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A Quasi-Experimental Study on Enhancing EFL Learners' Grammar Precision in Writing Skills under Supported-ChatGPT Approach at a University in a Remote Region of Vietnam

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Abstract

A novel artificial intelligence (AI)-driven approach was designed to support Vietnamese learners of English as a Foreign Language (EFL) to improve their grammar in writing tasks. Among AI tools, ChatGPT, into the students' writing learning process, curent research explores how ChatGPT can impact grammar accuracy in writing. The approach is evaluated through classroom implementation and learner reflections, demonstrating its efficacy in to identify grammatical issues and to develop self-correction. A quasi-experimental study was designed to measure the impact of a ChatGPT powered language model on first-year English majors' writing skills in a remote university in Vietnam. Using a quantitative design, the current study involves 90 participants, divided equally into an experimental group with 45 students, and a control group of 45 ones. The experimental group applied ChatGPT to compose and receive real-time feedback on writing assignment, while the control group received traditional classroom instruction. The writing's grammatical competence was examined through the pre- and post-tests. The results drawed that the experimental group's scores significantly outperformed the control group in terms of grammatical accuracy scores through the analysis results from SPSS. Along with this, questionnaire data interpreted the experimental participants hold positive attitudes towards integrating ChatGPT in writing's grammar among the experimental group participants. These findings suggested that ChatGPT can improve grammar instruction as an effective writing assistant in EFL context, providing real-time feedback and promoting autonomous learning. In addition, the current study also implied that educators should address overreliance and gaps in technology knowledge for instruction. Finally, the study's limitations on small sample size, short intervention, unaccounted student differences, limiting generalizability, are expected to be done in the future research.

Keywords*:* AI-powered language model, ChatGPT, EFL learners, grammar accuracy, remote rural university, writing skills

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Introduction

In recent decades, rapid advances in technology, especially in the field of artificial intelligence (AI), have significantly shaped language teaching and learning. Of this advancement, AI-powered language models like ChatGPT have emerged as revolutionary tools for EFL teaching and learning (Rababah et al., 2023). ChatGPT, born by OpenAI, provides grammar's real-time feedback, coherence, and content expansion, assists learners to effectively and autonomously hone their writing skills (Gutiérrez, 2023; Herda et al., 2024). However, for Vietnamese EFL students, attaining writing's grammar accuracy in English remains a remarkable challenge due to structural varieties between Vietnamese and English, constrained lexical resources, and lack of sufficient exposure to authentic academic texts on general and in writing performance particularly (Ngo & Truong, 2023; Vo, 2023). This barrier is notably evident for non English students at a university in a contryside of Vietnam, where the writing is one of English language skills as an essential demand in undergraduating educational and training program.

In the backdrop of growing emphasis on digital literacy and learner-centered pedagogy, AI platforms like ChatGPT demonstrates significant potential in enhancing learners' engagement and improving learning outputs in writing education (Godwin-Jones, 2022). Present research assesses ChatGPT' effectiveness as a pedagogical aiding equipment in boosting the academic writing performance of the first-year non-English majors at a romotely rural Vietnamese university. By examining non-English students' grammar accuracy in writing performance before and after the ChatGPT adoption, the study herewith measures the impact of the AI platform in EFL writing assistance (Tseng et al., 2023). As virtual literacy and learner-centered instructional approach increasingly gain prominence in language teaching and learning, AI-powered, ChatGPT, writing tools are presenting remarkable potential to transform EFL context (Godwin-Jones, 2022). The present study examines the effectiveness of ChatGPT as a useful technique to raise the academic writing skills of non-English freshmen at a university in Ho Chi Minh City. By comparing pre-test and post-test scores of writing's grammar accuracy, current research determines ChatGPT's influence on writing's structures as a innovative tool to develop writing skills in an EFL learning setting.

In addition, ChatGPT operating as an interactive learning support, allows students to practice writing in a self-directed, low-pressure environment, as opposed to a traditional classroom context. The tool's conversational interface facilitates experimentation with language structures, fosters creative expression, and boosts critical thinking and organizational skills of the students (Shirvan et al., 2023; Siregar et al., 2024). In particular, the demand of the flexible and autonomous learning solutions is increasing in the post-pandemic educational context. Thus, implementing the ChatGPT strategy offers dual benefits in modernizing writing grammar pedagogy while enhancing essential digital competencies for the 21st-century education. Therefore, this study deploys experimental program under ChatGPT integration on the experimental group and traditional approach on the controlled group, leading the findings to provide practical guidance for the AI application in Vietnameme English language teaching context (Vo, 2023).

ChatGPT-branched, in fact, AI-powered language models reveal significant potential in language education. However, there has still been a lack of empirical research on their effectiveness in improving grammatical accuracy and overall writing competence for EFL learners in Vietnam, especially second-year English majors (Vo, 2023). The persistent challenges in developing writing's grammar, coupled with the increasing demands for learner autonomy and digital literacy, make extensive research on the pedagogical integration of ChatGPT at the

university level a pressing demand (Al-Harahsheh et al., 2025). Current his study examines whether integrating ChatGPT into writing instruction results in statistically significant improvements in students' grammatical accuracy in writing skills (Hodges, 2022). It examines the effectiveness of ChatGPT as an AI-assisted academic writing support tool in improving the academic writing skills of the first-year English major students at a rural university.

Three research objectives are guided in current study on (1) measure changes in grammatical accuracy and writing performance before and after implementing ChatGPT as a writing support tool; (2) analyze the impact of ChatGPT on students' ability to develop and express grammatical accuracy in writing skills; and (3) explore students' attitudes toward using ChatGPT in the writing process.

Thus, the current inquiry addresses the following two research questions (1) To what extent does the use of ChatGPT improve the grammatical accuracy of academic writing in first-year English majors? (2) What are students' perceptions of integrating ChatGPT as a learning tool for academic writing?

It is firstly opposite to the research expectation called as the Null hypothesis focusing on H01: The integration of ChatGPT into academic writing instruction will not result in statistically significant improvements in students' grammatical accuracy; H02: The majority of students will have negative perceptions on using ChatGPT in writing grammatical accuracy.

The alternative hypothesis consists of H11: Integrating ChatGPT into academic writing instruction will result in statistically significant improvements in students' grammatical accuracy; and H12: The majority of students have positive perceptions on using ChatGPT in improving grammatical accuracy in their writing. According to the principles of statistical hypothesis testing, if the experimental results demonstrate that students' post-intervention scores are significantly different and their grammatical accuracy is improved, then the data provide sufficient evidence to reject the null hypothesis (H01 and H02). In other words, the observed improvement in grammatical accuracy suggests that the integration of ChatGPT has a statistically significant impact, and the positive feedback from most students continues to support the effectiveness and acceptance of ChatGPT as a learning tool. Thus, the hypotheses are evaluated based on the SPSS results, whether the p value meet the criteria of statistical significance and practical relevance smaller than 0.05, the alternative hypotheses (H11 and H12) will be accepted.

Literature Review

ChatGPT in Teaching Grammar in Writing Skills

Effective feedback enables learners to notice grammatical errors, gradually internalize rules, and develop greater accuracy in their writing over time (Hyland & Hyland, 2019). In research on second language writing, feedback is widely regarded as a central component in grammar development. Nevertheless, in many EFL contexts, and particularly in Vietnam, teachers often work under constrains such as large class sizes and demanding teaching schedules.

These conditions limit the amount of time and attention can devote to providing detailed, grammar-focused feedback (Nguyen et al., 2023). Consequenty, students frequently receive brief or general comments that address surface-level errors but offer limited guidance for sustained grammatical improvement (Boucharef & Nedjar, 2022).

To address these instructional constraints, AI-based tools such as ChatGPT have recently attracted attention as supplementary resources for writing support rather than standalone solutions.

In practice, ChatGPT offers timely and context-sensitive grammar feedback, enabling learners to notice patterns in their errors and revise their writing accordingly.

This form of interaction reflects the principles of continuous assessment and autonomous learning, where learners are positioned as active agents in the gradual development of grammatical accuracy (Zawacki-Richter et al., 2019). ChatGPT enables repeated practice and low-stakes interactions with grammatical forms, reducing anxiety and allowing students to learn from assessments without criticism as well (Farrell, 2022). Empirical research has shown that the pedagogically guided integration of AI-based tools such as ChatGPT can result in measurable gains in grammatical accuracy, particularly when AI feedback complements, rather than replaces, teacher input (Gutiérrez, 2023; Sari et al., 2025).

Unlike conventional grammar-checking software that primarily identifies surface-level errors, ChatGPT engages learners through interactive exchanges, encouraging them to justify grammatical choices and consider alternative forms more critically. This adaptability enables feedback to be adjusted across proficiency levels, an aspect that is frequently constrained in large-scale EFL classrooms.

Taken together, in light of ongoing grammatical difficulties among Vietnamese EFL learners and the structural limitations of traditional feedback practices, ChatGPT provides a practical supplementary approach to enhancing both grammatical accuracy and overall writing quality. Viewed as an intelligent yet supportive writing aid, ChatGPT marks a timely and contextually appropriate development in contemporary EFL pedagogy.

Theoretical Framework on Grammar Advancement in Writing Skills

Several interrelated theoretical perspectives help clarify the instructional value of integrating ChatGPT to assist teachers in enhancing grammatical accuracy and sentence construction in EFL writing instruction. The present study is grounded in two principal theoretical frameworks.

Vygotsky's (1978) Sociocultural Theory first emphasizes the pivotal role of social interaction and mediating tools in cognitive development, particularly through the concept of the Zone of Proximal Development (ZPD), defined as the gap between what learners can accomplish independently and what they can achieve with appropriate support. Within this framework, ChatGPT functions as a digital mediating tool, providing immediate grammar-oriented feedback that enables learners to identify and revise syntactic errors more effectively. Secondly, Krashen's (1985) Input Hypothesis further supports the pedagogical relevance of ChatGPT, arguing that language acquisition is most effective when learners are exposed to input that is slightly beyond their current proficiency level (i+1). In this respect, ChatGPT offers linguistically appropriate input by generating accurate sentence models and grammatical patterns that can be adjusted to individual learners' needs.

In addition, the Process Writing approach strengthens the theoretical foundation of this study, conceptualizing writing as a recursive cycle of drafting, revising, and editing, during which ChatGPT can assist learners by providing targeted feedback and supporting syntactic refinement across multiple writing stages (White & Arndt, 1991).

These double theoretical foundations together provide a solid base for grasping how ChatGPT can foster the development of grammatical and syntactic competence in EFL writing environments, which is showed as the following theoretical framework.

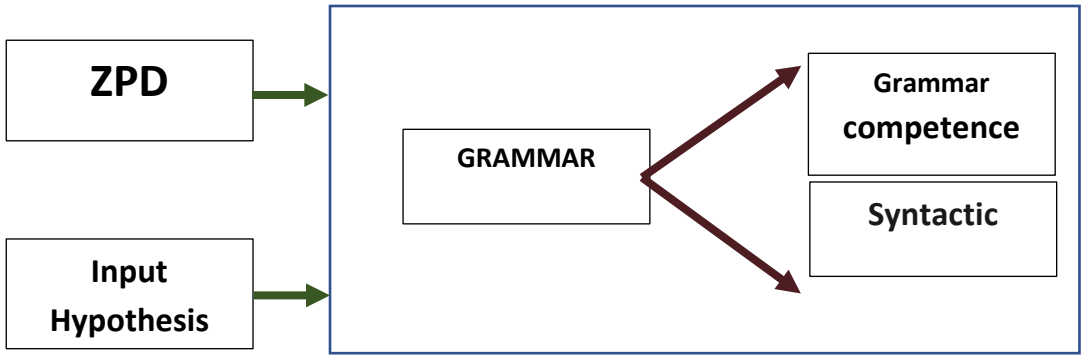


Figure 1. Theoretical framework for grammar accuracy treatment

Vietnamese Learners' Attitudes towards ChatGPT Application in Writing Teaching

Two main aspects of perceived usefulness (PU) and perceived ease of use (PEOU) according to the Technology Acceptance Model (TAM2) (Venkatesh & Davis, 2000) have been extensively utilized in the previous research on learners' attitudes towards using tecnology in writing teaching in general, towards integrating ChatGPT in writing's grammar in particular. In terms of grammatical effectiveness, students rate the ChatGPT as applicable due to its ability to improve grammatical accuracy (Jamshed et al., 2024), clear rule explanations, and instant feedback, factors that are consistent with the Vietnamese educational culture that values concrete results (Hai, 2022). Ease of use is also appreciated thanks to its simple interface and Vietnamese language support, which helps reduce technological barriers (Vo, 2023).

Although TAM has limitations in that it does not assess long-term retention (Ejaz et al., 2025) or emotional factors (Dörnyei, 2020), its merits still outweigh the drawbacks that users' spychology and attitudes were evaluated appropriately and systematicly. Consequently, ChatGPT is positively accepted its practical benefits though, the development of AI applications in writing teaching in Vietnam needs to balance between technical efficiency and learners' emotional experience.

The Empirical Research of AI-powered Tools and ChatGPT in EFL Writing Instruction

Prior studies suggests that feedback generated by ChatGPT can contribute to improvements in learners' grammatical accuracy and overall fluency (Dwivedi & Pandey, 2023). The rapid development of large language models, including ChatGPT, has prompted increasing scholarly attention to their role in EFL writing instruction.

More broadly, the application of artificial intelligence in foreign language education has expanded, particularly in relation to writing development. Within this broader trend, Automated Writing Evaluation (AWE) systems have been reported to offer pedagogical benefits, as students gain access to immediate grammar-focused feedback that supports revision processes and encourages greater learner autonomy (Wang et al., 2012; Fan & Ma, 2024).

In further, learners generally percieve ChatGPT supportively, as it decreased writing anxiety and supports self-directed learning (Bok & Cho, 2023). However, concerns remain about over-reliance on AI, authenticity, and academic integrity (Halaweh, 2023; Wu et al., 2023). It encourages learners to experiment with complex sentence structures (Algaraady & Mahyoob, 2023; Tusino et al., 2025) and enhances learner autonomy and engagement (Kasneci et al., 2023).

The present study was investigated to address these unexplored areas by investigating the impact of integrated grammar instruction on first-year English major students' writing skills through ChatGPT support at a university in rural in Vietnam. As the given these research gaps, this research contributes the insights and empirical data to this field, especially on the effectiveness and educational implications of using ChatGPT to improve writing's grammar accuracy in the remote EFL contexts under limited learning conditions.

Method

A quasi-experimental design was done through incorporating pre-test and post-test to measure grammar accuracy scores before and after the experimental for the experimental group, alongside the inclusion of a control group for comparative purposes. This design was applied for its practicality within real-world educational settings, where random assignment of participants is often neither feasible nor ethical. The quasi-experimental was frameworked to assess the effectiveness of ChatGPT-assisted writing instruction on students' writing performance over a defined period. In order to ensure equivalence and control for external variables, both the experimental and control groups were exposed to similar writing topics, task formats, and instructional conditions, with the primary distinction being the integration of ChatGPT in the experimental group.

Participants

Ninety (90) first-year non-English majored students studying at a university in a rural area of a province in Vietnam where learning conditions are still challenging in accessing modern technology in teaching because the lecturers belong to the older generation; the use of technology in teaching is still quite limited due to barriers of slow operation, hesitation and fear in changing and updating new things in teaching. Therefore, most lecturers prioritize the traditional teaching method, teaching skills according to the Grammar-Translation method, especially writing skills, which are designed by teachers in the proper steps from theory to practice, writing, - mutual correcting, - teacher correcting, – feedback, - students' update, which takes many steps and students do not learn many sentence patterns or knowledge in each lesson.

They were selected by the convenience sampling method and divided equally into two groups: the experimental group (n = 45) and the control group (n = 45). The study was attempted to ensure the balance between two groups in terms of gender distribution, equivalent written English proficiency, and previous writing experience; the filtering age of the participants was between 18 and 19 years.

Instruments and Data Analysis

First, a pre-test and post-test, two primary instruments were employed to collect data for this study, were structured to assess students' average scores and improvement in writing proficiency, with a specific focus on grammatical accuracy. Both pre- and post-tests included the aspect of Grammar corection and Syntatic pattern, designing a similar format, meaning, and purpose: they were tested to assess learners' language proficiency prior to an experimental intervention and to evaluate the intervention influence afterwards. This approach enables educators to establish a baseline, measure progress, and determine the effectiveness of instructional activities by comparing the results before and after the experimental (Weigle, 2002).

Table 1. Pre-test and post-test summary

Test	Format	Meaning	Purpose
Pre-test	Correcting errors in a given passage	Assessing grammar accuracy and correction	Diagnosing initial level, setting baseline
Post-test	Writing a passage of the given topic	Assessing writing and grammar	Measuring improvement, evaluating teaching/workshop

By the aim to verify a standardized and reliable measure of learners' grammar accuracy, these writing tasks were firstly evaluated using the grammar asessment rubric summarized as main criteria of grammatical accuracy on correcting use of verb tenses, subject-verb agreement, articles, prepositions, and sentence structures; and minimal errors that did not impede comprehension (Weigle, 2002; Zimmerman, 2002), as following.

Table 2. Grammar assessment rubric

Criteria	2 – Poor	4 – Fair	6 – Satisfactory	8 – Good	10-Excellent
Sentence Structure	Sentence fragments	Awkward	Sentences are generally structured	Sentences are clear	Sentences are varied
Grammatical Errors (Overall Accuracy)	Many errors	Several errors	Some errors	A few minor errors	Virtually error-free

Adapted from a previous study (Zhang & Zou, 2022), a Likert-scale questionnaire seen as the second instrument, was administered to participants in the experimental group to examine their attitudes toward using ChatGPT in writing instruction, which included two main components: (1) Cognitive efficacy in grammar support and (2) Affective and motivational attitudes. The first part was to assess how ChatGPT helped students understand grammar rules, identify and correct errors, and improve the grammar accuracy and structure variety of their writing.

The most items' mean scores demonstrate that the EFL learners revealed ChatGPT both effective in improving grammar and promoting learning, highlighting its positive impact on both language proficiency and learner attitudes. It is obviously revealed in the second part, measuring students' engagement, confidence, enjoyment, and motivation in using ChatGPT to learn grammar in writing.

The data analytical process involving the quantitative approach under Independent Samples T-Tests from the software SPSS version 26. It was applied to compare the performance between the experimental and control groups. Statistical significance was set at $p < .05$. The questionnaire responses were analyzed using descriptive statistics to identify trends in learners' attitudes towards the use of ChatGPT in writing.

Procedures

The experimental group was treated under an eight-week intervention with ChatGPT support. The detailed instructions on how to use ChatGPT support to learn grammar and syntatic structures during the entire writing process. The phase one: is to focus on brainstorming, where

students learnt how to use AI to explore ideas, expand on topics. The phase two: is to express the topic sentence generation phase, ChatGPT was used to help them construct strong closing sentences, ensuring correct grammar and structure focus. When they moved into the drafting phase, students had ChatGPT to develop their ideas into complete paragraphs' structures, while being reminded to maintain their own voice rather than relying entirely on the machine.

The final one is editing, where students compared the suggestions from ChatGPT with their own drafts, analyzing the pros and cons to choose the optimal way to express themselves. Throughout the process, teachers re-taught and emphasized accurate gramaartical structures, asking students to explain why they accept or reject suggestions from the AI integration.

This approach was not only trained writing's grammar accuracy but also enhance the ability to evaluate writing content, assist students become independent and creative writers even with the support of technology. The results showed that the experimental group's participants were not only improve the quality of their essays but also form proactive learning habits, and know how to effectively combine human thinking under ChatGPT assistant.

Results

Writing Test Scores

For the purpose to evaluate the impact of ChatGPT-assisted instruction on learners' grammatical performance, Independent Samples T-Tests was used to compare two group's mean scores. The statistical results mean to measure the improvements over time between-group differences, providing empirical evidence of ChatGPT's effectiveness in developing grammar accuracy in EFL writing instruction.

Table 3. *Pre-Test comparison results from Independent Samples T-Test*

Table 3 reports the grammar performance beteen the experimental group with M = 5.5, SD = 1.16 and the control group holds M = 5.1, SD = 1.05 through an independent samples t-test.

Group	N	Mean	SD	Std. Error Mean	Levene's F	Levene's Sig.	t-value	df	p-value 2-tailed	Mean Difference	Std. Error Diff.
Controlled	45	5.1	1.05	0.206	0.353	0.521	3.77	58	0.51	1.29	0.327
Experimental	45	5.5	1.16	0.206	0.353	0.519	3.97	58		1.26	0.341

The results indicated that there was no statistically significant difference in grammar scores between the two groups at the pre-test stage (both groups' p = .51 > .05). The mean difference was 1.29, suggesting that both groups started with comparably low and the same grammar levels before the intervention.

The equivalence performance of the baseline supports the subsequent comparisons' validity to ensure that all post-test differences were attributed to the teaching approach rather than pre-test disparities.

Table 4. *Post-Test comparison results through Independent Samples T-Test*

Group	N	Mean	SD	Std. Error Mean	Levene's F	Levene's Sig.	t-value	df	p-value 2-tailed	Mean Difference	Std. Error Diff.
Controlled	45	6.0	1.02	0.201	0.352	0.612	3.89	90	0.49	1.31	0.381

Experimental	45	7.83	1.12	0.201	0.323	0.631	3.89	90	0.00	1.42	0.334

Grammar post-test between the experimental group (M = 7.83, SD = 1.12) and the control group (M = 6.0, SD = 1.02) through the second independent samples t-test comparason. The significant improvement of the experimental group's participants proved ChatGPT-assisted instruction's efficacy, and demonstrates that AI integration can aid learners' grammatical accuracy in writing develop notably.

Table 4 demonstrats a statistically meaningful difference in grammar post-test performance *(control group with p = .49 > .05 while the experimental group with p < .05)*, with students in the experimental group achieving higher scores than those in the control group by an average margin of 1.83 points. The remarkable progress associated with the intervention underscores the instructional value of ChatGPT-supported writing, which function not only as a means of error correction but also as a learning scaffold that helps learners recognize grammatical structures and develop greater independence in their writing practices**.** Moreover, it is confirmed that AI-power has capacity to provide immediate, individualized feedback and sentence-level corrections. The results suggest that ChatGPT performs as a key role in facilitating students' grammar development, an advantage often limited in conventional teacher- or peer-led feedback settings due to time and resource constraints.

Questionnaire Results

Following clusters' statements were measured for clarity, consistency, and construct alignment; the internal consistency of the questionnaire double-checked significantly through a rigorous pilot parallel to the Cronbach's Alpha coefficient for both clusters. For the cluster 1, the factor "Perceived effectiveness" in grammar support increases to 0.75**,** indicating good internal consistency**.** It was supposed that the items in this cluster were to reliably measure learners' perceptions of how ChatGPT supports grammar learning through correction, explanation, and improvement of sentence structure.

Similarly, the Cronbach's Alpha for cluster 2's Affective and motivational attitudes rise to 0.73, reflecting acceptable internal consistency. Items in this cluster now better capture learners' affective responses, such as confidence, enjoyment, engagement, and behavioral intentions.

Table 5. *Exprimental participants' attitudes toward ChatGPT*

Items	Statements	Min	Max	Mean	SD
I. Perceived effectiveness in grammar support					
1.	ChatGPT helped me grasp English grammar rules more efficiently.	3	5	4	0,67
2.	ChatGPT is a valuable resource for spotting and fixing grammar mistakes.	2	5	4.27	0.79
3.	My sentence structure became more grammatically accurate thanks to ChatGPT.	3	5	4.29	0.69
4.	I relied on ChatGPT to proofread and refine grammar in my writing.	3	5	4.2	0.78
5.	With ChatGPT, I became more aware of repeated grammar errors in my work.	2	5	4.17	0.87

6.	The grammar explanations from ChatGPT were straightforward and easy to understand.	3	5	4.31	0.59
7.	My writing's verb tenses' comprehension and application is improved with ChatGPT support.	2	5	4.16	0.77
8.	In my writing, ChatGPT allows me to incorporate a broader range of grammatical structures.	3	5	4.32	0.56
9.	I learn new grammar structures and apply them effectively when using ChatGPT.	3	5	4.21	0.67
II. Affective and motivational attitudes					
10.	ChatGPT may enable grammar learning more interactive and approachable.	2	5	4	0.88
11.	I feel more self-confident when using grammar correctly after using ChatGPT.	1	5	3.91	1.08
12.	I usually use ChatGPT to review grammar before turning in my writing assignments.	2	5	4.12	0.85
13.	ChatGPT offers more thorough grammar precision compared to peer feedback.	3	5	4.26	0.59
14.	Writing becomes more enjoyable when I use ChatGPT for grammar aid.	2	5	4.18	0.69
15.	I plan to use ChatGPT to enhance my grammar in learning English language in future.	3	5	4.45	0.55

In Cluster I, the mean scores ranged from 3.91 to 4.45, with the highest agreement reported for the item "*With ChatGPT, I became more aware of repeated grammar errors in my work*" (M = 4.31, SD = 0.59), suggesting that learners found the tool's grammatical feedback both accessible and useful. Similarly, high scores were recorded for statements "*It was a valuable resource for spotting and fixing grammar mistakes*" (M = 4.29) and "*My sentence structure became more grammatically accurate thanks to ChatGPT*" (M = 4.32), indicating strong perceptions of its effectiveness in grammartical acquisition.

The data were organized into two thematic clusters; Perceived effectiveness in grammar support and Affective and motivational attitudes**,** both of which revealed generally positive perceptions across all 15 items. The relatively low standard deviations (all below 0.81) reflected a high degree of response consistency through the cluster's internal consistency was confirmed with a Cronbach's Alpha of 0.75. The results from questionnaire's 5-point-Likert scales offered valuable insights into learners' attitudes toward the use of ChatGPT in writing instruction, particularly in grammar-focused contexts.

The second cluster's variability was observed (with SDs reaching 1.08) though, responses indicate that ChatGPT positively influenced learners' emotional attitudes toward writing.

This cluster achieved a Cronbach's Alpha of 0.75, signifying acceptable internal consistency. The affective and motivational aspects, yielded similarly favorable results. The high-scoring items include enhanced enjoyment (M = 4.12), frequency of use (M = 4.18), and increased confidence in grammar application (M = 3.91

The highest-rated item, "*I plan to keep using ChatGPT to enhance my grammar in learning English language in future*." (M = 4.45, SD = 0.55), demonstrates strong learner engagement and behavioral intention. This cluster achieved a Cronbach's Alpha of 0.75, signifying acceptable internal consistency. The affective and motivational aspects, yielded similarly favorable results. The high-scoring items include enhanced enjoyment (M = 4.12), frequency of use (M = 4.18), and increased confidence in grammar application (M = 3.91).

Discussions

The observed improvement in grammatical accuracy, reflected in the increase from a pre-test mean score of 5.5 to a post-test mean score of 7.83, together with favorable student perceptions (with 87% of participants reporting improvements in vocabulary and grammar), highlights the practical value of ChatGPT as an accessible and scalable instructional resource, particularly for learners in underserved educational contexts.

This study aimed to address two central research questions: (1) the degree to which ChatGPT enhances grammatical accuracy in the writing performance of first-year English majors, and (2) students' attitudes toward the integration of ChatGPT into their writing development. The analysis of both quantitative and qualitative data offers converging evidence that responds to these questions.

Overall, the findings not only align with previous research on AI-assisted language learning but also contribute an important perspective by situating ChatGPT use within a context of limited educational resources.

The findings of this study point to the considerable potential of ChatGPT in supporting EFL learners in remote areas of Vietnam, where access to high-quality language instruction and individualized feedback remains limited. Within rural teaching and learning contexts, teachers often face constraints related to instructional resources and professional training, which restrict their capacity to offer detailed, grammar-focused guidance. In such circumstances, ChatGPT can function as a consistently accessible digital support tool, complementing classroom instruction rather than replacing it.

These results are consistent with previous studies by Shirvan et al. (2023), Ding and Yusof (2025), and Rahma and Fithriani (2024), which emphasize the role of AI in broadening access to language learning opportunities, while the present study extends this line of research by demonstrating ChatGPT's practical value in low-resource educational settings. Specifically, its capacity to provide immediate corrective feedback, explain complex grammatical features, and offer varied sentence models helps address persistent gaps in conventional EFL instruction.

For Vietnamese learners in remote areas, ChatGPT's dual function as a grammar coach and motivational aid (evidenced by reduced anxiety and increased confidence in 85% of respondents) is particularly groundbreaking.

Furthermore, the findings of this study call into question the common assumption that advanced language-learning technologies are applicable only within well-resourced urban classrooms. The strong internal consistency of the attitudinal measures (Cronbach's alpha = .75), together with the experimental group's statistically significant advantage over the control group ($p < .05$), suggests that the instructional benefits of ChatGPT extend beyond geographical boundaries. By providing empirical evidence from a Vietnamese tertiary education context, an area that remains underrepresented in research on AI in education, this study contributes a context-sensitive perspective and supports the need for policy-level consideration of AI tool integration as a means of reducing educational inequality.

Thus, the comparison between pre-test and post-test scores, analyzed using an independent samples *t*-test in SPSS, indicates that the use of ChatGPT contributed to a statistically significant improvement in grammatical accuracy among first-year English majors, with a *p*-value below .05. Learners' attitudes toward the intervention were further reflected in mean scores ranging from 3.91 to 4.45, suggesting a general tendency toward agreement and support for integrating ChatGPT into grammar instruction for writing development. Based on these findings, hypotheses H1-1 and H1-

2 were accepted, while hypotheses H0-1 and H0-2 were rejected. Taken together, these results provide a clear response to Research Question 1, demonstrating that ChatGPT use was associated with significant gains in grammatical performance in EFL writing among English-major freshmen.

Regarding the research question 2**,** students expressed overwhelmingly positive attitudes, indicating that ChatGPT is both a pedagogically effective and affectively supportive tool. Obviously, these findings, together, suggested that integrating ChatGPT into EFL writing instruction may enhance both writing-skill-linguistic outcomes and learner engagement, especially when scaffolded by clear instructional design and reflective usage.

Conclusion

The analysis presented above provides evidence of a statistically significant improvement, thereby reinforcing the role of ChatGPT as a supportive resource in EFL writing instruction. Specifically, the study examined the effect of ChatGPT on grammatical accuracy in the writing performance of first-year non English majors.

Learners' favorable attitudes toward ChatGPT-assisted learning, along with heightened engagement and willingness to adopt this approach, were reflected in the questionnaire results. Taken together, the findings indicate that ChatGPT can effectively complement conventional grammar instruction by delivering timely and individualized feedback that supports learner autonomy.

At the same time, the results highlight the importance of guiding students to use AI-based assistance in a critical and informed manner, particularly by acknowledging its pedagogical limitations while benefiting from its motivational advantages.

From a curriculum development perspective, the careful integration of AI-based tools (ChatGPT) into EFL programs has the potential to strengthen grammar instruction, provided that appropriate safeguards are implemented to prevent overdependence and to promote digital literacy among learners. Evidence from the present study suggests that ChatGPT can effectively support EFL learners in improving writing accuracy, including those studying in remote areas where instructional resources are often limited.

This research not only substantiates the role of AI in enhancing grammatical performance but also underscores its potential to promote educational equity by supporting learners in marginalized contexts. With regard to future research, larger-scale implementation models should be examined to better assess the sustainability and impact of ChatGPT in low-resource settings, thereby addressing current limitations related to sample size, localized research contexts, and the relatively short duration of the intervention, all of which may constrain the generalizability of the findings.

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