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# THE EFFECTIVENESS OF CHATGPT IN ENHANCING ACADEMIC WRITING SKILLS OF GRADE 11 STUDENTS

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**Abstract:**
This study examined the effectiveness of the intervention of ChatGPT in enhancing the academic writing skills of Grade 11 students. The primary objective was to determine the impact of AI-assisted instruction on students' academic writing performance. A one-group pre-test – post-test quasi-experimental research design was utilized, with thirty-two participants from Humanities and Social Sciences (HUMSS) and Accountancy, Business, and Management (ABM) tracks. A fourteen-day intervention program was employed where students engaged in writing tasks assisted by ChatGPT, assessed through a standardized rubric. Statistical tools such as the mean and paired t-test were utilized. Results showed significant improvements in content development, organization, vocabulary, grammar, coherence, and mechanics. An increase in the post-test mean score was seen while the standard deviation decreased, indicating improved consistency. The t-test revealed a statistically significant difference between pre-test and post-test results, confirming the intervention's effectiveness. These findings suggest that ChatGPT can be a transformative support tool for academic writing instruction. The study contributes to the ongoing discourse on AI integration in education, highlighting its pedagogical benefits and implications for instructional design.

**Keywords:** ChatGPT, academic writing skills, Grade 11 students, quasi-experimental research design

## 1. Introduction

In this modernized world of education, being equipped with skills in terms of academic writing is crucial because it is where communication effectiveness happens (Graham &

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Perin, 2007). Writing is a critical skill that impacts humanity's educational and professional aspects. It is a powerful tool for persuasion, explanation, and emotional expression (Gibson, 2002). However, academic writing skills among students are considered a serious problem across various educational contexts. The study of Mohammed (2024), which analyzes students' research papers at the English Department, shows that students struggle with cohesion, coherence, and general writing proficiency. In addition, C.F. Asdang (personal communication September 11, 2024) a SHS Grade 11 teacher from UM Peñaplata, stated that "*there is really a problem in terms of the writing skills of my students in senior high school supposedly we are about to move on to unit 3 of the topic, however, we are still stuck to subject-verb agreement that we should not tackling since it's not included in their subject English for Academic and Professional Purposes (EAPP) and they don't even know how to create a simple sentence, that becomes my problem that is why I do a one on one instructions to them just to make them understand and it is so hassle on my part*". Through this, the researchers see an urgency to integrate innovative solutions to enhance the students' academic writing skills.

Integrating Information Communication Technology (ICT) in education is one such solution, with studies (Crompton, 2017; Prensky, 2001) showing its positive impact on learning outcomes. Specifically, writing assistants like ChatGPT, an AI tool developed by OpenAI (Radford *et al.*, 2019), have been recognized for their ability to enhance academic writing by improving fluency, generating ideas, and providing immediate feedback(Rezaei *et al.*, 2024; Royani *et al.*, 2024).

In India, a study conducted by Mahapatra (2024) tested ChatGPT as a formative feedback tool on the writing skills of undergraduate ESL students, and the findings indicate a positive impact of ChatGPT on students' academic writing skills, and also the perceptions of the students towards using ChatGPT show positivity. The study strengthens and advances theories of feedback as a dialogic tool and ChatGPT as a reliable writing tool, and has practical implications. However, the study has limitations, specifically the time of intervention, which only lasted six hours. Mahapatra (2024) recommended that future researchers investigate the impact of ChatGPT using an extended intervention period to strengthen the claims. This became the basis of the researchers' study, focusing on 2 weeks of intervention for 14 hours. Moreover, another study in Lanao del Norte, Philippines, was conducted by Maghamil and Sieras (2024) titled "*Impact of ChatGPT on the Academic Writing Quality of Senior High School Students*". This study investigated the impact of ChatGPT on the Grade 12 TVL of Mindanao State University- Lanao del Norte Agricultural College students' writing quality using a pretest-posttest experimental design. The study concluded that ChatGPT impacts students' writing quality in terms of content, grammar, mechanics, and organization. Therefore, integrating ChatGPT in teaching writing skills can be beneficial and efficient. While this study shows that ChatGPT can benefit teachers and students, it has limitations. The scope of this study was restricted to the examination of data from the writing pre-test and post-test of only one strand of senior high school students, specifically the Technical Vocational and Livelihood (TVL) students in a specific senior high school.

Maghamil and Sieras (2024) recommended that future researchers enhance the

present study in the context of other areas of language teaching and learning, specifically studies that will look into the impact of ChatGPT on the academic writing quality of students in different learning tracks among senior high schools. With this, the researchers will not focus on the TVL senior high track. Still, they will delve into the ABM (Accountancy Business Management) and HUMSS (Humanities and Social Sciences) academic tracks that both have subjects related to academic writing, like the EAPP (English for Academic and Professional Purposes), Creative Writing, and Practical Research 1 & 2, which require them to produce an academic writing output. On the other hand, another study conducted at UM Peñaplata College by Marquez *et al.* (2024) that focuses on Grammarly as a tool to enhance the students' academic writing, shows positive results on the qualitative and quantitative sides of the research.

Marquez *et al.* (2024) recommended that future researchers study other Artificial Intelligence (AI) writing assistant tools besides Grammarly. This served as the basis for the researchers to examine the effectiveness of ChatGPT in enhancing the academic writing skills of grade 11 students.

The researchers aimed to fill all of these gaps by examining the effectiveness of ChatGPT on SHS students' academic writing skills at UM Peñaplata College, delving into an extended time of intervention, focusing on other senior high tracks specifically ABM and HUMSS, and the use of ChatGPT as a writing assistant. It is evident that there is an existing problem with the academic writing quality of the Grade 11 students in UM Peñaplata College. Researchers aim to conduct this study to address this problem by integrating ChatGPT to enhance students' academic writing skills. Moreover, the researchers will conduct explanatory experiments using numerical data. A quasi-experimental design will be integrated with only a single group receiving the intervention.

This study is based theoretically on the Extended Technology Acceptance Model (ETAM), which was an extension of the Technology Acceptance Model (TAM) developed by Davis (1989) and expanded by Venkatesh and Davis (2000). ETAM has become a prominent instrument that can be used in educational studies to elaborate on the ways and reasons of adopting and using technological tools in studying people (Marikyan & Papagiannidis, 2023). The independent variable (IV) in this study is the intervention/use of ChatGPT, a scholarly intervention oriented to assist and support the students' academic writing. In this case, the outcome (DV) variable is the students' writing competency level, which will be determined based on the pre- and post-curriculum writing exercise. Referring to the actual scores of writing, the study employs a quantitative approach to examine the indirect effect of PU (Perceived Usefulness) and PEOU (Perceived Ease of Use) in the relationship between the intervention program by ChatGPT and the performance of the study participants in terms of their academic writing skills. The results of previous studies (Or & Chapman, 2021; Abbad, 2021) show that both PU and PEOU have a very close connection to more favourable learning outcomes with an appropriate educational technology. The ETAM model makes it easy to utilize ChatGPT in teaching writing, leading to better writing results. Moreover, by analyzing the impact of the intervention on the academic writing of students in Grade 11

with and without ChatGPT, it finds its consequence as it is implemented in comprehending the implications that led to the enhancement of students' writing skills. This knowledge will be helpful in the design and application of instructional material and procedures by incorporating the notions of the AI language model ChatGPT.

The foundation of this research is that adequate usage of ChatGPT as a learning aid can be used to enhance the academic writing skills of Grade 11 learners substantially. The use of ChatGPT, which is the independent variable, focuses on useful prompting, the utilization of feedback, and supported writing instructions, as he presented during the 14-day intervention stage. Kasneci *et al.* (2023) support this idea by believing that tools that rely on AI, like ChatGPT, can be used to help students improve their writing by providing them with real-time, personalized instructions. Pre-test and post-test essays with a modified rubric evaluating content, organization, grammar and mechanics, use of vocabulary, and coherence will be used as the dependent variable since they are indicators based on the Bauer-Ramazani (2006) MELAB (Michigan English Language Assessment Battery) writing assessment. This theoretical framework was used in designing the intervention and defining the evaluation process to determine whether ChatGPT will improve students' writing competency.

This study primarily aims to determine the effectiveness of ChatGPT in enhancing the academic writing skills of grade 11 students. Specifically, this seeks to answer the research questions in the study whether using ChatGPT among Grade 11 students at UM Peñaplata College helps improve their writing skills. This research aims to answer the following questions: 1.) What are the students' pre-test and post-test mean scores before and after the intervention? 2.) Is there a significant difference in the students' pre-test and post-test mean scores? 3.) To what extent does the use of ChatGPT enhance students' academic writing skills, particularly in areas such as content development, organization, coherence, grammar, vocabulary and mechanics?

The significance of this research contributes to global literature on artificial intelligence in the education sector through examining the effectiveness of ChatGPT in enhancing the academic writing skills of Grade 11 students, aligning with Kasneci *et al.* (2023), who highlight the impact of AI tools to support personalized learning. In the social aspect, it promotes digital inclusion by helping students develop confidence and competence in academic writing, especially those with limited writing support. Educators and school institutions can also benefit from insights into AI-assisted instruction, while curriculum developers may use the findings to guide responsible AI integration in teaching processes. Future researchers can build and enhance this work to further discover AI's significant role in literacy development. This study supports Sustainable Development Goal 4 (Quality Education) by fostering equitable, tech-enhanced learning opportunities for students and teachers.

## 2. Material and Methods

### 2.1 Research Respondents

The respondents of this study comprised Grade 11 SHS students of UM Peñaplata College, with 32 students—18 HUMSS and 14 ABM. The researchers employed a total population sampling technique that served as the single group of the study and received the pre-test and post-test. However, the total enrolled students of UM Peñaplata College Grade 11 were 36. The researchers set an inclusion/exclusion criterion: students who failed to attend three consecutive intervention sessions were automatically withdrawn as study respondents, and those who only signed the consent/assent form were considered. Four students fell under this criterion. Myre and Curry (2018) cited that total population sampling is useful in specific research contexts, particularly when only a small population is small and the characteristics being studied are rare.

Additionally, Lavrakas (2008) highlighted that this method can offer deeper insights into the target population compared to partial samples. The respondents included in this study were Grade 11 SHS students of UM Peñaplata College (both HUMSS and ABM strands), who were enrolled in academic writing courses. Grade 11 students in different academic tracks or students from other year levels who were not enrolled in the institution were excluded.

Any respondents had the right to voluntarily withdraw from the study at any time without penalty, explanation, or impact on their academic standing. Noncompliance, such as refusing to use ChatGPT during guided activities or failing to submit required pre-test or post-test essays, also led to withdrawal.

The study was conducted at the UM Peñaplata College during the school year 2024–2025. The school is located at Obenza St., Brgy. Peñaplata, Island Garden City of Samal, Philippines. The choice of UM Peñaplata - Senior High School as the study locale was justified by its significance to the research focus on exploring academic writing skills among Grade 11 SHS students and the school's excellent academic resources, which provided quality, affordable, and open education.

### 2.2 Research Instruments

This study utilized a writing task as a reaction paper essay to examine students' academic writing competency. The students were tasked to create a reaction paper based on the 2015 Filipino movie *Heneral Luna*, aligned with their EAPP (English for Academic and Professional Purposes) lesson, *Four Values in Filipino Drama and Film* (pp. 34–40). Writing a reaction paper was one of the measures of students' competencies and one of the expository discourse tasks Senior High School students had to know how to write based on the DepEd Curriculum Guide for SHS English for Academic and Professional Purposes (2020). Reaction papers effectively improved written and oral communication skills, which were relevant for managerial success and highly valued by employers (Axley, 1990; Andrade & Miller, 2019).

This study used a percentage scale from Rahmadani (2022) to classify students' pre-test and post-test scores based on research question 1, categorizing and justifying the

scores of the students' output. In educational environments, percentage scales are commonly used to assess and evaluate student performance. According to Vouyoukas (2018), these scales provide a quantifiable evaluation of a student's achievement compared to specific score categories, such as the lowest, average, or top scorers.

A standardized analytic rubric was also used to grade the respondents' essay outputs per criterion. Christine Bauer-Ramazani (2006) developed the rubric, adapted from the MELAB (Michigan English Language Assessment Battery), and modified it to suit an academic writing assessment.

**Scale from Putri Rahmadani (2022)**

| | | |
|---|---|---|
| **90-100** | Excellent | This means that the students' writing skill demonstrates exceptional clarity, focus, and complexity in content, with flawless organization, precise vocabulary, and impeccable grammar and mechanics. |
| **80-89** | Good | This means that the students' writing skill showcases clear and focused content, effective organization with minor flaws, adequate vocabulary usage, and practical proficiency in grammar and mechanics. |
| **70-79** | Fair | This means that the students' writing skill offers satisfactory content with some deficiencies, lacking in organization, vocabulary, and grammar, with noticeable errors hindering understanding. |
| **60-69** | Poor | This means that the students' writing skill is below-average, lacking fluency and coherence, unstable transitions, problematic vocabulary usage, and significant errors in grammar and mechanics. |
| **<60** | Bad | This means that the students' writing skill is very low-quality, with no organization, poor vocabulary usage, severe deficiencies in grammar and mechanics, rendering the writing largely incomprehensible. |

**CONTENT DEVELOPMENT**

| Score | Level | Indicator |
|---|---|---|
| **23–25** | Excellent | Thorough, detailed development; fluent and sophisticated expression. |
| **20–22** | Good | Clear, thorough development; strong fluency and clarity. |
| **16–19** | Fair | Sufficient development; lacks clear positions or detail; hesitant expression. |
| **9–15** | Poor | Limited or ambiguous development; lacks fluency. |
| **5–8** | Bad | Oversimplified content; often copied or listed. |

| Organization | | |
|---|---|---|
| **Score** | **Level** | **Indicator** |
| **18–20** | Excellent | Well-suited structure with strong intro, thesis, and topic sentences. |
| **15–17** | Good | Clear organization with appropriate structure and transitions. |
| **12–14** | Fair | Adequate but restricted structure; some paragraphing issues. |
| **9–11** | Poor | Weak structure; intro/conclusion/thesis may be missing. |
| **5–8** | Bad | Minimal or ineffective paragraphing; lacks key elements. |

| Vocabulary | | |
|---|---|---|
| **Score** | **Level** | **Indicators** |
| **18–20** | Excellent | Wide, fluent vocabulary with precise word choice and forms. |
| **15–17** | Good | Flexible vocabulary; mostly accurate word form usage. |
| **12–14** | Fair | Adequate range; some misuse and word form errors. |
| **9–11** | Poor | Limited, frequently misused vocabulary; basic meanings only. |
| **5–8** | Bad | Very basic, often misused; difficult to understand. |

| Sentence Structure / Grammar | | |
|---|---|---|
| **Score** | **Level** | **Indicator** |
| **13–15** | Excellent | Wide variety of sentences with no grammar errors. |
| **10–12** | Good | Mastery of sentence patterns; few grammar errors. |
| **8–10** | Fair | Some success with varied patterns; several errors. |
| **6–8** | Poor | Frequent grammar errors; unclear sentences. |
| **5–6** | Bad | Many errors; even simple sentences often incorrect. |

| Coherence | | |
|---|---|---|
| **Score** | **Level** | **Indicator** |
| **13–15** | Excellent | Clear, logical flow with effective cohesive devices. |
| **10–12** | Good | Good coherence; cohesive devices generally well-used. |
| **8–10** | Fair | Mostly clear ideas; cohesive devices underused. |
| **6–8** | Poor | Weak or awkward connections; sequencing unclear. |
| **5–6** | Bad | Disconnected or confusing ideas; no logical flow. |

| Mechanics | | |
|---|---|---|
| **Score** | **Level** | **Indicator** |
| **5** | Excellent | Correct format; no errors in mechanics. |
| **4** | Good | Minor errors; do not distract. |
| **3** | Fair | Occasional distracting mechanical errors. |
| **2** | Poor | Frequent distracting mechanical issues. |
| **1** | Bad | Mechanical errors throughout the text. |

### 2.3 Design and Procedure

In this study, the researchers used a one-group pre–test–post–test, quasi-experimental research design. It is a logical procedure of studying numerical information and measurable characteristics (Clarke & Collier, 2015). It is preferred most in many sectors, because it can measure behavior, opinions, and attitudes and generalize regarding large sample populations (Pandey *et al.*, 2023; Vijayendra *et al.*, 2023). Hence, the likelihood that the research questions were addressed thoroughly was high because the quantitative paradigm offers a map that can be referred to when planning, conducting, and analyzing study efforts to reach research objectives with a high degree of success (Mohajan, 2020).
The researchers conducted an intervention to determine the academic writing prowess of the respondents and the level of academic writing prowess. In the study, the quasi-experimental research design using two testing workgroups, one pre-test and one post-test, was proposed to determine the level of the academic writing skills of the students. As Brown (2020) commented, quasi-experimental designs may be multiple or single-group.

Research goals are more attainable through a single-case quasi-experimental design with limited participants. This research design contained various advantages compared to experimental groups. Among the ways through which it becomes an asset

is by giving more attention to the performance outcome of individual performance rather than the performance outcomes of group performance (Rassafiani & Sahaf, 2010).

All Grade 11 SHS of UM College of Peñaplata were the participants of the 14-day study, involving a pre-test and a post-test intervention using an essay test. To guarantee the results, the essays created by the respondents were initially assessed by the researchers based on predetermined scoring rubrics and checked by a licensed language teacher. Descriptive statistics were used to present the data summary of the group's pre- and post-test scores. These are vital because this research provides a quantitative or qualitative overview of a collection of data (Sharma *et al.*, 2018).

The researchers used the analytic rubric and essay test to collect details on the academic writing level of Grade 11 students with and without the ChatGPT intervention. With full knowledge of the extent and quality of academic writing and being aware of the capacities of ChatGPT that can improve or undermine the academic write-ups of the students, these designs are offered.

The data-collection methodology was applied in an orderly and ethical process to ensure the success and integrity of the study. The researchers initiated by first making a formal letter to the UM Peñaplata College dean, the SHS principal, and the senior high school subject instructors. The letter humbly requested authorization to carry out the study, which used a pre-test and post-test design to evaluate how well ChatGPT helped students with their academic writing. Assuring that all activities would adhere to ethical standards and cause minimal interference to regular academic activities, the letter outlined the study's objectives, the topic's significance to educational results, and the processes involved. Upon receiving permission, the researchers moved forward with the study's next steps. An orientation was then held for the participating Grade 11 SHS students. The researchers presented the study's objectives, scope, and procedures during this session. Informed consent forms were issued to respondents and students' parents or guardians, outlining the voluntary nature of participation, the confidentiality of replies, and the students' rights during the study. Only students who signed consent papers were included in the study. To initiate the intervention, students were given an instructional video to pique their attention and offer context for real-life communication and writing scenarios. Following the movie, the students were given a pre-test to determine their baseline academic writing performance. After the pre-test, the researchers checked the students' results based on the adapted rubric, which the collaborating instructor confirmed to verify scoring reliability and consistency.

The study involved daily 1-hour discussions over a 14-day period, which focused on the importance of writing skills in academic and professional life, the value of authenticity in writing, proper prompting, and strategies for effectively conveying thoughts through writing. These sessions were facilitated with the support of the students' senior high school teachers, who helped to ensure active and sincere student participation. The strict supervision emphasized how the researchers ensured ethical usage of ChatGPT—each student was closely monitored to guarantee that they used the AI tool properly, such as paraphrasing responses instead of directly copying them, and collecting their phones during pre-test and post-test essays. After the 14-day intervention,

a post-test was given to assess any academic writing progress. The post-test outputs, like the pre-test, were verified by the researchers first, followed by the validator, to verify correctness and fairness in scoring. The final component was to tabulate and interpret the collected data. Descriptive statistics were adopted to give the performance results, and the difference in significance between the post-test and pre-test results was determined using the paired sample t-test. Calculating the effect size (*Cohen's d*) was also possible, showing a practical intervention's effect. Validity of the data was achieved, and the systematic data collection ensured ethical reliability of the data and its proper interpretation.

Mean was used to report students' academic writing level before and after the intervention with ChatGPT. To analyze the differences between academic writing pre-test and post-test results, the paired sample t-test was performed to determine the significance of the difference and enable the researchers to compare the measure of the intervention provided on the parameters of academic writing. Meanwhile, the effect size, which refers to the size of the improvement, was estimated by calculating *Cohen's d*, allowing better interpretation of the real significance of the changes. Cohen's d is an efficient and common-sense approach to establishing the effect size in the context of educational research, as it helps to put the statistics into perspective by referring to the practical significance (Lakens, 2013). This combination of statistical tools ensured a comprehensive and reliable analysis of the intervention's effectiveness in enhancing the writing skills of Grade 11 students.

The researchers ensured that the study was conducted with adherence to ethical standards. It followed protocol and underwent examination. The researchers observed the necessary study processes to ensure ethical considerations were met.

## 3. Results and Discussion

### 3.1 Pre-test and Post-test Mean Scores of the Students

Table 1 shows the students' essays' pre-test and post-test mean scores before and after the 14-day intervention plan. The students' pre-test mean score ($\bar{x} = 61.97, SD = 14.36$) was described as poor. This shows that students' academic writing skills during the pre-test essay were below average, characterized by a lack of fluency and coherence, inconsistent transitions, problematic vocabulary, and substantial grammar and mechanics errors. On the other side, the post-test mean score ($\bar{x} = 84.69, SD = 6.52$) was described as good. This signifies that the students' writing skills feature clear and focused content, effective organization with minor errors, satisfactory vocabulary usage, and a practical grasp of grammar and mechanics. In addition, there was a decrease in standard deviation before the intervention, up to the after-intervention process.

During the pre-test essay, the standard deviation was 14.36, and the post-test decreased to 6.52. This indicates reduced score variability and more consistent performance among the students. These results imply that the integration of ChatGPT into students' academic writing tasks had a notable impact on the quality and consistency of their outputs.

**Table 1:** Pre-test and post-test mean scores of the students

| | N | Mean | SD | Descriptive Equivalent |
|---|---|---|---|---|
| Before Using ChatGPT (Pre-test) | 32 | 61.97 | 14.36 | Poor |
| After Using ChatGPT (Post-test) | 32 | 84.69 | 6.52 | Good |

Moreover, the researcher suggests using ICT in education, emphasized by Tamim *et al.* (2011) as a beneficial intervention supported by evidence demonstrating improvements in learning outcomes. Specifically, ChatGPT, as this AI enhances academic writing by boosting fluency, assisting with idea formation, and giving students immediate feedback, all of which successfully help their writing process, as shown by Kohnke *et al.* (2023). Budjalemba and Listyani (2020) highlighted that the significant factors contributing to poor academic writing skills include external influences such as teaching style, classroom environment, and course materials, and internal elements include knowledge gaps, self-motivation, and self-confidence. AI helps students become better academic writers by giving them individualized, real-time feedback on their grammar, vocabulary, structure, and content. This makes it easier for students to see and fix errors and improves the quality of their writing overall.

These findings imply that integrating ChatGPT through a structured intervention process can significantly improve students' writing performance, particularly in core areas such as grammar, coherence, and content development, where students often struggle. The sharp increase in the mean score and the reduced standard deviation in the post-test indicate overall improvement and greater consistency and confidence in students' writing abilities. This suggests that ChatGPT served as a writing tool and a scaffold for independent learning and skill application. Therefore, educators, especially in EFL/ESL contexts, should consider incorporating AI-powered tools like ChatGPT as complementary instructional aides to support personalized, feedback-driven learning and to promote equity among learners with diverse writing abilities.

The results undeniably aligned with the study's Extended Technology Acceptance Model (ETAM) theory. The improvement in scores implies the students' Perceived Usefulness (PU) of ChatGPT, as they saw it as a helpful tool to improve their writing. The reduced variability and improved performance also indicate a high Perceived Ease of Use (PEOU**)**, showing that students could use ChatGPT comfortably and effectively. This suggests that when students accept and understand a tool, they are more likely to engage with it productively and achieve better outcomes.

### 3.2 Paired Sample t-test Showing the Mean Gains of Respondents in Academic Writing

Table 2 presents the paired sample t-test showing the mean gains of respondents in academic writing of 32 participants before and after using ChatGPT. There is a significant difference as a result of the pre-test ($\bar{x} = 61.97, SD = 14.36$) and post-test scores ($\bar{x} = 84.69, SD = 6.52$), indicating that the utilization of ChatGPT resulted in an improvement in the academic writing skills of the students, $t(31) = 7.94$, $p<.05$.

**Table 2:** Results of paired sample t-test showing the mean gains of respondents in academic writing (n=32)

| Outcome | Before | | | After | | 95% CI for Mean Difference | *t* | df | Effect size |
|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | *SD* | | $\bar{x}$ | *SD* | | | | |
| Skills in Academic Writing | 61.97 | 14.36 | | 84.69 | 6.52 | 16.882, 28.555 | 7.94* | 31 | 1.40 |

*$p$<0.05

The effect size of 1.40 suggests a substantial improvement in the students' academic writing skills. This shows that ChatGPT, which provides organized examples, iterative help, and real-time feedback, has a transformational effect on writing development. The findings are consistent with the current research on using ChatGPT and other technologies in the classroom. Kasneci *et al.* (2023) highlighted that huge language models can act as intelligent writing aids that help students better arrange their ideas and polish their academic writing. A study by Elkins and Chun (2023) found that ChatGPT also promotes iterative writing, enabling learners to enhance their drafts' coherence and clarity. Zhai (2022) further highlights how AI-powered platforms may scaffold writing teaching by providing examples, explanations, and real-time feedback, therefore bridging learning gaps and encouraging independence in writing assignments.

In addition to that, the researchers found that improvements were really evident. This tells us that the program had a substantial impact on improving students' writing skills, and ChatGPT significantly improved the students' writing proficiency, especially in areas like grammar, structure, vocabulary, and clarity—all of which are crucial for academic writing. Moreover, the results validate the Extended Technology Acceptance Model (ETAM), showing that students found ChatGPT to be both practical and user-friendly, which increased their willingness to utilize AI technologies for academic tasks (Romero-Rodríguez *et al.*, 2023).

### 3.3 Extent of Enhancing Students' Academic Writing Skills Using ChatGPT

To further assess the effectiveness of ChatGPT, the researchers analyzed its impact on specific components of academic writing skills: *content development, organization, vocabulary, structure/grammar, coherence, and mechanics*. Table 3 presents the extent of improvement in each component following the intervention. The paired *t*-test results revealed statistically significant differences across all components, with effect sizes ranging from 0.93 to 1.40, indicating large effects. These findings suggest that the improvements were not only substantial but also exerted a strong influence on the participants' academic writing proficiency.

A closer examination of the results shows that ChatGPT notably enhanced students' ability to organize ideas logically and create smooth transitions between paragraphs. Vocabulary use improved significantly, with students demonstrating more precise, versatile, and context-appropriate word choices. This reflects the tool's capacity to suggest synonyms, provide accurate terminology, and offer alternative expressions, making students' writing clearer, more formal, and more effective. The large effect sizes

also emphasize improvements in grammatical accuracy and sentence structure. ChatGPT supported learners in constructing grammatically correct sentences, reducing errors, and varying sentence patterns. Students exhibited stronger control over introductions, transitions, and conclusions, indicating improved text structure and cohesion. Furthermore, mechanics improved substantially, including punctuation, capitalization, and spelling. This can be attributed to ChatGPT's immediate feedback and corrective recommendations, reinforcing fundamental writing conventions.

Lastly, these findings align with the Extended Technology Acceptance Model (ETAM), highlighting ChatGPT's role as an effective and accessible technological tool for enhancing academic writing. Consistent with the observations of Farrokhnia *et al.* (2023), the findings suggest that AI writing assistants not only support language learning—particularly for English learners and those struggling with articulation—but also strengthen multiple dimensions of writing competence. Ultimately, the results indicate that ChatGPT can be a valuable instructional aid, guiding students through developing key writing elements and contributing to a more efficient and supportive learning process.

**Table 3:** Extent of enhancing students' academic writing skills using ChatGPT (n=32)

| Components | Before | | After | | 95% CI for Mean Difference | *t* | df | Effect size |
|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | *SD* | $\bar{x}$ | *SD* | | | | |
| Content Development | 15.88 | 3.65 | 21.19 | 2.55 | 3.818, 6.807 | 7.25* | 31 | 1.28 |
| Organization | 12.53 | 3.45 | 17.06 | 1.52 | 3.179, 5.883 | 6.84* | 31 | 1.21 |
| Vocabulary | 12.53 | 3.35 | 17.44 | 1.46 | 3.528, 6.284 | 7.26* | 31 | 1.28 |
| Structure/Grammar | 9.31 | 2.38 | 13.03 | 1.15 | 2.642, 4.795 | 7.04* | 31 | 1.25 |
| Coherence | 9.16 | 2.11 | 12.28 | 0.96 | 2.323, 3.927 | 7.94* | 31 | 1.40 |
| Mechanics | 2.56 | 0.80 | 3.69 | 0.74 | 0.688, 1.562 | 5.25* | 31 | 0.93 |

*$p<0.05$

## 4. Recommendations

Based on the findings and conclusions of this study, several recommendations are offered to guide key stakeholders—students, teachers, administrators, and researchers—in maximizing the benefits of AI-assisted writing tools like ChatGPT in senior high school education. For senior high school students, it is recommended that ChatGPT be used as a supplementary tool to support the development of academic writing skills, particularly in subjects such as English for Academic and Professional Purposes (EAPP), Creative Writing, and Research. However, students should be encouraged to interact with ChatGPT critically by reviewing, revising, and reflecting on the content it generates, rather than copying it directly. This approach promotes more profound understanding, encourages analytical thinking, and helps students build stronger writing habits while using ChatGPT responsibly as a writing partner, not a replacement.

For English teachers and writing instructors, it is recommended to integrate ChatGPT into writing instruction through structured classroom activities. These may include guided essay drafting, grammar correction exercises, vocabulary-building tasks,

and editing challenges. Teachers can use ChatGPT to model academic writing structures, explain complex grammar rules, or demonstrate sentence revisions. Moreover, assignments should include tasks requiring students to critique or revise AI-generated texts, enhancing their evaluative and editing skills. It is equally important that teachers provide guidance on ethical AI use by educating students on issues such as plagiarism, proper citation, and academic honesty.

School administrators and curriculum developers are encouraged to incorporate AI tools like ChatGPT into the academic writing curriculum through well-designed, pedagogically sound strategies. This includes providing regular professional development for teachers to ensure they are equipped to use AI tools effectively in instruction. Administrators should also invest in reliable digital infrastructure, including internet connectivity and access to AI platforms, to promote equitable learning opportunities for all students. Furthermore, schools should develop clear institutional policies and ethical guidelines on AI use, ensuring that all students—regardless of socio-economic status—can use these tools responsibly and fairly.

Lastly, future researchers are encouraged to explore further the long-term effects of AI-assisted writing instruction on student learning outcomes. Studies may examine its impact across different grade levels, academic disciplines, and learning tracks, and explore student and teacher perceptions of AI use in the classroom. In addition, future research may address ethical concerns; evaluate the effectiveness of AI compared to traditional teaching methods, and use larger sample sizes, experimental designs, or longitudinal approaches to produce more generalizable findings. Expanding research in these areas will help provide a deeper understanding of the evolving role of ChatGPT and similar AI tools in the educational landscape.

## 5. Conclusion

First, the outcome of the research showed that the group of students had an evident and significant increase in academic writing skills after the 14-day intervention, during which the implementation of the use of ChatGPT was provided. The students had low writing skills before the intervention, especially in content development, structure, grammar, vocabulary, coherence, and mechanics. Evidence of this discovery can be found in the earlier studies done by Maghamil and Sieras (2024), who stated that senior high school students showed little or no ability to express complex ideas, organize their thoughts logically, and adhere to the writing style in academia. However, compared to the pre-intervention stage, the students had greatly improved their writing skills due to exposure to ChatGPT throughout the intervention process.

They could express ideas more clearly, organize their arguments better, and follow proper writing conventions. This improvement suggests that AI tools like ChatGPT can play an essential role in helping students become more competent and confident writers when used consistently and with proper guidance. In addition, statistical analysis further confirmed that the differences between pre-test and post-test scores were statistically significant and practically meaningful. Students moved from low to high performance

levels, showing real and observable gains in their writing abilities. The reduced variation in post-test scores also shows that ChatGPT helped a wide range of learners—not just those already performing well. With real-time feedback and straightforward suggestions, ChatGPT supported students in editing their work, improving clarity, sentence flow, and content depth. These findings affirm that ChatGPT is an effective educational tool, especially in senior high school writing.

Finally, the study found that ChatGPT significantly improved all core areas of academic writing. Significant improvements were seen in coherence, vocabulary, content development, structure and grammar, organization, and mechanics—skills that are vital for high-quality academic writing. These findings directly support the Extended Technology Acceptance Model (ETAM), particularly the roles of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The measurable gains in students' writing skills suggest that they found ChatGPT useful in helping them write better and making it easier to use when completing tasks. PU reflects how students developed richer content, used more precise vocabulary, and wrote with more transparent structure. PEOU is demonstrated by the students' ability to quickly apply feedback, revise their work, and show steady improvement within a short period. These outcomes confirm that when students perceive a digital tool as helpful and user-friendly, they are more likely to engage with it meaningfully—leading to improved learning outcomes. In conclusion, ChatGPT is not just a digital aid but a powerful educational partner that can support students in building stronger, more effective academic writing skills.

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**Conflict of Interest Statement**
The authors declare no conflicts of interest.

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