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Effectiveness of AI- Integrated Pedagogy Using CHATGPT in Enhancing Writing Proficiency Among Grade 10 Students

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ABSTRACT: This study investigated the effectiveness of AI-Integrated Pedagogy using ChatGPT in enhancing the writing proficiency of Grade 10 students. It specifically aimed to determine the students' writing proficiency before and after the intervention, examine the significant difference between pre-test and post-test scores, and explore students' experiences in using AI-assisted writing instruction. The study employed a quasi-experimental design using pre-test and post-test assessments, supported by qualitative data gathered from students' experiences. Results revealed that students' writing proficiency improved from the Developing level in the pre-test to a higher level in the post-test, indicating enhanced performance in grammar, organization, and composition. A significant difference between the pre-test and post-test scores further confirmed the effectiveness of the intervention. In addition, students reported positive experiences with ChatGPT, highlighting its usefulness in improving writing skills, providing grammar support, and enhancing learning. However, some challenges were also identified, such as misunderstanding of prompts, occasional inaccuracies, and the tendency toward overreliance on the tool. Overall, the findings suggest that AI-integrated pedagogy can be an effective instructional strategy in improving students' writing proficiency when properly guided and monitored by teachers.

Keywords: AI-Integrated Pedagogy, ChatGPT, writing proficiency, Grade 10 students, quasi-experimental study, artificial intelligence in education, writing instruction



Introduction

Writing proficiency has long been recognized as a fundamental component of language learning and academic success. Effective writing allows learners to communicate ideas clearly, organize thoughts logically, and demonstrate critical thinking skills. In secondary education, writing proficiency is particularly important because it supports learners' ability to express arguments, synthesize information, and engage in academic discourse across subject areas. However, despite its importance, many students continue to experience difficulties in developing strong writing skills, particularly in grammar, organization, vocabulary, and mechanics (Graham, & Perin, (2007).

Globally, the integration of digital technologies in education has been increasingly explored as a means of improving students' writing abilities. Advances in artificial intelligence (AI) have introduced new opportunities for supporting writing instruction through automated feedback, language modeling, and interactive learning tools. Among these emerging technologies, generative AI systems such as ChatGPT have gained attention for their potential to assist learners in generating ideas, improving sentence structure, and refining written outputs. These systems provide immediate feedback and interactive support, allowing students to engage in iterative writing processes that can enhance both linguistic accuracy and creative expression (Kasneci, Sessler, Küchemann, Bannert, Dementieva, (2023).

Recent studies have highlighted the potential benefits of AI-assisted learning environments in language education. AI-based tools have been shown to support writing development by facilitating brainstorming, improving coherence and organization, and providing real-time suggestions for grammar and vocabulary improvement. Such tools allow learners to experiment with different writing strategies while receiving continuous feedback, which may promote deeper engagement with the writing process (Zhai, 2023). Furthermore, AI-supported writing platforms have been found to encourage learner autonomy by enabling students to independently revise and refine their written work.

In the context of English language education in Southeast Asia, the integration of digital tools into writing instruction has gradually gained attention as educators seek innovative strategies to address persistent challenges in language proficiency. Several studies have reported that technology-enhanced learning environments can positively influence students' writing performance by providing structured guidance and interactive learning experiences (Ranalli, 2018). However, the effectiveness of AI-assisted writing tools among secondary school students remains underexplored, particularly in developing educational contexts.

In the Philippines, improving students' literacy and writing proficiency remains a continuing educational priority. National and international assessments have consistently highlighted the need to strengthen language competencies among Filipino learners. For instance, results from international learning assessments have indicated that many Filipino students demonstrate difficulties in reading comprehension and written expression, which underscores the need for more



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Volume 1 Issue 3 - 2026

effective instructional strategies in language education (Organisation for Economic Co-operation and Development. (2019). In response, educational institutions have begun exploring the integration of digital technologies to enhance teaching and learning practices.

Within classroom contexts, writing instruction often relies on traditional teacher-centered approaches, which may limit opportunities for individualized feedback and iterative revision. Teachers frequently face challenges in providing immediate and detailed feedback to large numbers of students, which may hinder learners' ability to improve their writing skills effectively. The emergence of AI-based writing assistants presents a potential solution to this challenge by offering automated feedback and interactive support that complements classroom instruction.

Recent educational research has begun examining the role of AI-assisted learning tools in supporting language development among students. Studies have reported that AI-based writing tools can improve students' engagement in the writing process and facilitate the development of essential writing components such as organization, vocabulary, and grammatical accuracy (Cotton, & Shipway, 2023). Despite these promising findings, empirical investigations examining the effectiveness of AI-integrated pedagogy in secondary school writing instruction remain limited.

At the local level, teachers have continued to observe challenges among Grade 10 students in composing coherent and well-structured written outputs. Many students struggle with organizing their ideas, maintaining grammatical accuracy, and applying appropriate vocabulary in their written compositions. These challenges often result in written outputs that lack clarity, coherence, and linguistic precision. Such difficulties highlight the need for instructional approaches that can support students in developing stronger writing skills while encouraging active engagement in the writing process.

Given the rapid development of artificial intelligence technologies and their potential applications in education, integrating AI-based tools into writing instruction may offer new opportunities for improving students' writing proficiency. By combining teacher guidance with AI-assisted feedback, learners may benefit from a more interactive and responsive learning environment that supports both skill development and creative expression.

Therefore, this study was conducted to determine the effectiveness of AI-integrated pedagogy using ChatGPT in enhancing the writing proficiency of Grade 10 students. Specifically, the study examined the students' writing performance before and after exposure to the AI-supported instructional approach and determined whether the integration of ChatGPT in writing instruction significantly improved students' writing proficiency in terms of content, organization, grammar, vocabulary, and mechanics.

Statement of the Problem

This study aimed to investigate the effectiveness of AI-integrated pedagogy in improving the writing proficiency of Grade 10 students at Saint Joseph High School of Flora, Inc.

Specifically, it sought to answer the following questions:



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Volume 1 Issue 3 - 2026

1. What is the level of writing proficiency of Grade 10 students before and after exposure to AI-integrated pedagogy using ChatGPT?
2. Is there a significant difference between the pre-test and post-test writing proficiency scores of the students after exposure to AI-Integrated pedagogy using ChatGPT?
3. What experiences do students encounter in using AI ChatGPT tools for writing enhancement?

Hypothesis

There is no significant difference between the pre-test and post-test writing proficiency scores of the students.

Theoretical and Conceptual Framework

This study was grounded on theories that explain how learners improve writing skills through interaction, cognitive engagement, and technology-supported instruction. These included Vygotsky's Sociocultural Theory, Piaget's Cognitive Constructivism, Flower and Hayes' Cognitive Process Theory of Writing, and Mayer's Theory of Multimedia Learning. These theories provided the foundation for integrating AI tools such as ChatGPT in writing instruction.

Vygotsky's Sociocultural Theory emphasized that learning develops through social interaction and guidance within the Zone of Proximal Development (Vygotsky, 1978). In this study, ChatGPT acted as a digital scaffolding tool that helped learners generate ideas, organize sentences, and improve compositions. Piaget's Cognitive Constructivism explained that learners actively construct knowledge through engagement and reflection (Piaget, 1950). Through interaction with AI-generated prompts and suggestions, students enhanced their understanding of writing structures and language use.

Flower and Hayes described writing as a recursive process involving planning, translating, and reviewing (Flower & Hayes, 1981). ChatGPT supported these stages by assisting learners in brainstorming, drafting, and revising their written work. Meanwhile, Mayer's Theory of Multimedia Learning stated that learners process information more effectively when instructional support engages multiple cognitive channels (Mayer, 2009). AI-assisted feedback and prompts helped students process information better and strengthen their writing proficiency.

Technological Pedagogical Content Knowledge (TPACK)

The Technological Pedagogical Content Knowledge (TPACK) framework explains how effective teaching emerges from the integration of technology, pedagogy, and content knowledge (Mishra, & Koehler, 2006). The framework emphasizes that instructional technologies must be



meaningfully integrated with appropriate teaching strategies and subject matter expertise to enhance learning outcomes. In this study, ChatGPT represented the technological component, writing instruction in English represented the content domain, and student-centered instructional strategies represented the pedagogical component. The integration of these elements enabled the implementation of AI-supported writing instruction designed to enhance students' writing proficiency.

Research Paradigm

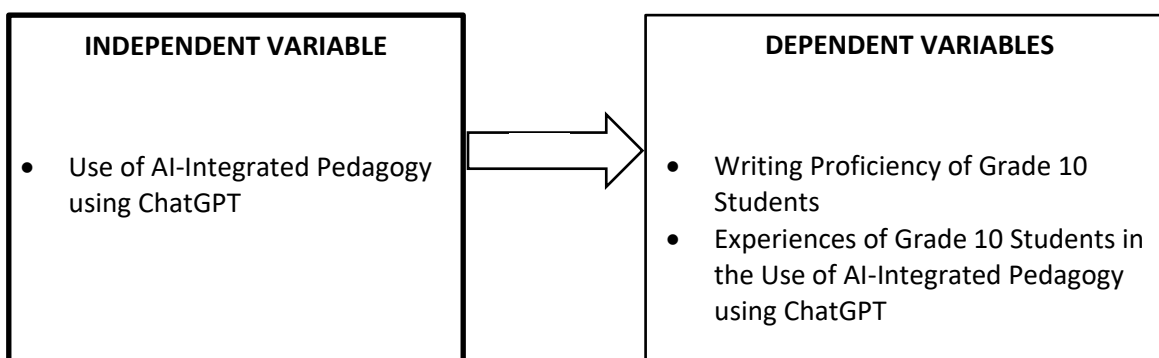


Figure 1. Research Paradigm

This study is anchored on the Independent Variable–Dependent Variable (IV–DV) paradigm, which illustrates the relationship between the variables of the study. The paradigm shows how the independent variable influences the dependent variables in the teaching-learning process.

The independent variable of the study is the use of AI-Integrated Pedagogy using ChatGPT. This refers to the integration of artificial intelligence in writing instruction through the use of ChatGPT as a teaching and learning tool. The AI-integrated pedagogy includes writing activities, guided exercises, drafting, revising, and editing tasks that provide students with AI-generated feedback and assistance in improving their writing skills.

The dependent variables of the study are the writing proficiency of Grade 10 students and the experiences of Grade 10 students in the use of AI-Integrated Pedagogy using ChatGPT. Writing proficiency refers to the students' performance in writing in terms of content, organization, grammar, vocabulary, and mechanics. This variable determines whether the use of AI-integrated pedagogy contributes to the improvement of students' writing abilities. On the other hand, the students'



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Volume 1 Issue 3 - 2026

experiences pertain to their perceptions, engagement, challenges, and overall learning experiences while using ChatGPT in writing instruction.

The paradigm assumes that the use of AI-Integrated Pedagogy using ChatGPT significantly influences the writing proficiency and learning experiences of Grade 10 students. Through this framework, the study aims to determine the effectiveness of AI-assisted instruction in enhancing students' writing skills and to explore how learners experience the integration of artificial intelligence in the classroom setting.

RESEARCH METHODOLOGY

This presents the research methods and procedures utilized in the study. It includes research design, locale of the study, respondents of the study, research instrument, data gathering procedure, and statistical treatment of data.

Research Design

This study employed a one-group pretest-posttest mixed-methods research design to examine the effectiveness of AI-integrated pedagogy using ChatGPT in improving the writing proficiency of Grade 10 students. The design combined quantitative and qualitative approaches to provide a comprehensive analysis of students' writing performance and learning experiences.

The quantitative component utilized a one-group pretest-posttest design, where students were assessed before and after exposure to the instructional intervention to determine changes in writing proficiency (Campbell, & Stanley, 1963). A pre-test writing assessment was administered to establish the students' baseline proficiency. This was followed by the implementation of AI-integrated pedagogy using ChatGPT during writing instruction. After the intervention, a post-test assessment was conducted to measure improvements in students' writing proficiency in terms of content, organization, grammar, vocabulary, and mechanics.

The qualitative component explored the students' experiences in using ChatGPT as a writing support tool. This provided insights into how AI-assisted feedback contributed to idea generation, revision, and language development. The integration of quantitative and qualitative data allowed the study to provide a more comprehensive understanding of the effectiveness of AI-supported writing instruction (Creswell, & Clark, 2018).

Locale of the Study

The study was conducted at Saint Joseph High School of Flora, Inc., a private Catholic secondary institution located in the municipality of Flora, Province of Apayao, Cordillera Administrative Region (CAR), Philippines. The municipality of Flora represents a rural educational setting where schools are gradually integrating digital technologies to support teaching and learning.



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Saint Joseph High School of Flora, Inc. serves junior and senior high school students from various barangays within the municipality and nearby communities. As a developing academic institution, the school has begun incorporating digital innovations into its instructional practices, making it an appropriate setting for examining the effectiveness of AI-integrated pedagogy using ChatGPT in writing instruction.

Participants of the Study

The participants of this study consisted of twenty-four (24) Grade 10 students enrolled at Saint Joseph High School of Flora, Inc. during the academic year of the study. Among the participants, sixteen (16) were male and eight (8) were female learners. The students belonged to a single intact Grade 10 class, which served as the target group for the implementation of the AI-integrated writing pedagogy using ChatGPT.

The participants were selected through purposive sampling, as the class represented the population to which the instructional intervention was applied. The selection ensured that the students met the inclusion criteria of the study, which included regular classroom attendance, access to digital tools during writing instruction, and participation in both the pre-test and post-test writing assessments. These conditions were necessary to ensure that all participants fully engaged in the AI-assisted writing activities implemented during the study.

Research Instruments

This study utilized three research instruments to address both the quantitative and qualitative components of the investigation: an analytic writing proficiency rubric, a structured experience survey, and open-ended qualitative prompts. These instruments were designed to measure students' writing performance and examine their experiences in using ChatGPT as a writing support tool.

To assess students' writing proficiency before and after the instructional intervention, an analytic scoring rubric was employed. The rubric was adapted from the ESL Composition Profile developed by Jacobs et al. (Zinkgraf, Wormuth, Hartfiel, Hughey, 1981) and aligned with the Department of Education's K to 12 English Curriculum Guide. It evaluated five domains of writing proficiency: content, organization, grammar, vocabulary, and mechanics. Each domain was rated using a five-point scale, resulting in a maximum possible score of 25 points. Based on the total score, writing performance was categorized into proficiency levels: 22–25 (Advanced), 18–21 (Proficient), 14–17 (Developing), 10–13 (Beginning), and 5–9 (Emerging).



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The writing assessment required students to respond to argumentative writing prompts. During the pre-test, students wrote an essay on the topic *"Is Social Media More Helpful or Harmful to Students?"*. For the post-test, students responded to the prompt *"Should Schools Implement a No Gadget Policy During Class Hours?"*. Both prompts were designed to elicit argumentative writing and were evaluated using the same analytic scoring rubric to ensure consistency in assessing students' writing proficiency.

To explore students' experiences in using ChatGPT for writing enhancement, a structured survey questionnaire was administered. The survey instrument was adapted from existing studies on artificial intelligence in language learning, blended learning environments, and the Technology Acceptance Model (TAM), which examine learners' perceptions of educational technologies and their influence on engagement and learning outcomes (Idrusu, 2023).

In addition to the survey items, open-ended questions were included to gather qualitative insights into students' experiences while using ChatGPT during writing activities. These responses enabled the researcher to identify students' perceived benefits, challenges encountered, and suggestions for improving the integration of AI tools in writing instruction.

Data Gathering Procedure

The data gathering process followed a structured sequence aligned with the implementation of AI-integrated writing instruction. The procedure ensured the validity and reliability of the collected data through careful planning, ethical compliance, and systematic administration of the research instruments.

Initially, permission to conduct the study was secured from the school head of Saint Joseph High School of Flora, Inc. After approval was granted, informed consent forms were distributed to the participating students and their parents or guardians. The consent forms explained the purpose of the study, the voluntary nature of participation, confidentiality measures, and the intended use of the collected data.

Following the approval and consent process, an orientation session was conducted to introduce the objectives of the study and the use of the AI writing tool, ChatGPT. During this session, the researcher demonstrated how students could access and utilize the AI platform through guided instruction to ensure that participants were familiar with the tool before the intervention phase.

After the orientation, the participants completed the writing pre-test, in which they were asked to write an argumentative essay responding to the prompt *"Is Social Media More Helpful or Harmful to Students?"*. The task was completed under timed and monitored classroom conditions to ensure fairness and consistency. The written outputs were evaluated using the validated analytic writing rubric.

The intervention phase was then implemented over a period of approximately two to three weeks. During this phase, students engaged in structured writing activities in which ChatGPT was integrated into the drafting and revision processes. The activities were aligned with curriculum-



based writing objectives and incorporated AI-assisted features such as idea generation, sentence restructuring, and language feedback. The researcher facilitated the instructional sessions and monitored students' engagement with the AI tool throughout the intervention.

At the conclusion of the intervention, the participants completed the post-test writing assessment, where they responded to the prompt *"Should Schools Implement a No Gadget Policy During Class Hours?"*. Similar to the pre-test, the writing task was conducted under timed and supervised conditions. The essays were assessed using the same analytic scoring rubric to allow objective comparison of students' writing proficiency before and after the implementation of AI-integrated instruction.

To complement the quantitative results, open-ended reflection prompts were administered to gather qualitative data on students' experiences using ChatGPT during the writing activities. These reflections enabled the participants to describe the benefits, challenges, and overall learning experiences associated with the use of AI tools in writing instruction.

All collected data, including writing scores and qualitative responses, were encoded, anonymized, and securely stored for analysis. To ensure scoring consistency, inter-rater reliability was established by involving a secondary evaluator who independently assessed the students' written outputs using the same rubric. Throughout the data collection process, the researcher strictly adhered to ethical research standards, including participant confidentiality and the right of students to withdraw from the study at any time.

Statistical Treatment of Data

The data collected in this study were analyzed using appropriate statistical and qualitative techniques to determine the effectiveness of AI-integrated pedagogy using ChatGPT in improving the writing proficiency of Grade 10 students.

To determine the level of writing proficiency before and after the implementation of the AI-integrated writing instruction, the mean and standard deviation were used. These descriptive statistics summarized the students' writing performance in terms of the five writing domains assessed in the analytic rubric: content, organization, grammar, vocabulary, and mechanics. The mean scores were interpreted according to the established proficiency levels of the rubric.

To determine whether there was a significant difference between the pre-test and post-test writing proficiency scores, the paired-samples t-test (dependent t-test) was utilized. This statistical test is appropriate for comparing two related sets of scores obtained from the same group of participants before and after an intervention [19]. The test determined whether the observed changes in writing proficiency were statistically significant following the implementation of AI-integrated pedagogy using ChatGPT. The level of significance was set at 0.05, which served as the basis for accepting or rejecting the null hypothesis.



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For the qualitative component of the study, students' responses to the open-ended reflection prompts were analyzed using thematic analysis. This method involved identifying, organizing, and interpreting recurring patterns or themes in the participants' responses in order to understand their experiences in using ChatGPT as a writing support tool. The qualitative findings were used to complement the quantitative results by providing deeper insights into how AI-assisted instruction influenced students' writing development and engagement in the writing process (Zinkgraf, Wormuth, Hartfiel, Hughey (1981).

Ethical Considerations

This study followed strict ethical standards to ensure the safety, privacy, and rights of all participants. Permission to conduct the research was obtained from the school head of Saint Joseph High School of Flora, Inc., and informed consent was secured from both students and their parents or guardians. Participants were informed of the study's purpose, procedures, and their right to withdraw at any time without academic consequences.

Confidentiality and anonymity were ensured by using codes instead of names, and all collected data were used solely for academic purposes. Data from writing tasks and reflections were securely stored and accessible only to the researcher.

Since the study involved the use of ChatGPT, students were guided on its ethical use as a support tool for idea generation, feedback, and writing improvement, not as a replacement for their own work. Original authorship was emphasized throughout the process.

Overall, the study upheld ethical principles of respect, beneficence, and academic integrity, ensuring responsible conduct and protection of participants' welfare at all stages of the research.



This presents results from the data gathered. Discussion and thorough analysis of the results are also reflected.

Table 1. Writing Proficiency Level of Grade 10 Students Before and After Exposure to AI - Integrated Pedagogy

Respondents	Pretest Scores	Writing Proficiency Level	Posttest Scores	Writing Proficiency Level
1	13	Beginning	15	Developing
2	17	Developing	20	Proficient
3	12	Beginning	14	Developing
4	10	Beginning	12	Beginning
5	10	Beginning	12	Beginning
6	13	Beginning	15	Developing
7	12	Beginning	14	Developing
8	11	Beginning	12	Beginning
9	12	Beginning	15	Developing
10	16	Developing	18	Proficient
11	16	Developing	20	Proficient
12	16	Developing	19	Proficient
13	15	Developing	18	Proficient
14	16	Developing	17	Developing
15	15	Developing	18	Proficient
16	12	Beginning	13	Beginning
17	10	Beginning	11	Beginning
18	15	Developing	17	Developing
19	11	Beginning	14	Developing
20	16	Developing	17	Developing
21	10	Beginning	13	Beginning
22	10	Beginning	12	Beginning
23	10	Beginning	14	Developing
24	18	Proficient	21	Proficient
Mean Score	13	Beginning	15	Developing
Standard Deviation	2.66		2.94	



Table 1 presents the pretest and posttest writing proficiency levels of Grade 10 students before and after their exposure to AI-Integrated Pedagogy using ChatGPT. The pretest results revealed a mean score of 13.17, interpreted as Beginning level of writing proficiency, while the posttest results showed an increased mean score of 15.46, corresponding to the Developing proficiency level. The increase in mean scores indicates a measurable improvement in students' writing performance after the implementation of the instructional intervention.

A closer examination of the results shows that, during the pretest, the majority of students were classified within the Beginning and Developing levels, with only one learner reaching the Proficient category. This suggests that prior to the intervention, students demonstrated emerging writing competence but still experienced difficulties in organizing ideas, applying grammatical conventions, and expressing arguments coherently. Many learners had not yet fully developed essential writing competencies such as logical organization, vocabulary usage, and syntactic accuracy. These findings are consistent with studies showing that secondary learners often struggle with higher-order writing tasks when opportunities for guided revision and feedback are limited (Alhassan & Iddrusu, (2023).

Following the implementation of AI-integrated pedagogy, a notable shift in proficiency levels was observed. More students achieved scores within the Proficient level, while fewer learners remained in the Beginning category. This improvement suggests that AI-assisted writing support contributed positively to the enhancement of students' writing skills, particularly in organizing ideas, refining sentence structures, improving grammar, and expanding vocabulary usage. The findings imply that the integration of AI-supported instruction provided students with meaningful opportunities to improve their written outputs through continuous feedback and revision.

The pretest standard deviation of 2.66 and posttest standard deviation of 2.94 indicate moderate variability in students' writing scores. The slightly higher dispersion in the posttest suggests that although many students improved after the intervention, the degree of improvement varied among learners. Such variation is expected in instructional interventions because students differ in prior writing competence, engagement, motivation, and ability to utilize feedback during the learning process. Nevertheless, the overall improvement in scores demonstrates that the intervention had a generally positive effect on student writing proficiency.

The observed improvement may be attributed to the instructional support provided by AI-integrated pedagogy using ChatGPT. Through AI-assisted instruction, students were able to receive immediate feedback, generate ideas, revise drafts, and refine sentence structures more effectively. Studies suggest that AI-supported learning environments facilitate the writing process by assisting learners during planning, drafting, and revising stages, which are essential components of writing development (Iddrisu, 2023). Likewise, AI tools provide learners with opportunities for iterative feedback and guided revision, helping students produce clearer, more coherent, and more organized written outputs (Hayes,1981).

Furthermore, previous research indicates that the integration of artificial intelligence in education can enhance student engagement and promote independent learning through personalized instructional support (Holmes, Bialik 2019). By interacting with ChatGPT, students



were able to explore vocabulary alternatives, experiment with language structures, and continuously revise their work. These experiences contributed to the gradual development of writing proficiency and increased students' confidence in expressing their ideas through writing. Consequently, the findings of the study suggest that AI-Integrated Pedagogy using ChatGPT can serve as an effective instructional strategy in enhancing the writing proficiency of Grade 10 students.

Table 3. Comparison of Pre-test and Post-test Writing Proficiency Scores

Group	Mean
Posttest	15.46
Pre - test	13.17
Mean Gain	2.29

Table 3 presents the comparison between the pre-test and post-test mean scores of Grade 10 students' writing proficiency following the implementation of AI-integrated pedagogy using ChatGPT. The results show that the mean score increased from 13.17 in the pre-test to 15.46 in the post-test, yielding a mean gain of 2.29 points. This mean gain indicates a positive improvement in students' writing proficiency after the intervention. Relative to the baseline mean score, the increase represents approximately a 17% improvement, suggesting that the AI-integrated writing instruction contributed to measurable progress in students' writing performance.

The increase in the mean score suggests that the instructional intervention contributed to enhancing students' ability to organize ideas, develop arguments, and apply appropriate language conventions in their written outputs. Although the overall proficiency level remained within the Developing category, the positive mean gain indicates that learners were able to refine their writing skills through the structured support provided during the intervention.

This improvement may be attributed to the role of AI-assisted tools in facilitating the writing process. Writing is widely recognized as a recursive cognitive activity involving planning, drafting, and revising stages, where learners continuously refine their ideas and linguistic structures during composition (Hayes, 1981). AI-based writing tools such as ChatGPT can assist learners during these stages by providing prompts, suggestions, and feedback that guide students in improving the clarity and coherence of their texts.

Moreover, studies on artificial intelligence in education indicate that AI-powered systems can enhance writing development by providing immediate and personalized feedback, which helps learners identify errors, restructure sentences, and expand vocabulary usage (Iddrisu, 2023). Such features allow students to engage in iterative writing practices that promote gradual improvement in writing proficiency.

Similarly, research on AI-supported learning environments suggests that digital technologies can support student learning by enabling interactive and self-regulated learning experiences, allowing learners to independently revise and refine their work with minimal reliance on traditional



teacher feedback (Hayes, 1981). These capabilities are particularly beneficial in writing instruction, where multiple revisions and continuous feedback are necessary for skill development.

Furthermore, recent studies emphasize that generative artificial intelligence technologies such as ChatGPT can enhance writing instruction by providing learners with structured guidance during idea generation, drafting, and editing processes, thereby improving overall writing quality and learner engagement. These AI-assisted systems enable students to receive immediate feedback and suggestions that support the development of coherent and well-structured written outputs (Sessler, Kasnecci, Bannert 2023). The availability of such technological support encourages learners to experiment with language use, revise their compositions more effectively, and engage more actively in the writing process.

Table 4: Test of Significant Difference Between Pre-test and Post-test Writing Proficiency Scores

Group	t-computed	t-critical	Decision	Interpretation
Pretest vs. Posttest	-12.37	2.07	Reject Ho	Significant
<i>Significant at $\alpha = 0.05$</i>				

Table 4 presents the results of the t-test analysis conducted to determine whether a significant difference exists between the pre-test and post-test writing proficiency scores of the students. The results reveal that the computed t-value (-12.37) is greater in absolute value than the critical t-value (2.07) at the 0.05 level of significance. Based on this comparison, the null hypothesis was rejected, indicating that there is a statistically significant difference between the pre-test and post-test writing proficiency scores of the students.

The statistical result suggests that the improvement observed in the students' writing scores after the intervention was not due to chance, but rather can be attributed to the implementation of the AI-integrated pedagogy using ChatGPT. The substantial difference between the computed and critical t-values indicates that the instructional intervention had a significant positive effect on the writing proficiency of the participating learners.

This finding supports the growing body of research indicating that artificial intelligence-assisted learning environments can enhance writing development by providing structured guidance, immediate feedback, and opportunities for iterative revision. AI-powered tools such as ChatGPT enable learners to generate ideas, refine sentence structures, and correct linguistic errors during the writing process, thereby improving the overall quality of written outputs Kasneci, Sessler, Küchemann, Bannert, M., Dementieva, et al. (2023)

Furthermore, studies suggest that AI-supported educational technologies can promote personalized and interactive learning experiences, allowing students to engage more actively in the writing process and independently revise their compositions [16]. Such instructional support aligns



with the cognitive process theory of writing, which emphasizes that effective writing development occurs through continuous planning, drafting, and revising activities (Piaget, (1950).

The significant improvement observed in this study therefore indicates that integrating AI tools into writing instruction can serve as an effective pedagogical strategy for enhancing students' writing proficiency. By providing learners with accessible guidance and feedback throughout the writing process, AI-assisted instruction supports the development of essential writing competencies, including organization of ideas, vocabulary usage, grammatical accuracy, and coherence.

Overall, the findings confirm that the AI-integrated pedagogy implemented in this study significantly improved the writing proficiency of Grade 10 students, demonstrating the potential of generative AI technologies as supportive instructional tools in language education.

Table 5. Thematic Analysis of Students' Experiences Using ChatGPT for Writing Enhancement

CODING FRAMEWORK Verbatim Statements	Description VERBATIM	PATTERNS AND THEMES Coding Framework	Themes
"improve my writing skills" (R1); "improve my grammar" (R3, R10); "humusay sa pagsulat" (R9); "pinapahusay ang pagsusulat" (R19)	Students commonly perceive ChatGPT as a tool that enhances their writing abilities, particularly in grammar, sentence construction, and overall composition. It supports skill development through guided corrections and examples.	Writing Improvement and Skill Development	Enhancement of Writing Skills
"follow chatgpt grammar suggestions" (R2); "determine my grammar errors" (R3); "check my grammar" (R11); "improves grammar" (R20)	Many respondents highlight ChatGPT's effectiveness in identifying grammatical errors and providing accurate corrections, making it a reliable support tool for improving language mechanics.	Grammar Correction and Language Support	Grammar Assistance and Accuracy
"gives advice, solution and knowledge" (R1); "helps me understand words"	ChatGPT functions as a supplementary learning resource, helping students understand concepts, expand vocabulary, and	Learning Support and Knowledge Acquisition	Learning Enhancement and Knowledge Source



(R10); “napagkukunan ng impormasyon” (R16); “learn and analyze topics” (R7)	acquire new knowledge relevant to their academic tasks.		
“mahirap maintindihan” (R4, R19, R20); “did not understand the explanations” (R17); “nakakalito” (R22)	Despite its usefulness, several students report difficulty understanding ChatGPT’s explanations, especially when responses are complex, unclear, or overly technical.	Difficulty in Understanding Explanations	Comprehension Challenges
“sometimes I abuse it” (R2); “we should not rely on it” (R14); “I base on it” (R10)	Some respondents acknowledge the risk of overdependence on ChatGPT, which may hinder independent learning and critical thinking when used excessively or without reflection.	Dependence and Misuse Concerns	Overreliance and Misuse
“Mabilis gamitin” (R18, R23); “Easy access of infos” (R16); “use for homework and assignments” (R2, R5)	ChatGPT is widely appreciated for its convenience, quick responses, and accessibility, making it a practical tool for completing assignments and academic tasks efficiently.	Accessibility and Convenience	Ease of Use and Accessibility
“did not understand my questions correctly” (R12); “not correct information” (R15); “depends on proper prompts” (R24); “internet connection” (R7, R8)	Respondents note limitations such as inaccurate responses, misunderstanding of queries, dependence on proper prompts, and reliance on internet connectivity, which affect the effectiveness of the tool.	Technical Limitations and Accuracy Issues	System Limitations and Reliability Issues

Table 5 presents the thematic analysis of students’ experiences in using ChatGPT for writing enhancement. The coding framework revealed several recurring patterns that were grouped into



themes reflecting both the benefits and challenges encountered by students when using the AI tool in writing activities.

One of the most prominent themes identified was enhancement of writing skills. Several respondents expressed that ChatGPT helped improve their writing abilities, particularly in grammar usage, sentence construction, and overall composition. Verbatim responses such as *"improve my writing skills," "improve my grammar,"* and *"humusay sa pagsulat"* indicate that students perceived the AI tool as helpful in strengthening their writing competence. This finding suggests that the integration of AI-assisted tools in writing instruction can support learners in refining their written outputs through guided corrections and examples. Previous studies have also emphasized that AI technologies can enhance writing instruction by providing structured assistance during drafting and revision processes, enabling learners to improve the clarity and organization of their written work (Kasneci, Sessler, Küchemann, Bannert, Dementieva, Fischer, F., et al. (2023)

Another major theme that emerged was grammar assistance and accuracy. Several respondents highlighted ChatGPT's ability to identify grammatical errors and provide suggestions for correction. Statements such as *"follow ChatGPT grammar suggestions," "determine my grammar errors,"* and *"check my grammar"* indicate that students used the AI tool as a form of language support to improve grammatical accuracy. Grammar correction tools can serve as effective scaffolding mechanisms for language learners by providing immediate feedback on linguistic errors. Research on AI-supported language learning environments suggests that automated feedback systems help learners improve language mechanics by enabling them to recognize and correct their mistakes during the writing process (Ranalli, 2018).

The theme learning enhancement and knowledge source also emerged from the responses. Students reported that ChatGPT provided useful explanations, advice, and information that helped them understand concepts and expand their knowledge. Statements such as *"gives advice, solution and knowledge," "helps me understand words,"* and *"napagkukunan ng impormasyon"* suggest that students viewed ChatGPT not only as a writing assistant but also as a supplementary learning resource. Artificial intelligence technologies are increasingly recognized for their ability to support knowledge acquisition by providing instant access to information and explanations that assist students in completing academic tasks (Jacobs, Zinkgraf, Wormuth, Hartfiel, 1981)

Despite these positive perceptions, the analysis also revealed certain challenges experienced by students. One of these themes was comprehension challenges, where some respondents reported difficulty understanding ChatGPT's explanations. Statements such as *"mahirap maintindihan," "did not understand the explanations,"* and *"nakakalito"* indicate that some students struggled with the complexity or clarity of the responses generated by the AI system. This finding suggests that although AI tools can provide useful information, learners may sometimes require additional guidance from teachers to interpret and apply the explanations effectively.

Another theme identified in the analysis was overreliance and misuse. Some students acknowledged the risk of becoming too dependent on the AI tool when completing their academic tasks. Statements such as *"sometimes I abuse it," "we should not rely on it,"* and *"I base on it"* indicate awareness among students that excessive reliance on AI tools may hinder independent thinking and



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learning. Concerns regarding overdependence on AI technologies in education have been raised in previous studies, which emphasize the importance of maintaining academic integrity and ensuring that AI tools are used as support systems rather than replacements for students' own learning processes (Shipway, 2023).

Another notable theme was ease of use and accessibility. Several respondents described ChatGPT as a convenient and accessible tool for completing academic tasks. Statements such as *"mabilis gamitin," "easy access of infos,"* and *"use for homework and assignments"* suggest that students appreciate the efficiency and accessibility of AI technologies in supporting their learning activities. Digital learning technologies are known to increase students' engagement and productivity by providing quick access to information and resources needed for academic work (Holmes, 2019)

The analysis revealed system limitations and reliability issues as another theme. Some respondents mentioned that ChatGPT occasionally misunderstood their questions, provided inaccurate information, or required proper prompts to generate relevant responses. Other students also pointed out the dependence of the tool on internet connectivity. These findings highlight the technical limitations of AI systems and emphasize the need for critical evaluation of AI-generated responses. Researchers have noted that while generative AI technologies offer numerous educational benefits, they may also produce incorrect or misleading information, which requires users to verify the accuracy of the content provided (Kasneci, Sessler, Küchemann, Bannert, Dementieva, Fischer, 2023)

The findings further suggest that misunderstandings between students and ChatGPT may have been influenced by several factors. One possible reason is the use of vague or incomplete prompts, which may limit the AI system's ability to generate accurate and contextually appropriate responses. Contextual ambiguity in students' questions may also contribute to misinterpretation, especially when instructions or ideas are not clearly expressed. In addition, AI-generated responses are dependent on the quality and specificity of user input, meaning that unclear prompts can lead to irrelevant or confusing answers. Another contributing factor may be the learners' limited familiarity with effective prompting techniques, particularly in formulating precise and detailed questions. These findings indicate the importance of providing students with proper guidance on how to communicate effectively with AI tools to maximize the accuracy and usefulness of AI-generated feedback and responses.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of Findings

This study investigated the effectiveness of AI-integrated pedagogy using ChatGPT in improving the writing proficiency of Grade 10 students at Saint Joseph High School of Flora, Inc.

The results revealed that before exposure to AI-integrated pedagogy, the writing proficiency of the Grade 10 students was generally at the Developing level, with a mean score of 13.17. This



indicates that although students possessed basic writing skills, many still experienced difficulties in organizing ideas, constructing grammatically accurate sentences, and expressing arguments clearly in written form.

After the implementation of AI-integrated writing instruction, the results showed an improvement in the students' writing performance. The post-test mean score increased to 15.46, which remained within the Developing proficiency level but reflected noticeable progress in students' writing abilities. The improvement suggests that the integration of ChatGPT in writing activities helped students enhance their grammar usage, sentence structure, and overall composition skills.

The statistical analysis further revealed that there was a significant difference between the pre-test and post-test writing proficiency scores of the students. The computed t-value of -12.37 exceeded the critical value of 2.07 at the 0.05 level of significance, leading to the rejection of the null hypothesis. This indicates that the improvement in students' writing performance was statistically significant and may be attributed to the implementation of the AI-integrated pedagogy using ChatGPT.

Furthermore, the qualitative findings regarding students' experiences in using ChatGPT for writing enhancement revealed several recurring themes. Students reported that ChatGPT helped improve their writing skills, particularly in grammar correction, sentence construction, and overall writing development. Many respondents also recognized the tool as a useful learning resource that provided information, suggestions, and explanations that supported their writing tasks. In addition, students appreciated the accessibility and convenience of the tool for completing assignments and academic tasks. However, some students also reported challenges such as difficulty understanding certain explanations, occasional inaccuracies in responses, and the risk of overreliance on the AI tool. Despite these concerns, the overall findings indicate that students generally perceived ChatGPT as a helpful support tool in improving their writing skills and facilitating their learning process.

Conclusion

Based on the findings of the study, it is concluded that before the implementation of AI-Integrated Pedagogy using ChatGPT, the writing proficiency of Grade 10 students was at the Developing level, indicating that learners had basic writing skills but still experienced difficulties in grammar, organization, and clarity of ideas. After the intervention, their writing proficiency improved as shown in the higher post-test mean score, suggesting that AI-assisted instruction contributed to better grammar usage, sentence construction, and overall composition skills. The results further indicate a significant improvement between the pre-test and post-test scores, confirming that the enhancement in writing performance was associated with the use of AI-integrated pedagogy. In addition, students generally had positive learning experiences using ChatGPT, as it supported their writing development, grammar correction, and learning process; however, issues such as misunderstanding of prompts, occasional inaccuracies, and overreliance were also observed, indicating that the use of AI tools should be properly guided and monitored to ensure effective and responsible learning.



Recommendations

In light of the findings and conclusions of the study, the following recommendations are proposed to enhance the effective integration of artificial intelligence tools in writing instruction:

1. School Administrators and Curriculum Coordinators should support the integration of AI-assisted instructional strategies in writing instruction by establishing policies and providing professional development programs for teachers. Training workshops may be conducted to equip educators with the necessary knowledge and skills in integrating AI tools such as ChatGPT into classroom instruction while ensuring responsible and ethical use of technology in academic activities.
2. School ICT Coordinators and Educational Technology Personnel should ensure the availability of adequate technological infrastructure, including reliable internet connectivity and access to digital devices, to support the effective implementation of AI-based instructional tools. Strengthening the school's digital resources can facilitate the successful integration of innovative learning technologies in the teaching and learning process.
3. English Teachers should integrate AI-assisted writing tools such as ChatGPT as supplementary instructional resources during writing lessons. Teachers should design structured writing activities that guide students in using AI tools for idea generation, grammar checking, and revision while ensuring that students actively participate in the writing process and maintain originality in their written outputs.
4. Students should utilize AI tools such as ChatGPT responsibly as learning support systems rather than substitutes for their own writing efforts. Learners may use these tools to generate ideas, improve grammar, and revise drafts while continuing to develop independent writing skills, critical thinking, and academic integrity.
5. Future Researchers should conduct further studies involving larger sample sizes, different grade levels, or other academic subjects to examine the broader impact of AI-integrated pedagogy on students' learning outcomes. Future research may also explore additional variables such as writing motivation, digital literacy skills, and long-term writing development when using AI-supported instructional tools.



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