



The Impact of AI Tools on English Writing Skills Development

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Abstract

This study investigates the impact of artificial intelligence tools on English writing skills development among 160 Vietnamese university students. The research examines five key independent variables: type of AI tool (ChatGPT, Grammarly, QuillBot), level of interaction with AI, instruction method, initial English proficiency, and duration of AI use. Using a quantitative approach with pretest/posttest design over a two-month period, the study employed multiple regression analysis to evaluate these factors' influence on writing performance. Results revealed that all five variables significantly contributed to writing skills development, collectively explaining 58.1% of variance. Duration of AI use emerged as the strongest predictor ($\beta = 0.331$), followed by instruction method ($\beta = 0.243$), initial English proficiency ($\beta = 0.181$), level of interaction with AI ($\beta = 0.152$), and type of AI tool ($\beta = 0.148$). These findings suggest that effective integration of AI tools in writing instruction requires consideration of multiple factors, including sustained engagement, structured pedagogical approaches, learner proficiency levels, and critical interaction with AI feedback. The study offers important implications for educators, educational technology developers, and policymakers regarding AI implementation in language education.

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Keywords: Artificial Intelligence, English Writing Skills, Language Learning, Computer Assisted Language Learning, Educational Technology

1. Introduction

The rapid development of artificial intelligence (AI) has brought significant changes to many fields, with language education witnessing profound transformations (Chen *et al.*, 2022) ^[1]. Particularly, the emergence of AI tools such as ChatGPT, Grammarly, and similar systems has opened new doors for teaching and learning English writing skills, which are considered among the most complex skills for second language (L2) learners (Qassrawi & Al Karasneh, 2025) ^[8]. Particularly, the emergence of AI tools such as ChatGPT, Grammarly, and similar systems has opened new doors for teaching and learning English writing skills, which are considered among the most complex skills for second language (L2) learners (Jamshed *et al.*, 2024) ^[4]. Recent studies have indicated that learners often struggle with various aspects of English writing, from grammatical accuracy and vocabulary richness to coherence and cohesion in compositions (Liu *et al.*, 2023) ^[6].

In this context, AI technology is expected to offer breakthrough solutions by providing immediate, personalized, and comprehensive feedback that previously could only be achieved through direct teacher support (Sakmiankaew *et al.*, 2024) ^[9]. However, despite some initial research on the use of AI in teaching in general, there remains a lack of comprehensive empirical studies examining the specific impact of different AI tools on English writing skill development.

This gap becomes particularly significant considering the exponential growth in AI adoption among both educators and students worldwide (Xiaolei & Teng, 2024) ^[10].

Several questions remain unanswered: Which types of AI tools are most effective for improving specific aspects of writing? How does the level of interaction with AI affect learning outcomes? What role does prior English proficiency play in determining the effectiveness of AI-assisted writing? This study aims to address these questions by examining the impact of AI tools on the development of English writing skills among 160 participants with varying proficiency levels. By investigating five independent variables type of AI tool, level of interaction with AI, instruction method, initial English proficiency, and duration of AI use against the dependent variable of English writing skills, this research seeks to provide empirical evidence that can inform pedagogical practices and tool development.

The findings of this study have significant implications for language teachers seeking to integrate AI tools effectively into their writing instruction, for developers working on educational AI applications, and for policymakers considering the role of AI in language education curricula. In an era where digital literacy increasingly encompasses the ability to work alongside AI tools, understanding how to optimize these technologies for language learning becomes not just beneficial but essential (Corbita *et al.*, 2024) ^[2].

2. Literature Review and Research Model

The integration of AI tools in language education has evolved dramatically over the past decade, shifting from simple grammar checkers to sophisticated writing assistants capable of providing comprehensive feedback and generating content (Yılmaz Virlan & Tomak, 2024) ^[11]. Recent research on computer-assisted language learning laid the theoretical foundation for understanding how technology mediates language acquisition, with sociocultural theory emphasizing the role of scaffolding in the development of writing skills (Liu *et al.*, 2023) ^[6].

Recent studies have categorized AI writing tools into several types: error-correction tools like Grammarly and QuillBot, focusing primarily on accuracy; generative tools like ChatGPT, capable of producing complete texts; and hybrid

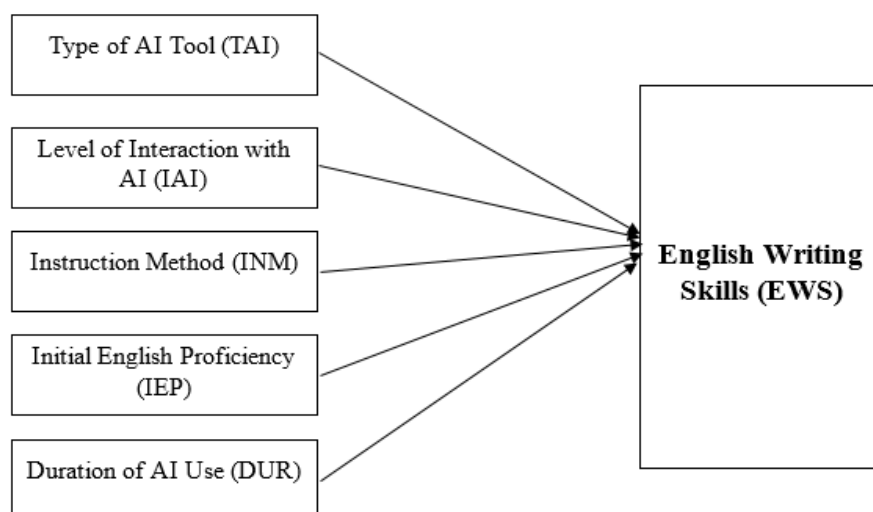
systems that combine both functionalities (El-Garawany, 2024) ^[3]. The effectiveness of these tools varies considerably depending on implementation factors. Jamshed *et al.* (2024) ^[4] conducted a quasi-experimental study on AI-assisted writing tools, finding positive effects overall, with stronger benefits for intermediate learners compared to beginners or advanced students.

Regarding interaction patterns, Liu *et al.* (2023) ^[6] identified that deeper engagement with AI tools characterized by requesting explanations rather than merely accepting corrections correlates with greater improvements in linguistic accuracy and discourse organization. The researchers proposed a reflective thinking promotion mechanism-based AI-supported English writing (RTP-AIEW) approach to deepen learners' thinking and improve their writing quality. The role of instruction in effective AI tool use cannot be overstated. Sakmiankaew *et al.* (2024) ^[9] demonstrated that explicit training on AI tool capabilities and limitations led to significant improvement in appropriate tool use compared to self-discovered learning approaches. Their study of 40 teachers and 80 students from Thailand and Vietnam revealed that while teachers believed AI tools could aid in developing writing skills, many struggled with integrating these tools into their teaching.

The initial proficiency level of learners emerges as a significant moderating factor, with Kanwal (2025) ^[5] reporting differential effects of AI assistance across proficiency levels. Their study of 142 undergraduate students found that ChatGPT significantly correlates with enhanced cognitive skills, including thought organization, vocabulary retention, and analytical abilities in English writing. The longitudinal effects of AI tool use were explored by Xiaolei and Teng (2024) ^[10], who observed the relationships between critical thinking skills, self-directed learning competency, and AI-assisted writing over three time periods.

Research Model

Based on these findings, we propose a research model examining five key independent variables (type of AI tool, level of interaction with AI, instruction method, initial English proficiency, and duration of AI use) and their impact on English writing skills as the dependent variable.



Source: Author's proposal, 2025

Fig 1: Research Model

The model hypothesizes that these factors interact synergistically, with instruction method potentially moderating the relationship between AI interaction and writing improvement. This comprehensive approach addresses current gaps in the literature by simultaneously examining multiple variables that previous studies have investigated in isolation, offering a more holistic understanding of the complex dynamics between AI tools and writing skill development (Corbita *et al.*, 2024) [2].

3. Methodology

This study used a quantitative research design with a pretest/posttest method and was conducted over a two-month period from October to December 2024. The study was conducted at two major universities in Vietnam: Hanoi University of Foreign Languages and International Studies (VNU-IS) and Ho Chi Minh City University of Education. The study involved 160 participants (65% female, 35% male) aged 19-22, recruited through stratified random sampling based on English proficiency. All participants were second and third-year students majoring in English language teaching, linguistics, and translation.

Five independent variables were investigated: (1) Type of AI tool - participants were randomly assigned to use ChatGPT, Grammarly, QuillBot, or no AI assistance (control group); (2) Level of interaction with AI - measured via a validated 5-point scale questionnaire; (3) Instruction method - participants received either no guidance, basic instructions, integrated learning strategy guidance, or comprehensive instruction with supervision; (4) Initial English proficiency -

determined through standardized writing assessment; and (5) Duration of AI use - within the study period. The dependent variable, English writing skills, was assessed using a comprehensive rubric evaluating grammatical accuracy, vocabulary richness, coherence, idea development, and overall effectiveness. Two certified language instructors independently rated all writing samples with an inter-rater reliability coefficient of 0.87. Data collection occurred in three phases: initial assessment, intervention period with bi-weekly writing tasks, and post-intervention assessment. Data analysis included reliability testing (Cronbach's alpha), exploratory factor analysis, and multiple regression analysis. Ethical considerations included informed consent, data privacy, and providing control group participants with AI tool access after study completion.

4. Results and Discussion

4.1. Reliability Analysis

Reliability analysis was conducted to evaluate the internal consistency of measurement scales used in the study. As shown in Table 1, all independent variables demonstrated high reliability, with Cronbach's Alpha coefficients exceeding the recommended threshold of 0.7 (Nunnally & Bernstein, 1994). The Level of Interaction with AI (IAI) scale showed the highest internal consistency ($\alpha = 0.852$), followed by Instruction Method (INM) ($\alpha = 0.843$), Type of AI Tool (TAI) ($\alpha = 0.836$), Initial English Proficiency (IEP) ($\alpha = 0.808$), and Duration of AI Use (DUR) ($\alpha = 0.727$). These results confirm that all measurement scales used in this study have acceptable to excellent reliability.

Table 1: Reliability Analysis Results of Study Variables

Variable	Cronbach's Alpha	N of Items	Item-Total Correlation Range
Type of AI Tool (TAI)	0.836	4	0.618 - 0.713
Level of Interaction with AI (IAI)	0.852	4	0.648 - 0.736
Instruction Method (INM)	0.843	4	0.538 - 0.755
Initial English Proficiency (IEP)	0.808	3	0.637 - 0.683
Duration of AI Use (DUR)	0.727	3	0.509 - 0.571

4.2. Factor Analysis

Prior to examining the relationship between variables, exploratory factor analysis was performed to confirm the construct validity of the measurement model. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.864, and Bartlett's Test of Sphericity was significant ($\chi^2 = 1333.673$, $df = 153$, $p < 0.001$), indicating that the data were suitable for factor analysis. As presented in Table 2, the

analysis extracted five factors with eigenvalues exceeding 1.0, which collectively explained 70.093% of the total variance. After Varimax rotation, all items loaded significantly on their respective factors (loading values ranging from 0.670 to 0.867), with no significant cross-loadings, confirming the discriminant validity of the constructs.

Table 2: Rotated Component Matrix from Factor Analysis

Items	Component 1 (INM)	Component 2 (IAI)	Component 3 (TAI)	Component 4 (IEP)	Component 5 (DUR)
INM4	0.867				
INM1	0.807				
INM2	0.800				
INM3	0.592				
IAI3		0.824			
IAI4		0.815			
IAI2		0.767			
IAI1		0.733			
TAI3			0.847		
TAI4			0.815		
TAI2			0.750		
TAI1			0.710		
IEP2				0.780	

IEP3				0.776	
IEP1				0.773	
DUR2					0.816
DUR1					0.757
DUR3					0.670

4.3. Multiple Regression Analysis

Multiple regression analysis was conducted to examine the influence of the five independent variables on English writing skills development. As shown in Table 3, the regression model was statistically significant ($F(5, 154) = 45.136, p < 0.001$), with an adjusted R^2 of 0.581, indicating that the model explained 58.1% of the variance in English writing skills. All five independent variables made statistically significant contributions to the model ($p < 0.05$).

Duration of AI Use ($\beta = 0.331, p < 0.001$) emerged as the

strongest predictor of English writing skills development, followed by Instruction Method ($\beta = 0.243, p < 0.001$), Initial English Proficiency ($\beta = 0.181, p = 0.006$), Level of Interaction with AI ($\beta = 0.152, p = 0.014$), and Type of AI Tool ($\beta = 0.148, p = 0.013$). The collinearity diagnostics showed tolerance values ranging from 0.623 to 0.759 and Variance Inflation Factor (VIF) values between 1.317 and 1.605, indicating no multicollinearity concerns among the independent variables.

Table 3: Multiple Regression Analysis Results

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Beta	Tolerance
(Constant)	-0.169	0.260		-0.650	0.517		
Type of AI Tool (TAI)	0.147	0.058	0.148	2.518	0.013	0.759	1.317
Level of Interaction with AI (IAI)	0.147	0.059	0.152	2.473	0.014	0.699	1.431
Instruction Method (INM)	0.240	0.063	0.243	3.831	0.000	0.653	1.531
Initial English Proficiency (IEP)	0.169	0.061	0.181	2.776	0.006	0.623	1.605
Duration of AI Use (DUR)	0.326	0.060	0.331	5.416	0.000	0.706	1.417

*Note: Dependent Variable: English Writing Skills (EWS) $R = 0.771, R^2 = 0.594, Adjusted R^2 = 0.581, F(5, 154) = 45.136, p < 0.001$ Significance levels: $p < 0.05, p < 0.01, p < 0.001$

The standardized regression equation, which reflects the relative importance of each predictor, can be expressed as:

$$EWS = 0.148TAI + 0.152IAI + 0.243INM + 0.181IEP + 0.331DUR$$

4.4. Discussion

The findings of this study offer several important insights into the factors influencing the effectiveness of AI tools in enhancing English writing skills. First, the strong positive effect of Duration of AI Use suggests that consistent and prolonged engagement with AI writing tools leads to greater improvement in writing skills, supporting the notion that developing proficiency with these technologies requires sufficient time for learners to adapt to and leverage their capabilities (Xiaolei & Teng, 2024) [10].

Second, the significant influence of Instruction Method highlights the crucial role of pedagogical approaches in maximizing the benefits of AI tools. This aligns with Sakmiankaew *et al.*'s (2024) [9] finding that explicit training on AI tool capabilities substantially improves learning outcomes compared to self-discover learning approaches. Teachers should therefore consider implementing structured guidance for students when introducing AI writing assistants into their curriculum.

Third, the moderating effect of Initial English Proficiency confirms the observations of Jamshed *et al.* (2024) [4] that the effectiveness of AI-assisted writing varies according to learners' starting levels. This suggests the need for differentiated approaches to AI tool implementation based on student proficiency levels, with potentially different tools or interaction strategies recommended for beginners versus advanced learners.

Fourth, the significant contribution of Level of Interaction with AI supports Liu *et al.*'s (2023) [6] finding that deeper engagement with AI tools characterized by requesting explanations rather than merely accepting corrections correlates with greater improvements in writing skills. This emphasizes the importance of encouraging students to engage critically with AI suggestions rather than passively accepting them.

Finally, the influence of Type of AI Tool indicates that the selection of specific AI writing assistants matters, with different tools potentially offering varying benefits for different aspects of writing development. This finding highlights the need for educators to carefully evaluate available tools and select those that best align with their specific pedagogical objectives.

Overall, these results demonstrate that the effective integration of AI tools in English writing instruction requires thoughtful consideration of multiple factors, including tool selection, interaction patterns, instructional approaches, learner proficiency, and implementation duration. The findings provide empirical support for a comprehensive approach to AI-assisted writing instruction that addresses all these dimensions to maximize learning outcomes.

5. Conclusion and Implications

5.1. Conclusion

This study investigated the impact of AI tools on English writing skills development by examining five key factors: Type of AI Tool, Level of Interaction with AI, Instruction Method, Initial English Proficiency, and Duration of AI Use. The findings reveal that all five factors significantly influence the development of English writing skills, collectively

explaining 58.1% of the variance in writing performance. Duration of AI Use emerged as the strongest predictor, followed by Instruction Method, Initial English Proficiency, Level of Interaction with AI, and Type of AI Tool.

The results confirm that the effectiveness of AI tools in enhancing writing skills is not determined by a single factor but rather by the interplay of multiple variables. This underscores the complexity of integrating AI tools into writing instruction and highlights the need for a comprehensive approach that considers both technological and pedagogical dimensions. The study also demonstrates that while AI tools offer significant potential for improving writing skills, their effectiveness is mediated by how they are implemented, how learners interact with them, and the context in which they are used.

5.2. Theoretical Implications

This research contributes to the existing literature on computer-assisted language learning by providing empirical evidence for a multifactorial model of AI-assisted writing development. By simultaneously examining five variables that previous studies have investigated in isolation, this study offers a more holistic understanding of the complex dynamics between AI tools and writing skill development. The findings extend sociocultural theory perspectives on technology-mediated language learning by highlighting the importance of scaffolded interaction with AI tools and the role of explicit instruction in maximizing learning outcomes.

The strong influence of Duration of AI Use supports theoretical frameworks that emphasize the developmental nature of technology-enhanced learning, suggesting that the benefits of AI tools accrue over time as learners become more familiar with their capabilities and develop strategies for effective use. Similarly, the significant effect of Instruction Method aligns with theoretical perspectives that emphasize the importance of pedagogical mediation in technology-enhanced learning environments.

5.3. Practical Implications

5.3.1. Implications for Educators

The findings offer several practical implications for language teachers seeking to integrate AI tools into their writing instruction. Educators should plan for sustained, long-term implementation of AI tools rather than short-term interventions, given the strong influence of Duration of AI Use on writing outcomes. Additionally, teachers should provide explicit guidance on how to effectively use AI tools, including demonstrating strategies for critical engagement with AI feedback and suggestions. Instruction should be tailored according to students' proficiency levels, with potentially different tools or interaction strategies recommended for beginners versus advanced learners. Educators should also encourage students to engage deeply with AI tools by asking questions, seeking explanations, and critically evaluating suggestions rather than passively accepting corrections. Finally, teachers should carefully evaluate available AI writing assistants to select those that best align with specific pedagogical objectives and student needs. By addressing these multiple dimensions of AI implementation, educators can create more effective learning environments that maximize the potential benefits of these technologies for writing skill development.

5.3.2. Implications for Educational Technology Developers

For developers of AI writing tools, the findings suggest several directions for enhancement. Developers should prioritize creating features that prompt deeper user engagement, such as explanation capabilities that clarify why specific suggestions are made, which would support the significant impact of interaction level on writing outcomes. AI tools should be designed with proficiency-adaptive systems that can tailor their feedback and suggestions based on the user's language proficiency level, addressing the finding that initial proficiency moderates AI effectiveness. Developers should also focus on creating tools that can be easily integrated into existing instructional approaches and that support guided learning experiences, acknowledging the strong influence of instruction method on writing improvement. Additionally, implementing features that track user progress over time would support sustained engagement and provide evidence of improvement, aligning with the finding that duration of use significantly impacts writing skill development. By incorporating these research-informed design principles, developers can create more effective AI writing tools that better serve the needs of diverse language learners and maximize educational outcomes.

5.3.3. Implications for Educational Policy

For policymakers considering the role of AI in language education curricula, the findings of this study offer several important considerations. Policymakers should invest in comprehensive teacher training programs focused on effective AI integration in writing instruction, recognizing that instruction method significantly influences outcomes. Educational authorities should ensure adequate technological infrastructure to support sustained use of AI tools in educational settings, acknowledging the importance of duration of use in achieving meaningful writing improvement. The development of clear guidelines addressing ethical considerations in AI-assisted writing, including issues of academic integrity and appropriate attribution, is essential as students engage more deeply with these technologies. Additionally, policymakers should allocate resources for ongoing research into the effectiveness of AI tools in various educational contexts and for different learner populations, particularly given the finding that initial proficiency levels moderate the benefits of AI assistance. By implementing policies that address these multiple dimensions of AI integration, educational authorities can create supportive frameworks that allow institutions to leverage the potential of AI tools while mitigating potential concerns and ensuring equitable access across diverse educational settings.

5.4. Limitations and Future Research Directions

While this study provides valuable insights, several limitations should be acknowledged. First, the research was conducted over a period of two months, which may not fully capture the long-term effects of AI tool use. Future studies should consider longitudinal designs spanning academic years to better understand the developmental trajectory of AI-assisted writing skills.

Second, the study focused on quantitative measures of writing improvement and did not deeply explore qualitative aspects of how students experience and perceive AI-assisted writing. Mixed-methods approaches combining quantitative assessments with interviews or focus groups could provide

richer insights into the learning process.

Third, while the study examined five key variables, other factors such as learning styles, motivation, and attitudes toward technology might also influence the effectiveness of AI tools. Future research should expand the model to include these additional variables.

Finally, this study examined the impact of AI tools on overall writing skills. Future research could investigate how these tools affect specific aspects of writing, such as grammatical accuracy, vocabulary use, coherence, and argumentative structure. Additionally, research could explore potential differences in effectiveness across different genres of writing and different first language backgrounds.

In conclusion, this study contributes to our understanding of how AI tools can enhance English writing skills by highlighting the multiple factors that influence their effectiveness. As AI technologies continue to evolve, ongoing research will be essential to ensure that these tools are implemented in ways that maximize their potential to support language learning and development.

6. References

1. Chen X, Zou D, Xie H, Cheng G, Liu C. Two decades of artificial intelligence in education: contributors, collaborations, research topics, challenges, and future directions. *Educ Technol Soc* 2022;25(1):28-47.
2. Corbita DP, Mendoza M, Cordova M, Balmas R, Vijayan PM, Madronero J. Evaluating the reliability and impact of AI-assisted tools on argumentative writing competency among EFL Omani learners. *Contrib Finance Account* 2024;509-518. https://doi.org/10.1007/978-3-031-67547-8_43
3. El-Garawany MSM. The effects of a QuillBot-based intervention on English language majors' EFL writing performance, apprehension, and self-efficacy. *Lang Teach Res Q* 2024;43:167-189. <https://doi.org/10.32038/ltrq.2024.43.10>
4. Jamshed M, Ahmed ASMM, Sarfaraj M, Warda WU. The impact of ChatGPT on English language learners' writing skills: an assessment of AI feedback on mobile. *Int J Interact Mob Technol* 2024;18(19):18-36. <https://doi.org/10.3991/ijim.v18i19.50361>
5. Kanwal A. Exploring the impact of ChatGPT on psychological factors in learning English writing among undergraduate students. *World J Engl Lang* 2025;15(3):404-413. <https://doi.org/10.5430/wjel.v15n3p404>
6. Liu C, Hou J, Tu Y-F, Wang Y, Hwang G-J. Incorporating a reflective thinking promoting mechanism into artificial intelligence-supported English writing environments. *Interact Learn Environ* 2023;31(9):5614-5632. <https://doi.org/10.1080/10494820.2021.2012812>
7. Nunnally J, Bernstein I. *Psychometric theory*. 3rd ed. New York: McGraw-Hill; 1994.
8. Qassrawi R, Al Karasneh SM. Redefinition of human-centric skills in language education in the AI-driven era. *Stud Engl Lang Educ* 2025;12(1):1-19. <https://doi.org/10.24815/siele.v12i1.43082>
9. Sakmiankaew I, Tu NM, De NND, Buripakdi A. EFL tertiary teachers' and students' conceptualizations and challenges of using AI tools to improve writing skills in Thailand and Vietnam during the Covid-19 pandemic. *rEFLections* 2024;31(3):1120-1143. <https://doi.org/10.61508/refl.v31i3.277354>
10. Xiaolei S, Teng MF. Three-wave cross-lagged model on the correlations between critical thinking skills, self-directed learning competency and AI-assisted writing. *Think Skills Creat* 2024;52:101524. <https://doi.org/10.1016/j.tsc.2024.101524>
11. Yılmaz Virlan A, Tomak B. A Q method study on Turkish EFL learners' perspectives on the use of AI tools for writing: benefits, concerns, and ethics. *Lang Teach Res* 2024:1-1. <https://doi.org/10.1177/13621688241308836>