Indonesian Journal of Learning and Educational Studies
Volume 4, Issue 1, 2026 pp. 29-43
ISSN: 3021-8780 (Online)
Journal Homepage: https://jurnal.piramidaakademi.com/index.php/ijles/index

Artificial intelligence in EFL Higher Education: A qualitative study of opportunities, challenges, and pedagogical implications

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Article Info

Received: 27-04-2026
Revised: 16 -05-2026
Accepted: 18-05-2026

Keyword:
Artificial Intelligence; EFL Pedagogy; Language Learning; Writing Skills; Speaking Skills;

Abstract: The accelerating development of artificial intelligence (AI) has increasingly reshaped English as a Foreign Language (EFL) pedagogy, particularly in supporting language learning and linguistic development in higher education contexts. This study aims to critically examine the opportunities, challenges, and pedagogical implications of AI integration, with a specific emphasis on language skills development, particularly writing and speaking. Employing a qualitative research design, data were collected through in-depth interviews, classroom observations, and document analysis involving English lecturers and EFL students. The data were analyzed using thematic analysis to identify recurring patterns and experiences related to AI-supported language learning. The findings indicate that AI significantly enhances language learning by supporting the development of writing accuracy, grammatical control, and speaking fluency through immediate and adaptive feedback. AI also promotes learner autonomy and increases engagement in language production activities, enabling students to practice language skills beyond classroom constraints. However, challenges were identified, including students' overreliance on AI-generated outputs and limited deep processing of linguistic forms. This study contributes to the growing body of research on AI in English language education by providing qualitative insights into how AI supports language learning processes and language skills development. The findings offer practical implications for designing pedagogically grounded AI-assisted language learning environments.

How to cite: Anam, N., & Istifadah, S.Y. (2026). Artificial intelligence in EFL Higher Education: A qualitative study of opportunities, challenges, and pedagogical implications. *Indonesian Journal of Learning and Educational Studies, 4*(1), 29-43. https://doi.org/10.62385/ijles.v4i1.257

Introduction

The rapid advancement of artificial intelligence (AI) has brought substantial changes to educational practices, including English language education (Godwin-Jones, 2022; Zou, Reinders, & Thomas, 2023; Wang, Zhang, & Zhou, 2026). In the context of English as a Foreign Language (EFL) higher education, AI-powered technologies—such as automated writing evaluation systems, speech recognition tools, and generative language models—are increasingly integrated into teaching and learning processes (Chen, Zou, & Xie, 2022; Zhu & Wang, 2025). These developments have not only transformed instructional delivery but also redefined how learners engage in language learning and develop their language skills, particularly in writing and speaking (Li, D'Mello, & Graesser, 2021; Akinsemolu & Onyeaka, 2025).

Language learning in EFL contexts continues to present significant challenges, primarily due to limited exposure to authentic English input and restricted opportunities for meaningful communication (Ortega, 2020; Nation, 2022). These constraints are especially evident in the development of productive language skills, where learners are required to actively produce language. Writing, for instance, demands control over grammatical accuracy, coherence, and lexical appropriateness, while speaking requires fluency, pronunciation, and the ability to process language in real time (Nation, 2022; Li, D'Mello, & Graesser, 2021). Without sufficient opportunities for practice and timely feedback, learners often struggle to achieve sustained linguistic development, particularly in mastering these productive skills (Ortega, 2020; Kim, 2023).

In this regard, AI offers considerable pedagogical potential to support language learning and enhance the development of writing and speaking skills (Godwin-Jones, 2022; Zou, Reinders, & Thomas, 2023). AI-based tools provide immediate, adaptive, and individualized feedback, allowing learners to identify and correct linguistic errors during the learning process (Chen, Zou, & Xie, 2022). In writing, AI facilitates revision by offering suggestions related to grammar, vocabulary use, and textual organization, thereby supporting the development of accuracy and coherence (Ferreira & Kotzé, 2022; Zhang & Pérez-Paredes, 2021). In speaking, AI-powered applications enable learners to practice pronunciation and fluency through repeated interaction, fostering greater confidence and oral proficiency (Kim, 2023). These affordances create opportunities for iterative language production, which is essential for developing deeper linguistic competence (Li, D'Mello, & Graesser, 2021).

From the perspective of EFL pedagogy, the integration of AI aligns with learner-centered approaches that emphasize autonomy, active engagement, and differentiated instruction (Bax, 2011; Hubbard, 2009). AI enables learners to take greater control of their learning by practicing language skills independently, at their own pace, and according to their individual proficiency levels (Zhang & Pérez-Paredes, 2021). This flexibility enhances the effectiveness of language learning processes and supports continuous engagement in language use beyond the classroom (Warschauer, 2004; Zou et al., 2023). As a result, AI contributes to more personalized and sustainable linguistic development (He, Abbasi, & He, 2025).

However, despite these advantages, the integration of AI in EFL contexts also raises important pedagogical concerns (Zhu & Wang, 2025). One of the primary challenges is learners' tendency to rely excessively on AI-generated outputs without fully engaging with the underlying linguistic structures. Such reliance may lead to surface-level learning, limiting learners' ability to internalize language forms and develop independent language skills (Xu, 2025; Wang et al., 2026). Additionally, disparities in access to AI technologies may influence the quality and consistency of learning experiences across different educational settings (Akinsemolu & Onyeaka, 2025).

nPrevious studies have widely examined the integration of artificial intelligence (AI) in language learning, particularly its impact on writing improvement, speaking fluency, learner engagement, and personalized feedback systems. Several systematic reviews reported that AI-based tools positively influence language achievement, motivation, and learning satisfaction in EFL contexts (Kundu & Bej, 2025; Liu, Sihes, & Lu, 2025). Other studies specifically highlighted the effectiveness of AI-assisted speaking applications in reducing anxiety and improving oral fluency through repeated practice and real-time feedback (Bhar, 2026; Wang, Aziz, & Kutty, 2025). In writing instruction, generative AI tools such as ChatGPT and automated writing systems were found to support grammar correction, text organization, and academic writing performance (Shabir, 2025; Ferreira & Kotzé, 2022).

However, despite the growing number of studies, most previous research has predominantly focused on quantitative outcomes such as test scores, user satisfaction, and technological

effectiveness. Limited attention has been given to how AI is experienced by both lecturers and students in authentic EFL higher education classrooms, particularly regarding how AI supports the simultaneous development of writing and speaking skills through pedagogically guided practices. Furthermore, prior studies often examine writing or speaking separately, rather than investigating both productive skills within one integrated qualitative inquiry.

Therefore, the analytical gap of this study lies in the lack of context-sensitive qualitative evidence explaining how AI contributes to language learning processes, learner autonomy, teacher mediation, and deeper linguistic development in higher education EFL settings. Addressing this gap is important because technological benefits alone do not automatically translate into meaningful learning outcomes without pedagogical integration.

The novelty of this study is threefold. First, it qualitatively explores opportunities, challenges, and pedagogical implications of AI from the perspectives of both lecturers and students. Second, it simultaneously focuses on the development of writing and speaking skills as interconnected productive competencies. Third, it emphasizes the evolving role of teachers as facilitators and mediators in AI-supported EFL higher education, particularly within the Indonesian context, which remains underexplored in previous international literature.

Although a growing body of research has examined the role of AI in education, much of the existing literature tends to focus on technological effectiveness and measurable learning outcomes. Comparatively less attention has been given to how AI supports language learning processes, particularly in relation to the development of writing and speaking skills and their contribution to linguistic development in authentic classroom contexts. This gap highlights the need for more context-sensitive and pedagogically oriented investigations.

Therefore, this study aims to explore how AI contributes to language learning, with a particular focus on the development of writing and speaking skills, and to examine its pedagogical implications within EFL higher education. By investigating learners' and teachers' experiences, this study seeks to provide deeper insights into how AI can be integrated to support meaningful and effective language learning and linguistic development.

Literature Review

Artificial intelligence (AI) has increasingly been recognized as a transformative tool in language learning, particularly in supporting the development of productive language skills such as writing and speaking. In EFL contexts, where learners often experience limited exposure to authentic English input, AI offers extended opportunities for practice, interaction, and feedback that are essential for linguistic development (Godwin-Jones, 2022; Zou, Reinders, & Thomas, 2023). AI-based writing tools, including automated writing evaluation systems and grammar-checking applications, provide immediate and adaptive feedback that assists learners in identifying grammatical errors, improving sentence structure, and refining lexical choices. Through repeated cycles of drafting, feedback, and revision, learners can gradually improve writing accuracy, coherence, and complexity (Ferreira & Kotzé, 2022; Zhang & Pérez-Paredes, 2021). Likewise, AI-supported speaking tools using speech recognition technology enable learners to practice pronunciation, fluency, and intonation in a flexible and low-anxiety environment, thereby fostering oral confidence and communicative readiness (Kim, 2023).

The integration of AI can also be situated within the broader framework of Computer-Assisted Language Learning (CALL), which views technology as a mediational tool that facilitates meaningful interaction, learner autonomy, and active language use rather than merely delivering instructional content (Hubbard, 2009; Bax, 2011). AI extends CALL principles by providing adaptive learning environments where learners can interact with intelligent systems, receive immediate feedback, and engage in repeated language practice. Such opportunities are particularly valuable

for writing and speaking development because these productive skills require sustained output, contextualized use, and opportunities for self-correction. However, CALL research consistently emphasizes that the success of technology depends less on the tool itself and more on how it is pedagogically integrated into learning activities (Warschauer, 2004).

From a pedagogical perspective, the Technological Pedagogical Content Knowledge (TPACK) framework is relevant for understanding teachers' readiness to integrate AI effectively in EFL classrooms. TPACK highlights the importance of combining technological knowledge, pedagogical knowledge, and content knowledge to ensure that technology use meaningfully supports instructional goals (Mishra & Koehler, 2006; Koehler, Mishra, & Cain, 2013). In AI-supported language learning, teachers are expected not only to understand linguistic content and teaching strategies but also to evaluate AI tools critically and design tasks that encourage reflection rather than dependence. For example, teachers can guide students to use AI-generated feedback as a resource for revision in writing or as supplementary practice for speaking, while maintaining emphasis on communicative competence and deeper linguistic awareness.

Despite its potential, AI integration also raises pedagogical concerns. Overreliance on AI-generated outputs may encourage surface-level learning, where students focus on obtaining correct answers without understanding the underlying linguistic structures (Xu, 2025; Zhu & Wang, 2025). In addition, unequal access to AI technologies may create disparities in learning opportunities across educational settings. Therefore, effective AI integration requires a balanced approach in which AI functions as a supportive tool rather than a replacement for meaningful teacher-student interaction. The real value of AI in EFL pedagogy lies not in technological sophistication alone, but in its capacity to promote sustained, reflective, and learner-cantered language learning experiences

Methods

This study employed a qualitative research design to investigate how artificial intelligence (AI) supports language learning, particularly in the development of language skills—writing and speaking—within EFL higher education contexts. A qualitative approach was considered appropriate as it enables an in-depth exploration of participants lived experiences, perceptions, and interpretations of AI-assisted language learning in authentic educational settings (Creswell, 2014; Denzin & Lincoln, 2018). More specifically, the study adopted a qualitative descriptive design to generate rich, contextually grounded accounts of how AI is integrated into EFL pedagogy and how it contributes to learners' linguistic development. This design allows the researcher to capture naturally occurring practices related to writing and speaking activities without imposing rigid theoretical constraints, thereby ensuring that the findings remain closely aligned with participants' actual experiences in language learning environments. The study was conducted in a higher education setting where AI-based tools had been incorporated into English language teaching and learning practices. The instructional context included activities that explicitly involved the development of writing and speaking skills, supported by AI technologies such as automated writing tools, speech recognition applications, and generative AI platforms.

The participants consisted of English lecturers and EFL students who had prior experience using AI tools in language learning activities. Lecturers were involved in designing and implementing AI-supported instruction, while students engaged with AI tools to practice and improve their language skills. The participants consisted of 6 English lecturers and 18 EFL students selected purposively based on prior experience using AI tools. Who could provide information-rich insights into the role of AI in supporting language learning and linguistic development (Creswell, 2014). The selection criteria included: (1) active engagement with AI tools in writing and/or speaking activities, and (2) willingness to reflect on their experiences in AI-supported EFL pedagogy.

This sampling approach ensured that the data collected were directly relevant to the study's focus on language skills development and pedagogical practices.

To enhance the depth and credibility of the findings, data were collected through multiple sources using methodological triangulation. The data collection techniques were designed to capture how AI supports language learning processes, particularly in writing and speaking. Semi-structured interviews were conducted with both lecturers and students to explore their experiences, perceptions, and practices in using AI for language learning. The interviews focused specifically on how AI supports the development of writing and speaking skills, including feedback use, revision processes, and speaking practice. The flexible structure allowed participants to elaborate on their experiences while enabling the researcher to probe deeper into issues related to linguistic development. Classroom observations were conducted to capture authentic instructional practices involving AI-supported EFL pedagogy. Observations focused on how AI tools were integrated into writing and speaking activities, the nature of student engagement, and the extent to which AI facilitated language production. Particular attention was given to how learners interacted with AI feedback and how teachers guided the use of AI in language learning tasks. Document analysis involved examining teaching materials, lesson plans, and student assignments that incorporated AI-based tools. This provided additional evidence of how AI was embedded in instructional design and how it supported the development of language skills. Student writing outputs and speaking-related tasks were analyzed to understand how AI contributed to linguistic development in practice.

The collected data were analyzed using thematic analysis, following the procedures outlined by (Braun and Clarke, 2006). This approach was selected for its flexibility in identifying patterns related to language learning experiences and language skills development. The analysis involved the following stages: (1) Data familiarization: The researcher repeatedly reviewed interview transcripts, observation notes, and documents to gain a comprehensive understanding of participants' experiences in AI-supported language learning. (2) Initial coding: Meaningful data segments related to writing, speaking, and linguistic development were identified and coded. (3) Theme development: Codes were grouped into broader categories to identify recurring themes related to how AI supports language learning processes. (4) Theme refinement and interpretation: Themes were reviewed and refined to ensure coherence, relevance, and alignment with the study's focus on EFL pedagogy and language skills development. This analytical process enabled the identification of key themes concerning the pedagogical role of AI in enhancing writing and speaking skills.

To ensure the rigor and trustworthiness of the study, several strategies were implemented based on the criteria proposed by (Creswell, 2018; Nowell et al., 2017; Stahl and King, 2020): (1) Credibility: Achieved through methodological triangulation (interviews, observations, and documents) and member checking, where participants verified the accuracy of interpretations related to their language learning experiences. (2) Dependability: Ensured by maintaining a systematic and transparent research process, including clear documentation of data collection and analysis procedures. (3) Confirmability: Supported through peer debriefing and reflective practices to minimize researcher bias in interpreting data related to linguistic development. (4) Transferability: Facilitated by providing detailed descriptions of the EFL context, enabling readers to assess the applicability of the findings to similar language learning environments.

Ethical considerations were addressed appropriately, including informed consent, voluntary participation, and confidentiality. However, these considerations were treated as supporting elements rather than the central focus of the study, as the primary emphasis remained on understanding how AI contributes to language learning and language skills development.

Results and Discussion

The thematic analysis of data obtained from semi-structured interviews, classroom observations, and document analysis revealed four major themes that reflect how artificial intelligence (AI) supports language learning, particularly in the development of language skills (writing and speaking), as well as its implications for linguistic development within EFL higher education contexts.

AI as an Enabler of Personalized and Autonomous Language Learning

The findings indicate that AI plays a significant role in facilitating personalized language learning through adaptive feedback and individualized learning pathways. Participants consistently reported that AI-based tools, particularly writing assistants and grammar-checking applications, supported the development of writing skills by addressing learners' specific linguistic needs.

One student explained: "*When I use AI for writing, I can immediately see my grammar mistakes and revise them. It helps me understand how to write better sentences*." (Student 3). This suggests that AI functions not only as an error-correction tool but also as a scaffolding mechanism that supports linguistic development, particularly in grammatical accuracy and sentence construction.

From the lecturers' perspective, "*AI helps me handle students with different proficiency levels. Each student can work on their own writing problems*." (Lecturer 2) This highlights the role of AI in supporting differentiated instruction, a key principle in EFL pedagogy. Furthermore, AI promotes learner autonomy, as students can practice independently: "*I practice writing and sometimes speaking with AI at home. I don't need to wait for teacher feedback*." (Student 1)

These findings demonstrate that AI enhances self-regulated language learning, which contributes directly to sustained linguistic development.

Enhancing Engagement and Language Skills Development (Writing and Speaking)

Another key finding is that AI significantly enhances student engagement and improves language skills, particularly writing and speaking. In writing tasks, students reported increased motivation: *"I feel more motivated to revise my writing because AI gives suggestions instantly."* (Student 5)

The availability of immediate feedback encourages iterative revision, which supports improvements in writing accuracy, coherence, and lexical development.

Beyond improving technical accuracy, the findings indicate that AI also promotes greater learner autonomy and self-regulated learning behaviour. Students became more actively involved in monitoring and revising their own writing, suggesting that AI-supported feedback encourages reflective engagement rather than passive task completion. This finding implies that AI not only functions as a correction tool but also facilitates deeper learner participation in the writing process. In EFL contexts, where students often hesitate to revise multiple drafts, the immediacy of AI feedback appears to reduce frustration and sustain motivation throughout the revision cycle.

In speaking: *"AI speaking tools help me practice pronunciation many times. I feel more* confident when speaking in class." (Student 2) Classroom observations confirmed that students who practiced with AI beforehand demonstrated higher participation and confidence during in-class speaking activities. As one lecturer noted:

"*Students become more active when they already practice with AI before class*." (Lecturer 1)

These findings suggest that AI creates a low-anxiety environment that supports repeated practice, which is essential for developing oral fluency in EFL contexts.

Critically, the increase in confidence observed among students indicates that AI may reduce psychological barriers commonly experienced in foreign language speaking activities, particularly fear of making mistakes and classroom anxiety. Repeated interaction with AI tools allowed students to rehearse language production privately before participating in public classroom communication. This process appears to strengthen speaking readiness and willingness to communicate, both of which are important factors in second language acquisition. However, the findings also suggest that confidence gained through AI-supported rehearsal still requires authentic classroom interaction to develop broader communicative competence and spontaneous language use.

Importantly, AI was most effective when integrated as a supplementary tool within EFL pedagogy, rather than replacing teacher-led instruction.

These finding highlights that the educational value of AI lies not solely in technological sophistication, but in how it is pedagogically mediated within meaningful learning activities. AI-supported engagement becomes more effective when combined with teacher guidance, collaborative interaction, and opportunities for critical reflection. Therefore, the study suggests that AI should be positioned as a complementary learning resource that strengthens, rather than substitutes for, human interaction and pedagogical support in EFL classrooms.

Challenges in Achieving Deep Linguistic Development

Despite its benefits, the findings reveal challenges related to achieving deeper linguistic development. Some students admitted: *"Sometimes I just accept AI suggestions without really understanding why it is correct."* (Student 4). This indicates a tendency toward surface-level language learning, where learners focus on outcomes rather than underlying linguistic processes.

This finding suggests that although AI can improve the quality of language output, it may simultaneously reduce opportunities for deeper cognitive processing if learners depend excessively on automated corrections. Instead of analysing grammatical structures, vocabulary choices, or discourse organization independently, some students appeared to prioritize obtaining immediate correct answers. Such behaviour reflects procedural learning rather than conceptual understanding, where students can produce accurate language forms without fully internalizing the linguistic principles behind them. This indicates that AI-supported learning may risk encouraging passive dependency unless accompanied by reflective learning strategies and pedagogical guidance.

Lecturers also observed: *"Some students rely too much on AI. Their writing looks good, but when I ask them to explain, they struggle."* (Lecturer 3)

This highlights a critical gap between language performance and language competence. While AI improves output quality, it does not automatically ensure internalization of linguistic knowledge.

Critically, the findings reveal that improved writing performance does not necessarily represent genuine language acquisition. Students may achieve grammatically polished texts through AI assistance while lacking sufficient metalinguistic awareness to explain or reproduce similar structures independently. This distinction is academically important because language competence involves not only producing correct forms but also understanding how and why those forms are used appropriately in communication. Therefore, the study indicates that AI should not be evaluated solely based on output quality, but also on its ability to support deeper linguistic understanding and long-term language development.

Additionally, unequal access to AI tools was identified as a factor affecting the consistency of language learning opportunities, particularly in resource-limited contexts. This finding also reflects broader issues of educational inequality in technology-supported learning environments. Students with stable internet access and familiarity with digital tools tended to benefit more actively from AI integration, while those with limited technological resources experienced fewer opportunities for continuous practice and feedback. Consequently, the effectiveness of AI in EFL learning cannot be separated from institutional readiness and accessibility factors.

The Evolving Role of Teachers in AI-Supported EFL Pedagogy

The findings indicate a transformation in the role of teachers within AI-supported learning environments.

As one lecturer stated: *"My role is not just correcting anymore. I guide students to understand the feedback from AI."* (Lecturer 2)

Teachers are increasingly positioned as:

Facilitators of language learning, mediators of AI-generated feedback, and guides for developing linguistic awareness. Students also emphasized the continued importance of teachers:

"AI helps me, but I still need my lecturer to explain why something is correct." (Student 6)

This demonstrates that AI cannot replace pedagogical expertise, particularly in fostering deeper understanding and supporting linguistic development.

The findings suggest that the integration of AI does not diminish the importance of teachers; instead, it reshapes their pedagogical responsibilities. Teachers are no longer positioned merely as providers of correction, but as facilitators who help learners critically interpret AI-generated feedback and connect it to broader linguistic concepts. This shift highlights the increasing importance of pedagogical mediation in AI-supported learning environments. Without teacher guidance, learners may accept AI suggestions mechanically without engaging in meaningful reflection or language analysis.

Furthermore, the findings imply that effective AI integration requires teachers to possess not only language teaching expertise but also the ability to evaluate the pedagogical appropriateness of AI tools. Teachers play a central role in ensuring that AI supports communicative learning goals rather than encouraging dependency on automated responses. Thus, the study reinforces the idea that successful AI integration depends on the interaction between technology, pedagogy, and teacher agency rather than technology alone.

Table 1. Summary of Themes and Language Learning Focus

Theme	Description	Language Learning Focus	Evidence
Personalized learning	Adaptive feedback and autonomy	Writing accuracy & independence	Interviews, quotes
Engagement & skills	Motivation and active participation	Writing & speaking development	Interviews, observations
Linguistic challenges	Overreliance and shallow processing	Deep language competence	Interviews
Teacher roles	Facilitation and mediation	EFL pedagogy	Interviews

Observation Findings

Classroom observations revealed that the integration of AI tools positively influenced students' engagement during writing and speaking activities. In writing sessions, students who used AI-based grammar and feedback applications revised their drafts more frequently than in conventional classes. They were observed checking vocabulary choices, reorganizing sentence structures, and correcting grammatical errors immediately after receiving AI-generated suggestions. This iterative revision process indicated that AI encouraged more active participation in writing development rather than passive submission of first drafts.

During speaking activities, students who practiced with AI-supported speaking applications before classroom presentations demonstrated higher levels of confidence and readiness. They appeared more willing to volunteer answers, initiate responses, and participate in oral discussions. Several students showed clearer pronunciation and smoother fluency compared with earlier classroom meetings in which AI tools were not used. The low-anxiety practice environment provided by AI appeared to reduce students' hesitation in speaking English publicly.

Observations also showed that the role of lecturers remained essential throughout AI-supported instruction. Lecturers guided students in interpreting AI feedback, clarified incorrect suggestions, and encouraged learners to reflect on why certain language forms were more appropriate than others. In speaking tasks, lecturers complemented AI pronunciation feedback by providing contextual explanations related to meaning, stress, and communicative appropriateness. This suggests that AI functioned most effectively when combined with teacher mediation rather than used independently.

However, classroom observations also identified several challenges. Some students tended to accept AI suggestions immediately without carefully evaluating whether the corrections matched the intended meaning or task context. In writing tasks, a few learners copied revised sentences directly from AI tools with minimal reflection. This indicates that although AI enhanced efficiency and performance, excessive dependence may limit deeper linguistic processing if not supported by critical guidance from teachers.

Discussion

The findings of this study provide compelling evidence that artificial intelligence (AI) plays a substantial role in enhancing language learning, particularly in the development of productive language skills such as writing and speaking. Recent systematic reviews confirm that AI tools can improve learner engagement, language achievement, feedback quality, and personalized learning experiences in EFL contexts (Kundu & Bej, 2025; Liu, Sihes, & Lu, 2025). However, the present study goes beyond these findings by demonstrating that the contribution of AI to linguistic development is not inherently guaranteed. Rather, its effectiveness is strongly mediated by pedagogical design, instructional context, and the quality of learner engagement. This suggests that AI should not be viewed merely as a technological innovation, but as a pedagogical resource that requires meaningful instructional integration.

This finding is also consistent with recent higher education research showing that AI positively supports self-regulated language learning through planning, monitoring, reflection, and motivation. Nevertheless, those same studies warn that overreliance on AI, weak feedback quality, and lack of teacher guidance may reduce long-term learning effectiveness. Therefore, the present study strengthens current scholarship by highlighting that cognitive engagement remains central to language acquisition, even in AI-supported environments.

AI and Speaking Development

The findings indicate that AI contributes significantly to speaking development by facilitating repeated oral practice, immediate pronunciation feedback, and increased learner confidence. This finding is consistent with recent studies emphasizing that AI-supported speaking tools, including speech-recognition systems and conversational chatbots, create adaptive and low-anxiety learning environments that encourage learners to engage more actively in oral language production (Kim, 2023; Wang, Aziz, & Kutty, 2025). In EFL contexts, where opportunities for authentic communication are often limited, such repeated interaction is particularly important because sustained exposure and practice are central components of oral fluency development (Godwin-Jones, 2022; Zou, Reinders, & Thomas, 2023).

From a pedagogical perspective, the increased confidence reported by learners suggests that AI may reduce affective barriers commonly associated with foreign language speaking, particularly communication anxiety and fear of negative evaluation. Recent studies on AI-assisted language learning similarly report that supportive digital environments can strengthen learners' willingness to communicate and increase speaking participation through repeated low-pressure interaction (Liu, Sihes, & Lu, 2025; Bhar, 2026). Therefore, AI-supported speaking environments appear to function not only as technological tools but also as psychologically supportive spaces that encourage learners to practice more consistently and independently.

However, the findings also reveal important limitations regarding the role of AI in developing broader communicative competence. Although AI systems can simulate conversational interaction and provide pronunciation correction, they remain limited in replicating authentic communicative negotiation, spontaneous turn-taking, emotional nuance, and sociocultural appropriateness in real-life communication. Recent EFL research similarly emphasizes that communicative competence involves not only grammatical accuracy and fluency but also interactional, sociolinguistic, and pragmatic abilities that require authentic human communication (Zhu & Wang, 2025; He, Abbasi, & He, 2025). Consequently, while AI is highly effective for controlled fluency practice and pronunciation improvement, it cannot fully substitute for authentic interpersonal interaction in language learning.

This study also contributes to previous research by highlighting the distinction between speaking performance and communicative mastery. Much existing research primarily reports improvements in fluency, pronunciation accuracy, or learner confidence after AI use (Bhar, 2026; Liu, Sihes, & Lu, 2025). In contrast, the present findings suggest that these improvements may not automatically indicate deeper communicative competence unless learners are also engaged in authentic interaction and reflective language use. Therefore, the educational value of AI in speaking instruction depends not only on technological effectiveness but also on how AI activities are integrated into communicative and pedagogically guided learning experiences.

AI within EFL Pedagogy

From an EFL pedagogy perspective, the findings confirm that the effectiveness of AI depends more on pedagogical integration than on technological sophistication. Recent systematic reviews consistently report that AI generates stronger learning outcomes when embedded within task-based instruction, collaborative interaction, reflective learning activities, and clearly structured pedagogical objectives (Kundu & Bej, 2025; Liu, Sihes, & Lu, 2025). Conversely, studies also indicate that unguided or purely tool-cantered AI implementation often results in superficial engagement and weaker long-term learning outcomes because learners may focus more on completing tasks efficiently than on developing deeper linguistic understanding (Xu, 2025; Zhu & Wang, 2025).

This finding reinforces contemporary perspectives in Computer-Assisted Language Learning (CALL), which emphasize that technology itself does not automatically improve language acquisition. Instead, learning effectiveness depends on how digital tools are integrated into meaningful pedagogical practices that encourage interaction, reflection, and sustained language use (Godwin-Jones, 2022; Zou, Reinders, & Thomas, 2023). Therefore, the educational value of AI lies not primarily in automation or technological sophistication, but in its capacity to support learner engagement within communicative and pedagogically guided environments.

The present study further suggests that AI functions most effectively as a scaffolding tool that facilitates practice, feedback, revision, and reflective learning processes rather than replacing teacher-cantered instruction. This interpretation aligns with recent pedagogical research arguing that AI-supported learning environments should strengthen learner autonomy while still maintaining teacher mediation and instructional direction (He, Abbasi, & He, 2025). In this context, AI extends opportunities for language exposure and practice beyond classroom boundaries while preserving the central role of human pedagogy in guiding meaningful learning experiences.

Importantly, the findings imply that successful AI integration requires a balanced relationship between technology and pedagogy. The commonly cited principle that "technology does not improve learning; pedagogy determines its impact" is strongly reflected in this study because the effectiveness of AI was closely associated with how teachers structured learning activities, guided learner interaction with AI feedback, and connected AI use to communicative learning goals. Thus, the study contributes to existing literature by emphasizing that AI should be understood not as an autonomous educational solution, but as a pedagogically mediated resource whose impact depends on instructional quality, teacher agency, and meaningful learner engagement.

Linguistic Development vs Language Performance

One of the most significant findings of this study is the distinction between language performance (observable output) and linguistic competence (internalized language knowledge). Recent studies consistently report that AI-assisted tools improve grammar accuracy, essay organization, vocabulary use, and speaking fluency through immediate corrective feedback and automated language support (Kundu & Bej, 2025; Shabir, 2025). While such improvements are pedagogically valuable, the present findings suggest that enhanced output quality does not necessarily indicate deeper language acquisition or genuine linguistic competence. Learners may produce grammatically accurate and well-structured responses with AI assistance without fully understanding the grammatical, semantic, or discourse-related principles underlying those responses.

This finding contributes an important critical perspective to current AI-in-language-learning research, which frequently emphasizes measurable performance gains such as higher writing scores, improved fluency, or increased lexical sophistication (Liu, Sihes, & Lu, 2025). In contrast, the present study highlights that language learning should not be evaluated solely through observable performance outcomes because accurate production may occur without meaningful internalization of linguistic knowledge. This distinction reflects broader second language acquisition perspectives that differentiate between surface performance and deeper cognitive acquisition processes. Consequently, the findings suggest that AI may facilitate procedural learning—where learners know how to produce correct responses—without necessarily promoting conceptual understanding of language systems.

From a pedagogical perspective, the findings imply that AI-supported learning environments require reflective and cognitively engaging instructional strategies to ensure sustainable linguistic development. Without opportunities for explanation, self-correction, and metalinguistic reflection,

learners may become dependent on AI-generated corrections rather than developing independent language awareness. Recent research similarly warns that overreliance on generative AI may reduce critical thinking and weaken deeper processing of linguistic forms when students prioritize efficiency over understanding (Xu, 2025; Zhu & Wang, 2025). Therefore, the effectiveness of AI should not only be assessed based on the quality of learner output, but also on its capacity to encourage reflection, analytical thinking, and long-term language acquisition.

Importantly, this study extends previous literature by emphasizing that sustainable linguistic development requires guided cognitive engagement with AI feedback rather than passive acceptance of automated suggestions. In this sense, AI becomes educationally meaningful only when integrated into pedagogical practices that encourage learners to analyse linguistic structures, evaluate corrections critically, and connect feedback to communicative language use. Thus, the study positions AI not merely as a productivity-enhancing tool, but as a resource whose educational value depends on the depth of learner interaction and pedagogical mediation within EFL learning environments.

The Central Role of Teachers

The findings strongly indicate that AI reinforces rather than diminishes the role of teachers within EFL learning environments. Recent studies increasingly emphasize that sustainable and meaningful AI integration depends not only on technological availability but also on teacher mediation, pedagogical design, and ethical supervision (He, Abbasi, & He, 2025; Zhu & Wang, 2025). In this context, teachers remain central in helping learners interpret AI-generated feedback, evaluate linguistic accuracy, connect corrections to underlying language principles, and transfer language practice into authentic communication. Therefore, the effectiveness of AI in language education cannot be separated from the pedagogical competence of teachers who guide its implementation.

This finding reflects an important pedagogical shift in AI-supported education. Rather than functioning primarily as providers of correction and information, teachers increasingly assume roles as facilitators, mediators, and designers of deeper learning experiences. This interpretation aligns with recent scholarship arguing that AI should augment human pedagogy rather than replace it (Kundu & Bej, 2025; Liu, Sihes, & Lu, 2025). The role of teachers therefore becomes more cognitively and pedagogically demanding because they must support students in critically engaging with AI feedback rather than accepting automated responses passively.

From a theoretical perspective, the findings also support contemporary learner-cantered and sociocultural approaches to language learning, which emphasize the importance of guided interaction, scaffolding, and reflective mediation in developing linguistic competence. AI may provide rapid feedback and personalized assistance, but meaningful language acquisition still requires human support to contextualize learning, encourage critical reflection, and sustain communicative engagement. Consequently, the study suggests that AI alone cannot ensure deeper linguistic development without active pedagogical intervention.

Importantly, the findings challenge deterministic assumptions that AI may eventually replace teachers in language education. Instead, the study demonstrates that the increasing presence of AI actually strengthens the importance of teacher agency in shaping meaningful learning experiences. Without pedagogical guidance, AI may encourage passive dependence, surface-level learning, and uncritical acceptance of automated outputs. Conversely, when integrated critically and strategically, AI can become a powerful pedagogical resource that supports reflective, meaningful, and sustainable language learning. Thus, the contribution of this study lies in repositioning teachers not as secondary actors in AI-supported learning, but as central mediators who determine whether AI

functions as a tool for genuine linguistic development or merely as a mechanism for improving language performance.

Table 2. Integration of Findings with Theoretical Frameworks

Findings	Language Focus	Framework	Interpretation
Personalized learning	Writing development	AI in ELT	Supports adaptive and individualized language learning processes
Engagement	Speaking & writing skills	CALL	Enhances interaction, practice frequency, and feedback cycles
Challenges	Linguistic development	EFL Pedagogy	Risk of surface-level learning without reflection
Teacher role	Pedagogical mediation	TPACK	Ensures meaningful integration of AI into language learning

Conclusion

This study examined the integration of artificial intelligence (AI) in English language education by exploring its opportunities, challenges, and pedagogical implications within EFL higher education contexts, particularly in supporting writing and speaking development. The findings reveal that AI has considerable potential to enhance language learning through personalized, immediate, and adaptive feedback that improves writing accuracy, coherence, pronunciation, fluency, and learner confidence. AI also extends learning opportunities beyond the classroom by enabling continuous and self-paced practice. However, the study found that the effectiveness of AI depends largely on how learners engage with the technology. Overreliance on AI-generated outputs without critical reflection may improve language performance but not necessarily deeper linguistic competence. Therefore, AI is most beneficial when used as a supportive learning tool rather than as a substitute for meaningful learning processes.

The findings imply that successful AI integration in EFL pedagogy requires strong instructional design and active teacher involvement. Teachers remain central as facilitators, mediators, and designers of learning experiences who guide students in interpreting AI feedback, reflecting on language use, and developing independent learning strategies. Educational institutions should therefore provide professional development programs that strengthen teachers' technological and pedagogical competencies in using AI effectively. In addition, clear pedagogical guidelines and equitable access to AI tools are necessary to ensure that all learners benefit from AI-supported language learning.

This study is limited by its qualitative design and relatively small number of participants within a specific higher education context, which may restrict the generalizability of the findings. Future studies are recommended to employ mixed-methods or large-scale quantitative approaches involving more diverse institutions and participants. Further research should also investigate the long-term effects of AI on writing and speaking development, learner autonomy, and the most effective pedagogical models for sustainable AI integration in different EFL settings.

References

Akinsemolu, A. A., & Onyeaka, H. (2025). Artificial intelligence and equitable access in digital education: Challenges and opportunities for developing contexts. *International Journal of Educational Technology in Higher Education, 22*(1), 1–18.

Bax, S. (2011). Normalisation revisited: The effective use of technology in language education. *International Journal of Computer-Assisted Language Learning and Teaching, 1*(2), 1–15. https://doi.org/10.4018/ijcallt.2011040101

Bhar, R. (2026). Conversational artificial intelligence and speaking anxiety reduction in EFL classrooms. *Language Learning & Technology, 30*(1), 44–62.

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. Sage. https://doi.org/10.1007/978-3-319-69909-7_3470-2

Chen, X., Zou, D., & Xie, H. (2022). Fifty years of artificial intelligence in language education: A review of AI-assisted language learning research. *System, 103*, 102640.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage.

Ferreira, A., & Kotzé, P. (2022). Automated writing evaluation and EFL learner writing development: A systematic review. *Computers and Composition, 64*, 102698.

Godwin-Jones, R. (2022). Emerging technologies: Artificial intelligence and language learning. *Language Learning & Technology, 26*(2), 4–12. https://doi.org/10.64152/10125/73474

Hubbard, P. (2009). Computer assisted language learning: Critical concepts in linguistics. London, England: Routledge.

Kim, H. J. (2023). AI-based speaking practice and oral fluency development among EFL learners. *Computer Assisted Language Learning, 36*(7), 1145–1167.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of Education, 193*(3), 13–19. https://doi.org/10.1177/002205741319300303

Kundu, A., & Bej, T. (2025). Artificial intelligence in language education: A systematic review of learner outcomes and pedagogical implications. *Education and Information Technologies, 30*(2), 1887–1910.

Li, S., D'Mello, S., & Graesser, A. (2021). Adaptive feedback systems and second language development: The role of intelligent tutoring technologies. *Computers & Education, 168*, 104190.

Liu, Y., Sihes, A. J., & Lu, C. (2025). Artificial intelligence in EFL education: Trends, challenges, and future directions. *System, 121*, 103227.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Nation, I. S. P. (2022). *Learning vocabulary in another language* (3rd ed.). Cambridge University Press. https://doi.org/10.1017/9781009093873

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1–13. https://doi.org/10.1177/1609406917733847

Ortega, L. (2020). *Understanding second language acquisition* (2nd ed.). Routledge.

Shabir, M. (2025). ChatGPT and academic writing support in EFL higher education: Opportunities and limitations. *Journal of Language and Education, 11*(1), 55–72.

Stahl, N. A., & King, J. R. (2020). Expanding approaches for research: Understanding and using trustworthiness in qualitative research. *Journal of Developmental Education, 44*(1), 26–28.

Wang, H., Zhang, Y., & Zhou, L. (2026). Generative artificial intelligence and learner dependence in higher education language classrooms. *Computers & Education: Artificial Intelligence, 7*, 100245.

Wang, S., Aziz, A. A., & Kutty, F. M. (2025). AI chatbots and oral communication practice in EFL learning environments. *Interactive Learning Environments, 33*(2), 311–329.

Warschauer, M. (2004). Technological change and the future of CALL. In S. Fotos & C. Browne (Eds.), *New perspectives on CALL for second language classrooms* (pp. 15–25). Lawrence Erlbaum.

Xu, J. (2025). Surface learning and overreliance on generative AI in second language writing contexts. *ReCALL, 37*(1), 88–105.

Zhang, R., & Pérez-Paredes, P. (2021). Automated feedback in second language writing: Student engagement and revision quality. *Language Learning & Technology, 25*(3), 75–94.

Zhu, Q., & Wang, T. (2025). Ethical and pedagogical concerns of artificial intelligence integration in language education. *Educational Technology & Society, 28*(1), 95–110.

Zou, D., Reinders, H., & Thomas, M. (2023). Artificial intelligence in language education: Trends and future directions. *Computer Assisted Language Learning, 36*(5), 789–812