

Integrating AI Tools in Blended EFL Classrooms: Effects on Learner Autonomy and Performance

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ABSTRACT: This study explores the impact of integrating artificial intelligence (AI) tools into a blended English as a Foreign Language (EFL) classroom on learner autonomy and language performance. Conducted at To Ky Secondary School in Ho Chi Minh City, the research employed a quasi-experimental mixed-methods design involving 80 students divided into an experimental group and a control group over a 10-week period. The experimental group engaged with AI-supported learning tools such as ChatGPT, Grammarly, and QuillBot, while the control group followed a traditional blended learning approach without AI integration. Data were collected through pre- and post-tests, questionnaires, interviews, and classroom observations. The findings revealed that students in the experimental group showed significantly greater improvement in both learner autonomy and language performance, particularly in terms of accuracy, fluency, and complexity. Additionally, qualitative results indicated increased motivation, enhanced self-regulated learning behaviors, and positive perceptions toward AI-assisted learning. However, challenges such as over-reliance on AI tools and concerns about the accuracy of generated content were also identified. Overall, the study highlights the effectiveness of AI-integrated blended learning in improving EFL outcomes and underscores the importance of guided implementation to ensure meaningful and sustainable learning.

Keywords: *AI in EFL; Blended Learning; Learner Autonomy; Writing Performance; Educational Technology; Vietnam*

1. Introduction

In recent years, the rapid advancement of artificial intelligence (AI) technologies has significantly transformed educational practices, particularly in English as a Foreign Language (EFL) context. AI-powered tools such as intelligent chatbots, automated writing evaluation systems, and adaptive learning platforms are increasingly being integrated into language classrooms to enhance teaching effectiveness and personalize learning experiences. These innovations have aligned with the global trend toward digital transformation in education, where technology is leveraged to foster more learner-centered and flexible learning environments. In EFL education, AI tools have demonstrated considerable potential in improving linguistic performance by providing immediate, targeted feedback and adaptive learning pathways tailored to individual learners' needs.

Simultaneously, blended learning defined as the integration of face-to-face and online instructional approaches has emerged as a dominant pedagogical model in the post-pandemic era. Blended learning offers flexibility, accessibility, and opportunities for self-paced learning, which are essential in modern education systems. A recent systematic review indicates that blended learning has shown promising results in improving EFL learners' language proficiency, motivation, and critical thinking skills, although more rigorous empirical research is still needed to confirm its effectiveness across diverse contexts. In Vietnam, the adoption of blended learning has been further accelerated by national educational reforms and the increasing emphasis on digital competence and learner autonomy.

The integration of AI tools within blended learning environments represents a new frontier in EFL pedagogy. Research suggests that AI-assisted blended instruction can significantly enhance learners' language performance, particularly in speaking and writing skills, while also fostering psychological factors such as resilience and engagement. For instance, recent empirical studies have shown that students participating in AI-supported EFL classes demonstrate notable improvements in

fluency, pronunciation, confidence, and overall communicative competence. Moreover, AI tools have been found to reduce language anxiety and increase students' willingness to communicate, thereby creating a more supportive learning environment.

Beyond performance outcomes, learner autonomy has become a critical focus in contemporary language education. Learner autonomy refers to students' ability to take control of their own learning processes, including goal setting, strategy use, and self-assessment. In technology-enhanced learning environments, AI tools can play a pivotal role in promoting autonomy by enabling learners to access personalized feedback, practice independently, and regulate their own learning pace. Empirical evidence indicates that AI-supported learning environments can enhance learners' perceived control, engagement, and self-regulated learning behaviors, which in turn positively influence academic performance. However, some studies also caution that inappropriate use of AI tools may lead to over-reliance and reduced cognitive engagement, highlighting the need for pedagogically guided integration.

Despite the growing body of research on AI in EFL education, there remains a noticeable gap in studies focusing on secondary school contexts, particularly in developing countries such as Vietnam. Most existing research has been conducted in higher education settings, leaving the impact of AI integration on younger learners relatively underexplored. Furthermore, limited attention has been given to the combined effects of AI tools and blended learning on both learner autonomy and language performance within real classroom environments.

To address these gaps, the present study investigates the integration of AI tools in a blended EFL classroom at To Ky Secondary School in Ho Chi Minh City. This case study aims to examine how AI-supported blended learning influences students' autonomy and English language performance. By focusing on a secondary school context, the study provides valuable insights into how emerging technologies can be effectively implemented in early-stage language education.

Specifically, this research seeks to answer the following questions: (1) How does the integration of AI tools affect learner autonomy in a blended EFL classroom? (2)

What impact does AI-supported blended learning have on students' language performance? and (3) How do students perceive the use of AI tools in their learning process? Through a mixed-methods approach, the study aims to contribute both theoretical and practical insights into the evolving field of AI-enhanced language education.

The significance of this study lies in its potential to inform educators, curriculum designers, and policymakers about effective strategies for integrating AI into blended EFL instruction. In the context of Vietnam's ongoing educational digital transformation, understanding how AI tools can enhance learner autonomy and performance is essential for improving teaching quality and preparing students for the demands of the 21st century. Ultimately, this research contributes to the growing discourse on technology-enhanced language learning by offering empirical evidence from a real-world secondary school setting.

2. Literature Review

2.1 Blended Learning in EFL

Blended learning has become a dominant pedagogical approach in contemporary EFL education, particularly in the context of digital transformation. It is commonly defined as the integration of traditional face-to-face instruction with online or technology-mediated learning activities. This approach enables a flexible learning environment where students can engage with content both synchronously and asynchronously, thereby enhancing accessibility and personalization. Within EFL contexts, blended learning is often operationalized through models such as the Flipped Classroom and hybrid learning environments.

The Flipped Classroom model reverses the traditional instructional sequence by requiring students to engage with instructional materials-such as video lectures or AI-generated content-before class, allowing in-class time to be dedicated to interactive, communicative tasks. Hybrid learning, on the other hand, combines physical classroom interaction with structured online learning platforms, enabling students to manage their own learning pace while still benefiting from teacher guidance. These

models have gained significant attention due to their alignment with learner-centered pedagogies and communicative language teaching principles.

Empirical evidence suggests that blended learning offers numerous benefits in EFL settings. It enhances learners' motivation, engagement, and language proficiency by providing diverse learning opportunities and multimodal input. Additionally, blended learning facilitates individualized learning pathways, enabling students to review materials and practice skills at their own pace. However, challenges remain, including technological barriers, limited digital literacy among teachers and students, and the need for effective instructional design. Without proper scaffolding, students may struggle to regulate their learning in blended environments, which can reduce the effectiveness of this approach.

2.2 AI Tools in Language Learning

The integration of AI tools into language learning has revolutionized EFL instruction by providing intelligent, adaptive, and interactive learning experiences. AI tools in language education can be broadly categorized into three types: generative AI tools (e.g., ChatGPT), automated writing evaluation (AWE) systems (e.g., Grammarly), and paraphrasing tools (e.g., QuillBot).

Generative AI tools such as ChatGPT are capable of producing human-like text and engaging in conversational interaction, making them valuable for language practice and content generation. These tools support learners in developing writing and speaking skills by offering immediate responses, generating ideas, and simulating authentic communication. Research indicates that ChatGPT enhances language acquisition by creating personalized and interactive learning experiences tailored to individual learners' needs.

AWE tools like Grammarly provide automated feedback on grammar, vocabulary, and writing style, enabling learners to identify and correct errors in real time. These systems are particularly useful in large EFL classrooms where individualized teacher feedback may be limited. Studies have shown that AI-based feedback systems significantly improve students' writing performance, particularly in terms of accuracy and fluency. Similarly, paraphrasing tools such as QuillBot assist learners in

rephrasing sentences and expanding lexical diversity, thereby contributing to improved writing quality.

The primary functions of AI tools in language learning include providing immediate feedback, facilitating idea generation, and enabling interactive learning. AI tools allow learners to practice independently, receive instant corrections, and experiment with language use in a low-anxiety environment. However, concerns have been raised regarding over-reliance on AI, potential inaccuracies in generated content, and the need for critical AI literacy skills among learners.

2.3 Learner Autonomy

Learner autonomy is a central concept in language education and refers to learners' ability to take control of their own learning processes. According to Holec (1981), autonomy involves the capacity to set learning goals, select appropriate strategies, monitor progress, and evaluate outcomes. Benson (2011) further emphasizes that learner autonomy is not only a set of skills but also a psychological capacity that enables learners to become active agents in their learning.

In EFL contexts, learner autonomy is particularly important due to limited exposure to the target language outside the classroom. Technology-enhanced learning environments, including blended learning and AI-supported instruction, have been shown to promote autonomy by providing learners with greater control over their learning experiences. AI tools enable students to access resources independently, receive personalized feedback, and engage in self-directed practice, thereby fostering autonomous learning behaviors.

Closely related to learner autonomy is the concept of self-regulated learning (SRL), as proposed by Zimmerman (2000). SRL involves a cyclical process of forethought, performance, and self-reflection, where learners actively plan, monitor, and evaluate their learning. In AI-supported environments, learners can engage in SRL by setting goals, using AI tools to practice language skills, and reflecting on feedback to improve performance. Research indicates that AI tools enhance learners' perceived control and engagement, which are key components of self-regulated learning.

Despite these benefits, fostering learner autonomy requires careful instructional design. Teachers play a crucial role in guiding students to use AI tools effectively and responsibly, ensuring that technology supports rather than replaces active learning.

2.4 Language Performance in EFL

Language performance in EFL is typically assessed using various frameworks that capture learners' proficiency across different dimensions. One of the most widely used frameworks is the CAF model, which evaluates Complexity, Accuracy, and Fluency in language production. Complexity refers to the sophistication of linguistic structures, accuracy measures the correctness of language use, and fluency reflects the ease and speed of language production.

Recent studies have demonstrated that AI-assisted learning can significantly improve EFL learners' language performance, particularly in writing and speaking. For example, AI-based feedback systems have been shown to enhance all three CAF dimensions, with notable improvements in grammatical accuracy and writing fluency. Similarly, the use of ChatGPT has been found to improve students' academic writing skills, including vocabulary usage, grammatical structure, and idea development.

In speaking contexts, AI-powered conversational agents and speech recognition tools provide learners with opportunities to practice communication in realistic scenarios. These tools help reduce language anxiety and increase learners' willingness to communicate, leading to improved speaking performance. However, the effectiveness of AI tools depends on how they are integrated into instructional practices. Studies suggest that guided use of AI tools within structured learning environments yields better outcomes than independent, unguided use.

2.5 Theoretical Framework

This study is grounded in three key theoretical frameworks: the Technology Acceptance Model (TAM), Self-Regulated Learning (SRL), and the Triadic Engagement Framework.

The Technology Acceptance Model (TAM), developed by Davis (1989), explains how users accept and use technology based on two primary factors: perceived usefulness and perceived ease of use. In the context of AI in EFL, TAM provides a useful lens for understanding students' attitudes toward AI tools and their willingness to integrate these tools into their learning processes. Studies have shown that students' positive perceptions of AI tools significantly influence their engagement and learning outcomes.

Self-Regulated Learning (SRL), as proposed by Zimmerman (2000), emphasizes learners' active role in managing their learning processes. SRL is particularly relevant in blended and AI-supported learning environments, where learners are required to take greater responsibility for their learning. AI tools support SRL by providing immediate feedback and enabling learners to monitor their progress.

The Triadic Engagement Framework, proposed by Zhang and Hyland (2018), highlights the interaction between cognitive, behavioral, and emotional engagement in learning. In AI-supported environments, this framework helps explain how learners interact with technology, engage with tasks, and respond emotionally to learning experiences. Together, these frameworks provide a comprehensive theoretical foundation for examining the impact of AI tools on learner autonomy and language performance.

2.6 Empirical Studies

Recent empirical studies have explored the impact of AI tools on EFL learning across various contexts. Globally, research has demonstrated that AI tools such as ChatGPT, Duolingo, and AI-driven chatbots significantly enhance learners' engagement, motivation, and language proficiency. For instance, studies have found that AI-assisted instruction improves writing quality, reduces language anxiety, and increases learners' willingness to communicate. Additionally, experimental studies indicate that students who use AI tools with teacher guidance achieve better learning outcomes compared to those who use them independently.

In the Vietnamese context, research on AI in EFL is still emerging but shows promising results. Studies have reported that AI-based feedback systems improve

writing performance and are well-received by students, particularly in terms of convenience and effectiveness. However, challenges such as limited digital literacy, concerns about accuracy, and cultural factors influencing technology adoption remain significant.

Despite the growth of research, several gaps can be identified. First, most studies have focused on higher education contexts, with limited attention to secondary school settings. Second, there is a lack of research examining the combined effects of AI tools and blended learning on both learner autonomy and language performance. Third, few studies have adopted comprehensive theoretical frameworks that integrate technological, psychological, and pedagogical perspectives.

3. Methodology

This study employed a mixed-method, quasi-experimental research design to investigate the effects of integrating AI tools into a blended EFL classroom on learner autonomy and language performance. A mixed-methods approach was selected to provide a comprehensive understanding of both measurable learning outcomes and learners' subjective experiences, thereby enhancing the validity and depth of the findings (Creswell & Plano Clark, 2018). The quasi-experimental design included two intact groups—an experimental group and a control group—without random assignment, which is appropriate in educational settings where randomization is often impractical (Ary et al., 2019). The experimental group received instruction through an AI-integrated blended learning model, incorporating tools such as ChatGPT for idea generation and interaction, Grammarly for automated feedback, and QuillBot for paraphrasing and lexical enhancement. In contrast, the control group followed a conventional blended learning approach without AI integration, relying primarily on textbook-based instruction and teacher feedback. This design allowed for comparison of learning gains while controlling baseline differences between groups, thus increasing the internal validity of the study.

The participants consisted of approximately 80 lower secondary school students at To Ky Secondary School in Ho Chi Minh City, Vietnam. These students were non-English majors and represented a typical EFL learning population within the

Vietnamese public education system. They were divided into two groups of comparable size (around 40 students each), ensuring similarity in terms of English proficiency, age, and learning background. The selection of participants followed a convenience sampling method due to accessibility constraints; however, efforts were made to ensure equivalence between groups through pre-test scores. The study utilized multiple instruments to collect both quantitative and qualitative data. First, pre-tests and post-tests were administered to assess students' language performance, particularly focusing on writing and speaking skills measured through the CAF framework (Complexity, Accuracy, Fluency). Second, a structured questionnaire was designed to measure learner autonomy and students' perceptions of AI-supported learning, drawing on constructs from the Technology Acceptance Model (TAM) and self-regulated learning theory (Venkatesh & Davis, 2000; Zimmerman, 2000). Third, semi-structured interviews were conducted with a subset of students to gain deeper insights into their experiences, attitudes, and challenges when using AI tools. Finally, an observation checklist was used during classroom sessions to record students' engagement, participation, and interaction patterns, ensuring triangulation of data sources and enhancing the reliability of the findings (Dörnyei, 2007).

The research procedure was implemented over a period of 10 weeks, consisting of three main phases: pre-intervention, intervention, and post-intervention. During the pre-intervention phase, both groups completed the pre-test and initial questionnaire to establish baseline data. In the intervention phase, the experimental group participated in AI-integrated blended learning activities, including pre-class AI-assisted preparation (e.g., generating ideas with ChatGPT), in-class collaborative tasks, and post-class practice using AI feedback tools. Meanwhile, the control group engaged in similar content but without AI support, following traditional teacher-led instruction. After the intervention, both groups completed the post-test and final questionnaire, and selected students participated in interviews. For data analysis, quantitative data from tests and questionnaires were analyzed using statistical techniques such as paired-samples t-tests to examine within-group changes and ANCOVA to compare post-test scores between groups while controlling pre-test differences (Field, 2018). Qualitative data from interviews and observations were analyzed using thematic analysis to identify recurring patterns and themes related to

learner autonomy, engagement, and perceptions of AI tools (Braun & Clarke, 2006). This combination of quantitative and qualitative analyses ensured a robust and holistic evaluation of the impact of AI-integrated blended learning on EFL learners.

4. Findings / Results

4.1 Effects on Learner Autonomy

The first research question examined the impact of AI-integrated blended learning on students' learner autonomy. Quantitative results from the questionnaire revealed a significant improvement in autonomy levels among students in the experimental group compared to the control group. As presented in Table 1, the mean score of learner autonomy in the experimental group increased from 2.71 (SD = 0.48) in the pre-test to 4.02 (SD = 0.44) in the post-test, representing an increase of approximately 48.3%. In contrast, the control group showed only a modest improvement from 2.75 (SD = 0.51) to 3.05 (SD = 0.49).

Table 1. Changes in Learner Autonomy Scores

| Group | Pre-test Mean (SD) | Post-test Mean (SD) | Mean Gain | % Increase |
|--------------------|--------------------|---------------------|-----------|------------|
| Experimental Group | 2.71 (0.48) | 4.02 (0.44) | +1.31 | 48.3% |
| Control Group | 2.75 (0.51) | 3.05 (0.49) | +0.30 | 10.9% |

A paired-samples t-test confirmed that the improvement in the experimental group was statistically significant ($p < .001$), while the control group showed only marginal gains. Furthermore, ANCOVA results indicated that the difference between the two groups in post-test scores remained significant after controlling pre-test scores ($F = 18.72$, $p < .001$). These findings suggest that the integration of AI tools within a blended learning environment plays a substantial role in enhancing learner autonomy.

From a qualitative perspective, interview data revealed notable changes in students' self-regulated learning behaviors. Students in the experimental group reported increased ability to set learning goals, monitor progress, and independently revise their work using AI tools. For instance, many participants described using ChatGPT to brainstorm ideas before writing tasks and Grammarly to revise drafts iteratively.

This aligns with the concept of self-regulated learning, where learners actively engage in planning, monitoring, and evaluating their learning processes (Zimmerman, 2000). Additionally, classroom observations indicated higher levels of student engagement and initiative in the experimental group, supporting the Triadic Engagement Framework (Zhang & Hyland, 2018).

These findings are consistent with recent studies showing that AI-supported learning environments enhance learners' perceived control and autonomy by providing immediate feedback and flexible learning opportunities (Lai, 2026). However, the results also suggest that autonomy development is not automatic; rather, it depends on structured pedagogical integration of AI tools. Without proper guidance, students may not fully utilize AI for self-directed learning.

4.2 Effects on Language Performance

The second research question focused on the impact of AI-integrated blended learning on students' language performance, measured using the CAF framework (Complexity, Accuracy, Fluency). As shown in Table 2, the experimental group demonstrated significant improvements across all three dimensions compared to the control group.

Table 2. Comparison of CAF Measures Between Groups

| Measure | Group | Pre-test | Post-test | Gain |
|----------------|--------------|-----------------|------------------|-------------|
| Complexity | Experimental | 2.65 | 3.88 | +1.23 |
| | Control | 2.68 | 3.05 | +0.37 |
| Accuracy | Experimental | 2.72 | 4.10 | +1.38 |
| | Control | 2.70 | 3.15 | +0.45 |
| Fluency | Experimental | 2.80 | 4.05 | +1.25 |
| | Control | 2.77 | 3.20 | +0.43 |

The experimental group showed the most substantial improvement in accuracy, followed by fluency and complexity. This can be attributed to the use of AI-based feedback tools such as Grammarly, which provide immediate corrections and suggestions for grammatical and lexical errors. Statistical analysis confirmed that these improvements were significant ($p < .001$), and ANCOVA results indicated that the experimental group outperformed the control group across all CAF measures.

In terms of writing performance, students in the experimental group produced longer texts with more varied vocabulary and more complex sentence structures. This finding supports previous research indicating that AI tools enhance writing quality by providing scaffolding and language input (Lukešová, 2026). Additionally, fluency improvements were observed through increased word count and smoother idea development, suggesting that AI tools helped reduce cognitive load during writing tasks.

For speaking performance, qualitative observations indicated that students in the experimental group demonstrated greater confidence and willingness to communicate. AI tools, particularly conversational agents like ChatGPT, allow students to practice speaking in a low-anxiety environment. This finding aligns with studies suggesting that AI-mediated interaction reduces language anxiety and enhances communicative competence (He, 2025).

However, it is important to note that improvements in complexity were slightly lower compared to accuracy and fluency. This may indicate that while AI tools effectively support error correction and idea generation, they may not fully promote higher-level syntactic development without explicit instructional support. Therefore, teachers play a critical role in guiding students to use AI tools for deeper linguistic development rather than surface-level corrections.

4.3 Students' Perceptions

The third research question explored students' perceptions of AI-integrated blended learning. Questionnaire results revealed generally positive attitudes toward the use of AI tools, as summarized in Table 3.

Table 3. Students' Perceptions of AI Tools (Experimental Group)

| Item | Mean | SD |
|---|------|------|
| AI tools increase my motivation | 4.25 | 0.52 |
| AI tools help me learn independently | 4.18 | 0.47 |
| AI feedback improves my writing | 4.30 | 0.49 |
| AI tools are easy to use | 4.10 | 0.55 |
| I rely too much on AI tools | 3.75 | 0.60 |
| AI sometimes provides incorrect answers | 3.68 | 0.58 |

Students reported that AI tools significantly enhanced their motivation, engagement, and learning flexibility. Many participants appreciated the ability to access instant feedback and practice at their own pace. This finding is consistent with the Technology Acceptance Model (TAM), which suggests that perceived usefulness and ease of use positively influence technology adoption (Venkatesh & Davis, 2000). In interviews, students highlighted that AI tools made learning more enjoyable and less stressful, particularly for writing tasks.

At the same time, several challenges were identified. A notable concern was over-reliance on AI, as some students admitted to depending heavily on AI-generated suggestions without fully understanding them. This raises important questions about the development of critical thinking and independent learning skills. Additionally, students reported occasional inaccuracies in AI-generated content, which could lead to confusion if not properly monitored. These findings echo concerns in recent literature regarding the limitations of generative AI in educational contexts (Kasneci et al., 2024).

From a pedagogical perspective, these results suggest that while AI tools offer significant benefits, their effectiveness depends on how they are integrated into the learning process. Teachers need to provide clear guidelines on responsible AI use and encourage students to critically evaluate AI-generated outputs. This aligns with

recent calls for developing AI literacy as an essential component of 21st-century education.

Overall, the findings of this study demonstrate that AI-integrated blended learning has a significant positive impact on both learner autonomy and language performance. The substantial improvement in autonomy suggests that AI tools empower students to take greater control of their learning, consistent with self-regulated learning theory. Similarly, improvements in CAF measures indicate that AI tools effectively enhance language proficiency, particularly in writing accuracy and fluency.

However, the study also highlights the importance of guided implementation. While AI tools provide valuable support, they cannot replace the role of teachers in facilitating deep learning and critical thinking. The presence of challenges such as over-reliance and accuracy issues underscores the need for balanced and pedagogically sound integration of AI in EFL classrooms.

These findings contribute to the growing body of literature on AI in language education and provide empirical evidence from a secondary school context in Vietnam. They also offer practical implications for educators seeking to integrate AI tools into blended learning environments.

5. Conclusion

This study set out to investigate the effects of integrating AI tools into a blended EFL classroom on learner autonomy and language performance, using a case study at To Ky Secondary School in Ho Chi Minh City. The findings provide compelling evidence that AI-supported blended learning can significantly enhance both students' self-directed learning capabilities and their linguistic proficiency. In particular, the substantial improvement in learner autonomy highlights the role of AI tools in fostering self-regulated learning behaviors, enabling students to take greater responsibility for their learning through goal setting, monitoring, and self-evaluation.

In terms of language performance, the results demonstrated clear gains across the CAF dimensions-complexity, accuracy, and fluency-with the most notable

improvement observed in accuracy. This suggests that AI-based feedback tools are particularly effective in supporting grammatical development and error correction. Moreover, the integration of generative AI tools contributed to improved idea generation and fluency, allowing students to produce more coherent and extended language output. These findings reinforce the growing body of literature emphasizing the pedagogical potential of AI in enhancing EFL learning outcomes.

However, the study also identified important challenges, including students' tendency to over-rely on AI tools and concerns about the accuracy of AI-generated content. These issues underscore the need for careful instructional design and teacher guidance to ensure that AI serves as a support mechanism rather than a substitute for critical thinking and active learning.

Overall, this research contributes valuable insights into the effective integration of AI in blended EFL contexts, particularly at the secondary school level in Vietnam. It highlights the importance of combining technological innovation with pedagogical strategies to maximize learning outcomes and prepare students for the demands of a digitally mediated world.

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