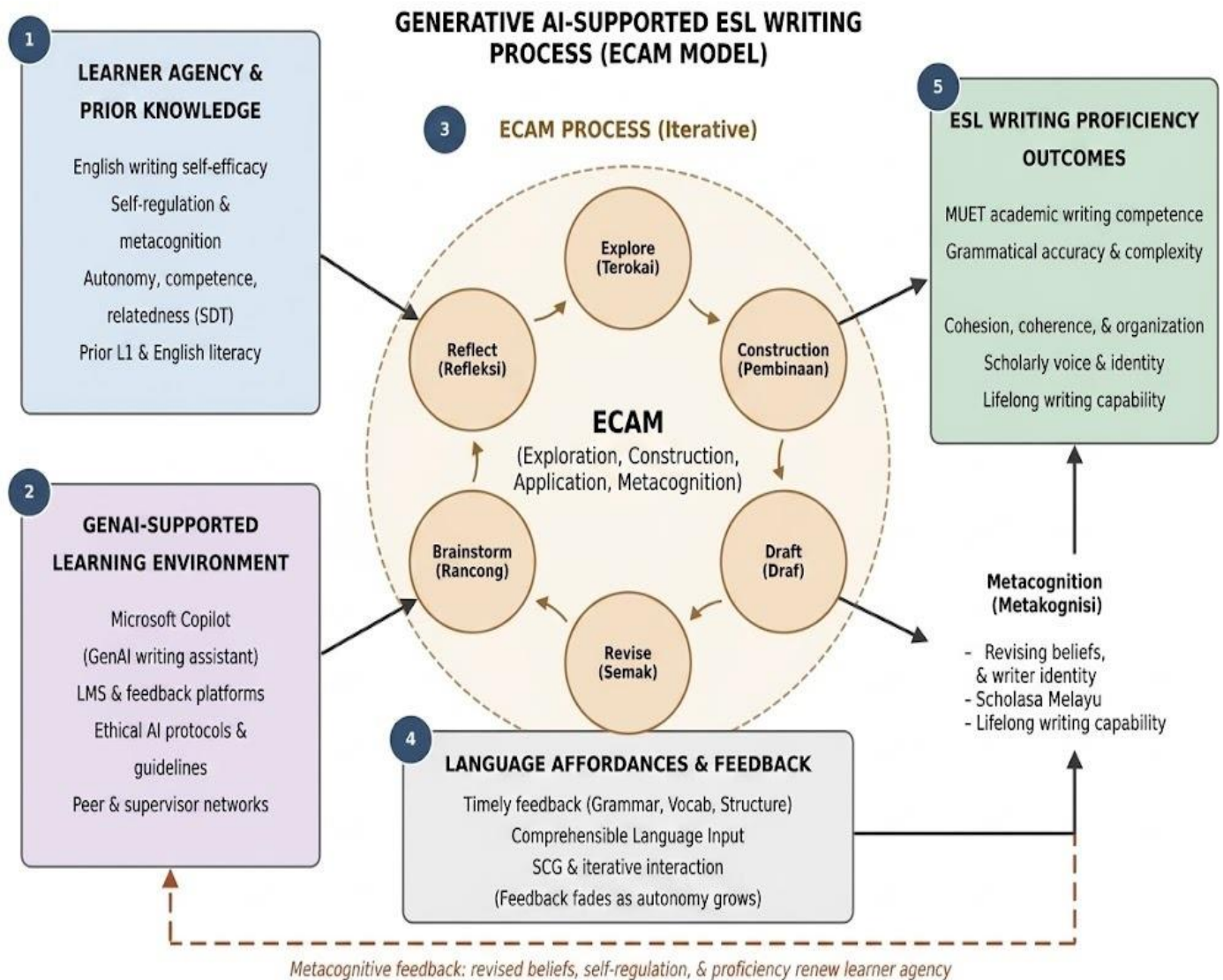


Figure 2. The Generative AI-Supported ESL Writing Process for MUET (conceptual model)

The Generative AI-Supported ESL Writing Process (ECAM Model) is initiated by two foundational inputs: Learner Agency & Prior Knowledge (encompassing English writing self-efficacy, self-regulation, prior L1 and English literacy, and Self-Determination Theory constructs like autonomy and competence) and the GenAI-Supported Learning Environment (utilizing tools such as Microsoft Copilot, LMS platforms, ethical AI protocols, and peer/supervisor support networks). These elements drive the central, iterative ECAM Process (Exploration, Construction, Application, Metacognition), which guides writers through a six-stage cyclical workflow: Explore, Construction, Draft, Revise, Brainstorm, and Reflect to scaffold the drafting and ideation process.

Throughout this cycle, the learner is supported by Language Affordances & Feedback, which delivers timely guidance on grammar, vocabulary, and sentence structure alongside comprehensible language input, gradually fading scaffolding as learner autonomy expands. This process fosters Metacognition, enabling the revision of beliefs and the development of a resilient writer identity leading directly to target ESL Writing

Proficiency Outcomes. These final competencies include MUET academic writing expertise, grammatical accuracy, cohesion, organization, scholarly voice, and lifelong writing capability; a continuous metacognitive feedback loop renews learner agency and refines future interactions within the AI-supported environment.

Table 1. Table of Generative AI-supported ESL writing process using the ECAM Model, contextualized for MUET

ECAM Stage (Element)	Generative AI (e.g., Copilot) Affordances	Representative MUET English Writing Activities
Exploration	Topic brainstorming and outline generation; perspective exploration for arguments; definition and example look-ups.	Analyzing MUET writing prompts (Task 1 Report or Task 2 Essay); brainstorming arguments and counterarguments; exploring relevant themes and vocabulary for the given topic.
Construction	Sentence-level scaffolding; vocabulary suggestions (synonyms, collocations); grammar and syntax correction; organization tips.	Drafting the MUET essay or report; developing topic sentences; connecting paragraphs with transitions; finding precise academic words to express ideas.
Application	Iterative writing partner; real-time feedback loop; context-aware text generation for specific genres (e.g., formal essay).	Formally completing the MUET Task 1 data analysis report or Task 2 persuasive essay using AI as a tool for refinement. Applying learnt structures to a timed practice.
Metacognition	Analyzing generated suggestions; evaluating stylistic options; asking follow-up questions for deeper understanding; tracking edits.	Reviewing and revising a MUET draft based on Copilot's feedback; critically selecting which AI suggestions to accept; identifying personal grammar errors or weaknesses to address.

The initial stages of the framework focus on idea development and structural composition, beginning with Exploration, where Generative AI (such as Copilot) facilitates brainstorming, outline generation, perspective discovery, and vocabulary insight. Generative AI is an advanced branch of artificial intelligence that generates new content, such as text, images, audio, and other media, by learning underlying patterns and relationships from vast collections of existing data (Solanki & Khublani,). In corresponding MUET writing activities, learners analyze Task 1 (Report) or Task 2 (Essay) prompts, explore key thematic vocabulary, and generate balanced arguments alongside counterarguments. Moving into Construction, the AI serves as a sentence-level scaffold that offers organization tips, grammar corrections, synonyms, and collocations, directly aiding students in drafting their essays, formulating coherent topic sentences, integrating transitional devices, and selecting precise academic terminology.

The subsequent phases shift toward production and reflective evaluation, starting with Application, where GenAI acts as an iterative writing partner, providing real-time feedback loops and genre-specific text generation. This enables learners to complete MUET Task 1 data analysis reports or Task 2 persuasive essays, applying refined structures effectively even within timed practice conditions. Finally, Metacognition engages students in analyzing AI suggestions, comparing stylistic alternatives, asking follow-up inquiries, and tracking modifications; through these reflective activities, writers critically decide which recommendations to adopt, review drafts against targeted feedback, and diagnose personal grammatical weaknesses to build autonomous writing skills.

DISCUSSION AND IMPLICATIONS

Theoretical Implications

This study contributes to the growing body of knowledge on Artificial Intelligence (AI)-assisted language learning by extending the application of Second Language Acquisition (SLA) Theory within technology-enhanced learning environments. The findings support the view that language acquisition can be facilitated through continuous interaction, immediate feedback, and meaningful language practice provided by Generative AI tools such as Microsoft Copilot. The study demonstrates how AI can function as a source of comprehensible input and corrective feedback, two fundamental principles of SLA theory. Despite enabling more cost-effective and scalable solutions, generative AI can introduce inherent biases and potentially weaken individuals' capacity for creative thought (Terblanche et al., 2022; Graßmann & Schermuly, 2021).

The study also enriches the application of the ECAM (Exploration, Construction, Application, and Metacognition) framework by illustrating how Generative AI can support each stage of the learning process. Through idea generation, text construction, writing practice, and reflective revision, Microsoft Copilot facilitates learner engagement and self-regulated learning. The integration of AI within the ECAM framework provides a contemporary perspective on student-centered learning and expands existing theoretical understandings of digital language learning.

Furthermore, the proposed SLA-ECAM-Generative AI Model contributes a conceptual framework for understanding the relationship between AI-assisted writing support and academic writing proficiency. The model highlights the interconnected roles of technology, learner autonomy, and language development, thereby offering a foundation for future research on AI-supported ESL writing instruction.

Practical and Pedagogical Implications

The findings suggest that Microsoft Copilot can serve as an effective supplementary tool for improving the academic writing skills of ESL learners, particularly in grammar, vocabulary usage, idea generation, and text organization. For students preparing for high-stakes examinations such as MUET, AI-assisted writing tools can provide immediate feedback and personalized guidance that may not always be available in traditional classroom settings.

Furthermore, institutional initiatives that provide subsidized or universal access to premium features can foster greater educational equity by ensuring that all learners, regardless of economic constraints, can leverage these digital tools to strengthen their writing competence (Rahman et al., 2023). From a pedagogical perspective, educators can incorporate Microsoft Copilot into writing conventions to support the ECAM learning cycle. During the exploration stage, students can use Copilot to brainstorm and develop ideas. During construction and application, the tool can assist with drafting, vocabulary enhancement, and text organization. During metacognition, learners can review AI-generated suggestions, reflect on their writing, and revise their work independently.

The findings also indicate the importance of fostering learner autonomy and self-regulated learning. Rather than replacing teachers, Microsoft Copilot can complement classroom instruction by providing continuous writing support outside class hours. This approach may increase student confidence, motivation, and engagement in academic writing tasks.

However, educators should provide explicit guidance on the critical evaluation of AI-generated content. Students must be encouraged to analyze, modify, and justify AI suggestions rather than accept them uncritically. Such practices can promote critical thinking and independent writing skills while minimizing overreliance on AI technologies.

Policy Implications

The increasing adoption of Generative AI tools in education highlights the need for clear institutional and national policies governing their use in teaching, learning, and assessment. The findings suggest that

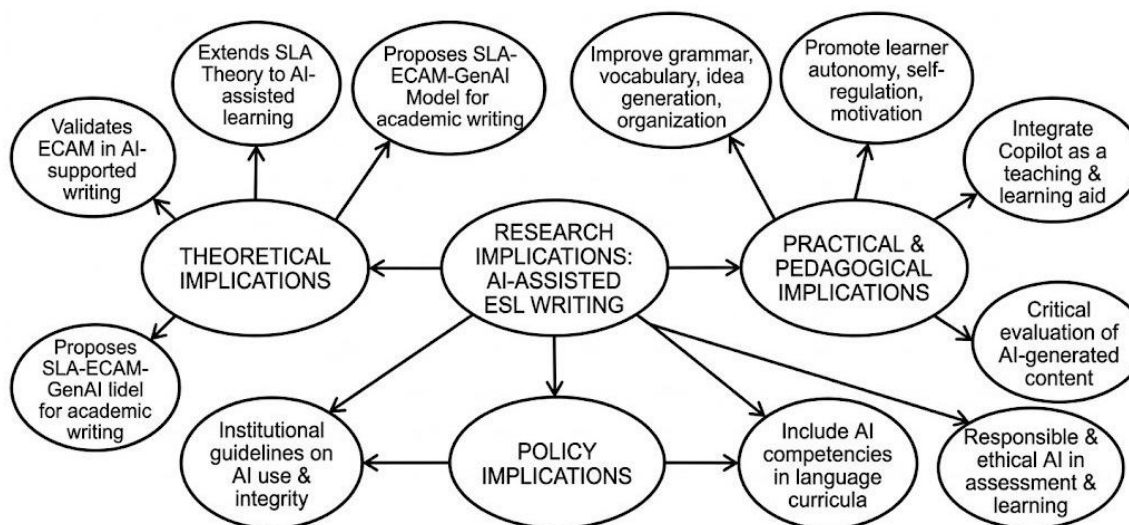
educational institutions should develop comprehensive guidelines that define acceptable uses of AI-assisted writing tools while protecting academic integrity and originality.

At the institutional level, schools and universities should establish AI literacy programmes to equip students and educators with the skills required to use Microsoft Copilot and similar technologies responsibly. Training should focus on ethical use of AI, critical evaluation of AI-generated outputs, citation practices, and the limitations of Generative AI systems. Educational institutions and instructors should take an active role in embedding digital tools within academic curricula. Well-designed workshops and experiential training sessions can equip students with the knowledge and skills needed to utilize applications such as Grammarly and ChatGPT effectively, while also reducing potential issues associated with excessive reliance and ethical challenges (Ozfidan et al., 2024).

For curriculum developers and policymakers, the findings support the inclusion of AI competencies in English language and digital literacy curricula. Such integration would ensure that learners are prepared for future academic and professional environments where AI technologies are increasingly prevalent. In the context of MUET and other language assessments, policymakers may also consider developing guidelines that clarify the role of AI tools in writing preparation and assessment practices.

Finally, policymakers should promote a balanced approach that encourages innovation while safeguarding educational values. AI tools should be positioned as learning aids that enhance writing development rather than substitutes for genuine learning. Clear ethical frameworks and quality assurance mechanisms will be essential to ensure that the benefits of Generative AI are realised without compromising academic standards and integrity.

Figure 3. Summary Implications



LIMITATIONS OF THE STUDY

This study is limited to pre-university ESL learners preparing for MUET in Malaysia; therefore, the findings may not be generalizable to other learner groups or educational contexts. The study focuses exclusively on Microsoft Copilot, and the results may not extend to other AI writing tools with different functionalities. Additionally, the investigation centers on selected aspects of writing proficiency, namely grammar, vocabulary, idea generation, coherence, and organization, while higher-order skills such as creativity and critical thinking are beyond its scope. The relatively short intervention period restricts conclusions regarding the long-term effects of AI-assisted writing. Variations in participants' digital literacy, English proficiency, motivation, and learning preferences may also influence the outcomes. Furthermore, learner perceptions were obtained through self-reported reflections and interviews, which may be subject to response bias.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research should investigate the effectiveness of Microsoft Copilot across diverse learner populations and educational contexts, its pedagogical value, and inform its effective implementation in teaching and learning. Although AI tools offer considerable benefits, their successful integration requires both AI literacy and ethical awareness. Concerns about reliance on AI-generated content, inaccuracies in generated information, and threats to academic integrity emphasize the need for students to critically evaluate, verify, and refine AI-generated outputs before incorporating them into their academic work.

The generalizability of the present findings is constrained by the specific context in this study, highlighting the need for further research in different educational settings and among learner groups. Comparative investigations of AI applications such as ChatGPT, Gemini, Grammarly, and Microsoft Copilot could yield valuable insights into their relative effectiveness in supporting writing development. Longitudinal studies are also necessary to examine the long-term effects of AI-assisted writing on language acquisition, writing proficiency, and learner autonomy. Furthermore, future research should explore the influence of Copilot on higher-order writing abilities, including critical thinking, creativity, argumentation, and academic reasoning. Examining the relationships between AI use, learner motivation, self-regulated learning, and writing performance would further enhance understanding of AI-supported learning processes. Additionally, studies addressing ethical AI practices, academic integrity, and institutional governance are essential for guiding responsible AI adoption in education. Finally, the proposed SLA-ECAM-Generative AI Model should be tested and validated across a range of educational environments to strengthen its theoretical foundation and practical applicability.

CONCLUSION

This study investigated the impact of Microsoft Copilot, a generative AI-powered writing assistant, on the academic writing proficiency of Malaysian pre-university ESL students preparing for the Malaysian University English Test (MUET). Guided by Second Language Acquisition (SLA) Theory and the ECAM framework, the findings indicate that Copilot can support improvements in grammatical accuracy, vocabulary development, idea generation, coherence, and overall text organization. Additionally, its use was associated with enhanced learner confidence, motivation, and self-directed learning. Nevertheless, concerns about excessive reliance on AI-generated content, issues of originality, and potential violations of academic integrity emphasize the importance of ethical and responsible AI use. Overall, the study suggests that Microsoft Copilot can serve as an effective supplementary tool in ESL academic writing instruction when implemented within sound pedagogical approaches that foster critical thinking, learner autonomy, and responsible engagement with artificial intelligence.

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