

Assessing the Impact of AI-Assisted Writing Tool Utilization on the Writing Proficiency of Senior High School Students

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Abstract. Writing proficiency remains an essential academic competency; however, many senior high school students continue to experience difficulties in writing, particularly in grammar, organization, and idea development, which often affect the quality of their written outputs. In this context, artificial intelligence (AI) writing tools have become increasingly integrated into writing instruction. This study aimed to assess the impact of AI-assisted writing tool utilization on the writing proficiency of senior high school students. The study employed a quantitative quasi-experimental research design. Using quota sampling, a total of 60 Grade 11 students from the Arts, Social Sciences, and Humanities (ASSH) strand of a private Catholic institution were selected and were equally divided into two groups, the experimental and control group. Data were gathered through a pretest-posttest writing assessment evaluated using an analytical scoring rubric. Descriptive and inferential statistical analyses were employed to examine differences in writing proficiency before and after the intervention. The results revealed that both groups had comparable pretest scores; however, the experimental group demonstrated greater improvement after the intervention. The experimental group achieved a higher post-test mean score ($M = 82.04$) compared to the control group ($M = 77.81$), and statistical analysis indicated a significant difference between the groups. These findings suggest that AI-assisted writing tools can significantly enhance the writing proficiency of senior high school students when used as supplementary instructional support. It recommends the integration of AI-assisted writing tools into writing instruction through appropriate policies, teacher training, and ethical guidelines. Future studies should explore longitudinal impacts of AI-assisted writing tools on students' learning and academic development.

Keywords: AI-assisted writing tool; writing proficiency; quasi-experimental; Philippines

Introduction

Writing proficiency remains a fundamental impediment in global language education, directly affecting students' academic success and communicative competence. While traditional writing difficulties historically centered on structural execution namely mechanics, sentence development, and rhetorical organization; the rapid integration of Artificial Intelligence (AI) has shifted the instructional paradigm from pure skill acquisition to technology-augmented composition. Consequently, evaluating how AI-assisted writing tools shape student outcomes has become a critical imperative across diverse educational contexts.

Empirical research reveals that AI support significantly increases structural writing quality of the students. For instance, studies in Turkey (Ekizoğlu & Demir, 2025) and Saudi Arabia (Alzahrani & Alotaibi, 2024) observed marked improvements in secondary students' development of ideas, vocabulary, and grammar. These findings align with experimental evidence from Lira et al. (2025), who established that AI-driven personalized feedback directly yields superior performance on subsequent independent writing assessments. Furthermore, AI-assisted writing tools systematically reduce cognitive load during initial drafting and ease linguistic anxiety (Almutairi, 2026). Similarly, recent investigations in Indonesian secondary students (Haziz et al., 2025; Puteri et al., 2025; Zahra & Fithriani, 2024) collectively confirm that conversational AI models enhance essay structure, lexical variety, and student writing confidence.

Despite these reported benefits, empirical research reveals as clear divide regarding the efficacy of AI-assisted writings tools in which researchers continue to express concerns regarding the educational implications of AI-assisted writing tools. Aljuaid (2024) emphasized that while AI effectively handles surface-

level mechanics, it cannot foster higher-order skills such as critical thinking, nuanced synthesis, or research argumentation. Affirming this view, Takallou (2025) argued that AI must strictly function as a temporary scaffold rather than a primary instructional replacement. Similarly, studies have reported that unguided AI use may reduce students' originality, problem-solving abilities, and autonomous learning, suggesting that AI should function as an instructional scaffold rather than a substitute for the writing process (Dangin et al., 2024; Mekheimer, 2025; Sanjaya, 2026).

In the Philippine context, this dichotomy becomes even more pronounced due to systemic literacy challenges, particularly deficits in sentence mechanics and structural coherence among learners (Briones, 2022; Castillo, 2025). In response to these challenges, researchers have explored AI-assisted writing tools as potential instructional support, with studies by Garcia (2023) and Reyes et al., (2023) found that AI-assisted writing tools function effectively as formative feedback, helping students improve grammar accuracy and strengthen rhetorical clarity. However, results from Ramos (2024) and Santos and Del Mundo (2023) point to a different pattern that exposed significant drawbacks, including reduced output originality, weakened ideation, and severe grammar stagnation resulting from automated over-reliance.

This uncertainty is especially evident in Mindanao, particularly in the Davao region, where writing proficiency continues to be an instructional concern, where studies report difficulties in idea development, organization, planning, and revision (Balderas et al., 2024; Miralles & Nesperos, 2022). Given these persistent difficulties, recent research has explored the role of AI-assisted writing tools in supporting students' writing development. However, significant challenges persist, as evidenced by Franca and Napil (2024) reported that nearly 37.5% of surveyed high school students in selected Davao schools failed to achieve basic competence in academic writing. Likewise, many students in Davao del Norte and Davao del Sur exhibited challenges in completing writing activities during class (Eman-Bangkulit & Limpot, 2022). Although preliminary local inquiries (Dagangon et al., 2023) suggest that guided AI intervention can remediate these localized skills gaps, actionable empirical data regarding the actual extent to which AI tool usage influences writing proficiency among senior high school students in this region remains noticeably scarce.

Despite the rapid proliferation of AI-assisted writing tools, a critical research gap remains concerning whether AI-assisted writing tools genuinely improve the independent writing proficiency of senior high school students or simply compensate for underlying weaknesses in writing skills. Much of the existing literature presents fragmented or inconsistent findings on AI adoption. Addressing this gap, the present study examines the impact of AI-assisted writing tool utilization on the writing proficiency of senior high school students by comparing learners who use AI-assisted writing tools with those who receive conventional writing instruction. By determining whether AI-assisted writing tools foster active skill acquisition or passive reliance, the research aligns with Sustainable Development Goal 4 (Quality Education) to support pedagogical strategies that protect authentic learning. The findings likewise provide the foundation for the theoretical framework that explains the concepts guiding this study.

Research Questions

This quasi-experimental study aims to assess the impact of AI-assisted writing tool utilization on the writing proficiency of senior high school students. Specifically, it aims to answer the following questions.

1. What is the level of Writing Proficiency of Senior High School Students in the:
 - 1.1 Experimental Group; and
 - 1.2 Controlled Group?
2. Is there a significant difference between the level of writing proficiency of Senior High School students in the experimental and control groups?

Scope and Delimitation of the Study

This study focused on assessing the impact of AI-assisted writing tool utilization on the writing proficiency of Senior High School students from the Arts, Social Sciences, and Humanities (ASSH) strand of a private Catholic institution during the school year 2025–2026. The respondents were identified through the pre-test writing activity which was checked and rated by three experts and an initial statistical analysis was done to identify the sections that were part of the study, and to ensure that the selection of sections who demonstrate writing skills and are most likely to benefit from the intervention. This inclusion ensured consistency in academic background and performance among participants. Lastly, this study was conducted from January to February 2026. Those from other academic strands or tracks, other sections, and individuals unwilling to participate are also excluded. The results may not have generalized to students from other strands, schools, or performance levels, as differences in academic background, exposure to writing activities, and learning environments may influence the outcomes. Furthermore, the study's relatively small and purposively selected sample size limited the generalizability of the findings, as they primarily reflect the experiences of the selected group of participants.

Literature Review

Writing Proficiency among Senior High School Students

Writing proficiency is a foundational skill for academic success, enabling students to communicate ideas effectively and engage with academic tasks. However, students continue to experience difficulties in developing these skills, particularly in content, structure, lexico-grammatical ability, and mechanics (Callora & Suñas, 2023). For instance, in Nigeria, Obi (2022) revealed substantial difficulties in written production, with only 12% of students able to produce the required 450 words, although 53.4% demonstrated an understanding of the essay topic. These findings suggest that the students may understand a writing task while still struggling to adequately express and organize their ideas in written form. Similarly, Adebayo et al. (2024) found that secondary students continue to encounter challenges in both expressing ideas and applying the linguistic and structural features necessary to produce accurate and cohesive written texts. Similarly, in the ASEAS context, writing proficiency remains a significant challenge among students, particularly in English as a foreign or second language. For instance, in Malaysia, Ghulamuddin et al. (2021) found that ESL (English as a Second Language) students experienced difficulties in expressing and organizing their ideas clearly in written form. Similarly, in Indonesia, Syaprizal and Ramadona (2028) reported frequent grammatical errors among senior high school students, particularly in the use of verb forms, while Anakampun and Fithriani (2023) identified various grammatical errors in students' recount texts, including misinformation, omission, misordering, and addition. Likewise, Toba et al. (2019) found that students experienced difficulties in content, organization, vocabulary, grammar, and mechanics, while Riadil (2022) reported challenges in developing ideas, structuring arguments, and maintaining coherence in academic writing. These findings demonstrate that writing difficulties among ASEAN students extend beyond grammatical accuracy to include idea development, organization, and overall coherence. Furthermore, many students in the Philippines continue to struggle with writing proficiency, particularly in grammar, coherence, and organization of ideas. Castillo (2025) found that students demonstrated low writing proficiency and difficulties in mechanics and structure, while Briones (2022) emphasized challenges in constructing coherent and grammatically accurate texts. Also, in Mindanao, particularly in the Davao Region, according to a study conducted in Davao de Oro, many students demonstrated deficiencies in key writing components, including idea development, revision, and the overall writing process, highlighting gaps in their ability to produce effective academic texts (Balderas & Jambangan, 2024). In particular, studies in Davao del Sur emphasized that writing-related skills such as organizing, planning, and editing ideas significantly influence students' overall literacy performance (Miralles & Nesperos, 2022). Collectively, these challenges suggest that students often struggle with both the cognitive and procedural aspects of writing, making it difficult for them to meet academic standards.

AI-Assisted Writing Tools in Education

The emergence of Artificial Intelligence (AI) has transformed writing instruction from traditional skill development into technology-assisted composition. AI-assisted writing tools provide automated feedback on the grammar, style, and organization, enabling students to receive immediate feedback and support during the writing process. Consequently, these technologies have become increasingly integrated into educational context worldwide. Several international studies demonstrated the educational benefits of AI-assisted writing tools. For instance, research conducted in Turkey and Saudi Arabia found that AI supported significantly improved students' grammar, vocabulary, and development of ideas (Ekizoğlu & Demir, 2025; Alzahrani & Alotaibi, 2024). Lira et al. (2025) reported that AI improved the performance of the students when it comes to writing tasks. Additionally, other studies further revealed that AI tools reduce students' cognitive load during drafting, minimize writing anxiety and increase writing confidence (Almutairi, 2026). Within Southeast Asia, AI-assisted writing tools have likewise gained widespread acceptance. For instance, a study conducted by Marzuki et al. (2023) proved that AI-assisted writing tools positively improved their students' writing quality, particularly enhancing the quality of their content and organization. Similarly, studies from the Philippines suggested that AI serves as an effective feedback mechanism, helping to improve grammar and vocabulary of the students (Valdez et al., 2025; Aruta & Madeja, 2026). These findings indicate that AI-assisted writing tools possess considerable instructional potential when appropriately integrated into classroom writing activities.

AI-Assisted Writing Tools and Writing Proficiency

Artificial Intelligence (AI) has increasingly become a global tool in education, especially in improving students' writing skills. According to Ekizoğlu and Demir (2025) AI-based writing support significantly improved secondary students' grammar, vocabulary, and coherence, proving its potential to enhance writing proficiency. Likewise, Alzahrani and Alotaibi (2024) found that AI applications strengthened high school students' writing performance, particularly in organization and idea development, supporting AI as a useful learning assistant in language learning. However, not all scholars present purely positive conclusions. In a

systematic review, although AI can support grammar, style, and organization, it cannot fully replace formal writing instruction in universities because critical thinking, creativity, and research skills still require guidance from human educators (Aljuaid, 2024). Similar caution was also noted in Nigeria, where Takallou (2025) found that AI tools improved students' grammar and vocabulary, but recommended that teachers should only use AI as a supplement to traditional instruction, not a replacement to ensure balanced learning. Despite these cautions, new evidence continues to show potential benefits. Students who practiced cover-letter writing with AI support performed better on later writing tests than those who practiced without AI, suggesting AI can provide personalized feedback that enhances writing development (Lira et al., 2025). Overall, global literature shows that AI can strengthen writing proficiency in various contexts, yet it must be used responsibly and combined with teacher instruction to avoid overdependence. Research increasingly emphasizes the role of AI-assisted writing tools in developing the writing proficiency of secondary and senior high school learners. In Indonesia, Puteri et al. (2025) found that the use of ChatGPT as a writing assistant provided students with real-time feedback and support in developing their ideas and improving the overall quality of their essays, particularly in terms of organization and engagement. Supporting this, Haziz et al. (2025) discovered that Indonesian EFL senior high school students who used ChatGPT showed notable improvement in organization, vocabulary use, and coherence, demonstrating AI's effectiveness in enhancing English writing skills. Similarly, Zahra and Fithriani (2024) observed that AI tools contributed to measurable improvements in vocabulary, syntax, coherence, and writing confidence among secondary school students. However, some studies reported negative effects of AI-assisted writing, such as reducing students' critical thinking and problem-solving skills, and overreliance on AI tools potentially hindering independent writing development (Dangin et al., 2024). Collectively, these findings suggest that AI-assisted writing tools can enhance students' writing proficiency, but their use must be guided carefully to ensure balanced learning and the development of authentic writing skills. Furthermore, in the Philippines, Reyes et al. (2023) found that AI-assisted writing tools in Metro Manila significantly improved students' grammar and vocabulary proficiency, leading to higher overall writing performance. However, in contrast, Santos and Del Mundo (2023) reported that students in Baguio City who relied heavily on AI-generated text showed reduced originality and a weakened ability to generate independent ideas. Moreover, AI tools were found to support ESL learners in Iloilo by providing personalized feedback that enhanced clarity and improved writing structure (Garcia, 2023). On the other hand, high school students in Quezon experienced stagnation in grammar mastery due to overdependence on automated corrections (Ramos, 2024). Ultimately, these contrasting findings highlight the need to evaluate how AI-assisted writing tools genuinely shape Filipino learners' writing proficiency within diverse educational settings. However, Dagangon et al. (2023) suggest that AI-assisted writing tools can provide measurable improvements in students' writing skills, particularly when used with proper guidance to avoid overdependence. This indicates that, when thoughtfully integrated, AI-assisted tools can serve as effective support systems to enhance students' writing proficiency while addressing the gaps identified in prior studies.

Methodology

Research Design

This study employed a quantitative quasi-experimental research design to explore the impact of AI-assisted writing tool utilization on the writing proficiency of senior high school students. A quantitative quasi-experimental research design is used to examine cause-and-effect relationships between variables when random assignment of participants is not possible (Capili & Anastasi, 2024). It employed numerical data and statistical analysis to measure the effect of an intervention on specific outcomes (Thomas, 2024). The researchers selected this type of research design because it was the most suitable approach for addressing the main objective of the study, wherein the independent variable was the use of AI-assisted writing tools, which served as the intervention provided to the treatment group. Through this design, the researchers aimed to examine how the integration of AI-based tools influences students' writing performance compared to those who rely on traditional writing methods. This research design was chosen to obtain a clearer understanding of how AI-assisted tools contribute to the enhancement of students' writing proficiency within a real classroom environment.

Sampling Design

The sample of this study was selected through non-probability sampling wherein samples are selected based on Quota sampling. As noted by Simkus (2023), quota sampling is a non-probability technique where the researchers select individuals based on particular characteristics to ensure they mirror certain traits in relation to their occurrence in the population. The researchers applied quota sampling in gathering the respondents (controlled group and experimental group) and the study specifically focused on Grade 11 students under the ASSH strand from religious catholic private institutions in Digos City. Furthermore, the researchers

conducted a pretest among the three sections to determine which groups would serve as the experimental and control groups. The pretest scores were analyzed by a statistician to identify sections with comparable academic performance. Based on the analysis, two sections were selected because their pre-test scores showed no statistically significant difference. After identifying the two comparable sections, the researchers randomly assigned which section would serve as the experimental group and which would serve as the control group. The experimental group received the intervention, which was conducted over three sessions, while the control group did not receive the treatment. A total of 60 respondents took the post-test examination, with 30 respondents from the experimental group and 30 respondents from the control group. The researchers utilized quota sampling in selecting the respondents as it provides a more efficient method for identifying and selecting the respondents.

Research Participants

The respondents of the study were Senior High School students from a private Catholic institution, specifically two sections under the Arts, Social Sciences, and Humanities (ASSH) strand, officially enrolled during the school year 2025–2026. In the initial part of the study, three sections were selected to participate in a pretest writing activity. After analyzing the results, two sections that showed no significant difference were retained for the study. A total of 60 students participated, with 30 students from one section assigned to the experimental group and 30 students from the other section assigned to the control group. Those who belong to other academic strands or tracks, students from other sections, and individuals unwilling to participate are excluded from the study. These exclusion criteria were implemented to maintain consistency, reliability, and validity of results by ensuring that only eligible and academically comparable participants were included in the research.

Research Instrument

The study employed a pre-test and post-test writing assessment, with all topics and instructions undergoing validation by an English teacher to ensure clarity and appropriateness. The students' written outputs were evaluated using the adopted analytical scoring rubric developed by Jacobs et al. (1981), which measures five key components of writing: Content (30 points), Organization (20 points), Vocabulary (20 points), Language Use (25 points), and Mechanics (5 points). These criteria collectively assess idea development, coherence, word choice, grammatical accuracy, and technical correctness. To assess the performance of students, the outputs were rated by three English teachers. The students' performance was evaluated out of a total of 100 points. To ensure the validity of the rubric, it underwent a validation process. The rubric was validated by three experts in the related field utilizing a standardized validation tool through the use of 5 likert scale including clarity of language, presentation/organization of topics, suitability of items, adequacy of purpose, and objectivity. The content validity has a mean score of 4.67 which indicates excellent level of validity indicating that the rubric is highly reliable and appropriate for assessing the intended learning outcomes of the study.

Data Gathering Procedure

The data gathering procedure was carefully structured to ensure validity and reliability of the study. First, the researchers secured formal authorization by obtaining consent from the principal or relevant authority. To measure writing proficiency, Jacobs et al.'s analytical rubric was adopted and validated by three experts to establish content validity. An orientation was conducted for each of the three ASSH sections before administering the pre-test essay writing activity, which served to assess students' initial writing proficiency and establish heterogeneity in the dataset. The pre-test outputs were then evaluated by three inter-raters, followed by an initial statistical analysis to determine differences among sections and to identify the control and experimental groups. Once the groups were established, another orientation was conducted prior to the intervention. The experimental group engaged in three writing sessions using AI-assisted writing tools, guided by prompts such as "Make this sentence grammatically correct and give comments and suggestions." Students completed worksheets where they recorded their original sentences, the AI-generated corrections, and the feedback provided. After the intervention, both groups participated in a post-test using the same essay writing activity, this time without AI assistance. The outputs were again assessed by the same three expert raters using the validated rubric to maintain scoring consistency. Finally, all pre-test and post-test scores were encoded, organized, and subjected to statistical analysis, with results summarized, interpreted, and discussed to determine the significance of the AI-assisted writing tool's impact on students' writing proficiency.

Results and Discussions

Research Question 1: What is the level of Writing Proficiency of Senior High School Students in the Experimental Group; and Controlled Group?

Table 1. Pretest–Posttest Writing Proficiency of Senior High School Students in the Experimental and Control Groups

	Treatments	Mean	SD	Description
Pre-Test	Experimental	73.67	6.98	Fairly Satisfactory
	Control	74.49	6.66	Fairly Satisfactory
Post-test	Experimental	82.04	7.78	Satisfactory
	Control	77.81	4.60	Fairly Satisfactory

Table 1 presents the pretest–posttest writing proficiency of senior high school students in the experimental and control groups. The students were divided into two groups: an experimental group, which utilized an AI-assisted writing tool as the intervention, and a control group, which did not receive the intervention. The pretest scores for both groups were relatively similar, with the experimental group scoring a mean of 73.67 (SD = 6.98) and the control group scoring a mean of 74.49 (SD = 6.66). Both groups were classified as fairly satisfactory, indicating that prior to the intervention, students demonstrated comparable writing proficiency and were at a similar baseline level.

Moreover, the posttest scores revealed a marked descriptive difference between the two groups. The experimental group achieved a mean score of 82.04 (SD = 7.78), classified as satisfactory, suggesting that the AI-assisted writing tool enhanced their writing proficiency. In contrast, the control group's posttest score remained relatively unchanged at a mean of 77.81 (SD = 4.60), classified as fairly satisfactory, indicating minimal improvement without the intervention. These findings highlight the effectiveness of the AI-assisted writing tool in improving students' writing performance and highlight the potential benefits of integrating technology-assisted instruction in enhancing writing skills among senior high school students.

Moreover, the results are aligned with the study of Ekizoğlu and Demir (2025) who found that AI-based writing support significantly improved secondary students' grammar, vocabulary, and coherence, showing its potential to enhance writing proficiency. This finding is also supported by Alzahrani and Alotaibi (2024) who revealed that AI applications strengthened high school students' writing performance, particularly in organization and idea development, highlighting AI as a useful learning assistant in language learning. Similarly, Zahra and Fithriani (2024) observed that the use of AI tools led to measurable improvements in vocabulary, syntax, coherence, and students' confidence in writing. In addition, Garcia (2023) emphasized that AI tools can support learners by providing personalized feedback that helps improve clarity and writing structure. Lastly, these findings support the study of Haziz et al. (2025) stating that students who used AI demonstrated notable improvements in organization, vocabulary use, and coherence. Given these findings, the results of this study confirm that the use of AI has a significant and positive impact on students' writing proficiency by providing guided feedback, improving language accuracy, and supporting the development of well-organized and coherent written outputs.

The results show that the control group demonstrated a slight improvement in writing proficiency, increasing from a mean score of 74.49 in the pretest to 77.81 in the posttest while still remaining within the fairly satisfactory level. This aligns with Yang et al. (2024), who noted gradual improvement with conventional practices, and Ju (2023), who explained that independent writing develops skills more slowly without technological assistance. Basic et al. (2023) observed minimal gains in control groups following standard instruction, while Liang et al. (2025) highlighted that traditional methods improve writing over time but less than technology-supported learning. Khairunniswita and Daulay (2024) also noted that the lack of additional support limits higher-level skills such as coherence, vocabulary variety, and organization, supporting the finding that the control group's progress remained limited. These findings therefore support the results of this study, indicating that although the control group experienced some improvement in their writing proficiency, the level of progress remained limited compared to groups exposed to enhanced writing interventions.

Research Question 2: Is there a significant difference between the level of writing proficiency of Senior High School students in the experimental and control groups?

Table 2. Significance of the Difference between the Pretest Writing Proficiency of Senior High School Students in the Experimental and Control Groups

Variables	t	p-value	Decision	Interpretation
Pre-Test				
Writing Proficiency	-0.467	.643	Failed to Reject H_0	No Significant Difference

The study aimed to determine whether there is a statistically significant difference in the writing proficiency of senior high school students in the experimental and control groups. An independent t-test was conducted on the pretest scores to assess whether the two groups had comparable baseline performance. As presented in Table 2, the results show a t-value of -0.467 and a p-value of 0.643, which is greater than the 0.05 level of significance. Consequently, the study failed to reject the null hypothesis, indicating that there is no significant difference in the pretest writing proficiency between the experimental and control groups. This finding confirms that the two groups started at similar levels of writing proficiency prior to the intervention.

To evaluate the effect of the intervention, a paired-sample t-test was conducted comparing pretest and posttest scores within each group. Table 3 presented the t-value of -5.168 and a p-value of 0.000 for the experimental group, which is less than the significance level of 0.05. This indicates a statistically significant improvement in writing proficiency following the intervention, suggesting that the AI-assisted writing tool effectively enhanced the students' writing performance. In contrast, the control group also showed a t-value of -2.498 and a p-value of 0.018, which, although smaller, is still statistically significant, indicating only minimal improvement in writing proficiency without intervention.

Table 3. Significance of the Difference between the Pretest-Posttest Writing Proficiency of Senior High School Students

	Mean Difference	t	df	p	Decision	Interpretation
Pre-test - Posttest Experimental	-8.378	-5.168	29	0.000	Reject H ₀	Significant Difference
Pre-test - Posttest Control	-3.322	-2.498	29	0.018	Reject H ₀	Significant Difference

An independent t-test was further conducted to compare the posttest scores between the experimental and control groups. As shown in Table 4, the results indicate a t-value of 2.564 with a p-value of 0.014, which is below the 0.05 level of significance. This demonstrates a significant difference in posttest writing proficiency between the two groups, confirming that the experimental treatment had a statistically significant effect on students' writing performance compared to the control treatment. Overall, these results highlight the effectiveness of the AI-assisted writing tool in improving writing proficiency among senior high school students, whereas students who did not receive the intervention exhibited relatively smaller gains.

Table 4. Significance of the Difference between the Posttest Writing Proficiency of Senior High School Students in the Experimental and Control Groups

Variables	t	P-value	Decision	Interpretation
Post-Test Writing Proficiency	2.564	.014	Reject H ₀	Significant Difference

Moreover, the results of the study support previous research on the effectiveness of AI-assisted writing tools in improving students' writing proficiency. Haziz et al. (2025) found that EFL senior high school students who used ChatGPT demonstrated significant improvement in organization, vocabulary use, and coherence in their writing. Similarly, students who practiced writing with AI support performed better in later writing assessments compared to those who practiced without AI assistance, indicating that AI can provide personalized feedback that enhances writing development (Lira et al., 2025). In addition, the use of AI-assisted writing tools significantly improved students' grammar and vocabulary proficiency, which led to better overall writing performance (Reyes et al., 2023). Cruz and Santos (2022) also emphasized that students who used AI tools showed increased confidence and better organization in their academic essays. Likewise, AI applications were found to strengthen high school students' writing performance, particularly in terms of organization and idea development (Alzahrani & Alotaibi, 2024). Given these findings, the results of the present study confirm that the utilization of AI-assisted writing tools has a significant positive impact on the writing proficiency of senior high school students.

Finally, the findings of the study support the theoretical foundations that anchored this research. First, the findings can be explained through Vygotsky's (1978) Zone of Proximal Development (ZPD). According to this concept, learners are able to perform more complex tasks when they are provided with appropriate guidance or scaffolding. During the three-day intervention period, the AI-assisted writing tool served as a supportive resource that helped students understand how to organize ideas, structure sentences, and improve the clarity of their writing. Through this guided interaction with the tool, students were exposed to examples, suggestions, and corrections that helped them develop a better understanding of effective writing practices. Over time, this support may have strengthened their independent writing abilities. The fact that the students

demonstrated improved performance even without the use of AI during the posttest suggests that the knowledge and skills gained during the intervention were internalized by the learners. This reflects Vygotsky's idea that scaffolding initially provided by external tools or assistance can eventually lead to independent skill development.

In addition, the findings support Siemens' (2005) Connectivism Learning Theory, which emphasizes that learning in the digital age occurs through connections with technological resources and information networks. The integration of AI during the intervention allowed students to interact with a digital learning tool that provided immediate feedback and guidance. Through this interaction, students were able to explore new ways of structuring their ideas and expressing their thoughts in writing. Connectivism suggests that learning is strengthened when individuals can access diverse sources of information and feedback beyond traditional classroom instruction. In this study, the AI tool acted as an additional knowledge source that complemented the teacher's instruction. Even though the students did not use the technology during the posttest, the exposure to these digital learning interactions during the intervention likely enhanced their understanding of writing strategies, which they were able to apply independently during the assessment.

Furthermore, the results are consistent with the Cognitive Process Model of Writing developed by Hayes and Flower (1981), which describes writing as a complex cognitive activity involving planning, translating ideas into text, and reviewing written output. During the intervention period, the AI-assisted writing tool likely supported these cognitive processes by helping students generate ideas, organize their thoughts, and revise their compositions. By repeatedly engaging with these writing processes while using the AI tool, students may have developed stronger cognitive strategies for composing written texts. When they later completed the posttest without the use of AI, they were still able to apply these strategies independently. This suggests that the intervention helped students strengthen the cognitive skills required for effective writing rather than simply relying on the technology to produce written outputs.

Overall, the results demonstrate that AI-assisted writing tools can function as effective instructional supports that enhance students' learning during the writing process. Even when the technology is no longer available during the assessment phase, the skills developed through guided interaction with the tool can still influence students' independent performance. This outcome reinforces the idea that technological tools, when used as part of the learning process, can facilitate deeper understanding and skill development in writing.

Ethical Considerations

Ethical considerations were carefully observed throughout this study to protect the rights, dignity, and welfare of all participants. Permission to conduct the study was obtained from the school administration prior to data collection. Informed consent was obtained from all participants after they were provided with a clear explanation of the study's purpose, procedures, and their right to withdraw from the study at any time, ensuring voluntary participation. The study also adhered to the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173) in the collection, storage, and handling of the participants' information. Confidentiality was maintained by securely storing all collected data, including writing outputs and test scores, in password-protected files accessible only to authorized researchers. Anonymity was ensured by excluding personally identifiable information from all research records and reports. Furthermore, the study declared the limited use of artificial intelligence, with ChatGPT utilized only for grammar improvement, wording clarification, and reference organization. All AI-assisted outputs were thoroughly reviewed and revised by the researchers, and no AI tools were involved in data collection, analysis, or interpretation of the research data. The researchers remained fully responsible for the accuracy, originality, and integrity of the study.

Conclusion

The study concluded that the utilization of AI-assisted writing tools significantly enhanced the writing proficiency of senior high school students when used as supplementary instructional support. While both the experimental and control groups demonstrated improvement, the experimental group achieved significantly greater gains, highlighting the added value of integrating AI-assisted writing tools into writing instruction. These findings contribute to the growing body of knowledge on technology-enhanced learning by providing empirical evidence that supports the educational use of AI-assisted writing tools to improve students' writing proficiency. However, the findings should be interpreted within the scope of the study, as the participants were limited to Grade 11 students from a single private Catholic educational institution and the intervention was conducted over a specific period. Consequently, the results may not be generalizable to all educational contexts. Future studies are encouraged to replicate this research using larger and more diverse populations, extended intervention periods, and different educational settings to further establish the effectiveness and broader educational implications of artificial intelligence-assisted writing tools.

Recommendations

Based on the findings, it is recommended that the Department of Education (DepEd) officials, school administrators, and educational institutions develop clear policies and implementation guidelines that support the responsible integration of AI-assisted writing tools into writing instruction. Also, professional development programs be provided to enhance teacher's technological and pedagogical competencies in using these tools effectively and ethically. In classroom practice, teachers are encouraged to incorporate AI-assisted writing tools as supplementary instructional resources for drafting, revising, and providing formative feedback. Student should be encouraged to use these tools responsibly as learning aids by critically evaluating and refining AI-generated suggestions rather than relying on them to complete writing tasks independently, thereby fostering academic integrity and reducing overdependence on these tools. Future researchers are also encouraged to replicate and extend this study using larger and more diverse populations, different educational settings, and longer intervention periods to strengthen the generalizability of the findings. Further studies may also investigate the long-term effects and broader impact of AI-assisted writing tools on student's learning and academic development.

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