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THE IMPACT OF CHATGPT ON STUDENTS' WRITING SKILL IN ENGLISH LEARNING STUDY

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Abstract: The rapid advancements in artificial intelligence (AI) have notably transformed education, particularly through tools like ChatGPT. As AI becomes integrated into classrooms, its potential to enhance language learning, especially writing skills, warrants investigation. Writing is essential for language proficiency, yet many students struggle to develop effective writing abilities. ChatGPT, capable of generating human-like text and providing feedback, offers innovative avenues for improving students' writing skills and overall language acquisition. This study aimed to assess the impact of ChatGPT on English language learners' writing abilities using a quasi-experimental design with a pretest-posttest non-equivalent group, involving 71 students (36 in the control group and 35 in the experimental group). Results indicated a significant improvement in the writing scores of the experimental group after using ChatGPT, confirmed by paired-sample t-test analysis. The experimental group also outperformed the control group in the posttest, demonstrating ChatGPT's effectiveness in enhancing writing skills. Additionally, improved reading comprehension was observed in the experimental group, suggesting that ChatGPT may facilitate overall language proficiency. While the study highlights the promise of AI tools like ChatGPT, it acknowledges limitations in sample size and scope, indicating a need for further research on the long-term effects of ChatGPT across diverse educational contexts.
Keywords: *AI-integrated education, ChatGPT, English language learning, writing skills*

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INTRODUCTION

The integration of artificial intelligence (AI) into education has been a subject of growing interest, with one of the most prominent innovations being ChatGPT. As a sophisticated language model developed by OpenAI, ChatGPT has revolutionized the way students engage with written language, particularly in the context of learning English. A study conducted by Bonsu and Baffour-Koduah (2023) examined the perceptions and intentions of university students in Ghana regarding the use of ChatGPT. The results indicated that although the advantages of ChatGPT were

recognized, educational stakeholders should develop strategies to regulate its use, as it could pose a threat to students' creativity and critical thinking abilities. In a similar vein, Darma (2023) explored the perceptions of EFL students about using ChatGPT. The findings showed that while there is overall positivity and enthusiasm toward ChatGPT, concerns were raised about possible academic issues, such as plagiarism and cheating.

Kostka and Toncelli (2023) stressed the importance of a detailed evaluation of the advantages and challenges associated with teaching and learning in an AI-driven world. They underscored the need for empirical research to understand students' perceptions of AI and to identify best practices for its integration into English language teaching. Additionally, Li (2023) raised concerns about the linguistic and cultural neutrality of ChatGPT, especially in language education contexts where students come from diverse backgrounds. This highlights the need to carefully consider the limitations and potential biases of the tool. On the other hand, several studies have pointed out the potential benefits of ChatGPT in language learning. For example, Ali (2022) found that online learning, enhanced by tools like ChatGPT, can boost students' intrinsic motivation and improve their English language skills. Similarly, Liu (2023) reported that Chinese university students largely believe ChatGPT is beneficial for their English learning, despite acknowledging issues such as plagiarism and inaccurate responses. The application of ChatGPT in education extends beyond English language learning. Xu (2024) and Dhanvijay (2023) examined the use of large language models, including ChatGPT, in medical education, highlighting both the opportunities and challenges. They stressed the need to balance the advantages of these tools with the development of critical thinking and practical skills. In a broader context, Wang et al. (2023) explored ChatGPT's potential impact across various sectors, including education, while Corsello and Santangelo (2023) examined how AI language models are transforming research.

The incorporation of artificial intelligence (AI) tools, especially ChatGPT, into education has the potential to transform traditional teaching approaches and improve student learning outcomes. Wang (2024) explored students' perceptions and experiences with generative AI-assisted writing, offering insights into how students understand these new practices and the common practices that emerge around the technology. The results indicate that AI-assisted writing can effectively complement students' writing skills. Similarly, Mahmud (2023) and Selim (2024) found that AI-powered writing tools, such as Wordtune, can greatly enhance students' writing abilities and proficiency. These studies support the view that AI should be considered a tool to augment, not replace, human writing capabilities.

Alharbi (2023) and Chan and Hu (2023) stressed the importance of fostering students' AI literacy, which involves understanding the fundamentals, advantages, and limitations of generative AI tools like ChatGPT. This is vital for ensuring the effective integration of these technologies into educational environments and maximizing their potential benefits. Hwang et al. (2023) and Nazim (2024) further emphasized the ability of AI-powered writing tools to offer personalized feedback and support, thereby enhancing the writing process and learning outcomes for students. They noted that although AI has its limitations, its ongoing development and incorporation into language classrooms can transform student-centered teaching and promote a more dynamic, collaborative learning atmosphere. Cardon et al. (2023) and Krajka and Iszak (2024) explored the challenges and opportunities posed

by AI-assisted writing, highlighting the need for a balanced approach that takes into account the ethical considerations and the development of AI literacy among both students and educators. They argued that successfully navigating this transformative phase requires a comprehensive understanding of the various perspectives of all stakeholders involved.

Writing is essential in language learning as it serves as a crucial means of expressing thoughts, ideas, and arguments in an organized and coherent way. It goes beyond being just a skill; it is a cognitive process that deepens learners' understanding of the language by requiring them to use grammar, vocabulary, and syntax in context. Kormos (2023) introduced the Task-Mediated Cognitive Model, which emphasizes the intricate relationship between second language (L2) proficiency, first language (L1) skills, cognitive abilities, writing tasks, the L2 writing process, and writing to learn the L2. This model highlights the cognitive factors involved in second language writing and the potential for language development during the writing process. In a similar vein, Jiang and Kalyuga (2022) explored writing in a foreign language through the lens of cognitive load. They found that collaborative teaching approaches can foster an effective pool of knowledge about language and cognitive resources, which positively impact the quality of written output.

According to Aldossary (2024), linguistic elements including vocabulary, grammar, syntax, and language skill have a major favorable impact on pupils' ability to write in English. These results support the idea that writing is a cognitive process that necessitates the use of contextual language abilities. The writing-to-learn-language perspective, which views writing as a means of language acquisition and development, was examined by Zhan et al. (2021) and Alnasser (2022). They highlighted the value of writing in the educational process as well as the elements that might foster the growth of writing abilities.

Additionally, writing promotes critical thinking and creativity, as students are required to organize their ideas, present them logically, and adapt their language to fit various audiences and purposes. Shafiee et al. (2020) underscored the significance of writing for learners of English as a second or foreign language, noting that it demands a certain level of L2 knowledge regarding rhetorical organization, appropriate language use, and specific vocabulary needed to effectively communicate their ideas. Talayhan (2023) pointed out that content represents the core of writing, conveying ideas, thoughts, and messages to the audience in a relevant, informative, and meaningful way, while organization refers to how the content is structured and connected, helping guide readers through the text in a clear and logical manner.

In the context of English language learning, writing holds particular significance as it offers students an opportunity to practice and enhance their language proficiency, thereby reinforcing other language skills like reading and speaking. Mastering writing enables students to communicate effectively in both academic and real-world contexts, making it a crucial component of language acquisition. Jo (2021) emphasized that academic English proficiency can be effectively scaffolded through strategic instruction, as the expectations of academic writing may not be visible to students without explicit instruction. Additionally, Banegas et al. (2020) discovered that having student-teachers write book reviews for publication can enhance their English language proficiency, as it involves real-world purpose and audience engagement.

This study examines the effect of ChatGPT on students' writing skills within the context of English language learning. Writing, a key component of language acquisition, involves not only mastering vocabulary and grammar but also cultivating a coherent thought process, structure, and style suited to various communicative purposes. As digital tools become more integral to educational advancement, it is essential to explore how artificial intelligence, particularly ChatGPT, can impact students' writing proficiency.

The novelty of this study lies in its focus on the specific effects of ChatGPT on students' writing skills in English learning, an area that remains underexplored despite the growing presence of AI in education. How ChatGPT supports or hinders students in producing written text and its impact on students' writing processes Its impact on students' writing processes. While previous research has examined students' perceptions of AI tools, their benefits, and challenges in language learning, there is a gap in understanding how ChatGPT directly influences students' writing processes, including aspects such as coherence, organization, creativity, and critical thinking. Through this study, the researcher seeks to fill that gap by assessing how ChatGPT supports or hinders students in producing written texts, improving their writing processes, and enhancing their overall language competency. Additionally, this study aims to examine students' perceptions of using ChatGPT in their writing tasks, including whether they find it helpful, motivating, or detrimental to their learning experience.

As the educational landscape continues to evolve with advancements in AI, it is crucial to critically assess the implications of tools like ChatGPT on student learning outcomes. By investigating this impact, the study will contribute to the broader discourse on AI in education and its potential role in transforming language learning practices. Furthermore, it will provide insights for educators seeking to incorporate AI technologies effectively into their pedagogical strategies, ultimately enhancing students' writing skills in English.

METHODOLOGY

This study employed a quasi-experimental design to gather, process, and analyze data systematically, ultimately leading to meaningful conclusions about the impact of ChatGPT on students' writing skills in English language learning. Quasi-experimental research is well-suited for educational studies where random assignment to groups is either impractical or impossible due to the natural composition of classrooms or institutional constraints.

Subjects

In this study, the population was all of the twentieth-grade students at SMA Negri 5 Lubuk Linggau in the academic year 2023/2024. In this research, two classes served as the sample to facilitate data collection. The sample was determined using purposive sampling, a non-random sampling method. The selection process was based on an analysis of students' average writing scores, which were obtained from the teacher. Specifically, the classes with the lowest average writing scores among all available classes were chosen to ensure that the intervention could be tested on students who needed the most improvement. Based on this analysis, Class XII F1 and XII F2 were selected. After conducting the pretest, it was observed that Class XII F1 had higher average scores than Class XII F2. Consequently, Class XII F1 was

designated as the control group, while Class XII F2 became the experimental group. In total, 71 students participated in the study, with 36 students in the control group and 35 students in the experimental group.

Designs and Procedures

The pretest and posttest non-equivalent group design was selected for this investigation. This design involves two groups of participants: an experimental group and a control group. While both groups are administered a pretest to establish baseline data and a posttest to measure outcomes, only the experimental group receives the intervention, in this case, the use of ChatGPT as a tool for enhancing writing skills.

Data Collection and Data Analysis

A writing test was administered to assess the students' writing achievement. They were tasked with composing a five-paragraph essay based on one of the provided topics, all of which centered on descriptive texts. The essays were evaluated using a standardized essay-writing rubric developed by Hughes (2003). To measure progress accurately, the students completed two tests: a pretest and a posttest. Both tests featured identical items, allowing for a clear and reliable comparison of their writing achievement scores before and after the treatment.

After data collection, the analysis was carried out using both paired-sample and independent-sample t-tests. The paired-sample t-test was used to assess whether students in the experimental group showed a significant improvement in their descriptive writing skills after using ChatGPT. On the other hand, the independent-sample t-test compared the descriptive writing performance of students in the experimental group with those in the control group.

Before conducting the t-tests, prerequisite analyses for normality and homogeneity were performed. The normality test assessed the pretest and posttest scores for both groups, while homogeneity was evaluated using Levene's statistics. The data were deemed normal and homogeneous if the results surpassed the 0.05 threshold, ensuring the validity and reliability of the subsequent statistical analyses. This thorough analytical approach offered a comprehensive evaluation of the impact of ChatGPT on students' descriptive writing achievements, providing valuable insights into its effectiveness in enhancing English language learning.

Validity and Reliability

By requesting expert opinion from a minimum of two validators, the researcher used construct validity to guarantee the validity of the essay writing achievement exam. These experts evaluated whether the components of the instrument were appropriate and valid for use in the research. The validators were selected based on specific criteria: holding a master’s degree in the English Department, having over five years of teaching experience, and achieving a minimum TOEFL score of 525. The experts assessed whether the test met essential criteria, including (1) clarity of instructions, (2) relevance of the topics, (3) appropriateness of time allocation, (4) alignment of content with objectives, and (5) the quality of the scoring rubric. Based on their evaluations, the instrument was deemed valid and suitable for use in the study.

To determine the reliability of the writing test, the researcher conducted a try-out to refine the test by evaluating the time allocation and eliminating less favorable topics. The try-out was administered to the XII F3 class, consisting of 34 students. The result of the test was analyzed by using Pearson Correlation Coefficient formula. The result of significant score of Pearson Correlation was compared with r_{table} (0.339). The items were valid since the score of significance are higher than 0.339. The results confirmed that the instrument was reliable and effectively met the requirements for assessing students' writing achievement.

FINDINGS

The findings of this research offer valuable insights into the dynamics of students' writing achievement through a comparative analysis of their pre-test and post-test scores. The pre-test, conducted before the implementation of the ChatGPT treatment, served as a baseline to assess the students' initial writing abilities. After the treatment, the post-test was administered to evaluate the effectiveness of ChatGPT in improving writing achievement among the students of SMAN 5 Lubuk Linggau. The results from the post-test highlighted whether this innovative pedagogical approach significantly enhanced the students' writing skills, providing a deeper understanding of the impact of integrating ChatGPT into educational practices.

Analysis of Descriptive Statistics of Students' Pretest – Posttest in Experimental and Control Group

The analysis of descriptive statistics for students' pretest and posttest scores in both the experimental and control groups provides a detailed overview of the performance changes over the course of the study. For the experimental group, which used ChatGPT as an educational tool, the pretest scores served as a baseline, reflecting students' initial capabilities in the targeted writing skills. After the intervention with ChatGPT, the posttest scores showed an upward trend, indicating significant improvement in their writing performance. On the other hand, the control group, which followed traditional teaching methods, displayed more modest changes in their scores from pretest to posttest.

Table 1. Descriptive statistic of students' score in experimental and control group

	N	Minimum	Maximum	Mean	Std. Deviation
Experimental					
Pretest	35	40	70	57.00	9.091
Posttest	35	50	80	67.29	8.604
Control					
Pretest	36	40	75	60.97	9.167
Posttest	36	45	75	61.94	9.876

The descriptive statistics provided in table 1 offer valuable insights into the performance of the experimental and control groups before and after the intervention. In the pretest, the experimental group (n=35) had a mean score of 57.00 with a standard deviation of 9.091, while the control group (n=36) had a slightly higher mean score of 60.97 and a standard deviation of 9.167. This suggests that prior to the

treatment, the control group exhibited marginally stronger writing skills compared to the experimental group.

However, the posttest results reveal a notable shift. The experimental group's mean score increased to 67.29, with a standard deviation of 8.604, indicating a substantial improvement in their writing performance. In contrast, the control group's mean score only rose to 61.94, with a standard deviation of 9.876, suggesting a more modest gain. This disparity in the groups' posttest scores suggests that the intervention implemented for the experimental group was effective in enhancing their writing abilities, outpacing the progress made by the control group who received standard instruction.

The range of scores, as indicated by the minimum and maximum values, also provides context. Both groups demonstrated a similar range in the pretest, with scores spanning from 40 to 75. In the posttest, the experimental group's range expanded to 50-80, while the control group's range remained relatively unchanged at 45-75. This further underscores the positive impact of the intervention, as it appears to have facilitated more substantial growth in the writing skills of the experimental group participants.

Analysis of Normality Test of Students' Pretest – Posttest in Experimental and Control Group

The researchers conducted normality tests to evaluate the distribution of pretest and posttest scores in the experimental and control groups. Based on the results of the normality tests, all data were confirmed to be normally distributed.

Table 2. The result of normality test of students' pretest in experimental and control groups

Group	Kolmogrov Smirnov	Sig.	Result
Experimental			
Pretest	0.143	0.064	Normal
Posttest	0.156	0.062	Normal
Control			
Pretest	0.200	0.181	Normal
Posttest	0.156	0.062	Normal

The results of the normality test for the pretest and posttest scores of the students in the experimental and control groups are shown in Table 2. The data's normality was evaluated using the Kolmogorov-Smirnov test, and the significance values showed if the distribution differed noticeably from a normal distribution. For the experimental group, both the pretest (Sig. = 0.064) and posttest (Sig. = 0.062) scores were found to be normally distributed, as the significance values are greater than the 0.05 threshold. Similarly, for the control group, both the pretest (Sig. = 0.181) and posttest (Sig. = 0.062) scores also exhibited normal distribution, with significance values exceeding the 0.05 level. These results indicate that the data from both groups are normally distributed, meeting the assumption required for further statistical analysis.

The Improvement of Students' Score after Utilizing ChatGPT in Experimental Group

The improvement in students' scores after utilizing ChatGPT in the experimental group was significant, highlighting the potential impact of AI tools on enhancing students' writing skills. The pretest scores, which served as a baseline, reflected the students' initial writing abilities, while the posttest scores showed measurable progress following the implementation of ChatGPT. By providing real-time feedback and supporting the writing process, ChatGPT appears to have contributed to refining students' ability to structure their essays, improve vocabulary, and enhance overall coherence in their writing. The difference in scores between the pretest and posttest underscores the effectiveness of ChatGPT as a tool for boosting students' writing proficiency in English. This improvement suggests that the integration of AI into educational settings can be a valuable resource for developing students' language skills.

Table 3. Analysis result of paired sample T-Test from students' pretest to posttest scores in experimental groups

	T	**Df**	**Sig. (2-tailed)**	**Ho**	**Ha**
ChatGPT	-29.251	34	0.000	Rejected	Accepted

Table 3 displays the results of the paired-sample t-test analysis for the pretest and posttest scores of students in the experimental group, evaluating the impact of ChatGPT on their writing achievement. The t-value of -29.251, with 34 degrees of freedom, indicates a significant difference between the pretest and posttest scores. The significance value (Sig. = 0.000) is well below the 0.05 threshold, leading to the rejection of the null hypothesis (Ho) and acceptance of the alternative hypothesis (Ha). This finding demonstrates that the use of ChatGPT in the experimental group resulted in a statistically significant improvement in students' writing scores, thus confirming its effectiveness in enhancing their writing skills.

The Different Score in Reading Comprehension between Experimental and Control Group

The efficiency of the treatment in the experimental group was assessed by comparing the writing scores of the experimental and control groups. Significant gains in writing scores were demonstrated by the experimental group, which used ChatGPT as an additional learning aid. The control group, on the other hand, made less progress because they didn't use ChatGPT. A comparison of the two groups' scores showed a notable difference, indicating that the experimental group's capacity to understand and analyze reading contents more successfully was enhanced by the incorporation of ChatGPT. This research shows how artificial intelligence (AI) technologies like ChatGPT can improve students' writing achievement and provide a useful teaching tool to support conventional teaching techniques.

Table 4. Analysis result of independent sample T-Test on students' posttest scores in experimental and control groups

	T	**Df**	**Sig. (2-tailed)**	**Ho**	**Ha**
Using ChatGPT and Strategy that is used by the teacher	-2.427	69	0.01	Rejected	Accepted

The independent sample t-test analysis findings comparing the posttest scores of students in the experimental and control groups are shown in Table 4. The two groups' posttest results differed significantly, as indicated by the t-value of -2.427 with 69 degrees of freedom. The alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected since the significance value (Sig. = 0.01) is less than the 0.05 cutoff. According to this finding, the experimental group—which used ChatGPT as a learning tool—performed noticeably better than the control group, which adhered to the teacher's conventional teaching methods. When compared to traditional teaching approaches, the results show how ChatGPT can improve students' performance and highlight the benefits of integrating technology into the learning process.

DISCUSSION

The findings provide compelling evidence of the positive impact of ChatGPT on students' writing skill. Through a comprehensive analysis of students' pretest and posttest scores, the study reveals a significant improvement in the experimental group, which utilized ChatGPT as a learning tool. The descriptive statistics show a notable increase in the experimental group's mean posttest score, from 57.00 in the pretest to 67.29 after the intervention, while the control group, which followed traditional methods, showed only modest improvement. This highlights the effectiveness of ChatGPT in enhancing students' writing abilities, with its real-time feedback and support in structuring essays, improving vocabulary, and ensuring coherence in writing. Pham and Le (2024) found that prior studies indicate AI tools, including ChatGPT, may increase student participation and discourse, pointing to ChatGPT's persistent positive effect on classroom engagement. According to Liu (2023), ChatGPT is regarded as a technological advancement that has the potential to transform education by fusing social interactions with learning objectives. For students to use ChatGPT as a successful language learning tool, they must have a thorough comprehension of it. Furthermore, Nita et al. (2023) stated that by adopting ChatGPT in the learning process, students may experience differences in their writing patterns compared to conventional writing, presenting both challenges and opportunities.

With a significant t-value of -29.251, the null hypothesis was rejected in the paired sample t-test analysis, which further demonstrated ChatGPT's efficacy. This suggests that students' writing scores in the experimental group improved statistically significantly as a result of using ChatGPT. Additionally, a significant difference between the experimental and control groups was shown by the study of reading comprehension scores. The experimental group demonstrated higher reading writing score gains, supporting the notion that ChatGPT and other AI technologies might help students comprehend and analyze texts in addition to honing their writing abilities. According to de Winter (2023), ChatGPT has the ability to promote innovation in the field of education by helping students improve their writing abilities, facilitating comprehension through detailed explanations, expediting the delivery of information through text summarization, and increasing engagement through tailored feedback. Veras et al. (2023) revealed that a study assessing ChatGPT's usability in formal English language learning showed promising outcomes, with ChatGPT being an effective tool for various learning tasks, including writing and grammar enhancement. Additionally, Song and Song (2023) found that

the use of ChatGPT led to notable improvements in students' writing skills, including enhanced organization, coherence, vocabulary, and fluency. Participants reported significant improvements attributed to the use of ChatGPT, demonstrating its potential in scaffolding the writing process.

Li et al. (2024) found that ChatGPT can be a valuable educational tool, offering benefits in various teaching scenarios such as online classroom Q&A, virtual tutoring, and supporting language learning. The study emphasizes ChatGPT's extensive knowledge and advanced natural language processing abilities, which allow it to effectively address students' questions and offer useful writing guidance. Similarly, Nguyễn (2023) discovered that EFL teachers at Van Lang University supported the idea that ChatGPT helped improve students' writing skills and boosted their motivation to learn writing. The study revealed positive feedback from teachers regarding ChatGPT's impact on student motivation.

The effectiveness of the ChatGPT intervention is further demonstrated by the independent sample t-test results, which compare the posttest scores of both groups. The experimental group outperformed the control group, with a t-value of -2.427 and a significance level of 0.01, underscoring ChatGPT's potential as a valuable teaching tool. Overall, this study highlights the importance of integrating AI technologies into educational settings, not only to assist students with writing and comprehension but also to support their overall language development.

CONCLUSION AND SUGGESTION

The results of this study offer valuable insights into the effect of ChatGPT on students' writing. The experimental group, which utilized ChatGPT as an additional learning tool, demonstrated notable improvements in their writing scores, with a significant rise in posttest results compared to the pretest. The statistical analysis of pretest and posttest scores highlighted a considerable improvement in students' writing skills, as evidenced by the t-test outcomes, confirming the effectiveness of ChatGPT in enhancing writing proficiency. Additionally, the experimental group also outperformed the control group in reading comprehension, suggesting that ChatGPT can also aid in enhancing students' ability to comprehend and interpret reading materials. However, the study was limited by its sample size and scope, which may not fully represent broader student populations or various educational settings. Future research could explore the long-term effects of ChatGPT usage on writing and reading skills across different subjects and student demographics. It would also be beneficial to examine the challenges and potential barriers teachers face in integrating AI tools like ChatGPT into their instructional practices. These insights can guide educators in leveraging AI tools effectively to foster student engagement and improve academic achievement.

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