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The Use of Generative AI Tools in English Academic Writing: Implications for Teaching and Learning

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Abstract

The rapid emergence of generative artificial intelligence (AI) tools has significantly influenced academic writing practices in higher education. This study investigated the impact of generative AI tools on the quality of English academic writing and examined their implications for teaching and learning. A mixed-methods research design was employed, involving pre-test and post-test writing tasks, a structured questionnaire, and semi-structured interviews with university students and instructors. Quantitative findings revealed a statistically significant improvement in students' writing performance after the guided use of generative AI tools, particularly in grammar, vocabulary, and organisational structure. Qualitative results indicated generally positive perceptions among students, who reported increased writing confidence and enhanced idea generation. However, concerns related to overreliance and academic integrity were also identified, particularly among instructors. The findings suggest that generative AI can serve as an effective instructional support tool when integrated within a structured pedagogical framework that emphasises ethical use and critical engagement. The study highlights the importance of AI literacy, balanced instructional design, and institutional guidelines to ensure that technological innovation supports rather than replaces independent academic writing skills.

Keywords: Generative Artificial Intelligence, Academic Writing, English Language Learning, Pedagogical Implications, Educational Technology

Introduction

The use of generative artificial intelligence tools in English academic writing has gained significant attention in recent years, particularly with the emergence of large language models capable of producing coherent and contextually appropriate texts. These tools are increasingly used by students to support drafting, revising, and editing academic work. Research indicates that generative AI can enhance grammatical accuracy, lexical choice, cohesion, and overall organisation of academic texts, especially for second language writers (Mahmood et al., 2025; Mekheimer, 2025). However, scholars also caution that excessive reliance on AI-generated output may reduce students' engagement with critical thinking and independent writing processes, raising concerns about originality and academic integrity (Rodafinos, 2025).

From a teaching perspective, generative AI presents both pedagogical opportunities and challenges. Educators can integrate AI tools to provide timely and individualised feedback, allowing instructors to focus more on higher-order writing skills such as argumentation, critical analysis, and disciplinary conventions. Studies suggest that when AI tools are embedded within guided instructional frameworks, they can promote learner motivation and confidence while supporting the writing development process (Zamorano, 2025). At the same time, teachers must address ethical considerations, including transparency, responsible use, and plagiarism prevention, by developing clear institutional policies and promoting AI literacy in academic writing instruction (Rodafinos, 2025).

For learners, generative AI tools function as scaffolding mechanisms that support idea generation, language refinement, and revision. Evidence shows that such tools can be

particularly beneficial for EFL and ESL learners who face linguistic challenges in academic writing, helping them meet academic expectations more effectively (Mekheimer, 2025). Nevertheless, concerns remain that uncritical use of AI may hinder the development of autonomous writing skills and reduce students' ability to construct original academic arguments. Therefore, the key implication for teaching and learning lies in fostering a balanced approach where generative AI is used as a supportive resource rather than a substitute for cognitive engagement and writer responsibility (Mahmood et al., 2025; Zamorano, 2025).

Significance of the Study

This study is significant because it addresses a rapidly emerging issue in English language education. As generative AI tools become increasingly accessible to students, understanding their impact on academic writing is essential for maintaining educational quality and integrity. The findings will help educators make informed decisions about how to integrate AI tools into writing instruction without compromising the development of critical thinking and independent writing skills.

The study will also contribute to the field of applied linguistics and educational technology by providing empirical evidence on the pedagogical value and limitations of generative AI in academic contexts. It may guide curriculum designers in developing AI-informed teaching frameworks that promote responsible and effective use of technology.

Finally, the research will support policy development at the institutional level by identifying ethical considerations and practical strategies for AI integration. This is particularly relevant in contexts where English is taught as a second or foreign language, and students may rely heavily on technological support to meet academic writing standards.

Research Questions

How does the use of generative AI tools influence the quality of English academic writing among university students?

What are students' and teachers' perceptions of integrating generative AI tools into academic writing instruction?

What pedagogical implications does the use of generative AI tools have for teaching and learning English academic writing?

Research Objectives

To examine the impact of generative AI tools on the linguistic and structural quality of students' English academic writing.

To investigate students' and instructors' attitudes toward the use of generative AI in academic writing tasks.

To explore effective instructional strategies for integrating generative AI tools into English academic writing classrooms.

Literature Review

A growing body of research shows that generative AI tools like ChatGPT and similar models are significantly influencing the way students approach academic writing. Evidence suggests that when integrated into writing tasks, these tools can support improvements in text quality, idea generation, and language organisation across a

range of learners. For example, studies indicate that AI can contribute to enhanced coherence, lexical richness, and argumentative structure in student writing, while also serving as a resource for immediate feedback and iterative revision (Eslami et al., 2026). At the same time, scholars highlight a critical balance between AI support and the development of great cognitive skills, noting that overreliance on generative output may reduce engagement in independent critical thinking and writing processes (Mahmood et al., 2025; Frontiers, 2025).

Another key area of research concerns the impact of AI-assisted feedback on writing development. A systematic review of generative chat feedback studies reports consistent findings that feedback via AI improves structure, grammar, and organisation in academic essays when compared to traditional feedback models (Baidoo-Anu & Ownsu Ansah, as cited in MDPI, 2025). These studies also show that hybrid models combining AI and teacher feedback can produce richer pedagogical outcomes, increasing student reflection and metacognitive awareness during revision (Solak, 2024; Lu et al., 2024; Banihashem et al., 2024). This indicates that generative AI can be an effective instructional aid when aligned with structured pedagogic frameworks that guide students on how to interpret and apply the feedback received.

Student attitudes toward generative AI in academic contexts provide another dimension of the literature. Survey research shows mixed perspectives: while many students are familiar with and frequently use generative AI tools, there is reluctance to embrace full-scale AI-generated writing, with a substantial proportion expressing concern about academic integrity and proper use. These findings underscore the importance of institutional policies that clearly define appropriate AI use to support learning without undermining academic standards (Student perspectives study, 2024).

The role of generative AI in motivation and learner engagement has also been highlighted by recent research. Studies in educational technology indicate that students often perceive AI assistance as motivating and confidence-building, particularly when tools help generate ideas, suggest vocabulary alternatives, or explain complex text structures (Elhag et al., 2025). However, evidence from some empirical work also shows that the relationship between AI use and motivation can vary by individual learner characteristics and instructional context, suggesting that technology alone is not sufficient to guarantee improved writing performance (Sun & Zhou, 2024). These studies point to the need for balanced instructional practices that integrate AI tools with explicit teaching on writing strategies.

Ethical and integrity concerns are a prominent theme in the literature on AI in academic writing. Research shows that both students and faculty worry about the potential misuse of AI for producing complete essays without substantive student engagement (Barrett & Pack, 2023). These concerns have led to calls for clearer guidelines at institutional levels that differentiate between ethically acceptable support and misuse that constitutes academic dishonesty (Barrett & Pack, 2023; student perspectives survey, 2024). Establishing clear boundaries and educating students about responsible AI use are seen as essential steps to maintain academic integrity while benefiting from AI-enhanced learning.

Finally, scholars are exploring how generative AI interacts with existing pedagogical models and writing instruction approaches. Recent work proposes new classroom designs where AI feedback is integrated with peer and instructor feedback in a complementary way, helping learners develop both technical and reflective writing skills (Zhu et al., 2025). Other research examines how active student engagement with

AI-generated text, such as modifying, reflecting on, and revising output, can lead to deeper learning outcomes and better writing quality than passive acceptance of AI suggestions alone (Yang et al., 2024; Jin et al., 2025). These studies suggest that instructional designs emphasising active AI engagement and critical evaluation may help mitigate risks and maximise the educational value of AI-assisted writing

Methodology

Research Design

This study adopts a mixed-methods research design to comprehensively examine the use of generative AI tools in English academic writing. The quantitative component measures the impact of AI tools on the quality of students' academic writing. In contrast, the qualitative component explores students' and teachers' perceptions and the pedagogical implications of AI integration. This design is appropriate because the first research question requires measurable writing outcomes, whereas the second and third research questions involve attitudes, experiences, and instructional practices.

Participants

The participants will consist of undergraduate university students enrolled in English academic writing courses and their course instructors. Approximately 60–80 students will be selected through purposive sampling to ensure that participants have experience with academic writing tasks. In addition, 5–8 English language instructors will participate in interviews to provide insights into pedagogical implications. All participants will provide informed consent before participation.

Instruments

To address Research Question 1, a pre-test and post-test writing task will be administered. Students will complete an academic essay without AI assistance (pre-test) and a similar essay task with guided AI support (post-test). Writing quality will be evaluated using an analytic scoring rubric assessing grammar, vocabulary, coherence, organisation, and argument development.

To address Research Question 2, a structured questionnaire will be distributed to students to examine their perceptions of generative AI use in academic writing. The questionnaire will include Likert-scale items measuring perceived usefulness, ease of use, confidence, and concerns about academic integrity. Semi-structured interviews will be conducted with selected students and instructors to gather deeper qualitative insights.

To address Research Question 3, classroom observations and instructor interviews will be conducted to explore instructional strategies used when integrating AI tools. Observation checklists will focus on how AI is introduced, monitored, and discussed during writing instruction.

Procedure

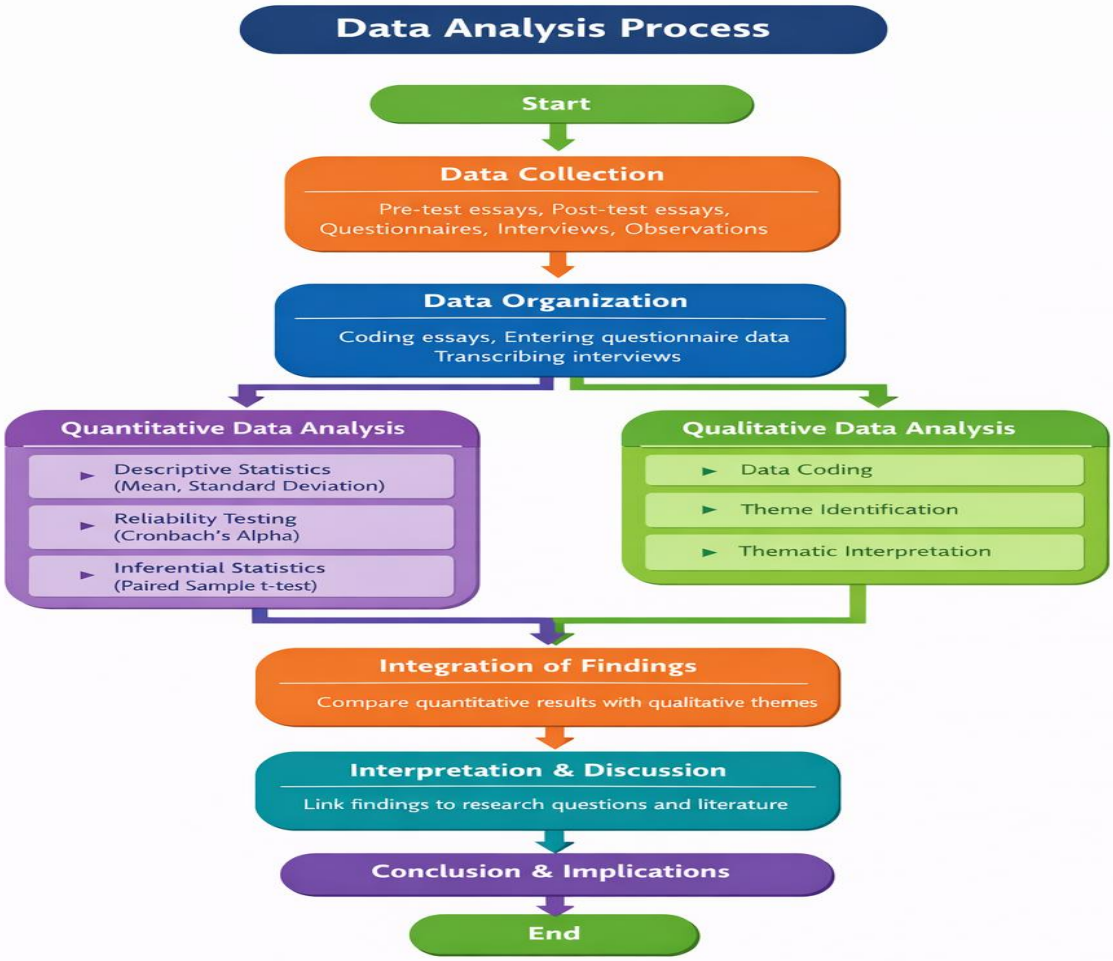
The study will be conducted over one academic semester. In the first phase, students will complete the pre-test writing task under controlled conditions without AI assistance. During the instructional period, students will receive guided training on how to use generative AI tools ethically and effectively for brainstorming, outlining, and revising. In the final phase, students will complete the post-test writing task using AI support within defined guidelines.

Following the writing tasks, questionnaires will be administered to all student participants. Interviews with selected students and instructors will then be conducted to gather qualitative data regarding perceptions and classroom practices.

Data Analysis Procedure

Quantitative data from the pre- and post-writing tests will be analysed using statistical methods. A paired sample t-test will be conducted to determine whether there is a statistically significant difference in writing quality before and after AI integration. Descriptive statistics (mean, standard deviation) will also be calculated for questionnaire responses. Qualitative data from interviews and classroom observations will be analysed using thematic analysis. Responses will be coded, categorised, and interpreted to identify recurring themes related to perceptions, benefits, challenges, and pedagogical strategies.

Figure 1



Ethical Considerations

The study will adhere to ethical research standards. Participants' identities will remain confidential, and data will be used solely for academic purposes. Students will be informed that participation is voluntary and that their academic grades will not be affected by their involvement in the study.

Data Analysis and Results

This section presents the analysis of the data collected to answer the research questions. Data from writing tasks, questionnaires, and interviews were processed using SPSS and thematic coding to provide both quantitative and qualitative insights. The chapter begins with descriptive statistics, followed by inferential analysis and thematic interpretation.

Descriptive Statistics

Writing Task Scores

Descriptive statistics for students' performance on the pre-test (without AI support) and post-test (with AI support) academic writing tasks are shown in Table 4.1. Scores were based on an analytic rubric assessing grammar, organisation, vocabulary use, and argument quality.

Table 1

Descriptive Statistics for Writing Task Scores
(N = 60)

Writing Task	Mean	SD	Minimum	Maximum
Pre-test	62.45	8.17	45	**85**
Post-test	71.82	7.63	55	**88**

Note. SD = standard deviation.

Descriptive results show an increase in writing scores after using generative AI tools, indicating improvement in written performance from pre-test to post-test.

Questionnaire Responses

Questionnaire items were grouped into four dimensions: perceived usefulness, ease of use, confidence, and concerns about academic integrity. Table 4.2 displays the mean scores and standard deviations for each dimension.

Table 2

Descriptive Statistics for Questionnaire Dimensions
(N = 60)

Questionnaire Dimension	Mean	SD
Usefulness	4.12	**0.58**
Ease of Use	4.05	**0.71**
Writing Confidence	3.89	**0.65**
Academic Integrity Concern	3.45	**0.83**

Results indicate generally positive perceptions of AI tools among students, particularly regarding usefulness and ease of use. Concerns about academic integrity were moderate.

Inferential Statistics

Paired Sample t-Test

A paired sample t-test was conducted to determine whether the differences between pre-test and post-test writing scores were statistically significant.

Table 3

Paired Samples t-Test for Writing Task Scores

Paired Comparison	Mean Difference	t	df	p
Post-test – Pre-test	9.37	10.21	59	**< .001**

The increase in post-test scores was statistically significant, suggesting that generative AI support had a positive impact on students' writing performance.

Reliability of Questionnaire Scales

Cronbach's alpha was calculated to assess internal consistency. All dimensions showed acceptable reliability ($\alpha > .70$), supporting the use of the questionnaire for further analysis.

Qualitative Data Analysis

Interview transcripts and classroom observation notes were coded using thematic analysis, focusing on perceptions of AI use and pedagogical implications. Themes were developed following established qualitative procedures and verified by multiple coders.

Themes from Student Interviews

Theme A: Enhanced Confidence and Idea Generation.

Many students reported that AI tools helped them generate ideas and navigate structural challenges in academic writing, aligning with previous findings that AI reshapes writing approaches and supports idea development.

Theme B: Concerns about Overreliance.

A recurrent concern was that some students became dependent on AI for sentence generation rather than engaging deeply with content, reflecting broader academic concerns about misuse and cheating.

Themes from Instructor Interviews

Theme C: Pedagogical Adjustment.

Instructors emphasised the need for structured AI integration into writing instruction, including guidance on ethical use and reflection on AI output.

Theme D: Assessment Challenges.

Educators noted difficulties in distinguishing AI-influenced writing from independent student work, echoing broader research on detection and policy issues.

Findings

This section presents the findings derived from quantitative and qualitative data analysis. The results are organised according to the three research questions of the study.

Impact of Generative AI Tools on the Quality of English Academic Writing

The first research question examined whether the use of generative AI tools significantly influenced students' academic writing performance. The quantitative results from the paired sample t-test revealed a statistically significant improvement in post-test scores compared to pre-test scores. The mean writing score increased from 62.45 in the pre-test to 71.82 in the post-test, with a mean difference of 9.37 points. The difference was statistically significant at $p < .001$, indicating that AI-assisted writing contributed positively to students' overall writing performance.

A closer analysis of rubric components showed improvements across all dimensions of writing. Grammar and sentence structure demonstrated noticeable enhancement, as students produced fewer syntactic and mechanical errors in the post-test essays. Vocabulary usage also improved, with students incorporating more academic and discipline-appropriate lexical items. In terms of organisation, post-test essays showed clearer thesis statements, better paragraph development, and improved logical transitions. Argument development scores increased moderately, suggesting that while AI supported structural and linguistic aspects effectively, critical reasoning still depended largely on student input.

These findings suggest that generative AI tools function as effective scaffolding devices, particularly in supporting lower-level writing skills such as grammar and cohesion, while also assisting in structural organisation. However, improvements in higher-order thinking skills appeared less pronounced compared to linguistic gains.

Students' and Teachers' Perceptions of Generative AI Integration

The second research question explored participants' perceptions of AI integration in academic writing. Questionnaire results indicated generally positive attitudes toward the use of generative AI tools. The highest mean score was recorded for perceived usefulness ($M = 4.12$), followed by ease of use ($M = 4.05$). Students reported that AI tools helped them generate ideas quickly, refine sentence structures, and reduce writing anxiety.

The writing confidence dimension also received a relatively high mean score ($M = 3.89$), suggesting that students felt more capable of completing academic writing tasks when AI support was available. Many students expressed that AI provided immediate feedback, which allowed them to revise drafts more effectively before submission.

However, concerns regarding academic integrity were moderately great ($M = 3.45$). Some students acknowledged the temptation to rely heavily on AI-generated content rather than producing original work. Interview data reinforced this finding, as several students admitted that without clear guidelines, AI use could blur the boundaries between assistance and authorship.

Instructor interviews revealed mixed perceptions. While teachers recognised AI as a valuable supplementary tool, they emphasised the need for structured guidance. Instructors expressed concern about assessing authentic student performance and distinguishing between independent writing and AI-supported output. Overall, both students and teachers acknowledged the potential of AI tools but stressed the importance of responsible and ethical use.

Pedagogical Implications for Teaching and Learning

The third research question focused on the pedagogical implications of integrating generative AI tools into academic writing instruction. Classroom observations and

interview data revealed several instructional adjustments made by teachers during the study.

First, instructors shifted their focus from correcting surface-level errors to emphasising higher-order skills such as argument strength, evidence integration, and critical analysis. Since AI tools handled many grammatical corrections, teachers reported having more time to discuss content quality and analytical depth.

Second, guided AI use emerged as a key strategy. Teachers who provided explicit instructions on how to use AI for brainstorming, outlining, and revising observed more meaningful student engagement. Students who were trained to critically evaluate AI-generated suggestions demonstrated better revision practices compared to those who passively accepted AI output.

Third, the findings indicated the need for AI literacy training. Both students and teachers emphasised the importance of teaching learners how generative AI works, its limitations, and ethical boundaries. Without structured guidance, students were more likely to misuse AI tools or become overly dependent on them. Overall, the findings suggest that generative AI can positively influence academic writing outcomes when integrated within a pedagogically sound framework. The results indicate measurable improvement in writing performance, generally positive student attitudes, and evolving instructional practices. However, the study also highlights the importance of maintaining academic integrity and fostering independent critical thinking alongside technological assistance.

Conclusion and Future Recommendations

This study examined the impact of generative AI tools on English academic writing and explored their implications for teaching and learning. The findings demonstrate that AI-supported writing tasks led to statistically significant improvements in students' overall writing performance, particularly in grammar, vocabulary use, and organisation. Students generally perceived generative AI as useful and supportive, reporting increased confidence and reduced writing anxiety. At the same time, concerns regarding overreliance and academic integrity were evident, especially among instructors who emphasised the need for structured implementation. These results suggest that generative AI can function as an effective pedagogical support tool when integrated thoughtfully, but it should not replace independent critical thinking or the development of higher-order writing skills.

Future research should investigate the long-term effects of generative AI use on students' cognitive development, originality, and academic identity. Longitudinal studies could provide deeper insight into whether continuous AI integration strengthens or weakens independent writing competence over time. Further research is also recommended across diverse educational contexts, particularly in ESL and EFL settings, to examine contextual differences in AI adoption and effectiveness. In practice, institutions should develop clear ethical guidelines, incorporate AI literacy training into writing curricula, and design instructional models that combine AI assistance with reflective and critical writing activities. Such balanced integration will help ensure that generative AI enhances learning while preserving academic integrity and intellectual growth.

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