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Artificial Intelligence in English Language Teaching: A Systematic Literature Review of Tools, Impact, and Challenges

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force in English Language Teaching (ELT), offering innovative tools to enhance proficiency across writing, speaking, listening, and reading skills. However, despite increasing interest, systematic investigations into how AI is currently applied and the challenges it presents in ELT remain scarce. This systematic literature review (SLR) critically synthesizes 35 peer-reviewed articles published between 2021 and 2025, selected from Scopus and SINTA 2-indexed journals using PRISMA guidelines and predefined inclusion criteria. The analysis identifies five categories of AI applications in ELT—pronunciation enhancement, writing assistance, speaking practice, listening comprehension, and personalized learning—alongside tools such as ChatGPT, Grammarly, ELSA Speak, and Duolingo. These tools demonstrate measurable improvements in learners' linguistic accuracy, fluency, and engagement. Nonetheless, the review highlights persistent challenges, including teacher dependency, ethical concerns, limited contextual awareness by AI systems, fluctuating student motivation, and infrastructure constraints. To address these issues, the study underscores the importance of establishing ethical standards, expanding teacher training, ensuring equitable technological access, and encouraging the development of culturally adaptive AI systems. Cross-sector collaboration among educators, researchers, developers, and policymakers is vital to fully realize the pedagogical potential of AI in English language education.

Keywords: Artificial intelligence, ELT, systematic literature review, learning applications, language proficiency

INTRODUCTION

Integrating digital technology into language education has revolutionized traditional teaching methods, leading to significant advancements in personalized and adaptive learning environments (Kolluru et al., 2018; Sajja et al., 2024). Among the various technological innovations, Artificial Intelligence (AI) stands out as particularly transformative, offering advanced tools capable of addressing individual learner needs and preferences (Popenici & Kerr, 2017; Bajaj & Sharma, 2018; Alam & Mohanty, 2023; Rane,

2024). Ellikkal and Rajamohan (2024) and Yekollu et al. (2024) noted that AI-powered applications can deliver tailored feedback, provide dynamic practice opportunities, and create adaptive learning pathways that accommodate various learning styles and paces.

In English Language Teaching (ELT), AI-driven solutions have shown considerable promise in supporting the development of key language skills, including speaking, listening, reading, and writing (Wu, 2024). Writing assistance platforms such as Grammarly, QuillBot, and ChatGPT, for instance, enable students to receive immediate grammatical corrections and stylistic suggestions, fostering greater learner autonomy and improving writing proficiency (Marzuki et al., 2023; Mahapatra, 2024; Wiboolyasarin et al., 2024; Kohnke, 2024). Similarly, pronunciation-focused tools such as ELSA Speak provide real-time phonetic feedback, enabling learners to enhance their pronunciation accuracy and fluency through repeated, individualized practice (Anggraini, 2022). Beyond writing and pronunciation, conversational AI technologies—including intelligent chatbots, virtual avatars, and speech-enabled interfaces—have created new spaces for speaking practice in low-pressure, learner-centered environments (Ericsson & Johansson, 2023; Lee et al., 2024).

Given the rapid proliferation of AI technologies in education, a systematic literature review is timely and essential for consolidating the fragmented body of research related to their integration in ELT. A systematic review allows for a rigorous and transparent synthesis of emerging evidence, helping to identify patterns, trends, and gaps often obscured by individual studies' isolated nature (Siddaway et al., 2018; Alexander, 2020). Drawing on a broad range of peer-reviewed sources, this approach provides a comprehensive understanding of how AI tools are utilized across language skills, their pedagogical effectiveness, and the conditions under which they succeed or falter (Sharadgah & Sa'di, 2022). Furthermore, evaluating their impact enables educators and researchers to distinguish between tools that enhance learning and those that require further refinement (Ayotunde et al., 2023; Idham et al., 2024; AlTwijri & Alghizzi, 2024). Equally important is identifying practical challenges that hinder successful implementation, including technological limitations, ethical concerns, and uneven levels of teacher preparedness.

Recent systematic reviews have highlighted the growing role of Artificial Intelligence (AI) in English Language Teaching (ELT), covering areas such as language skill development, interactional competence, affective factors, and instructional collaboration. Sharadgah and Sa'di (2022) conducted a broad review of AI in ELT from 2015 to 2021, noting increased scholarly attention and positive outcomes in language skills, assessment, learner attitudes, and satisfaction. They also reported widespread use of advanced AI techniques like machine learning and deep learning. However, gaps remain regarding non-verbal communication, instructional transparency, and clear definitions of AI in ELT contexts. Focusing on AI dialogue systems, Zhai and Wibowo (2023) found that these tools improve reading, writing, and listening but fall short in supporting debate, problem-solving, and culturally sensitive interaction. Similarly, Ji et al. (2022) identified limited collaboration between AI systems and human teachers, emphasizing the need for more research on "intelligence amplification" to balance automation with teacher-led instruction.

Klimova et al. (2023) explored emerging technologies in foreign language instruction, such as chatbots and virtual reality. While students are familiar with these tools informally, the study found that teachers often lack the training to apply them pedagogically, highlighting a need for professional development and more experimental research in applied

university settings, regarding learner psychology, AlTwijri and Alghizzi (2024) reviewed AI's impact on motivation, engagement, and anxiety. Though AI tools promise to enhance affective outcomes, the research base remains limited, especially in higher education. Meanwhile, Aljuaid (2024) examined AI's role in academic writing instruction. While tools like ChatGPT and Grammarly aid with grammar and style, concerns about creativity, critical thinking, and academic integrity persist, reinforcing the view that AI should support, not replace, traditional writing instruction. Finally, Dehghanzadeh et al. (2019) reviewed gamification in ESL contexts and found positive effects on engagement and motivation, but noted a lack of clarity regarding which gamification elements specifically enhance learning. This reflects a broader issue across the field: the need for more precise evaluations of how AI and digital tools influence specific learning outcomes.

The integration of Artificial Intelligence (AI) in English Language Teaching (ELT) has seen notable progress in recent years, reflecting growing interest in its potential to transform instructional practices. However, existing research tends to be fragmented, often focusing on individual tools, specific language skills, or limited learner demographics. Comprehensive analyses that examine AI applications across all four core language skills—listening, speaking, reading, and writing—remain scarce. Moreover, limited attention has been paid to how these tools function in authentic classroom contexts, what challenges emerge during their implementation, and how they align with broader pedagogical goals. This systematic literature review addresses these gaps by synthesizing recent studies published between 2021 and 2025. The review categorizes AI tools currently used in ELT, evaluates their pedagogical effectiveness, and identifies recurring challenges related to integration, such as technological limitations, learner engagement, and instructional alignment. The study provides a novel and practical perspective that informs future research, supports evidence-based pedagogical decisions, and offers recommendations for stakeholders aiming to integrate AI meaningfully into language education.

METHOD

This study employed a Systematic Literature Review (SLR) methodology, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The SLR approach was selected for its structured, transparent, and replicable procedure for identifying, analyzing, and synthesizing relevant literature (Xiao & Watson, 2017). This method allows for a critical and comprehensive exploration of how Artificial Intelligence (AI) has been integrated into English Language Teaching (ELT), including the range of tools employed and the pedagogical, technical, and contextual challenges encountered. Furthermore, to ensure the quality and academic credibility of the sources, data were collected from two prominent research databases: Scopus and SINTA. Scopus, developed by Elsevier, is one of the largest abstract and citation databases of peer-reviewed literature, widely used in global academic research for its rigorous indexing criteria and broad disciplinary coverage (Baas et al., 2020; Pranckutė, 2021). In contrast, SINTA (Science and Technology Index) is an Indonesian government-managed indexing platform developed by the Ministry of Education, Culture, Research, and Technology. It provides bibliometric evaluations and ranks national journals into tiers, with SINTA Level 2 representing high-quality, peer-reviewed publications recognized within Indonesia's academic ecosystem (Ahmar et al., 2018; Ahmadi, 2019).

The database search used the following keywords: (“artificial intelligence” OR “AI”) AND (“English teaching” OR “English learning”). These terms were entered into the title, abstract, and keyword fields to maximize the retrieval of relevant literature. The search and screening process followed a systematic protocol, ensuring objectivity and reproducibility in study selection. Only articles published between 2021 and 2025 in Scopus and SINTA Level 2 journals were included, based on their peer-reviewed status and relevance to the research objectives. The complete procedure for article identification, screening, eligibility assessment, and inclusion is illustrated in Table 1, following PRISMA standards.

Table 1. Search result summary

Step	Filtering Criteria	Query of Database	Documents
1	Initial keyword search	TITLE-ABS-KEY ("artificial intelligence" OR "AI") AND ("English teaching" OR "English learning")	52
2	Limited to peer-reviewed journal articles	LIMIT-TO (SRCTYPE, "j")	46
3	Filtered by publication year (2020–2025)	LIMIT-TO (PUBYEAR, "2020–2025")	41
4	Manual screening for relevance and metadata completeness	Manual exclusion of irrelevant studies and incomplete records	35

Table 1 outlines the systematic process of identifying and screening relevant studies for inclusion in this review. The initial search (Step 1) yielded 52 documents based on the use of specific keywords— ("artificial intelligence" OR "AI") AND ("English teaching" OR "English learning")—within the title, abstract, and keyword fields of the Scopus and SINTA databases. In Step 2, the search was refined to include only peer-reviewed journal articles, reducing the number of eligible documents to 46. Step 3 narrowed the results by applying a publication year filter (2020–2025), ensuring that only recent and relevant studies were considered, resulting in 41 articles. Finally, Step 4 involved manual screening to remove duplicate entries, studies with incomplete metadata, or those deemed irrelevant to the specific focus of AI in English Language Teaching. This rigorous process concluded with 35 articles selected for full review and analysis. This multi-stage approach ensured the credibility, recency, and relevance of the literature included in the study.

The selected articles were subjected to qualitative descriptive analysis to identify key thematic patterns, categorize the types of AI tools employed, examine emerging trends in their application, and uncover the challenges associated with their integration into English Language Teaching (ELT). This method is well-suited for systematically organizing and interpreting findings from diverse sources while remaining grounded in the data without imposing complex theoretical frameworks (Naeem et al., 2023). Through iterative reading, coding, and comparison, this analytical approach allowed for an in-depth synthesis that maintained the integrity of the original data while revealing broader conceptual insights. It also ensured the study's credibility, dependability, and confirmability—key criteria for establishing trustworthiness in qualitative research (Nowell et al., 2017).

FINDING AND DISCUSSION

AI tools in English teaching and learning

This subsection categorizes and summarizes the AI tools identified across the reviewed studies, focusing on their instructional functions in supporting English language teaching and learning. Drawing on a comprehensive analysis of the 35 selected articles, the tools are organized into five distinct functional categories, reflecting their primary roles in ELT contexts. Table 2 presents an overview of these categories, detailing the specific AI tools used and their corresponding instructional applications.

Table 2. AI tools identified in English teaching and learning

Category	Examples of AI Tools	Primary Instructional Function
Pronunciation Enhancement	1. ELSA Speak 2. Speechace	Real-time pronunciation feedback and speech recognition practice
Writing Assistance	1. Grammarly 2. QuillBot 3. Ecree 4. PaperRater 5. ProWritingAid 6. Ginger 7. Scribo 8. ChatGPT 9. INK AI	Grammar correction, paraphrasing, and AI-assisted writing refinement
Speaking Practice	1. ELSA Speak 2. Chatbot AI 3. ChatGPT 4. AsasaraBot 5. AI Replika 6. Kuki AI 7. Virtual Human AI	AI-powered conversation practice to improve fluency
Listening & Comprehension	1. Google Assistant 2. ChatGPT 3. Generative AI 4. AI-powered Podcasts 5. Voice-Thread AI	Adaptive listening exercises and real-time speech recognition
Personalized Learning	1. AI-enabled English Language Learning 2. DALL·E 3. AI Agent 4. Duolingo 5. Memrise AI 6. LingQ AI	Customized learning paths and automated performance-based assessment

AI tools have shown considerable effectiveness in enhancing various English language skills. Through real-time phonetic feedback, pronunciation enhancement technologies such as ELSA Speak, Microsoft Azure Speech Services, and Speechace have improved learners' pronunciation accuracy. However, these tools continue to face challenges in addressing intonation patterns and suprasegmental features of speech (Senowarsito & Ardini, 2023; Khalizah & Damanik, 2024; Sharadgah & Sa'di, 2022; Zawadzki, 2022). Similarly, writing assistance applications—including Grammarly, QuillBot, Scribo,

ProWritingAid, Ginger, PaperRater, and Ecree—demonstrate notable improvements in grammatical accuracy, lexical variety, and stylistic refinement. Despite these benefits, concerns remain regarding potential overdependence and issues related to academic integrity, particularly the risk of plagiarism (Celik et al., 2022; Gayed et al., 2022; Wang et al., 2023; Zhai & Wibowo, 2023).

For speaking practice, tools such as ELSA Speak, ChatGPT, AI Replika, Kuki AI, and Virtual Human AI offer interactive conversation simulations that promote fluency and communicative confidence. Nonetheless, limitations persist in the tools' ability to process cultural references, idiomatic expressions, and pragmatic appropriateness (Kostka & Toncelli, 2023; Kohnke et al., 2023). AI-powered platforms like Google Assistant, interactive podcasts, and VoiceThread AI provide adaptive and engaging listening experiences in listening and comprehension. However, their capacity to manage linguistic subtleties and nuanced contextual interpretation remains limited (Ji et al., 2023; Yeh, 2024; An et al., 2023). Personalized learning solutions—such as Duolingo, Memrise AI, LingQ AI, and AI-enabled English Language Learning (AIELL)—successfully customize instructional content to align with individual learners' proficiency levels and preferences. While these platforms support learner autonomy and engagement, challenges remain in fostering meaningful, context-aware human-AI interaction that supports deeper learning outcomes (Fannoni et al., 2023; Jia et al., 2022; Wang et al., 2023).

Challenges in AI integration

This section outlines the key challenges reported in the reviewed literature concerning integrating AI tools into English Language Teaching (ELT). While the pedagogical benefits of AI applications are well-documented, their implementation in educational contexts remains complex and multifaceted. Several recurring issues—technological and pedagogical constraints, ethical and contextual concerns—have been identified as barriers to effective adoption. Table 3 summarizes the major challenges reported across the selected studies, accompanied by supporting references.

Table 3. Challenges in AI integration in ELT

Challenge	Study	Explanation
Teacher Dependency	Gayed et al. (2022)	It was found that teachers expressed concerns over being replaced by AI, which influenced their willingness to adopt such tools entirely in the classroom.
	Sharadgah & Sa'di (2022)	Reported that teachers often struggle to encourage critical engagement when using AI tools and require significant guidance to use them effectively.
	Kostka & Toncelli (2023)	Highlighted the need for teacher supervision and mediation when integrating AI, as autonomous use can misalign with pedagogical goals.
Ethical Concerns	Jiang (2022)	Identified risks of plagiarism and superficial writing when students rely too heavily on AI-generated content.
	Zhai & Wibowo (2023)	Raised concerns about biased or context-insensitive feedback from AI systems, which can misguide learners.

	An et al. (2023)	Emphasized the ethical risks of reduced student originality and overreliance on AI for academic tasks.
Limited Contextual Understanding	Kohnke et al. (2023)	AI tools often fail to process idiomatic expressions and pragmatic cues, limiting their effectiveness in communication-based learning.
	Kostka & Toncelli (2023)	Pointed out limitations in AI's ability to understand socio-cultural nuances in language use.
	Susanto et al. (2024)	Stressed that AI-generated content frequently lacks contextual appropriateness in real-world language tasks.
Student Motivation	Barrett & Pack (2023)	Observed that AI interactions can feel impersonal, reducing student enthusiasm for engagement and practice.
	Farrelly & Baker (2023)	Reportedly, learners may disengage when AI fails to provide emotionally responsive or varied interaction.
	Jia et al. (2022)	Showed that learners expressed reduced motivation due to the repetitive nature of AI feedback and lack of meaningful interaction.
Technological Constraints	Jiang, R. (2022).	Discussed issues related to system maintenance, updates, and digital literacy as barriers to implementation.
	Celik et al. (2022)	Noted a lack of long-term evaluation mechanisms, making it difficult to assess the sustained impact of AI on learning outcomes.

Table 3 outlines five major challenges identified in the reviewed literature regarding integrating Artificial Intelligence (AI) into English Language Teaching (ELT). Each challenge is supported by multiple studies that offer complementary insights into the complexities of AI implementation in educational contexts. The first challenge, teacher dependency, underscores educators' apprehension about AI's perceived threat to their instructional roles. Gayed et al. (2022) noted that many teachers are hesitant to adopt AI tools due to fears of being replaced, which inhibits their willingness to explore the full pedagogical potential of these technologies. Beyond job security, this concern is rooted in the uncertainty surrounding how AI should be integrated to promote higher-order thinking, autonomy, and reflective learning. As Sharadgah and Sa'di (2022) reported, teachers often struggle to use AI in ways that sustain deep engagement and student agency, requiring considerable support to navigate the intersection of AI functionalities and pedagogical aims. Kostka and Toncelli (2023) emphasized that AI tools may lead to superficial or misdirected learning experiences without teacher mediation, reinforcing the need for educators to retain a guiding role in AI-enhanced classrooms.

Equally significant are the ethical concerns surrounding using AI tools in ELT. Jiang (2022) highlighted the growing risk of plagiarism and superficial language learning when students overly depend on AI-generated content. Instead of developing their ideas, learners may resort to automation for expediency, undermining academic integrity and limiting cognitive engagement. Zhai and Wibowo (2023) further warned that AI systems may produce biased or inaccurate feedback, which could mislead learners or reinforce stereotypes, especially when language models are trained on datasets lacking diversity or contextual nuance. An et al. (2023) added that excessive reliance on AI can diminish learner

originality, creativity, and critical thinking, core outcomes of language education. To mitigate these risks, educators must incorporate explicit instruction on ethical AI usage and digital responsibility into their curricula, and institutions should develop clear guidelines to support responsible engagement with AI technologies (Marzuki et al., 2023; Ji et al., 2022).

Another major theme is the limited contextual understanding of AI systems, which undermines their effectiveness in supporting authentic communication. While AI can perform rule-based corrections and generate grammatically sound responses, it frequently fails to grasp language use's pragmatic, idiomatic, and cultural dimensions. Kohnke et al. (2023) observed that this limitation hampers learners' ability to engage in real-world communication tasks, as the language produced by AI may lack appropriateness in social contexts. Similarly, Kostka and Toncelli (2023) pointed to AI's lack of socio-cultural sensitivity, while Susanto et al. (2024) highlighted the often contextually inappropriate responses generated by AI tools in open-ended tasks. These shortcomings suggest that AI in ELT must be supplemented by teacher-led contextualization, where learners are taught to evaluate AI outputs and adapt them for communicative appropriateness critically (Lee et al., 2024).

The challenge of student motivation further complicates AI implementation in ELT. While AI tools may offer novelty and interactivity, several studies have indicated that their impersonal nature can negatively affect learner engagement. Barrett and Pack (2023) found that the mechanical style of AI interaction reduces the emotional connection learners often seek in language learning, which is fundamentally a social and expressive process. Farrelly and Baker (2023) noted that the lack of emotional responsiveness and personalized variation leads to disengagement over time. Similarly, Jia et al. (2022) reported that repetitive and generalized AI feedback fails to sustain motivation, especially for learners who benefit from human affirmation and constructive dialogue. To maintain engagement, AI must be strategically combined with meaningful human interaction and emotionally intelligent instructional practices that respond to individual learner needs (Wu, 2024).

Finally, technological constraints pose a persistent barrier to the equitable and sustainable use of AI in ELT. As Jiang (2022) explained, maintaining AI systems requires technical infrastructure and digital literacy among teachers and learners. In contexts where access to reliable internet, updated software, or compatible devices is limited, the implementation of AI becomes uneven and potentially exclusionary. Celik et al. (2022) also pointed out the lack of long-term evaluation mechanisms, which restricts the ability of researchers and practitioners to assess the enduring pedagogical impact of AI tools. Short-term performance gains may be evident, but without longitudinal studies, it is difficult to determine whether AI contributes meaningfully to language development over time (Senowarsito & Ardini, 2023; Jia et al., 2022). These findings highlight the need for context-sensitive infrastructure planning, continuous training, and rigorous, long-term research that evaluates both efficacy and the socio-educational outcomes of AI integration.

CONCLUSION

This study aimed to systematically review recent literature on integrating Artificial Intelligence (AI) in English Language Teaching (ELT), identify the types of AI tools used, evaluate their instructional functions, and examine the challenges surrounding their implementation in language education contexts. The findings revealed five recurring

challenges that complicate the effective use of AI in ELT: teacher dependency, ethical concerns, limited contextual understanding, student motivation, and technological constraints. Many educators remain uncertain about how to use AI tools to foster higher-order thinking and reflective learning, indicating a misalignment between technological functionalities and pedagogical objectives. Concerns around plagiarism, superficial learning, and biased feedback further highlight the need for ethical oversight. In addition, AI's inability to interpret idiomatic and cultural nuances limits its contribution to authentic language learning. Motivation is also a concern, as AI systems often lack the emotional responsiveness needed to sustain learner engagement. Infrastructure gaps, digital literacy limitations, and the absence of long-term evaluative research further compound these issues.

A human-centered integration approach is essential to ensure AI is a pedagogically meaningful tool rather than a replacement for educators. This requires comprehensive teacher training, ethical guidelines, and collaborative design efforts that align AI capabilities with contextual classroom needs. Future research should focus on sustainable implementation models, teacher–AI collaboration frameworks, and longitudinal studies that assess learning outcomes and student agency, engagement, and equity in AI-supported ELT environments.

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