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Evaluating The Effectiveness Of A Chatgpt-Based Chatbot As A Support Tool For English Writing Instruction In Vietnamese High Schools

Nguyen Minh Anh, Nguyen Thi Hong Minh
Faculty Of Foreign Languages Education, Thai Nguyen University Of Education, Vietnam

Abstract
This study developed a customized ChatGPT-based chatbot, namely the WriteMate Chatbot, and investigated its impact as a support tool for English writing instruction in Vietnamese high schools, as well as students' attitudes towards the tool after the treatment. The study adopted a quasi-experimental design with an experimental group and a control group, totalling 93 high school students. The experimental group used the WriteMate Chatbot to support writing practice throughout an eight-week intervention, while the control group received conventional instruction. Research instruments included pre- and post-writing tests as well as pre- and post-questionnaires. Quantitative data were analysed using SPSS, including descriptive statistics, independent-samples t-tests, paired-samples t-tests, and effect size measures. The findings indicate that the WriteMate Chatbot functioned as a pedagogically grounded support tool through a development framework, a development model, a set of design principles, a chatbot development structure, and a systematized description of chatbot components. In terms of learning outcomes, the results show a significant improvement in the experimental group's mean writing scores from 6.80 (SD = 1.31) to 8.15 (SD = 0.87), $t(47) = -11.778$, $p < .001$, while the post-test mean of the experimental group was also significantly higher than that of the control group. In terms of student attitudes, questionnaire data showed generally positive responses to the WriteMate Chatbot. Overall, the findings suggest that the WriteMate Chatbot, as a customized and process-oriented ChatGPT-based support tool, was associated with improved English writing performance as well as more positive student attitudes toward writing and chatbot-assisted learning.

Keywords: *Customized ChatGPT-based chatbot; high school students; English writing instruction; English writing performance; the 2018 General Education English Curriculum; Vietnam*

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I. Introduction

With the development of globalization, information technology and artificial intelligence have been widely used in many aspects of life such as the economy, health care, tourism, industry and construction and have received considerable attention in education in general and English teaching and learning in particular. Artificial Intelligence (AI) provides great support for teachers and also students, making language learning easier outside the classroom than ever. The systematic review by Zawacki-Richter et al. (2019) shows that AI applications have attracted increasing attention in higher education, especially in learning support and teaching activities. Furthermore, Wang et al. (2024) confirmed, through a literature review, that AI in education is widely applied across many aspects, including learning support, personalized learning, and support for teaching activities. It proves that AI is not only a technology buzzword, but also a tool to support the quality of teaching and learning.

Writing, a crucial skill for English as a second or foreign language learners, is considered one of the most fundamental language skills because it involves integrating ideas and transferring them into various forms of expression. For many researchers and educators, writing is an integral part of language learning. Richards and Renandya (2002) state that writing is the most difficult skill for foreign language learners, since learners must not only generate ideas and organize them coherently, but also express themselves in coherent text. Therefore in Vietnam, English writing is still one of the most difficult skills for high school students. Research on writing education at the high school level in Vietnam by Nguyen Thi Thuy Loan (2021) further indicates that students are aware of the importance of writing, but teachers have limited time to teach or comment on this skill. In classroom and self-study, writing skills are often even less developed than reading, listening, or even speaking skills. This is partly due to limited class time, large classes, and little one-on-one teacher feedback. Consequently, writing remains a demanding skill in Vietnam's 2018 General Education English Curriculum, and many students still struggle to meet the standards of this curriculum.

AI is becoming more and more frequent in the field of English language teaching and learning in Vietnam as teachers have been applying AI to design various learning activities for students. According to Pham and Dang

(2025), the application of AI to language teaching and learning in Vietnam has been growing quickly. Results of the research revealed AI is widely used both in teaching and learning, and that it also supports teachers in their teaching. However, although AI-assisted learning tools have been studied in many different educational contexts, empirical evidence on the effectiveness of such tools in Vietnamese high-school remains limited, particularly with respect to national curriculum-based AI designs. There are many studies about AI application in English Language Teaching (ELT), but there is still limited on how to develop professional chatbots that can respond to the prescribed curriculums set out in Vietnam's General Education English Curriculum, which emphasizes students' writing skills.

This creates scope for AI-powered tools, such as chatbots based on the ChatGPT model, to assist classroom teaching. Unlike the general use of ChatGPT, this study focuses on a customized ChatGPT-based chatbot, or custom GPT. OpenAI (2023) describes GPTs as tailored versions of ChatGPT that can be created for specific purposes and configured with instructions, knowledge, and selected capabilities. Therefore, WriteMate Chatbot was developed as a purpose-built writing support tool rather than a general conversational chatbot. When customized and aligned with the writing skills required in Vietnam's 2018 General Education English Curriculum, such a chatbot can provide tailored guidance and immediate feedback on grammar, vocabulary, organization, and task completion. In addition, out-of-class access enables students to have more opportunities for writing practice. In this context, it is important to understand the practical benefits and limitations of using a ChatGPT-based English writing tutoring chatbot for educators, policymakers, and technology developers.

Thus, this study, titled "Evaluating the Effectiveness of a ChatGPT-Based Chatbot as a Support Tool for English Writing Instruction in Vietnamese High Schools", was conducted to investigate the effectiveness of a ChatGPT-based chatbot as an English writing support tool for Vietnamese high school students, in line with Vietnam's 2018 General Education English Curriculum. Specifically, the study aims to propose and describe the process of developing a ChatGPT-based chatbot to support English writing, evaluate the extent to which chatbots improve students' English writing performance, and explore students' attitudes towards using the chatbot as a supplementary tool to improve their English writing skills.

It is hoped that the findings can help bridge the research gap on technology-enhanced foreign language learning in Vietnam, where using AI as a pedagogical tool for teaching and learning remains relatively new and underexplored**.** This study contributes to the literature on technology-enhanced language learning by providing empirical evidence on the effectiveness of a ChatGPT-based chatbot aligned with Vietnam's 2018 General Education English Curriculum. For teachers, the findings offer insights into how to develop and use an AI chatbot as a personalized feedback tool for students' writing skills and as a means of diversifying writing activities in the classroom. For students, the study provides a useful tool for practicing and improving writing skills outside of class. For educational planners, the study provides concrete evidence to consider integrating AI into the curriculum in general, and into teaching English writing skills in particular. Ultimately, this research aims to bridge the gap between innovative AI applications and the specific needs of English writing instruction in Vietnamese high schools, promoting more effective and personalized learning experiences.

II. Methods

This study used a quasi-experimental design with a pre-test and post-test to evaluate the effectiveness of WriteMate Chatbot, a customized ChatGPT-based chatbot designed as a tool to support English writing instruction. This design was chosen because completely random grouping was not feasible in a real classroom context; therefore, two intact classes were used as the experimental group and the control group (Nunan, 1992). The independent variable was the use of WriteMate Chatbot, while the dependent variable was the students' English writing ability.

The study participants consisted of 93 tenth-grade students at a suburban high school in Hanoi. The experimental group comprised 48 students, while the control group comprised 45 students. Both groups studied English using Vietnam's 2018 General Education English Curriculum and used the Global Success textbook series in their regular classes. Before the intervention, the two groups were considered relatively similar based on their first-semester English scores and pre-test results.

WriteMate Chatbot was developed using GPT Builder in ChatGPT and can be accessed at: https://chatgpt.com/g/g-695f59815dbc8191a574ee959977b84f-writemate-chatbot. It was customized through a multi-layered prompt system that included role definition, writing-process guidance, grade-specific material control, rubric-based feedback, response restrictions, self-checking mechanisms, and anti-ghostwriting constraints. This system was designed to ensure that the chatbot supported students through the writing process rather than generating complete texts for them.

Students' English writing ability was measured using pre-test and post-test. According to Brown (2010), tests are tools used to gather information about learners' abilities, knowledge, or learning outcomes under defined conditions. In this study, the writing test was based on Task 1 of the VSTEP writing test, requiring students to write an email or letter of approximately 120–150 words. This format was chosen because it is suitable for 10th-

grade students and aligned with the writing requirements in Vietnam's 2018 General Education English Curriculum. The writing was graded using an analytic rubric adapted from the VSTEP writing rubric by Ton Nu My Nhat (2021), the CEFR Companion Volume (Council of Europe, 2020), and the writing requirements in the curriculum. The rubric included four criteria: task fulfillment, organization, vocabulary, and grammar. Each writing sample was graded independently by two trained English teachers to ensure inter-rater reliability.

A questionnaire was used to collect data on students' perceptions and attitudes. The questionnaire's content was based on the Technology Acceptance Model (TAM), in which Davis (1989) emphasized two core elements of technology acceptance: perceived usefulness and perceived ease of use. In addition, the questionnaire explored aspects such as writing self-efficacy, writing anxiety, AI awareness, and prior experience using AI. After the intervention, only the experimental group completed the post-questionnaire to reflect their perceptions and attitudes toward using the chatbot.

The study was conducted over eight weeks. In Week 1, both groups completed the pre-test and pre-questionnaire. From Week 2 to Week 7, the experimental group used WriteMate Chatbot outside of class to support weekly writing practice, including brainstorming, planning, drafting, editing, revising, and receiving feedback; while the control group learned the same content using conventional instruction and did not use the chatbot. In Week 8, both groups completed the post-test, and only the experimental group completed the post-questionnaire.

Quantitative data were analyzed using SPSS. Descriptive statistics were used to summarize students' writing scores and questionnaire responses. Independent-samples t-tests were used to compare the experimental and control groups, while paired-samples t-tests were used to examine the changes within each group from pre-test to post-test. Cronbach's Alpha was used to check the reliability of the questionnaire, and effect size measures were reported where appropriate. Statistical significance was set at $p < .05$.

III. Results And Discussion

Findings

First, the results show that WriteMate Chatbot was developed as a process-oriented writing tutor and assessor, not an automated text-generation tool. The chatbot was built on four main orientations: pedagogical orientation, curriculum alignment, assessment alignment, and interaction control. Therefore, the WriteMate Chatbot supports students through brainstorming, planning, drafting, revising, and editing, while using anti-ghostwriting rules to prevent the bot from writing complete essays for students.

Group	N	Mean	SD	t	p
Experimental group	48	6.80	1.31	0.880	.381
Control group	45	7.04	1.28		

Table 3.1. Pre-test Comparison between the Experimental and Control Groups

Table 3.1 presents the pre-test comparison results between the two groups. Before the intervention, the experimental group achieved $M = 6.80$ ($SD = 1.31$), while the control group achieved $M = 7.04$ ($SD = 1.28$). The independent-samples t-test results showed that this difference was not statistically significant, $t(91) = 0.880$, $p = .381$. This indicates that the two groups had relatively similar initial English writing abilities.

Group	N	Mean	SD	t	p
Experimental group	48	8.15	0.87	3.825	< .001
Control group	45	7.28	1.29		

Table 3.2. Post-test Comparison between the Experimental and Control Groups

After the intervention, Table 3.2 shows that the experimental group achieved a higher post-test score ($M = 8.15$, $SD = 0.87$) compared to the control group ($M = 7.28$, $SD = 1.29$). This difference was statistically significant, $t(91) = 3.825$, $p < .001$, indicating that students using WriteMate Chatbot achieved better writing results than the group learning through the conventional method.

Group	Pre-test Mean	Post-test Mean	Mean Difference	t	p
Control group	7.0389	7.283	-0.24444	-2.193	.034
Experimental group	6.8021	8.151	-1.34896	-11.778	< .001

Table 3.3. Within-group Changes from Pre-test to Post-test

The comparison results within each group in Table 3.3 further reinforce this observation. Both groups showed improvement from pre-test to post-test, but the increase in the experimental group was significantly greater. The control group only increased slightly from $M = 7.0389$ to $M = 7.283$, while the experimental group increased from $M = 6.8021$ to $M = 8.151$. This suggests that WriteMate Chatbot may have contributed to a stronger improvement in students' writing ability.

Subscale	N	Mean	SD	Interpretation
Students' perceptions of the importance of writing skills	93	3.8306	0.79499	Agree
Students' interest in English writing and self-study	93	3.2177	0.69473	Neutral
Writing self-efficacy	93	2.7957	0.91032	Neutral
Difficulties and writing anxiety	93	3.6290	0.79329	Agree
Understanding of AI and previous use of AI tools	93	3.7446	0.77405	Agree

Table 3.4. Pre-questionnaire Descriptive Results

For the questionnaire data, the scales showed acceptable to very good reliability, with Cronbach's Alpha ranging from .734 to .918. Table 3.4 shows that before the intervention, students had a positive perception of the importance of writing skills (M = 3.8306) and a certain level of awareness of AI (M = 3.7446). However, writing self-efficacy was only at the Neutral level (M = 2.7957), while writing anxiety and difficulties were at the Agree level (M = 3.6290). This indicates that students recognized the importance of writing but still lacked confidence and had difficulty writing in English.

Subscale	N	Mean	SD	Interpretation
Changes in students' interest in English writing	48	4.1562	0.72130	Agree
Attention and engagement during self-study writing practice	48	3.9635	0.71457	Agree
Perceived Usefulness	48	4.1964	0.65341	Agree
Perceived Ease of Use	48	4.1458	0.78183	Agree
Attitude toward Usage	48	4.2031	0.72870	Agree
Intention to continue using the WriteMate Chatbot	48	4.0781	0.69984	Agree
Actual use in writing tasks	48	4.1750	0.68245	Agree
Writing self-efficacy after the treatment	48	3.8625	0.81701	Agree
Post-treatment writing anxiety	48	2.6250	0.64366	Neutral

Table 3.5. Students' Responses to WriteMate Chatbot after the Intervention

After the intervention, Table 3.5 shows that students responded positively to the WriteMate Chatbot. Most of the main scales were at the Agree level, including perceived usefulness, perceived ease of use, attitude toward usage, intention to continue using the chatbot, and actual use in writing tasks. At the same time, post-intervention writing self-efficacy also reached the Agree level, while post-treatment writing anxiety decreased to the Neutral level.

Variable	Pre Mean	Post Mean	Mean Difference	t	p	Cohen's d
Writing self-efficacy	2.9875	3.8625	-0.87500	-7.016	< .001	-1.013
Writing anxiety	3.5035	2.6250	0.87847	5.511	< .001	0.795

Table 3.6. Changes in Writing Self-efficacy and Writing Anxiety

Finally, Table 3.6 shows the changes in writing self-efficacy and writing anxiety. Writing self-efficacy increased statistically significantly, $t(47) = -7.016$, $p < .001$, with a large effect size (Cohen's $d = -1.013$). Conversely, writing anxiety decreased statistically significantly, $t(47) = 5.511$, $p < .001$, with a moderate to large effect size (Cohen's $d = 0.795$). This result shows that after using WriteMate Chatbot, students became more confident and less anxious when writing in English.

IV. Discussion

Overall, the results show that the WriteMate Chatbot had a positive impact on students' English writing performance, writing self-efficacy, and writing anxiety. This is consistent with Kabir et al. (2025), whose study emphasizes that custom GPTs require clear guidance, repeated testing, and refinement to suit learners' needs. Similarly, Ankerstein (2024) showed that customized GPTs can effectively support written corrective feedback when combined with teacher guidance.

The research results also reinforce the view that chatbots should be considered support tools, not a replacements for teachers or a fully automated grading systems. This is consistent with Lan et al. (2025), who showed that scores provided by GenAI still only correlate weakly to moderately with human graders across different writing criteria. Therefore, WriteMate is more suitable for supporting writing practice and providing formative feedback.

Furthermore, the positive student feedback on WriteMate Chatbot is consistent with Rücker and Becker-Genschow (2025), who found that subject-specific chatbots can increase situational interest, and the research on tailored ChatGPT for Academic Korean Writing, which found that chatbots could provide feedback, facilitate independent learning, and reduce writing anxiety. However, results should be interpreted cautiously as student

progress may be influenced by the teacher, learner engagement levels, intervention duration, and the novelty of using AI. Nevertheless, the study suggests that a customized, curriculum-aligned, and process-oriented ChatGPT-based chatbot could be a potential tool to support English writing instruction in Vietnamese high schools.

V. Conclusion

This study shows that WriteMate Chatbot, a customized chatbot based on ChatGPT, can effectively support the teaching of English writing at the high school level in Vietnam. The results showed that the experimental group exhibited significantly better writing performance than the control group after the intervention. The questionnaire data also revealed positive changes in students' learning attitudes, particularly an increase in writing self-efficacy and a decrease in writing anxiety.

These results suggest that a ChatGPT-based chatbot can be effective when designed in a customized, curriculum-aligned, and process-oriented manner. WriteMate Chatbot should not be considered a replacement for teachers, but rather a supplementary tool to help students generate ideas, organize content, edit writing, receive feedback, and practice writing outside of regular class hours.

VI. Recommendations

Based on the research results, several recommendations can be made as follows. First, when using ChatGPT-based chatbots in writing instruction, teachers need to clearly define the pedagogical goals of the tool. Students need specific guidance on how to use the chatbot, the types of support it can provide, and what tasks they should still perform themselves. The chatbot should not replace the student's writing process, but only support steps such as idea generation, content organization, editing, self-assessment, and initial feedback. This helps maintain the learner's active role in the writing process.

Second, the chatbot design needs to be closely aligned with the curriculum, the learners' proficiency level, and classroom practices. Specifically, the designer needs to clearly define the chatbot's role, build a suitable prompt system, design a step-by-step support mechanism, and integrate rules to limit ghostwriting. A chatbot that assists in writing would be more effective if it were built around specific learning objectives, specific writing types, and clear evaluation criteria, rather than simply using a generic AI communication tool.

Third, students need to be encouraged to use chatbots responsibly and critically. They should be guided to view AI feedback as a source of support for pre-writing, editing, and self-reflection on the writing process, rather than as a complete answer that can be directly copied. This is especially important to protect learner autonomy and ensure that the use of AI in education remains ethically and pedagogically appropriate.

Fourth, schools and teachers should place greater emphasis on AI literacy in foreign language teaching and learning. Once students have a certain level of awareness of AI, guiding them to use this tool systematically is essential. Schools could organize training on how to ask questions to AI, how to test and evaluate chatbot responses, how to avoid over-reliance on AI, and how to use AI appropriately for learning goals. This helps students leverage the benefits of the technology while maintaining personal learning responsibility.

Finally, further research should expand the scale and scope of the study. Specifically, research should be conducted with larger samples, longer intervention periods, and in various school settings to test the stability of the results. Additionally, subsequent studies could examine the effectiveness of similar chatbots at different grade levels, language skills, or subjects. Combining quantitative data with qualitative data such as interviews, classroom observations, or analysises of student-chatbot interactions would also help clarify how students actually use chatbots in the writing learning process.

Generative AI Statement

In preparing this manuscript, the author used the AI-powered writing tool Grammarly (https://app.grammarly.com/) to check grammar, improve sentence clarity, and refine language. Grammarly was used solely for linguistic and stylistic support and was not used to generate original research content, conduct data analysis, produce research results, or provide academic interpretations. All AI-assisted suggestions were carefully reviewed, edited, and checked by the author to ensure accuracy, coherence, and relevance to the research objectives. The author assumes full responsibility for the integrity, completeness, and final content of this manuscript.

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