

Research Article

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Leveraging AI for Writing Instruction in EFL Classrooms: Opportunities and Challenges

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Abstract

Background/purpose. The use of AI in EFL writing instruction has been identified as a potential way of improving learning outcomes. Nevertheless, there are concerns about overreliance, cultural limitations, and the inability of AI to measure creativity and emotional tone. This paper aims to investigate the opportunities and challenges of applying AI tools in EFL writing instruction in order to gain pedagogical implications.

Materials/methods. The study used a mixed methods approach, using surveys and interviews to collect data from 150 fourth-year English major students in a university in the Mekong Delta. The participants used AI writing tools, and their experiences were evaluated to determine how well AI helps improve writing skills.

Results. Findings show that AI tools give quick and equal feedback, help the learner be independent, and achieve better writing skills. However, the research revealed opinions about over-reliance, cultural gaps, and restrictions in measuring creativity. While AI proved beneficial, students emphasized the need for teacher guidance to supplement AI-generated feedback.

Conclusion. The use of AI in EFL writing instruction can potentially provide learners with individualized support and an autonomous learning environment. However, it is crucial to avoid over-reliance on AI tools and ensure that traditional teaching methods are also incorporated to avoid the drawbacks of the tool. Future work should aim to improve the AI tools to suit the cultural and contextual variations and also to encourage critical and creative writing.

1. Introduction

AI has made substantial advancements in recent years, transforming various sectors, including education. The field of language learning, particularly EFL instruction, has experienced significant changes with the integration of AI technologies. Traditionally, language learning relied heavily on direct teacher involvement and manual feedback; however, AI tools now offer opportunities to enhance and personalize the learning experience in ways previously unimagined (Song, 2023). The application of AI in writing instruction, in particular, has garnered increasing attention due to its potential to offer individualized feedback, facilitate learner autonomy, and provide scalable instruction for large groups of students (Hwang et al., 2023).

AI-powered writing tools like Grammarly, Write & Improve, and ChatGPT are AI-powered writing tools that have changed the way EFL students write papers. These tools provide feedback, correct grammar, make style suggestions, and offer unique writing opportunities that help students become better writers and advance at their own rate (Mahmud, 2023). The adaptive AI models used in these tools enable them to understand the ability of each learner and, in turn, provide feedback that is particularly relevant to the learner's needs (Wale, 2024). Therefore, these technologies can be seen as having the capacity to enhance existing pedagogical strategies and generate novel and exciting approaches to teaching writing.

As for the advantages that can be seen, there are several challenges that are affiliated with integrating AI in the area of EFL writing instruction. This is because a major challenge is the potential of over-reliance on AI tools, which hinders the development of students' writing and editing skills (Aljuaid, 2024). Furthermore, the inability of AI to grasp cultural meanings, colloquial language, and the mood of writing is a major problem (Selim, 2024). Furthermore, while AI-based tools are useful for identifying grammatical errors, they are not very helpful in encouraging creativity and personal touches in writing, which are so important in natural language acquisition (Wang, 2024). While there is an increasing amount of literature available about AI in EFL writing instruction, there is still a gap in the long-term studies of AI effects on students' writing, especially in terms of creativity, cultural understanding, and personal expression. Moreover, the effects of AI tools on learners' self-editing and independent writing development strategies are still under-explored, especially in diverse cultural settings.

This paper aims to discuss the benefits and problems of applying AI tools in the teaching of EFL writing. Based on the current literature and empirical evidence, this paper aims to explore how the use of AI affects writing pedagogy, its impact on learners' writing abilities, and the issues students encounter when incorporating these technologies into the learning process. The aim is to offer a comprehensive review of the state of the art of AI in EFL writing instruction and to provide some recommendations on how these tools can be best used and when they should not be used. Against the background of the analysis of the role of AI in EFL writing instruction, the present study is intended to answer the following key questions:

1. How does the use of AI tools affect the writing skills and independence of EFL learners?
2. What are the opportunities and challenges of integrating AI tools into EFL writing teaching?

2. Literature Review

2.1. Introduction to AI in education

AI is the usage of computers to perform tasks that would have otherwise been done by human intelligence, e.g. problem-solving and pattern recognition (Russell & Norvig, 2016). It entails Machine learning (ML), Natural language processing (NLP) and Neural networks to emulate the cognitive processes (Marr, 2018). In education, AI assists with personalised learning, auto-grading of

assignments and intelligent tutoring systems (Baker et al., 2020). Its implementation improves the performance of administrative functions, individualizes learning experiences, and assists students and teachers (Luckin et al., 2016).

Beyond automation, AI changes the way of communication between educators and students and the way of accessing content. It recommends personalized suggestions, adaptive testing, and smart guidance (Holmes et al., 2019). Intelligent Tutoring Systems (ITS) solve the student's work, find out the student's mistakes, and give individual feedback (VanLehn, 2011). The application of AI is moving the teaching focus from the teacher to the learner (Zawacki-Richter et al., 2019).

In language learning, AI provides instant feedback, progress tracking, and adjustment to the student's level, as well as simulation of real-life scenarios. Games such as Duolingo, Babbel, and Busuu improve speaking, reading, and writing skills with gamification and speech technology (Hwang et al., 2020). Other assistants, such as Grammarly and Hemingway Editor, help with independent writing practice (Fitzgerald & McKinnon, 2020).

AI tools enhance writing by correcting grammar, coherence, vocabulary, and style with the help of NLP and ML. Grammarly highlights grammar, structure, and punctuation errors and helps to increase the overall correctness of the writing (Fitzgerald & McKinnon, 2020). Write & Improve by Cambridge English provides instant feedback on grammar and cohesion, which students can use to improve their writing (Engwall & Enström, 2018). Previous research has shown that they successfully enhance academic writing productivity (Bitchener & Knipe, 2008).

Turnitin, which is mainly used to detect plagiarism, also evaluates writing quality and supports academic integrity and correct citation (Sherman, 2020). Other AI tools, such as Quill and ScribeSense, assist in developing sentences, vocabulary, and writing fluidity through AI-generated prompts and structured feedback (Kukulka-Hulme & Shield, 2008; Godwin-Jones, 2018).

ChatGPT and other virtual assistants support learners in developing ideas, constructing sentences, and stylistically enhancing using the transformer model (Brown et al., 2020). Such tools enhance the EFL writing curriculum with real-time, contextual feedback. Nevertheless, AI should not overrule but enrich conventional pedagogical approaches to get the most out of the technology (Baker et al., 2020).

2.2. Theoretical framework

Vygotsky's Socio-Cultural Theory emphasizes the value of social contact and collaboration in learning. Chatbots and virtual tutors are AI technologies in language education that promote collaborative learning by allowing learners to connect with peers and technology (Tharp & Gallimore, 1988). AI can act as a mediator inside learners' Zones of Proximal Development (ZPD), allowing them to perform activities beyond their current ability with AI assistance (Lantolf & Thorne, 2006). Platforms such as Duolingo and Babbel employ artificial intelligence to imitate conversational environments, providing real-time feedback to improve social learning and cognitive progress.

Piaget (1970) argued for Learner Constructivist Theory, which has to do with learners constructing knowledge based on their experience. They offer individualized feedback to students, thus encouraging students to learn independently and personally. These technologies allow the students to decide what path of learning they want to follow, thus increasing the chances of them being more interested and independent, both of which are constructivist ideals, according to Jonassen (1999). The adaptation of AI to the learners' needs facilitates the process of exploration, which is an important aspect of experiential learning, as postulated by Kolb (1984).

In learning, Cognitive Load Theory Sweller, 1988) has stressed that learning is most effective if cognitive load is kept low. In language learning, AI tools can reduce cognitive overload by designing

simpler tasks and offering guidance and support for learning in a step-by-step manner. They employ algorithms to present learning content in optimal intervals, which reduces unnecessary cognitive strain in platforms like Quizlet and Memrise (De Leeuw & Sweller, 2005). Furthermore, the multimodal learning features of AI, such as speech recognition, can help in dividing the cognitive load across different channels, which is helpful in the language learning process (Mayer, 2009).

AI applications in language learning are based on several educational theories. Through collaborative learning (Vygotsky, 1978), self-directed knowledge construction (Piaget, 1970), and reducing cognitive load (Sweller, 1988), AI improves the learning experience for EFL students. These theories are useful in showing how AI tools support language learning, especially in writing instruction.

2.3. The role of AI in writing instruction

The application of AI in writing instruction has evolved from the primitive use of checking grammar and spelling to the more sophisticated applications that provide instant feedback and learning recommendations. AI tools like Writerly and Google Docs help students perform better and be future-ready academically and professionally (Wale, 2024). However, while AI enhances instruction, it does not replace traditional writing courses, and thus both should be incorporated properly (Aljuaid, 2024).

Research focuses on how AI influences writing skills, especially in the area of error identification and individual feedback. Some examples of AI-assisted tools include Chatgpt, which offers detailed advice on grammar and organization to enhance students' interest (Song, 2023). Smart RoamLingo enhances the coherence and language use by providing the students with individual feedback (Hwang et al., 2023). The study results show that the use of AI provides tailored support during the writing process to enhance the quality of writing (Zhao, 2022).

AI also helps create a more productive and enjoyable learning environment. Although teachers are still necessary, AI expands the opportunities for learners to participate in the writing teaching and learning process actively (Utami et al., 2023; Phan, 2023). It also helps students correct themselves and relieves teachers from monitoring and correcting students' grammar, thus allowing them to concentrate on other aspects of writing, like the composition of essays and research papers (Tang, 2023).

Therefore, integrating AI in writing instruction enhances the learning process by providing individual feedback, engaging students, and improving their writing skills. Thus, as language teaching and learning continue to develop, AI will continue to be a significant contributor to the development of an effective writing pedagogy.

2.4. Opportunities of AI in writing instruction

2.4.1. Personalized learning

AI-enabled tools that offer specific support in grammar, vocabulary, and writing easily meet the learners' specific needs. These instruments use patterns in writing to identify errors, learn from them and provide suggestions for improvement. For instance, Grammarly suggests words and tones that go with your text, while Write & Improve by Cambridge gives feedback on writing skills, providing competency scores and suggestions on how to enhance the coherence and organization of the writing (Sampson & Deane, 2019). This personalization increases students' interest in the process and helps them develop faster at the specific area of concern (Rahimi & Narafshan, 2023).

2.4.2. Instant and consistent feedback

Unlike conventional approaches, AI technologies provide instant, detailed and uniform feedback to the learners, which helps the learners to correct their mistakes during the writing process. Loewen et al. (2020) pointed out that this immediate feedback helps pupils better understand the errors and thus helps them learn the linguistic principles more effectively. Platforms like ProWritingAid help identify grammatical and stylistic errors and the reasons behind them, and the AI chatbots help make the writing process more interactive and engaging, thus enhancing understanding. Zhang and Litman (2021) have found that students who use AI for feedback develop writing quality faster than those who rely on delayed feedback from humans.

2.4.3. Enhancing learner autonomy

The AI tools support autonomous learning as the students can learn at their own pace and correct themselves independently. They can try out the language, check the feedback, and perfect their writing without the need for implicit teacher supervision, which is an excellent way of encouraging the students in their learning process (Lee, 2023). Some applications, like Hemingway Editor, help students to simplify and clarify their writing so that it is easy and interesting to read. This independence not only increases the students' self-esteem but also gets them ready for lifelong learning in a global and technological society (Rahimi & Narafshan, 2023).

2.4.4. Scalable instruction

The scalability of AI is revolutionary in the field of writing instruction, particularly in under-resourced or remote learning conditions. AI tools can help many people simultaneously, where traditional one-on-one instruction is limited. For instance, Edmodo and other similar platforms integrate AI to provide writing support in classrooms with a high student-teacher ratio (Wu et al., 2023). This scalability ensures that learners get quality instruction no matter their geographic or financial situation, making it easier to get a good writing education. Thus, the application of AI in EFL writing classrooms is possible due to the following benefits of the technology: autonomy, instant feedback, personalized learning, and scalability (Wu, 2021; Veo, 2022; Wu et al., 2023). These tools help learners develop their writing skills independently and efficiently, and help solve the systemic problems in education.

2.5. Challenges of AI in writing instruction

2.5.1. Over-reliance on AI tools

A major issue is the possibility of learners' over-reliance on AI for correction and feedback. This dependence may hinder their ability to learn important skills such as editing themselves and problem-solving independently (Rahimi & Narafshan, 2023). Some students may rely on the AI's corrections without understanding the language's basic rules, as Zhang and Litman (2021) explained in their study.

This issue can be solved with teacher engagement. Teachers can tell students to use AI as a companion tool rather than a replacement so that the approach is equally sustainable and active and incorporates students' meaningful participation in learning (Loewen et al., 2020).

2.5.2. Cultural and contextual limitations

AI tools have a limited ability to understand cultural nuances, slang, and context-related language, which can result in inappropriate or inaccurate suggestions. For example, colloquial phrases like 'kick the bucket' can be flagged as a mistake by some AI models that do not understand the cultural meaning behind the phrase (Wu et al., 2023). This standard limits the effectiveness of AI tools for multiple learner populations and settings.

To date, AI developers have failed to build systems as diverse and inclusive as learners, and this incoherence harms marginalized populations (Beck et al., 2022). Culturally aware NLP models and region-based datasets enhance the locality and situational awareness of the tools (Sampson & Deane, 2019).

2.5.3. Emotional and creative aspects of writing

Although AI proficiently performs grammatical and syntactical repairs, it encounters difficulties in evaluating emotional tone, inventiveness, and uniqueness. Writing is an inherently personal endeavour, frequently encompassing emotional articulation and distinctive stylistic preferences. AI systems might unintentionally encourage formulaic responses, hindering learners from investigating diverse creative writing approaches (Lee, 2023). Fostering genuine, imaginative writing necessitates human involvement. Educators can enhance AI tools by emphasizing higher-order skills such as narrative, persuasive argumentation, and emotional resonance, domains in which AI is deficient in nuance (Rahimi & Narafshan, 2023). The integration of AI with human guidance guarantees a comprehensive method for writing advancement.

While AI offers significant benefits in writing instruction, challenges such as over-reliance, cultural limitations, and emotional aspects must be addressed. A balanced integration of AI and teacher-guided instruction is essential for overcoming these challenges and maximizing the potential of AI in EFL classrooms.

The integration of AI in EFL writing has progressed from the primitive use of grammar checkers to more sophisticated systems that offer individualization of feedback and learning based on context. Tools like ChatGPT and Wordtune are quite helpful in improving the writing skills. Mahmud (2023) reported that the participants who used Wordtune in their writing produced better work than those who did not use the tool. Similarly, Song (2023) explained how artificial intelligence supported coaching and training because it provides fast and adaptive feedback.

In their paper, Hwang et al. (2023) highlighted the potential of AI to provide specific feedback on the coherence and structure of the text, which in turn enhances the quality of writing. According to Wale (2024), students who learned with the help of AI-enhanced writing tools performed better than their peers in traditional classrooms, meaning that AI can enrich the traditional approach. However, there are problems. In his paper, Wang (2024) mentioned that there is a need to change the pedagogical approach and digital literacy to include AI in the writing curriculum. In her view, Selim (2024) pointed out that students are concerned about the dependence on AI, which requires some direction and training. In her view, Aljuaid (2024) recommended a hybrid approach between AI and traditional instruction for the holistic development of writing skills.

In conclusion, the use of AI in EFL writing instruction is potentially transformative but must be approached with pedagogical care. Educators must also find ways to deal with the issues that come with such tools, while AI enhances writing skills and learner engagement.

3. Methodology

3.1. Research design

The research design for this study adopted a mixed-methods approach, combining quantitative and qualitative methods to comprehensively explore the opportunities and challenges of leveraging AI in writing instruction for EFL classrooms. Quantitative data was collected through the structured survey to gather learners' perceptions of these tools' usability, effectiveness, and limitations. Qualitative data was obtained through semi-structured interviews with learners to gain deeper insights into their experiences and challenges when using AI tools.

A convergent design was used to synthesize the results from both quantitative and qualitative data. This method enabled the concurrent collection of quantitative and qualitative information, and the two sets of findings were analysed separately, followed by a comparison of the results for common themes and differences. The study focused on triangulating the findings from each data source to gain insights into how AI tools are perceived and utilized in EFL classrooms. In this way, this merging process supported answering research questions, blending inflicted statistical trends and personal perspectives on the integration of AI into writing instruction experienced by the learners.

3.2. Participants

The study involved 150 fourth-year English-majored students from a university in the Mekong Delta, selected to provide insights into the use of AI tools for writing instruction (as shown in Table 1). The participants included 105 female students (70%) and 45 male students (30%), reflecting the typical gender distribution in English major programs in the region. Most participants were aged 21–22 years (80%), with a smaller proportion aged 23 years or older (20%). Regarding academic performance, 33.3% of the students were classified as high achievers, 53.3% as average achievers, and 13.3% as low achievers, based on their academic records.

Table 1. Demographics of the participants

Demographic Variable	Category	No. of Participants	Percentage (%)
Gender	Male	45	30
	Female	105	70
Age	22 years	120	80
	Over 22 years	30	20
Academic Performance	Low Achievers	20	13.3
	Average Achievers	80	53.3
	High Achievers	50	33.4
Prior AI Experience	Yes	77	51.3
	No	73	48.7

3.3. Instrumentation

The questionnaire was the primary data collection tool, consisting of seven key clusters: Personalized Learning, instant and Consistent Feedback, Enhancing Learner Autonomy, Scalable Instruction, over-reliance on AI Tools, cultural and Contextual Limitations, and emotional and Creative Aspects of Writing (as shown in Table 2). It was designed to assess learners' experiences, attitudes, and opinions regarding the use of AI tools in writing instruction, focusing on both the opportunities and challenges.

Regarding the quantitative instruments, internal consistency measures were calculated to determine the reliability of the questionnaire. A Cronbach's alpha value over 0.7 demonstrates strong internal consistency measures. A pilot test was also administered to 5% of the learners to verify the clarity and relevance of the items.

The semi-structured interview guide was drawn from themes identified in the literature and preliminary survey results for the qualitative tools. In order to establish the trustworthiness of the qualitative data, member checking was used by asking participants to review their interview responses and confirm accuracy. Data were also peer debriefed to ensure an unbiased and

participant-consistent interpretation of the data. Qualitative responses were analyzed thematically, identifying key patterns and themes to elucidate findings from the quantitative data. These procedures were essential to establish the rigour and validity of the study.

Table 2. Description of the questionnaire

Clusters	No. of items	Sample	Source
Personalized Learning	05	AI tools help me improve specific areas of my writing, such as grammar, vocabulary, and sentence structure.	Baker & Siemens (2020).
Instant and Consistent Feedback	05	Instant feedback helps me understand my mistakes better and improve my writing quickly.	Hockly (2021) García-Sánchez et al. (2023_
Enhancing Learner Autonomy	05	AI tools help me take responsibility for my learning by allowing me to track my progress.	Anderson (2022) Sung et al. (2021)
Scalable Instruction	05	The scalability of AI tools allows me to practice writing more frequently, even with large class sizes.	Lee et al. (2022) Cai et al. (2023)
Over-Reliance on AI Tools	05	Over-reliance on AI feedback has hindered my ability to self-correct and improve without assistance.	Park & Lim (2020) Perea et al. (2022)
Cultural and Contextual Limitations	05	AI tools sometimes provide feedback that is not appropriate for the cultural context of my writing.	Castaño et al. (2021) Hosseini et al. (2022)
Emotional and Creative Aspects of Writing	05	AI tools often focus on grammatical correctness at the expense of creativity and personal expression.	Jou (2022) Tan et al. (2021)

Note. The table does not include all items. Instead, only one item from each cluster is presented as a reference.

3.4. Data collection

The questionnaire served as the primary tool for collecting quantitative data and was administered to 150 fourth-year English-majored students from a university in the Mekong Delta. It consisted of 35 statements organized into seven clusters addressing the opportunities and challenges of AI in writing instruction. To ensure accessibility, the questionnaire was distributed in both online and paper-based formats. Participants were given clear instructions and assured of their anonymity to encourage honest responses. Completing the questionnaire took approximately 15–20 minutes.

In addition to the questionnaire, semi-structured interviews were conducted with a subset of 15 students (10% of the total participants) to gain deeper insights into students' experiences and perceptions through qualitative and quantitative data. The participants were interviewed face-to-

face or online, and the interviews lasted 20-30 minutes, depending on the participant. Open-ended questions aligned with the clusters in the questionnaire were used to elicit more detailed responses.

3.5. Data analysis

The questionnaire responses were analyzed using statistical methods. Descriptive statistics, such as means and standard deviations, were calculated for each statement and cluster to summarize the data. The analysis was conducted using the SPSS software. AI-related opportunities and challenges were explored through thematic analysis of interview data to identify recurring themes and subthemes. Audio recordings were transcribed verbatim, and the transcripts were read multiple times for familiarisation. Key phrases and ideas were coded to highlight patterns, which were then grouped into themes aligned with the seven clusters of the study. The themes were reviewed and refined for coherence and relevance to the research objectives.

4. Results

4.1. Participants' perceptions of opportunities for AI in writing instruction

Personalized learning

The results of the questionnaire assessing the perceptions of 150 EFL learners regarding the opportunities and challenges of AI in writing instruction are summarized below.

Table 3. Descriptive Statistics for Participants' Perceptions of Personalized Learning through AI Tools

Statements	N	Mean	Std. Deviation
1. AI tools adapt to my individual learning needs and provide relevant writing feedback.	150	4.25	.73
2. AI tools help me improve specific areas of my writing, such as grammar, vocabulary, and sentence structure.	150	4.32	.68
3. AI tools provide me with targeted recommendations to improve my writing style.	150	4.18	.75
4. I feel confident in receiving personalized feedback from AI tools.	150	4.10	.80
5. AI tools offer suggestions that are specific to my level and writing needs.	150	4.22	.70

The first cluster of statements was about AI tools' personalized learning experiences. Participants generally agreed that the tools adapt to their learning style and give them proper writing feedback, with a mean score of 4.25. This shows that learners consider AI a helpful tool in addressing their language learning requirements to some extent. Moreover, the tools were rated as very useful in enhancing certain aspects of writing, such as grammar, vocabulary, and sentence construction, which aligns with the learners' positive reviews of the spot-on support they received. However, when it comes to getting specific tips on enhancing one's writing skills, the mean decreases a bit to 4.18, which means that while the AI tools are helpful, the learners may not be as sure about the style feedback they get. However, a relatively high mean score of 4.10 on the statement "I am certain of the personalised feedback I am receiving from the AI tools" shows that learners are sure that AI can give individual feedback. The statement "AI provides ideas relevant to the learners' levels and writing tasks" got a mean of 4.22, which means that learners prefer the personalised approach of the AI tools and want their work to be related to their level of proficiency. In other words, learners consider AI tools as valuable in the context of personalized learning assistance, especially for grammar, vocabulary, and sentence formation. However, they may have some doubts concerning the

recommendations for the improvement of style that AI can offer, although they have no problem with the personal feedback.

Instant and consistent feedback

The second cluster of statements focused on the Instant and Consistent Feedback provided by AI tools in writing instruction.

Table 4. Descriptive Statistics for Participants' Perceptions of Instant and Consistent Feedback from AI Tools

Statements	N	Mean	Std. Deviation
6. AI tools provide immediate feedback on my writing.	150	4.40	.65
7. The feedback I receive from AI tools is consistent and reliable.	150	4.28	.70
8. Instant feedback helps me understand my mistakes and improve my writing quickly.	150	4.35	.67
9. AI tools correct my writing in real time, preventing errors from being repeated.	150	4.30	.72
10. I find that AI tools provide more consistent feedback than human teachers in certain aspects of writing.	150	4.15	.78

The learners, for example, agreed that the AI tools give them immediate feedback on their writing. This is because they value the instant responses that these tools provide. Such prompt feedback is considered a great advantage as it helps the learners identify errors and develop their writing effectively. In this case, learners also rated the consistency and reliability of the AI feedback highly, with a mean of 4.28, which shows that they consider the feedback provided by the AI tools to be constant and reliable.

Furthermore, the participants also agreed that instant feedback is useful in improving learners' grasp of errors and writing composition, achieving a mean of 4.35. This supports the claim that feedback provides learners with information on the errors they are making and how to fix them, leading to faster improvement in writing skills. The ability of AI to edit writing in real-time and avoid making the same mistakes again was highly appreciated, with a mean of 4.30, which indicates that learners consider AI tools useful for them to get continuous and real-time error correction.

Surprisingly, the statement that concerns AI tools giving more uniform feedback than a human teacher in some aspects of writing got a slightly lower mean of 4.15, which means that although learners consider AI to be consistent, they may not necessarily consider it better than human teachers in every way when it comes to writing.

Learners reported a positive perception of the instant and consistent feedback offered by AI tools. They find AI feedback to be timely, reliable, and helpful in quickly identifying mistakes and enhancing their writing. However, while AI is regarded as consistent, it is not seen as surpassing human teachers in every aspect of writing feedback, highlighting the importance of human involvement in the learning process.

Enhancing learner autonomy

The third cluster of statements focused on Enhancing Learner Autonomy through the use of AI tools in writing instruction.

Table 5. Descriptive Statistics for Participants' Perceptions of Enhancing Learner Autonomy through AI Tools

Statements	N	Mean	Std. Deviation
11. AI tools encourage me to work independently and make decisions about my writing.	150	4.20	.72
12. I can improve my writing skills without needing constant teacher intervention, thanks to AI tools.	150	4.32	.68
13. Using AI tools has helped me become more self-sufficient in improving my writing.	150	4.25	.71
14. AI tools help me take responsibility for my learning by allowing me to track my progress.	150	4.18	.75
15. I can develop my writing skills at my own pace with the help of AI tools.	150	4.30	.70

The participants said that the AI tools are very important in enhancing the participants' independence in writing. The statement "AI tools encourage me to work independently and make decisions about my writing" had a mean score of 4.20, showing that AI tools enable learners to take charge of their writing process. This is also supported by the statement "I can develop my writing skills without the need of the teacher's constant correction feedback, due to the AI tools," which got a slightly higher mean of 4.32 suggesting that the participants agreed with the statement that learners require less teacher guidance to develop their writing skills.

Furthermore, the participants argued that using AI tools made them more independent in enhancing their writing skills, as indicated by the mean score of 4.25. This result shows that AI tools assist learners in their writing development by allowing them to practice independently. Moreover, the statement "AI tools enable me to take responsibility for my learning by enabling me to track my progress" got a mean score of 4.18, which means that learners appreciate the ability to monitor their progress and take ownership of their learning process.

Finally, the statement "With the help of the AI tools, I can write at my own pace" had a mean score of 4.30, which means that the learners appreciated the flexibility of the AI tools in helping them develop at their own pace. This means that participants considered AI tools to support the development of learner autonomy. The study results show that learners consider AI tools as useful in encouraging independent decision making, at their own pace, and in giving the learner control of the learning process. This is in concurrence with the notion that AI promotes a more independent language learning style.

Scalable instruction

The fourth cluster of statements explores the Scalable Instruction enabled by AI tools in writing instruction.

Table 6. Descriptive Statistics for Participants' Perceptions of the Scalability of AI Tools in Writing Instruction

Statements	N	Mean	Std. Deviation
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16. AI tools make it easier for instructors to provide personalized writing instruction to many students.	150	4.35	.66
17. AI tools ensure that all students receive similar quality feedback, regardless of class size.	150	4.28	.70
18. The scalability of AI tools allows me to practice writing more frequently, even with large class sizes.	150	4.30	.68
19. AI tools provide writing practice and feedback outside of class hours, enhancing my learning experience.	150	4.40	.65
20. AI can help bridge the gap in writing instruction for under-resourced classrooms.	150	4.38	.67

AI tools are considered to help solve scalability problems in writing instruction. The statement “AI tools help instructors to give individualised writing instruction to many students at once” was rated 4.35. Thus, the participants are right in thinking that the tools assist instructors in giving more individual attention to many students at a time. Similarly, the statement “AI tools guarantee that every student gets quality feedback irrespective of the class size” got a mean score of 4.28, thus, it means that AI tools are applied to ensure that the quality of feedback is constant irrespective of the class size.

The mean score of 4.30 for the statement “The scalability of AI tools helps me to write more often in the case of large classes” shows that participants agree that the tools help them engage in writing practice more often. Moreover, learners appreciate the opportunity to get help from the application at any time, as shown by the result of the statement “AI tools offer writing practice and feedback, including during non-class time, which is beneficial to my learning” which is 4.40. This result shows that using AI tools after class hours is very helpful in developing learners’ writing skills.

Finally, the statement “AI can help narrow the gap in writing instruction for under-resourced classrooms” got a mean score of 4.38, which means that the participants understood the possibility of using AI in the given situation. The results show that participants greatly appreciate the AI tools in terms of their scalability and the ability to improve the effectiveness of writing instruction. They also noticed the possibility of using AI tools for continuous feedback, more practice, and covering the educational needs of learners in resource-challenged environments, which can be very useful for teachers in large and disadvantaged classrooms. These findings support the applicability of using AI in writing instruction to address the varying learning needs of the student population, particularly in environments with sparse teaching resources.

4.2. Participants’ perceptions of challenges of AI in writing instruction

Over-reliance

The fifth cluster of statements focuses on the Over-Reliance on AI Tools, examining how dependence on AI might impact learners’ development of independent writing skills.

Table 7. Descriptive Statistics for Participants’ Perceptions of Over-Reliance on AI Tools in Writing Instruction

Statements	N	Mean	Std. Deviation
21. I sometimes rely too much on AI tools to correct my writing, rather than developing my editing skills.	150	3.95	.78

22. Over-reliance on AI feedback has hindered my ability to self-correct and improve without assistance.	150	3.88	.85
23. I find it difficult to write without using AI tools for feedback and corrections.	150	3.90	.75
24. AI tools sometimes make me feel less confident in my own writing abilities.	150	3.78	.82
25. I depend on AI tools to ensure my writing is error-free, which limits my critical thinking.	150	3.85	.79

The results from this cluster suggest a mild concern among the learners regarding over reliance on AI tools for writing correction and feedback. The statement that read ‘I sometimes rely too much on AI tools to correct my writing as opposed to working on my own editing skills’ had a mean score of 3.95 which indicates that a majority of the learners may be over reliant on AI tools for error correction. Likewise, the statement “Using AI feedback too often has limited my capacity to learn to self-edit and need less assistance” got a mean of 3.88, this may be because learners are conscious of the possible negative implications of relying solely on AI feedback that may affect the growth of independent editing skills.

The statement “I can’t write without using AI tools for feedback and corrections” was rated 3.90 on the mean with a standard deviation of 0.75, this means that some learners face a challenge when it comes to writing without the assistance of AI tools. Also, the statement “AI tools sometimes make me feel less confident in my own writing abilities” had a mean of 3.78, this means that at times learners’ confidence and writing skills are affected by AI tools.

Lastly, the statement “I use AI tools to make sure that my writing is correct, and this limits my critical thinking” scored 3.85. This means that some learners are aware that the use of AI tools may negatively affect their critical thinking, as well as overdependence on the tools. These findings show that although AI tools have their place in providing feedback, users are concerned about the potential of overreliance on such tools. This reliance may adversely affect the development of self-correction, confidence, and critical thinking; hence, there is a need for balance in the use of AI in writing. Therefore, educators may have to make sure that AI is employed as an aid and not as a substitute for the independent writing production of learners.

Cultural and contextual limitations

The sixth cluster of statements explores Cultural and Contextual Limitations in the use of AI tools for writing instruction. These statements examine how AI might struggle with understanding cultural nuances, idiomatic expressions, and regional language use.

Table 8. Descriptive Statistics for Participants’ Perceptions of Cultural and Contextual Limitations of AI Tools in Writing Instruction

Statements	N	Mean	Std. Deviation
26. AI tools often misinterpret cultural nuances or specific language use in my writing.	150	4.02	.74

27. The AI tools I use are limited in handling idiomatic expressions or context-specific language correctly.	150	4.08	.72
28. AI tools may fail to understand the regional differences in language use, which impacts feedback quality.	150	4.00	.77
29. I believe AI tools need further development to account for cultural and contextual issues in language use.	150	4.15	.70
30. AI tools sometimes provide feedback that is not appropriate for the cultural context of my writing.	150	4.05	.73

The findings show that participants have a moderate understanding of the limitations of AI tools with respect to the cultural and contextual aspects of language. The statement "AI tools I use frequently make errors in the interpretation of certain cultural meanings or the use of certain terms in my writing" has a mean score of 4.02, which indicates that a majority of the learners are conscious of the fact that AI tools may not always be able to capture the cultural context of the input, which may result in incorrect feedback.

Furthermore, the statement "The AI tools that I have used are not very efficient in incorporating idiomatic phrases or context-related terms and language features" has a mean of 4.08, which means that the learners are aware that AI has its limitations in dealing with idioms, which are not always logical. The statement "AI tools may not be able to distinguish the variation in language use across regions, which will affect the quality of the feedback" obtained the score of 4.00, thus showing that learners are aware that AI has a problem with regulating regionally specific language forms, which can lead to the feedback being relevant and accurate.

The statement "To my knowledge, AI tools currently in use require additional development to incorporate cultural and contextual aspects of language use" obtained a mean of 4.15, which indicates that the learners think that the current AI tools can be improved to include cultural and contextual features. Last, the statement "AI tools can sometimes give feedback that is not suited to the cultural context of my writing" also got a mean score of 4.05, which shows that learners agree that, at times, AI feedback is not in sync with the cultural intentions of the writing.

These results show that while AI tools are useful in providing writing feedback, the lack of sensitivity to cultural and contextual aspects is a significant concern. The results of the study indicate that AI developers should pay more attention to enhancing these tools to encompass cultural diversity, idiomatic phrases, and regional language variants in order to enhance the reliability of the AI feedback.

Emotional and Creative Aspects of Writing

The final cluster examines Emotional and Creative Aspects of Writing, focusing on how AI tools handle the more subjective and creative elements of writing, such as emotional tone, creativity, and personal expression.

Table 9. Descriptive Statistics for Participants' Perceptions of Emotional and Creative Aspects of Writing Using AI Tools

Statements	N	Mean	Std. Deviation
31. AI tools struggle to understand the emotional tone or creativity in my writing.	150	4.12	.71

32. Using AI tools limits my creativity by encouraging formulaic writing instead of original expression.	150	4.08	.73
33. AI tools do not provide enough support for improving the emotional depth or personal style in my writing.	150	4.10	.72
34. I feel that my unique voice as a writer is not fully captured by AI feedback.	150	4.05	.75
35. AI tools often focus on grammatical correctness at the expense of creativity and personal expression.	150	4.07	.74

The results show that in general, learners are concerned with the restrictions of the AI tools in capturing the emotional content and the creative part of their writing. The statement “AI tools are bad at pinning down the emotional tone or the level of creativity in my writing” got a mean score of 4.12, which means that participants agree that AI tools have a low ability to determine the emotional tone or the creative details of the writing, which are often personal and difficult to express.

Also, the statement “Using AI tools hampers creativity because it forces one to resort to conventional approaches when writing rather than being creative” had a mean of 4.08, suggesting that most students think that the use of AI tools may result in more stereotyped or predictable approaches, which may reduce their creativity and genuine expression. The statement “AI tools are not effective in helping me enhance the emotional and stylistic features of my writing” got a mean of 4.10, which also shows that learners consider current AI tools as insufficient in enhancing the levels of emotion and individuality in writing.

The statement “I think that my voice as a writer is not fully represented by the AI feedback I receive” got a score of 4.05, which shows that participants are aware that the feedback provided by AI may not always be consistent with the writer’s style or voice. Last, the statement “AI tools are more concerned with grammatical accuracy than with other aspects of writing such as creativity and personal expression” also got a mean score of 4.07, which means that the learners in the study are likely to agree that AI tools give precedence to grammar as opposed to other aspects of writing like creativity, which could limit the freedom of individual expression and innovation when writing.

These results show that although AI tools are beneficial in offering structural feedback, there is a concern that they cannot properly support the more qualitative and generative aspects of writing. It seems that learners are concerned that while AI tools focus on the technical aspects of writing, they may not always capture the personal touch or the emotional content of a piece of writing. This is an important limitation of current AI writing tools, and it highlights the need for further development to address the balance between the technical and the creative in the feedback that writing tools provide.

4.3. Learner insights on AI in writing instruction

Personalized learning

These responses show that the AI feedback is highly tailored to the learner’s needs. The participants explained that the advantage of getting the feedback that is directly tailored to their writing needs is that it is easy to see where exactly they need to improve – be it grammar, vocabulary, or sentence structure. They liked how the AI tools adapt to their level and offer feedback that is not beyond or below their proficiency level.

“AI tools provide very specific feedback on my mistakes, without having to wait for the teacher to provide them.” (Student 1)

“The AI adapts to my level, so I can work on the areas that need it the most.” (Student 3)

"I really like how the AI helps me with the parts of my writing that I struggle with most, like grammar and vocabulary." (Student 5)

Instant and consistent feedback

The learners have expressed their appreciation of AI tools' ability to provide instant feedback to correct and improve work quickly. They mentioned that instant feedback is useful in identifying their mistakes and how to correct them. This form of immediate feedback enables the continuous learning process and avoids repetition of errors.

"It can take me minutes to get feedback on my work. That's a lot faster than having to wait for a teacher to correct it." (Student 7)

"This instant feedback makes me learn my mistakes better and enhance my writing effectively." (Student 9)

"The AI provides me with instant corrections, which will not let me make the same errors again." (Student 10)

Enhancing learner autonomy

The learners felt empowered and autonomous in the learning process as they applied the AI tools to manage their learning. They said that AI promotes autonomous learning, which enables them to find and correct their own mistakes without the need for the teacher's help on a regular basis. Autonomy was appreciated because the learners mentioned that AI assisted them in becoming independent in improving their writing.

"Using AI, I feel I have more control over my learning than when I do not. I can learn from my mistakes on my own without having to wait for a teacher to show me where I am wrong." (Student 12)

"My teacher and I use AI tools a lot and this makes me independent in my writing and I don't always have to seek my teacher's help." (Student 14)

"Using AI has encouraged me to check my work myself and I no longer have a problem with making mistakes." (Student 15)

Over-reliance on AI tools

Overreliance on AI tools was a prominent theme in the responses, with many learners expressing the fear that the use of AI may limit their ability to learn key editing skills. Participants mentioned that while the AI feedback tool is helpful in that it assists them in improving their writing, they are now using it to correct their work more than they are to edit it on their own. This is a problem because it reduces the cognitive activation that is needed for skill development.

"In some cases, I tend to use AI to check my mistakes instead of using my critical thinking skills to analyze what I have written." (Student 2)

"I think I am gradually becoming incompetent at editing because I allow AI to edit everything for me." (Student 4)

"It's so simple to agree with the AI suggestions, but I am concerned that I will start to neglect my own skill growth." (Student 6)

Cultural and contextual limitations

In this regard, learners highlighted the cultural and contextual limitations of AI tools as one of the major drawbacks. They complained that AI did not always recognize certain cultural nuances or idiomatic phrases that are used frequently in their writing. Some learners complained that the feedback they received from the AI tools was not culturally appropriate for the kind of writing they were doing and, at times, offered inappropriate suggestions.

“The AI doesn’t always reason about the context of my writing. At times, it will suggest edits that don’t suit the local language variations or culture I am writing for” (Student 8).

“The AI tools I use here are not very good at understanding idiomatic language and cultural references. They suggest changes that are not something I would write in my text in a natural way” (Student 9).

“I think AI can be improved in terms of comprehending regional linguistic variations. Some of the suggested alternatives do not fit the way we use language in my area” (Student 12).

Emotional and creative aspects of writing

A frequent concern of learners was that AI tools are designed to focus on grammatical accuracy and other mechanical details of writing, not on the emotional or creative aspects. In their view, learners understood the significance of grammar and format but were frustrated by the lack of assistance from AI tools in developing the emotional appeal, generativity, or personal voice in their writing.

“AI doesn’t pick the emotional tone of my writing. I think it pays more attention to the grammar than to the way I would want to convey my message.” (Student 11)

“Some AI tools can be good at finding and correcting grammatical errors, but they are lacking in suggestions that could help my writing become more interesting and engaging.” (Student 13)

“I think the AI feedback I have gotten is rather shallow and does not represent my own writing style at all. This makes it difficult to ensure that my voice is heard, especially when using AI tools.” (Student 7)

The semi-structured interviews and the qualitative data collected from them offer a deeper understanding of the learners' experiences with AI tools in writing instruction. Contributes to the study by identifying the strengths and weaknesses of integrating AI in the learning process. Positive impacts of AI tools include individual feedback, immediate correction, and the development of active learning. However, some issues were observed, including the possibility of overreliance on AI, the cultural and contextual limitations of the tools, and the lack of support for emotional and creative writing. These findings indicate that although AI tools can be useful in improving writing teaching and learning, they need to be improved and used in conjunction with conventional approaches for a more even and comprehensive learning process.

5. Discussion

The results of this study are in accordance with the previous research on the effectiveness of using AI in teaching EFL writing while at the same time highlighting some of the limitations of the technology. This is evident in the participants’ comments which are quite diverse, and which reveal the clear advantages of the tools as well as the common challenges such as over-reliance and context limits.

First of all, the opportunities that the AI brings for the development of EFL writing teaching are rather convincing, given the positive responses to the use of technology in terms of customized learning, feedback, and independence. Consistent with Mahmud (2023) in his research on Wordtune, which showed that the use of AI tools enhanced the writing ability of the students, the participants in this study said that the tools they used were suitable for their learning needs and gave them feedback on their grammar, vocabulary, and writing. As pointed out by Song (2023), new AI solutions like ChatGPT increase the level of students’ engagement because they provide instant and specific feedback that helps students learn at their own pace. This is in line with our findings that the learners appreciated the fact that the AI feedback was instant and accurate, which helped them learn the correct format of writing and make corrections quickly to enhance their writing skills.

Moreover, Hwang et al. (2023) explain how AI supports learner autonomy by providing individualized learning that helps learners with specific areas like cohesion and organization. The

results of our study were similar to this, because many people felt that way; some of the participants believed that the use of AI technologies enhanced independent work and responsibility for learning. This shift to independence is important in EFL contexts because students often require more guidance because of different levels of student ability.

However, the research also discovered some challenges of integrating AI in EFL writing instruction. The participants raised concerns on over reliance on the AI tools, they argued that relying on the AI feedback hampers their capacity to correct themselves and to learn how to edit their work. This is in line with Wang (2024), who called for changes in teaching strategies to include equipping students with AI literacy and critical thinking skills. Selim (2024) notes that over-reliance on AI may cause anxiety in students and reduce their confidence in their writing skills, a situation that was observed in the present study where some learners felt less confident when AI support was not available. However, Aljuaid (2024) has highlighted some concerns with over reliance on AI, and has suggested that it is important to find a balance between the use of AI technologies and traditional teaching methods. The participants in this study agreed with this view since they stated that while AI feedback was useful, the guidance of a teacher was necessary for a more comprehensive learning process.

The cultural and contextual aspects of AI technologies, as identified by Hwang et al. (2023) and observed in our work, present a major issue. A large number of students said that AI technologies had problems with colloquial language, local variation of language and the cultural background of the text. This is in conformity with the findings of Wang (2024), who pointed out that it was important to develop AI tools that understand cultural nuances. Though the current AI tools like ChatGPT are quite advanced, they have some limitations in their ability to understand the complex and dynamic aspects of language which are essential in writing composition.

Finally, emotion and creativity in writing, which are sometimes not captured by the AI technologies, were highlighted as another concern. While AI programs provide fast and accurate grammar correction, they are not very good at capturing the emotional tone, the innovative or creative approach, or the personal writing style. Our participants said that this was in line with the findings of Hwang et al. (2023), who pointed out that AI focuses more on the rules of language use than on the generation of new and unique language constructs. This is a problem in the development of genuine and creative writing skills, which are critical for the development of the writing process in the overall language development.

In conclusion, although the application of AI tools in EFL writing instruction can be very beneficial in improving students' learning, the drawbacks that come with it must be addressed. The findings and the literature review revealed that the use of AI in learning can provide customized learning, feedback, and even autonomy. Teachers must not only be aware of the possible dependence on AI, the cultural biases of the tools, and their inability to fully address the affective and creative aspects of writing. Further research and pedagogical changes are crucial to ensure the correct usage of AI in writing training, so as to take the best from the technology while avoiding the worst.

6. Conclusion

This research aimed at exploring the advantages and disadvantages of applying AI tools in the teaching of EFL writing. The results of the study reveal that there are a number of advantages of using AI in learning and teaching, which include: Individualized learning experiences, rapid and consistent feedback, high-order skills such as critical thinking and problem-solving, the autonomy of the student and Scalability of education. These benefits are in conformity with those of other researchers who have pointed out that AI can help EFL learners get individual feedback that meets their specific needs and enable them to learn at their own pace.

However, the study revealed some challenges that need to be solved to enable the use of AI in writing teaching effectively. The participants raised major concerns regarding the reliance on AI technologies, cultural and contextual considerations, and the ability of AI to distinguish the emotional tone and creativity. These challenges are in line with those identified in the literature, for instance, the need to balance the use of AI in teaching with the conventional methods and the development of culturally sensitive AI tools.

Therefore, while AI has the potential to revolutionize the way that EFL writing is taught, when incorporated into educational practices, it needs to be done strategically. The strengths and weaknesses of the AI tools in improving the writing skills and engaging learners should be well understood by the educators to ensure that the tools are used in conjunction with the teacher's guidance and critical thinking skills. A future study should explore how the use of AI affects writing education in different settings to ensure that the integration is both educationally sound and culturally appropriate. In addressing the issues identified in this study, AI will be in a better position to offer meaningful and quality language learning experiences to the EFL students.

7. Suggestion

In order to incorporate AI into EFL writing teaching appropriately, the AI feedback should be used alongside traditional teaching to reduce reliance and critical thinking. In this manner, however, AI literacy should be included in the curricula to assist students in learning to think critically about the AI feedback that they receive rather than accepting it. The current AI tools also need to be improved to be more culturally and linguistically sensitive to be relevant across different learning environments. In the meantime, the existing AI tools should also enhance their ability to help students develop creativity and emotional intelligence in writing, in addition to the technical aspect. Future work should also explore the long-term impacts of the use of AI on writing skills, student autonomy and engagement to ensure that the integration is sound from a pedagogical perspective and culturally appropriate.

Declarations

Author Contributions. All authors contributed equally to the conceptualization, design, data collection, and analysis of the study. They also collaborated on drafting, revising, and proofreading the manuscript to ensure its accuracy and coherence.

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