



Integrating Chatgpt to Enhance Students' Academic Writing in EFL Context

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Article Info	Abstract
Received: 2026-04-07 Revised: 2026-05-19 Accepted: 2026-09-18 Keywords: ChatGPT; Academic Writing; Writing Performance; EFL Students; AI-Assisted Learning DOI: 10.24256/ideas.v14i2.11745 Corresponding Author: Zahwa Laila Fazia zahwalailafazia@gmail.com Faculty of Teacher Training and Education, Universitas Muhammadiyah Mataram, West Nusa Tenggara	<i>This study investigates the effectiveness of integrating ChatGPT as a writing support tool to enhance EFL students' academic writing performance. Although ChatGPT has increasingly been used in higher education, empirical evidence on its impact on measurable writing outcomes remains limited. To address this gap, this research employed a one-group pre-experimental pre-test and post-test design involving 22 third-semester students of an English Study Program who had completed foundational writing courses. During the pre-test, students produced an academic essay without ChatGPT. The intervention introduced learners to ChatGPT for generating ideas, planning, drafting, and revising. The post-test required students to write another essay using ChatGPT actively. Their essays were assessed using an analytical rubric covering content, organization, vocabulary, and grammar. The data were analyzed through descriptive statistics, normality testing, and a paired samples t-test. The findings revealed a substantial improvement, with mean scores increasing from 68.25 in the pre-test to 89.05 in the post-test, and a very large effect size (Cohen's $d = 1.69$). These results indicate that essays produced with active ChatGPT support scored significantly higher, reflecting AI-assisted writing performance rather than independent writing gains alone. The study concludes that ChatGPT serves as an effective supplementary tool in EFL writing instruction and suggests further research involving larger sample sizes and comparative experimental designs.</i>

1. Introduction

ChatGPT has become one of the most prominent AI-powered tools used in higher education because of its ability to generate human-like text (Joshi et al., 2025), provide immediate explanations, and support students in completing academic tasks (Imran & Almusharraf, 2024). In recent years, the use of ChatGPT has grown significantly among university students because it can simplify complex concepts, offer instant clarification, and provide examples of academic language use (Javaid et al., 2023). As digital learning practices become increasingly integrated into university settings (Zou et al., 2025), many EFL learners depend on tools that help them clarify concepts, explore alternative expressions, and receive instant feedback without waiting for teacher availability (Procel et al., 2024). This situation indicates that students are increasingly accustomed to seeking academic support through digital platforms, particularly for improving the quality of their academic writing (George et al., 2024). ChatGPT enables learners to refine sentence structures, reorganize ideas, and check the clarity of arguments (Chatti, 2024), making it especially useful for students who struggle with limited vocabulary or difficulty expressing ideas in English (Hafidzallah, 2025). Several studies also emphasize that ChatGPT can help EFL learners build more logical argument structures and expand their vocabulary choices (Esfandiari & Allaf-Akbary, 2024). The rapid adoption of ChatGPT among students reflects a shift in learning habits, where technological assistance is combined with traditional instruction to enhance academic performance (Milakis et al., 2025). This shift demonstrates that AI integration is not merely a temporary trend but has become an essential component of students' learning strategies (Rajaram, 2023). As educational institutions continue to adapt to AI integration, understanding the role of ChatGPT in academic writing becomes increasingly important (Elbanna & Armstrong, 2024). Therefore, research on ChatGPT in the context of academic writing is crucial to understand how this technology influences the quality and process of students' writing (Sudrajad et al., 2024).

Despite technological advancements, academic writing remains one of the most challenging skills for EFL students due to its demands on linguistic control, idea development, structure, and coherence (Marlina, 2024). These difficulties become more apparent when students are required to develop essays that demand strong argumentation and the correct use of formal academic language (Yasuda, 2023). Students are expected to express their arguments clearly, organize paragraphs logically, apply appropriate academic vocabulary, and maintain grammatical accuracy skills that typically require extensive practice and explicit guidance (Naini & Ulya, 2025). Students who are not yet familiar with academic writing often make basic mistakes, such as inconsistent idea development and inappropriate vocabulary choices (Junaid & Santaria, 2022). Many learners face difficulties developing coherent arguments, incorporating supporting evidence, and ensuring cohesion between paragraphs (Ramadhan, 2024). These issues result in poorly structured writing that struggles to meet the academic standards

required by universities (Junaid & Santaria, 2022). Consequently, their writing often falls short of academic standards, affecting their performance and reducing confidence in expressing complex ideas (Taye & Mengesha, 2024). As confidence decreases, students become more reluctant to write because they feel their abilities are insufficient (Sari & Setyowati, 2021). Limited exposure to academic English outside the classroom further exacerbates these problems, making structured support essential for improving academic writing (Wei et al., 2024). This need for structured support creates a strong foundation for utilizing technological tools such as ChatGPT during the writing process (Haleem et al., 2022). As such, academic writing remains a central focus in EFL instruction because it influences learning outcomes and prepares students for scholarly communication in higher education (Yulandari & Suryadi, 2025). Developing academic writing skills is also essential for enabling EFL students to compete in academic publications and other scholarly activities (Santillán-Iñiguez & Rodas-Pacheco, 2022).

Given these ongoing challenges, ChatGPT presents a valuable opportunity to support students throughout various stages of the writing process (Adeshola & Adepoju, 2024). ChatGPT provides support that is accessible at all times, allowing students to improve their writing independently without always waiting for instructor feedback (AlAfnan et al., 2023). Research indicates that learners use ChatGPT to clarify assignment prompts, generate initial ideas, reorganize faulty structures, and correct grammatical errors (Hwang et al., 2025), suggesting that AI tools can supplement areas where students lack confidence (Batool et al., 2024). These findings show that ChatGPT holds significant potential for addressing common writing weaknesses experienced by EFL students (Asadi et al., 2025). ChatGPT's ability to provide multiple examples, lexical alternatives, and structural suggestions enables students to develop more refined drafts with improved clarity and coherence (Fredrick & Craven, 2025). With such recommendations, students can significantly enhance the quality of their writing in a relatively short period (Steiss et al., 2024). Studies also show that ChatGPT can reduce writing anxiety and increase learners' motivation by offering accessible guidance that facilitates idea generation and revision (Kartini et al., 2025). This reduction in anxiety contributes to students' readiness to complete more complex writing tasks (Abdi Tabari & Farahanynia, 2025). These benefits suggest that ChatGPT can function as a practical support tool that complements classroom instruction and assists students in producing more organized and academically acceptable texts (Wu, 2024). Thus, ChatGPT serves not only as a technical tool but also as a pedagogical support system in writing instruction (Javaid et al., 2023).

Although existing studies highlight the potential of ChatGPT in EFL writing, several limitations remain (Feng Teng, 2024). One major limitation is the scarcity of studies that systematically measure the impact of ChatGPT on writing outcomes using rigorous research designs (Alshami et al., 2023). Many studies have focused on perceptions of ChatGPT use rather than providing measurable evidence of

improvement in academic writing performance (Apriani et al., 2025). Perception-based studies often fail to capture objective improvements in students' writing abilities (Dewi, 2021). Other studies examine specific aspects, such as grammar or vocabulary, without evaluating broader writing outcomes such as content development or overall organization (Tran, 2025). As a result, there is still a need for studies that evaluate the impact of ChatGPT on all major components of academic writing (Dergaa et al., 2023). In addition, few studies have employed controlled quantitative approaches such as pre-test and post-test design to determine whether ChatGPT leads to statistically significant improvements (Yang et al., 2025). The limited number of quantitative studies leaves a lack of strong empirical evidence regarding ChatGPT's effectiveness (Albadarin et al., 2024). Research also rarely investigates gains across multiple writing components in a single study, leaving a gap in empirical evidence regarding the comprehensive impact of ChatGPT on academic writing in EFL contexts (Song & Song, 2023). Therefore, studies that examine multiple components simultaneously are necessary to provide a more complete understanding of ChatGPT's influence on writing (Punar Özçelik & Yangın Ekşi, 2024).

To address these gaps, the present study aims to examine the differences in EFL students' academic writing performance when writing with and without ChatGPT support, focusing on Indonesian university EFL learners. Rather than claiming a broad scarcity of research, this study contributes unique empirical evidence by simultaneously evaluating four core components of academic writing content, organization, vocabulary, and grammar within a structured pre-test and post-test framework. The results are expected to provide rigorous pedagogical insights into how structured AI integration influences EFL writing performance in higher education.

2. Method

This study employed a one-group pre-experimental pre-test-post-test design to investigate the performance differences in EFL students' academic writing when using ChatGPT as a support tool. Students were first required to produce an academic essay without the assistance of ChatGPT. Following the intervention, they wrote another essay while actively using ChatGPT throughout the writing process. The two sets of essays were then compared to identify performance differences.

This study employed a quantitative approach with supplementary perception data gathered via a questionnaire. The intervention lasted for 4 weeks (8 sessions) utilizing OpenAI's ChatGPT-4, focusing on prompt engineering for idea generation and structural organization.

The participants of this study were third-semester students of the English Education Study Program who had completed foundational courses in paragraph and essay writing. Third-semester students were considered appropriate for this study because they possess basic academic writing skills while still encountering

challenges related to coherence, vocabulary range, and grammatical accuracy, making them suitable subjects for evaluating the effectiveness of ChatGPT. A purposive sampling technique was adopted to select participants who met these criteria and were relevant to the aims of the research (Etikan et al., 2016). Purposive sampling was used to select third-semester students who agreed to the condition of the study and demonstrated foundational knowledge of academic writing. A total of twenty-two(22) students participated in this study, which is adequate for quantitative analysis in a pre-test and post-test design (Augustine et al., 2015).

The study utilized an analytical scoring rubric based on the ESL Composition Profile developed by Setyowati et al. (2020), which evaluates content, organization, vocabulary, and grammar. The same rubric was applied consistently to assess both pre-test and post-test essays. To ensure inter-rater reliability, two independent raters evaluated all essays, yielding an Intraclass Correlation Coefficient (ICC) of 0.88, indicating high scoring reliability.

Data collection proceeded through three stages commonly applied in experimental educational research (Rosalina, n.d.). In the pre-test stage, students wrote an academic essay without using ChatGPT, and their work was scored with the rubric. In the treatment stage, students were introduced to ChatGPT as a writing support tool and were guided on how to use it for generating ideas, planning paragraphs, and improving grammatical accuracy (Stofiana et al., n.d.). They then wrote academic essay using ChatGPT during the planning, drafting, and revising stages. The post-test stage required students to write another essay with ChatGPT, which was graded using the same rubric, enabling a direct comparison with the pre-test.

For the qualitative component, data were collected through a questionnaire designed to explore students' perceptions of using ChatGPT consisted of Likert-Scale items focusing on perceived benefits, linguistic support, motivation, and ethical awareness. The qualitative data were used to complement the quantitative findings and provide deeper insight into students' experiences during the intervention.

The quantitative data were first tested for normality. Since the normality assumption was met (or was not violated), a Paired Sample T-test was used to determine the statistical significance of the difference between the pre-test and post-test scores (Chipwanya et al., 2024). When normality assumptions were not met, the Wilcoxon Signed-Rank Test was used as a non-parametric alternative. Descriptive statistics (Mean, Standard Deviation) were also employed to observe improvements. Finally, Cohen's d (Effect Size) was calculated to determine the magnitude of the intervention's impact.

Qualitative data from the questionnaire were analyzed descriptively by calculating mean scores and percentages for each item. The results were then interpreted to support and explain the quantitative outcomes of the study.

Ethical considerations were addressed by informing students of the study's objectives, procedures, and voluntary nature. All participants provided informed consent, and their writing data were treated confidentially in accordance with ethical guidelines for educational research (Wa-Mbaleka & Rosario, 2022). No participant experienced any disadvantage, and all were allowed to withdraw at any stage of the study.

3. Result

This section presents the results of the data analysis conducted to examine the effect of integrating ChatGPT as a writing support tool on EFL students' academic writing performance. The findings are reported objectively and systematically based on the statistical analyses performed.

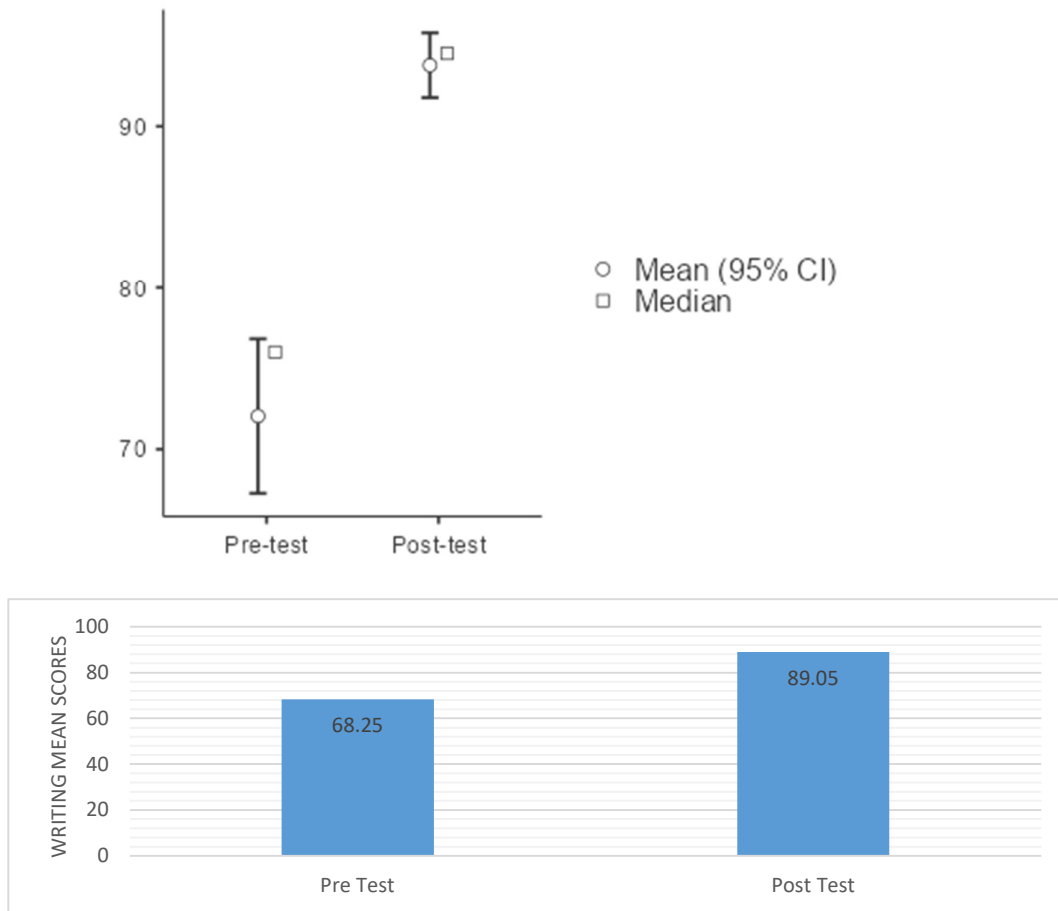
The study involved 22 students. Students' writing performance was measured using a pre-test and a post-test administered before and after the integration of ChatGPT. Descriptive statistics of the students' writing scores are summarized in Table 1.

Table 1. Descriptive Statistics of Students' Writing Scores

No	Statistic	Pre-test Score	Post-test Score
1	Mean Score	68.25	89.05
2	Minimum Score	50	80
3	Maximum Score	86	98
4	Standard Deviation	11.42	4.79
5	Number of Students (N)	22	22

As shown in Table 1, the mean score of the pre-test was 68.25. After the implementation of ChatGPT, the mean score of the post-test increased to 89.05. This indicates an average difference of 20.80 points in students' writing scores. The standard deviations of the pre-test (11.42) and post-test (4.79) reflect a less dispersed distribution of scores in the post-test assessment.

Figure 1. Comparison of EFL Students' Writing Mean Scores in the Pre-test and Post-test



Prior to conducting inferential analysis, the normality of the data distribution was examined using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results of the normality tests are presented in Table 2.

Table 2. Test of Normality

Test	Score Type	Statistic	df	Sig.	Description
Kolmogorov-Smirnov	Pre-test	0.181	22	0.064	Normal
Shapiro-Wilk	Pre-test	0.907	22	0.033	Not Normal
Kolmogorov-Smirnov	Post-test	0.198	22	0.021	Not Normal
Shapiro-Wilk	Post-test	0.895	22	0.023	Not Normal

The results indicate that the post-test scores and, partially, the pre-test scores deviated from the assumption of normality based on the Shapiro-Wilk test ($p < 0.05$). Therefore, to strictly adhere to statistical assumptions, the Wilcoxon Signed-Rank Test was primarily employed as the non-parametric alternative to examine the significant differences between paired scores, which confirmed a statistically significant difference ($Z = 4.12, p < 0.01$). Additionally, a Paired Samples T-test was supplementary evaluated to quantify the magnitude of the effect size using Cohen's d_z . The results of the Paired Samples T-test and effect size analysis are presented in Table 3.

Table 3. Paired Samples T-test Results and Effect Size

Score Comparison	Mean Difference	t-value	Degree of Freedom	p-value (Sig.)	Cohen's d	Decision
Post-test vs. Pre-test	+20.80	7.90	21	< .001	1.69 d_z	H_0 Rejected

The analysis resulted in a t-value of 7.90 with 21 degrees of freedom. The two-tailed significance value (p) was < .001, which is lower than the significance level of 0.05. Therefore, the null hypothesis is rejected, indicating a statistically significant difference between students' pre-test and post-test writing scores.

In addition, the effect size measured using Cohen's d_z was 1.69, which is categorized as a very large effect (Cohen, 1988). This result indicates a substantial magnitude of difference between the pre-test and post-test scores following the integration of ChatGPT in the writing process.

In addition to the test results, students' perceptions toward the use of ChatGPT as a writing support tool were collected through a questionnaire administered after the post-test. The questionnaire consisted of 20 Likert-scale items and was completed by 22 respondents. The data were analyzed using statistical software to obtain descriptive statistics.

The descriptive results indicate that students generally demonstrated positive perceptions toward the use of ChatGPT in academic writing. The mean scores of the questionnaire items ranged from 3.59 to 4.27, indicating that most students tended to agree with the statements related to the usefulness of ChatGPT.

For clearer interpretation, the questionnaire items were grouped into four main aspect: writing benefits, language support, motivation and confidence, and academic ethics. The descriptive statistics for each aspects are presented in Table 4.

Table 4. Descriptive Statistics of Students' Perceptions toward ChatGPT Use

Aspect	N	Mean	Std.	Interpretation
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Deviation				
Writing Benefits	22	3.93	0.78	Positive
Language Support	22	3.91	0.68	Positive
Motivation and Confidence	22	3.75	0.73	Moderately Positive
Academic Ethics	22	4.14	0.70	Highly Positive

The results show that the highest mean score was found in the academic ethics aspect ($M = 4.14$), indicating that students were aware of the importance of responsible and ethical use of ChatGPT in academic writing. The writing benefits ($M = 3.93$) and language support ($M = 3.91$) aspects also obtained high mean scores, suggesting that ChatGPT was perceived as helpful in generating ideas, organizing content, and improving language accuracy. Meanwhile, the motivation and confidence aspect showed a moderately high mean score ($M = 3.75$), indicating a positive contribution to students' confidence in writing.

Overall, the questionnaire findings complement the experimental test results by demonstrating that the statistically significant improvement in students' academic writing performance was accompanied by positive, consistent, and ethically responsible perceptions toward the use of ChatGPT as a writing support tool.

4. Discussion

This study aimed to examine the effect of integrating ChatGPT as a writing support tool on EFL students' academic writing performance. The findings revealed a statistically significant improvement in students' writing scores after the implementation of ChatGPT, indicating that AI-assisted tools may offer positive contributions to students' academic writing processes and final text quality.

The substantial increase in scores from the pre-test to the post-test indicates that essays produced with structured ChatGPT support achieved higher scores than those written independently. Rather than establishing definitive causal learning gains in independent writing ability, the findings suggest that ChatGPT served as an effective real-time scaffolding tool that helped students produce higher-scoring texts.

The statistical analysis further confirmed the robustness of the findings. The Paired Sample T-test showed a significant difference between the pre-test and post-test scores, and the large effect size (Cohen's $d = 1.69$) indicates that the impact of ChatGPT was not merely marginal but substantial in practical terms. According to Norouzian (2018), a large effect size reflects meaningful instructional effectiveness,

suggesting that ChatGPT functioned as an effective scaffolding tool for EFL learners who often face challenges related to vocabulary use, grammatical accuracy, and idea development.

In addition to the writing test results, the questionnaire findings provide further support for the effectiveness of ChatGPT integration. The generally high mean scores across questionnaire items indicate that students held positive perceptions toward the use of ChatGPT in academic writing. The writing benefits and language support aspects received high mean scores, suggesting that students perceived ChatGPT as helpful in improving content development, organization, and linguistic accuracy. This aligns with the notion that AI tools can serve as supportive learning resources rather than replacements for learners' cognitive processes (Imran et al., 2024).

The highest mean score was found in the academic ethics aspect, indicating that students were aware of the importance of responsible and ethical use of ChatGPT through self-reported awareness. This finding is particularly important in the context of higher education, where concerns regarding academic integrity and overreliance on AI tools are prominent. However, the findings suggest that with proper guidance, students the importance of using AI tools ethically as supportive resources rather than as substitutes for their own work.

Although the findings demonstrate positive outcomes, several limitations should be considered. Due to the one-group pre-experimental design without a control group and a delayed post-test, this study cannot isolate students' independent long-term learning gains from the immediate textual contributions of ChatGPT, nor can it establish definitive causality. The study also involved a relatively small sample size, and the analysis focused on overall writing performance rather than examining specific dimensions such as cohesion, lexical complexity, or syntactic accuracy in greater depth. Future studies are encouraged to involve larger samples, include control and experimental groups, and analyze more detailed aspects of writing performance to gain deeper insights into how AI tools support EFL learners' writing processes.

5. Conclusion

This study aimed to examine the effectiveness of integrating ChatGPT into the writing process to enhance EFL students' academic writing performance. The findings demonstrate a significant improvement in students' writing scores from the pre-test to the post-test with a large effect size indicating that the improvement was not only statistically significant but also practically meaningful. In addition, the questionnaire results revealed generally positive student perceptions regarding the use of ChatGPT, highlighting its usefulness in supporting content development, linguistic accuracy, and academic ethics awareness.

Overall, the results indicate that ChatGPT can function as an effective supplementary writing support tool for EFL learners. Its use appears to assist students in improving various aspects of writing, including organization,

vocabulary use, content development, and grammatical accuracy. When integrated with clear instructional guidance, ChatGPT has the potential to scaffold students' writing processes, helping them produce higher-quality academic essays while maintaining ethical standards in academic work.

Despite these positive outcomes, this study has several limitations. The relatively small sample size and the absence of a control group limit the generalizability of the findings. In addition, the writing tasks focused on short academic essays, which may not fully capture students' performance in more complex or extended writing genres. Furthermore, this study examined the use of a single AI tool, and results may differ if other AI-assisted writing tools are employed or combined with peer and instructor feedback.

Based on these limitations, future research is encouraged to involve larger samples, include both experimental and control groups, and explore a wider range of writing tasks. Further studies could also explore how students integrate AI-generated feedback with their critical thinking and creativity, and examine the long-term impact of AI-assisted writing tools on learners' writing development. Such research would provide deeper insights into AI integration in EFL academic writing instruction.

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