



Artificial Intelligence in English Language Teaching: Chatbot-Based Learning Innovation to Enhance Senior High School Students' Speaking Skills

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Received: 12/06/2025 Revised: 11/07/2026 Accepted: 14/08/2026

ABSTRACT

Purpose – This literature review explores the integration of Artificial Intelligence (AI)-powered chatbots in English Language Teaching (ELT), focusing on their role in enhancing speaking skills among senior high school EFL students. It examines conversational AI tools such as ChatGPT, Duolingo Max, and AI English tutors, particularly their pedagogical affordances, challenges, and implications for communicative competence development.

Methodology – This review employs a thematic synthesis of recent empirical studies, theoretical models, and best practices related to AI-mediated speaking instruction to identify recurring findings and pedagogical implications.

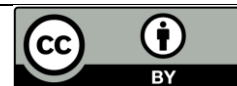
Findings – Findings reveal that AI chatbots foster learner autonomy, reduce speaking anxiety, and provide personalized, interactive, and immersive language learning environments. They support fluency, accuracy, confidence, and motivation through accessible speaking practice. However, challenges include technological access, data privacy concerns, and teachers' digital readiness.

Novelty – This study offers a focused synthesis of AI-powered chatbot applications for developing speaking skills among senior high school EFL students by integrating pedagogical benefits with Communicative Language Teaching (CLT), Sociocultural Theory, and Affective Filter perspectives.

Significance – This study highlights how chatbots provide personalized, accessible, and low-anxiety speaking practice while supporting language development and learner autonomy. It also provides practical implications for effective and ethical AI integration in ELT.

Keywords: Artificial intelligence; Chatbot-based learning; Conversational AI; English language teaching; Speaking skills.

How to cite: Saraswati, N. P. R, T. A. K. H., Rismayani, R., Hananingsih, A. (2026). Artificial Intelligence in English Language Teaching: Chatbot-Based Learning Innovation to Enhance Senior High School Students' Speaking Skills. *Journal of Literature Language and Academic Studies*, 05(3), pp, 159-167, doi: <https://doi.org/10.56855/j-llans.v5i3.2445>



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1. Introduction

In the era of rapid digital transformation, Artificial Intelligence (AI) has emerged as a central pillar of educational innovation, fundamentally redefining the relationship between learners, knowledge, and pedagogy. Across disciplines, AI technologies are reshaping instructional practices by offering new pathways for personalization, engagement, feedback, and assessment (Kalyani, 2024; Lima et al., 2024). In language education, this transformation is particularly significant because language learning depends not only on knowledge acquisition but also on continuous interaction, meaningful communication, and opportunities to use language in authentic contexts. The integration of AI therefore offers new possibilities for addressing persistent challenges in English Language Teaching (ELT), particularly in English as a Foreign Language (EFL) contexts where opportunities for authentic communication are often limited.

The development of AI in language education can be traced to the evolution of Computer-Assisted Language Learning (CALL) and Intelligent Tutoring Systems (ITS), which have long sought to integrate technology into the language learning process (Handley, 2024; Nurpratiwi, 2024). Early CALL applications primarily emphasized drill-and-practice activities, grammar exercises, and vocabulary memorization, with a strong focus on linguistic accuracy rather than communicative fluency. Although these systems increased accessibility and automated aspects of instruction, they were generally constrained by static content and limited contextual responsiveness. The subsequent emergence of ITS represented an important advancement because these systems introduced adaptivity, learner modeling, and individualized feedback. By adjusting difficulty levels, providing hints, and responding to learner performance, ITS laid the technological and pedagogical foundation for more sophisticated applications of AI in language learning.

With the rapid development of Natural Language Processing (NLP), machine learning, and speech recognition technologies, AI has moved beyond its earlier mechanical functions to become a dynamic facilitator of language acquisition (Chen, 2024; Arenas, 2024; Rismayani & Kania, 2024). Contemporary AI systems can analyze learners' linguistic input, recognize patterns, identify errors, and generate personalized feedback that reflects the context of language use. NLP enables AI systems to process human language semantically and pragmatically, allowing learners to participate in more contextually meaningful interactions rather than merely responding to predetermined exercises. Speech recognition technologies further expand these capabilities by enabling analysis of pronunciation, intonation, and fluency. In addition, AI-supported platforms can integrate text, audio, and visual inputs, providing multimodal learning experiences and adaptive learning pathways that respond to learners' individual progress and preferences (Zhang et al., 2024; Darji, 2023). These developments represent a shift from static, teacher-directed technological support toward dynamic and learner-centered learning environments.

The pedagogical potential of AI is particularly relevant to English speaking instruction. Speaking is frequently regarded as one of the most complex and anxiety-inducing language skills for senior high school students (Wang & Li, 2025; Hananingsih, 2026). Unlike reading or grammar, which can often be practiced independently, speaking requires spontaneous interaction, immediate processing, and opportunities to negotiate meaning with others. However, traditional EFL classrooms frequently

provide insufficient opportunities for sustained oral communication. Large class sizes, limited instructional time, fixed curricula, and examination-oriented teaching can make it difficult for teachers to provide individualized speaking practice and immediate corrective feedback (Abduvalieva, 2025). Consequently, many learners remain reluctant to participate orally because they fear making mistakes, receiving negative evaluation, or being judged by their peers. These conditions indicate the need for alternative learning environments that provide flexible, personalized, and low-stakes opportunities for oral practice.

In this context, AI-powered chatbots have emerged as a promising innovation for supporting language learning and speaking development (Bouafoud et al., 2024). Chatbots function as virtual conversational partners that simulate human-like dialogue and enable learners to engage in interactive communication without the social pressure associated with classroom interaction (Karyotaki et al., 2022). Unlike traditional computer-assisted drills, AI-driven chatbots use NLP to interpret learner input, generate contextually appropriate responses, and sustain conversations that resemble real-world exchanges. Learners can participate in role plays, interviews, everyday conversations, debates, and other communicative scenarios while receiving repeated opportunities to produce language. This interaction can increase learners' willingness to communicate by creating a supportive environment in which mistakes are treated as part of the learning process rather than as sources of embarrassment.

The potential of chatbot-based learning is particularly relevant for senior high school students because it can supplement classroom instruction while allowing learners to practice at their own pace. Students can use chatbots to rehearse everyday situations such as introducing themselves, ordering food, asking for directions, conducting interviews, or discussing familiar topics. Such interactions extend speaking practice beyond the limited time available in the classroom and allow learners to repeat activities until they become more confident. Moreover, AI chatbots can provide immediate feedback on grammar, vocabulary, pronunciation, and sentence construction, addressing a limitation commonly encountered in large classes where teachers cannot provide individualized feedback to every student. Through repeated exposure to language input and opportunities for language production, learners may gradually develop greater fluency, accuracy, and confidence.

Among contemporary conversational AI applications, ChatGPT exemplifies the increasingly sophisticated capabilities of AI-mediated language interaction (Gupta, 2024). Its ability to generate context-sensitive responses, adapt conversational complexity, provide explanations, and simulate different communicative situations enables learners to engage in flexible forms of speaking practice. For example, prompts can be designed to position ChatGPT as a conversation partner, interviewer, customer, teacher, or workplace colleague. The system can also adjust language difficulty and provide scaffolding according to learners' needs. Such adaptive interaction can support learners as they move from guided language production toward more autonomous communication, making conversational AI particularly relevant to communicative language learning.

The theoretical foundations of chatbot-supported speaking practice can be understood through several complementary perspectives. First, Communicative Language Teaching (CLT) positions interaction as both a central means and an important goal of language learning (Pemberton, 2024). CLT emphasizes meaningful communication, authentic language use, negotiation of meaning, fluency, and communicative competence rather than isolated memorization of grammatical forms. AI chatbots can support these principles by creating simulated communicative environments in which learners exchange information, respond to conversational partners, clarify meaning, and use language for purposeful communication. Because chatbots can provide virtually unlimited opportunities for

interaction, they can also address the limited speaking time typically available in conventional classrooms.

Second, Sociocultural Theory, particularly Vygotsky's concept of the Zone of Proximal Development (ZPD), provides a useful framework for understanding the scaffolding function of AI chatbots (Da Silva et al., 2024). Learning occurs through socially mediated interaction, while scaffolding enables learners to perform tasks that exceed what they can accomplish independently. In AI-mediated interaction, chatbots can function as digital mediators by providing prompts, reformulations, explanations, examples, and corrective feedback. Through context-sensitive responses, AI can provide graduated assistance that supports learners in producing increasingly complex language. As learners become more competent, they can gradually reduce their dependence on such assistance and perform communicative tasks more independently.

Third, the Affective Filter Hypothesis provides a psychological perspective on the potential of chatbots to support speaking development (Jiang et al., 2024). Anxiety, low motivation, and lack of confidence can create an affective barrier that prevents learners from fully engaging with language input and producing language. Speaking activities in particular may generate anxiety because students are required to respond spontaneously while being observed by teachers and peers. AI chatbots can potentially lower this affective filter by providing a patient and non-judgmental environment in which learners can experiment with language, make mistakes, repeat conversations, and practice without fear of immediate social evaluation. Such low-stakes interaction may encourage greater willingness to communicate and contribute to the development of speaking confidence.

The benefits of chatbot integration extend beyond increased opportunities for interaction. One major advantage is personalization. AI-based chatbots can analyze learner input and adapt the complexity of language, topics, prompts, and tasks according to individual proficiency and learning objectives (Bobro, 2024). This adaptability allows learners with different abilities to receive appropriately challenging practice while progressing at their own pace. Personalization can therefore promote learner autonomy and create learning experiences that more closely resemble individualized tutoring.

A second benefit is immediate feedback. AI chatbots can provide real-time responses and corrective information related to grammar, vocabulary, sentence construction, and, in some applications, pronunciation (Коренев, 2024). Immediate feedback enables learners to notice linguistic problems while they are still engaged in the communicative task. Rather than waiting for teacher correction, learners can reflect on errors, revise their responses, and immediately attempt alternative forms. This iterative process can support both linguistic accuracy and fluency.

A third benefit is accessibility. AI chatbots can be accessed through mobile devices, web browsers, and other digital platforms, enabling students to practice English beyond the physical and temporal boundaries of the classroom (Galijasevic et al., 2024). This flexibility is particularly valuable in contexts where classroom speaking time is limited. Students can integrate short periods of conversational practice into their daily routines, thereby increasing their exposure to English and supporting continuous learning.

A fourth benefit is motivation. Interactive and responsive chatbot environments can make language practice more engaging by allowing students to select topics, scenarios, and conversational roles that are relevant to their interests. Some AI-supported learning platforms also incorporate progress tracking, gamification, and interactive features that encourage sustained participation (Mao & Lucas, 2024). When learners perceive speaking practice as accessible, interactive, and personally relevant, they may become more willing to participate and persist in learning activities.

Despite these benefits, the integration of AI chatbots into ELT also presents important pedagogical, technical, and ethical challenges. The digital divide remains a significant concern because unequal access to smartphones, computers, stable internet connections, and digital services can create disparities in students' opportunities to benefit from AI-supported learning. Teacher readiness is another challenge, as effective integration requires teachers to understand not only how to operate AI tools but also how to design pedagogically meaningful tasks, evaluate AI-generated feedback, and monitor students' learning processes. Furthermore, data privacy requires careful consideration because AI platforms may collect and process users' personal information and interaction data. Finally, overreliance on AI may reduce opportunities for authentic human interaction if chatbot practice is treated as a replacement rather than a complement to teacher- and peer-mediated communication. These challenges demonstrate that successful AI integration requires appropriate pedagogical guidance, digital literacy, ethical awareness, and continued teacher involvement.

Although existing literature increasingly recognizes the potential of AI chatbots for language learning, further synthesis is needed to understand how chatbot-mediated speaking practice can be theoretically grounded and pedagogically optimized for senior high school EFL learners. In particular, the relationship between chatbot interaction, speaking development, communicative competence, affective factors, and learner autonomy requires systematic examination. A literature review that brings together empirical findings and theoretical perspectives can therefore provide a more comprehensive understanding of both the opportunities and limitations of chatbot-based speaking practice. Such an examination is important for ensuring that AI adoption is not driven solely by technological novelty but is instead aligned with established principles of language pedagogy and the developmental needs of adolescent learners.

Accordingly, this literature review aims to examine the role of AI-powered chatbots in supporting EFL speaking development among senior high school students. Specifically, it seeks to: (1) explore the theoretical foundations of AI-assisted speaking practice; (2) examine empirical evidence regarding the effectiveness of chatbots in improving EFL learners' speaking skills; (3) identify the pedagogical benefits and challenges associated with chatbot integration in ELT classrooms; and (4) provide recommendations for educators seeking to optimize chatbot-based learning for senior high school students. By integrating technological, theoretical, pedagogical, and ethical perspectives, this review seeks to contribute to a more critical and evidence-based understanding of how AI chatbots can be incorporated into speaking instruction to promote meaningful communication, learner autonomy, confidence, and sustainable language development.

2. Methods

This study employs a literature review design using thematic synthesis. Data were collected from peer-reviewed journals indexed in Scopus, ERIC, and Google Scholar, covering publications from 2019 to 2025. The search used the keywords "AI chatbot," "speaking skills," "EFL," and "English language teaching," with inclusion criteria focusing on studies that examined chatbot-assisted speaking instruction at the secondary level. The selected literature was analyzed thematically to identify patterns in pedagogical approaches, learner outcomes, and implementation challenges. The synthesis integrates theoretical and empirical findings to provide a holistic understanding of chatbot-based learning in English language teaching.

3. Results and Discussion

3.1. Enhancing Fluency and Accuracy

AI-powered chatbots offer learners continuous opportunities for repetitive, contextualized conversation practice, which is essential for the development of both fluency and grammatical accuracy (Goh et al., 2024). Through sustained interaction, learners are repeatedly exposed to target language structures, collocations, and functional expressions, enabling them to internalize linguistic patterns and apply them automatically in communication. The process of engaging in real-time dialogue helps shift declarative knowledge of grammar into procedural fluency, bridging the gap between knowing and using the language. Empirical research by Pham (2024) revealed that learners who participated in eight weeks of structured chatbot interaction demonstrated significant improvements in oral fluency and syntactic accuracy compared to control groups in traditional classroom settings. The immediacy of feedback provided by chatbots further accelerates this development, as learners can instantly identify and correct errors, reinforcing accurate language use through iterative practice.

3.2. Reducing Anxiety and Building Confidence

Chatbots also play a crucial role in addressing the affective dimensions of language learning. Many learners, particularly those who are introverted or anxious about speaking in front of peers, experience communication apprehension that inhibits oral participation. By offering a non-judgmental, patient, and low-pressure environment, chatbots allow learners to experiment with language freely, reducing fear of negative evaluation. This supportive atmosphere promotes a sense of psychological safety that encourages risk-taking and sustained practice. Studies such as Saraç and Doğan (2024) have reported notable reductions in speaking anxiety and increases in self-efficacy, as learners gain confidence through repeated, low-stakes interactions. Over time, this enhanced confidence transfers to classroom settings and real-world communication, contributing to more active and engaged learners.

3.3. Promoting Autonomous Learning

Another pedagogical advantage of chatbot integration is its ability to foster autonomous learning behaviors. Learners can engage in self-directed practice at their own pace and according to their individual goals, extending language exposure beyond the constraints of scheduled classroom hours (Rowberry, 2022). This flexibility encourages students to take greater responsibility for their progress, developing metacognitive skills such as self-monitoring, goal-setting, and reflection. As learners recognize their ability to improve through independent effort, they cultivate lifelong learning habits that sustain motivation and continuous growth. Chatbots thus function as accessible learning companions, enabling meaningful engagement outside formal instruction and supporting the shift toward learner-centered education.

3.4. Teachers' Role in AI Integration

The integration of AI into language classrooms also redefines the teacher's role from a knowledge transmitter to a facilitator and learning designer. Teachers become responsible for curating appropriate chatbot-based tasks, aligning them with curricular objectives, and guiding students in reflective learning practices that connect chatbot interactions with classroom instruction (Dau et al., 2024). This pedagogical shift requires educators to develop AI literacy—an understanding of how AI functions, its benefits, and its limitations—to ensure effective and ethical implementation. Professional development programs should focus on technological competence, instructional design, and assessment strategies that incorporate AI-mediated learning. When teachers are equipped with these skills, AI tools can be integrated seamlessly into communicative curricula, enriching the learning ecosystem and fostering a more interactive, adaptive, and personalized educational experience.

3.5. Implementation Challenges

The integration of AI chatbots in English language teaching also presents several challenges. Technical barriers, particularly poor internet connectivity, can limit the quality and continuity of chatbot interactions. Pedagogical alignment is another concern, as chatbot use may become superficial when activities are not guided by clear learning objectives. In addition, ethical issues, particularly regarding transparency in data usage, need to be carefully addressed. Overall, chatbots should be viewed as tools that complement rather than replace human instruction. When appropriately embedded in task-based or communicative lessons, they can enhance learners' exposure to English and provide additional opportunities for meaningful speaking practice.

4. Conclusions

AI-powered chatbots represent a transformative innovation in English Language Teaching, particularly for enhancing speaking skills in senior high school contexts. By providing interactive, adaptive, and accessible practice, they help learners gain fluency, accuracy, and confidence while reducing anxiety. However, successful implementation requires addressing digital equity, teacher preparedness, and ethical concerns. Training programs and institutional support are essential to equip educators with AI pedagogical competence. Future research should conduct longitudinal studies to assess sustained proficiency gains and explore hybrid models combining AI and human feedback. Integrating chatbot-based learning thoughtfully within communicative frameworks can bridge gaps in speaking practice and prepare learners for global communication in the AI era.

Acknowledgments

The authors would like to express their gratitude to Politeknik Negeri Bali for providing academic and institutional support for this study. The authors also sincerely thank all individuals and institutions whose contributions and support facilitated the completion of this research.

Conflict of Interest

The authors declare no conflicts of interest.

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