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AI CHATBOTS IN EFL: SYNTHESIZING COGNITIVE, PSYCHOLOGICAL, AND ETHICAL IMPLICATIONS

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ABSTRAK

Integrasi chatbot berbasis kecerdasan buatan (AI) dalam pembelajaran Bahasa Inggris sebagai Bahasa Asing (EFL) semakin mendapat perhatian karena potensinya dalam meningkatkan hasil belajar bahasa. Studi ini menyajikan tinjauan sistematis terhadap 43 artikel ilmiah terbitan tahun 2023 hingga 2025 untuk mensintesis bukti terkini mengenai implikasi kognitif, psikologis, dan etis dari penggunaan chatbot dalam konteks EFL. Temuan dikategorikan ke dalam tiga domain tematik: (1) hasil kognitif, meliputi peningkatan penguasaan kosakata, tata bahasa, dan kelancaran menulis; (2) dampak psikologis, seperti peningkatan kepercayaan diri dan penurunan kecemasan berbahasa; serta (3) isu etis, khususnya terkait privasi data, bias algoritmik, dan kesenjangan digital. Meskipun dampak penggunaan chatbot secara umum bersifat positif, beberapa studi memperingatkan potensi ketergantungan berlebihan terhadap alat AI dan menyoroti perlunya penerapan yang transparan dan berlandaskan etika. Kajian ini menyimpulkan bahwa chatbot AI dapat berperan sebagai alat bantu pembelajaran yang efektif dalam konteks EFL jika diintegrasikan secara bijak dan etis. Studi ini juga menawarkan rekomendasi praktis bagi para pendidik serta mengusulkan arah penelitian lanjutan untuk menjawab kesenjangan bukti, khususnya terkait dampak jangka panjang dan perlindungan etis.
Kata Kunci: AI Chatbots, EFL Learning, Cognitive Outcomes, Language Anxiety, Digital Ethics

ABSTRACT

The integration of AI-powered chatbots into English as a Foreign Language (EFL) education has garnered increasing attention for its potential to enhance language learning outcomes. This study presents a systematic review of 43 peer-reviewed articles published between 2023 and 2025, aiming to synthesize current evidence on the cognitive, psychological, and ethical implications of chatbot use in EFL contexts. The findings are thematically categorized into three domains: (1) cognitive outcomes, including improvements in vocabulary acquisition, grammar mastery, and writing fluency; (2) psychological impact, such as increased learner confidence and reduced language anxiety; and (3) ethical concerns, particularly related to data privacy, algorithmic bias, and digital equity. While the overall impact of chatbots is positive, several studies caution against over-reliance on AI tools and highlight the need for more transparent and ethically grounded implementations. This review concludes that AI chatbots can serve as effective supplemental tools in EFL learning when integrated thoughtfully and ethically. The study offers practical recommendations for educators and proposes future research directions to address current gaps in evidence, particularly regarding long-term impact and ethical safeguards.
Keywords: AI Chatbots, EFL Learning, Cognitive Outcomes, Language Anxiety, Digital Ethics

INTRODUCTION

The development of technology allows for the improvement of the quality of learning, especially by efl. One of the technologies that can be used in learning is chatbot ai. It can be used as an interactive platform that simulates a dialogue with a native speaker who can simultaneously provide direct feedback to the learner. Such tools are widely used to support

language acquisition, offering personalized, accessible, and real-time assistance to learners in various educational settings (Koç & Savaş, 2025; Xiao et al., 2025).

Technological developments have resulted in chatbots being increasingly applied in learning. This also allows researchers to expand research studies on the integration of AI chatbots in learning. (Xu et al., 2023; Huang et al., 2022). User language skills can be improved in vocabulary, writing, listening, and speaking because AI Chatbots provide a learning experience. Through AI Chatbots, users can practice natural conversations that can be personalized according to their needs. (Koç & Savaş, 2025).

Integration of language learning with AI chatbot provides a stress-free environment. Thus, learners can overcome psychological problems. Learners can focus more on overcoming foreign language anxiety, increasing the willingness to communicate and motivation (Jeon, 2023; Xiao et al., 2025). The achievement of learner skills is also influenced by emotional conditions. By using AI chatbot, learner can overcome emotional condition (Wang et al., 2024).

Despite these pedagogical advantages, the use of AI chatbots in education also raises a number of ethical concerns. Issues such as data privacy, algorithmic bias, digital dependency, and academic integrity have increasingly drawn scholarly attention (Zhu & Wang, 2025; Umer, 2024). However, current literature addressing these ethical dimensions remains scattered and often lacks integration with cognitive and affective evaluations of AI tools.

Although several reviews have explored AI in EFL education from either a cognitive, psychological, or ethical lens, integrated analyses remain rare. Labadze et al. (2023), for example, included ethical reflections in their evaluation of learning outcomes, but these were treated only briefly. On the other hand, Koç and Savaş (2025) offered rich insights into the cognitive and affective domains, yet omitted ethical perspectives entirely. This disconnect across domains underscores a pressing need for a comprehensive synthesis that bridges cognitive performance, learner psychology, and ethical concerns in AI-mediated language learning. The gap research is the basis for this research. So the research questions that can be asked are as follows.

1. How do AI chatbots develop cognitive aspect in language learning?
2. What psychological impacts do AI chatbots have on learners, particularly in anxiety reduction and engagement?
3. What ethical concerns arise from using AI chatbots in education?

By examining recent empirical studies from 2023–2025, this paper seeks to provide a holistic understanding of AI chatbot integration in EFL contexts, offering both theoretical insights and practical implications for educators, researchers, and policymakers.

RESEARCH METHOD

The analytical approach adopted in this chapter aims to explore the ethical, psychological, and cognitive implications of AI chatbots as intelligent learning tools for English as a Foreign Language (EFL) learners. To comprehensively address the research questions, this study employs a systematic and rigorous methodology that ensures both methodological robustness and transparency. A Systematic Literature Review (SLR) was conducted, guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. This approach was chosen to systematically identify, evaluate, and synthesize existing empirical research on the use of AI chatbots in EFL learning environments, particularly focusing on their cognitive, psychological, and ethical impacts.

In selecting relevant studies, clear inclusion and exclusion criteria were applied. Studies were included if they focused primarily on the use of AI chatbots in EFL classroom settings and presented empirical findings, preferably based on experimental or quasi-experimental

methodologies. Conversely, studies were excluded if they were purely conceptual, opinion-based, or literature reviews without original empirical data. Systematic reviews or meta-analyses lacking new experimental evidence were also excluded from the analysis.

To locate relevant literature, comprehensive searches were carried out across several electronic databases, including Scopus, Web of Science, Google Scholar, and ERIC. Keyword combinations such as "artificial intelligence," "AI chatbot," "English as a Foreign Language," "EFL," "language learning," and "intelligent tutoring systems" were used to identify studies pertinent to the research focus. The search process resulted in the identification of 49 potential studies. All 49 were screened based on their titles and abstracts to ensure relevance to the topic, and no studies were excluded at this stage. Full-text evaluations were then conducted based on the predetermined inclusion criteria. Six studies were excluded because they were systematic reviews or meta-analyses without original empirical data. As a result, 43 studies met all eligibility criteria and were included in the final synthesis.

The data from the selected studies were extracted using structured extraction tables designed to capture key information, such as article titles, authors, year of publication, research methodology, type and features of the AI chatbot used, findings related to cognitive and psychological outcomes, ethical considerations, strengths and weaknesses, practical implications, limitations, and directions for future research. Each study was carefully evaluated to determine its methodological quality and relevance to the research objectives. A comparative analysis and synthesis of the extracted data were then conducted to ensure a comprehensive interpretation of the findings.

To ensure the reliability and validity of the review, a consistent coding method was applied throughout the data extraction process. Each study was assessed independently to minimize potential bias and maintain objectivity. The inclusion and exclusion criteria were clearly defined before the selection process began, contributing to the overall validity of the review. The use of the PRISMA framework supported a systematic and transparent selection process, enhancing the internal validity of the study. Additionally, triangulation of findings across multiple studies strengthened the credibility and trustworthiness of the synthesized results.

RESULTS AND DISCUSSION

The results of this systematic review, which examined 43 studies, show that using AI chatbots to teach English as a foreign language (EFL) significantly affects three crucial areas: cognitive development, psychological responses, and ethical implications. Notwithstanding methodological differences throughout the studies, consistent patterns emerged, suggesting that chatbots can improve language skills, support students' mental well-being, and raise important ethical concerns regarding their use in classrooms.

This section's discussion is structured around the three main topic categories—cognitive outcomes, psychological impact, and ethical concerns—each of which has twelve subthemes. These are further subdivided into twelve subthemes. A detailed examination of every theme offers a thorough understanding of the ways in which AI chatbots impact different facets of EFL instruction. The distribution of these themes and subthemes, based on the reviewed literature, is illustrated in Figure 1 and serves as the foundation for the in-depth discussion that follows.

Results

The role of AI chatbots in teaching English as a foreign language (EFL) was examined in 43 articles that were published between 2023 and 2025 and included in this systematic review. The studies consistently looked at one or more of the following dimensions, despite

methodological variations that included mixed methods, quantitative, qualitative, and uncertain designs: 1. Cognitive development in EFL skills, 2. Psychological responses to AI chatbot use, 3. Ethical considerations of AI integration in learning

The studies were categorized into three primary themes and twelve subthemes for use in synthesis. The distribution of the literature's subthemes is displayed in the graph below:
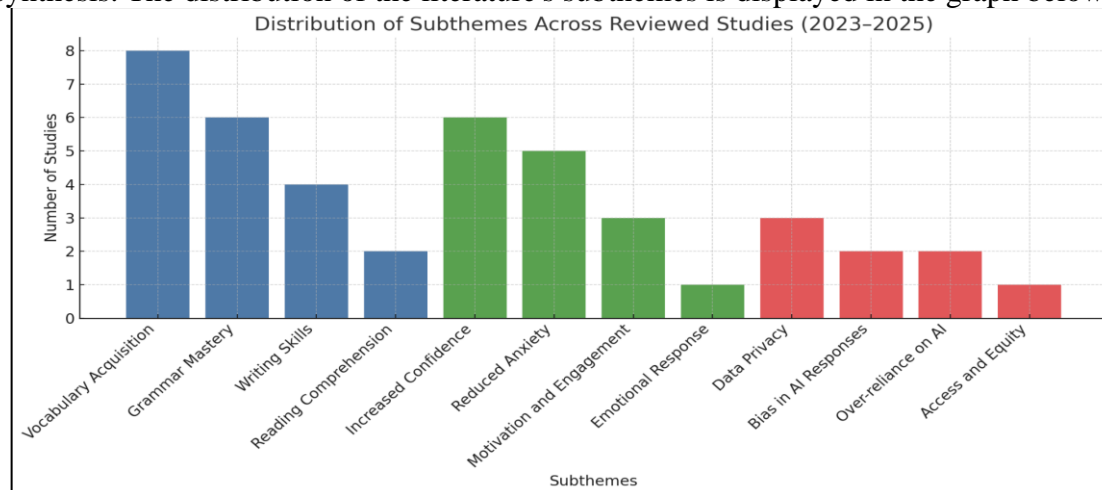

Figure 1. Distribution of themes and subthemes based on research (2023–2025)

Discussion

This chapter explores the cognitive, psychological, and ethical outcomes associated with the use of AI chatbots in English as a Foreign Language (EFL) learning contexts, based on a synthesis of empirical studies. Among the areas examined, cognitive outcomes received the most extensive attention, with 20 studies reporting notable improvements in various domains of language acquisition. These enhancements were particularly evident in vocabulary acquisition, where learners benefited from repeated exposure, contextual usage, and interactive quizzes. The availability of instant feedback and a low-pressure environment for practicing new words contributed to better retention (Chiu et al., 2021). Grammar mastery was also positively impacted, as chatbots provided real-time corrective feedback using templated responses and grammar-focused drills (Gayed et al., 2022). These tools enabled learners to identify and correct their own mistakes, although some studies noted limitations in the flexibility of the chatbot's grammar corrections, particularly in nuanced language contexts (Chen & Wang, 2020). Improvements in writing skills, though less frequently reported, were evident in areas such as sentence structure, coherence, and fluency. Learners appreciated the immediate suggestions and corrections that allowed for reflection and revision of their writing (Fryer et al., 2020). In terms of reading comprehension, a few studies incorporated chatbots into reading activities, such as posing comprehension questions and initiating dialogue based on texts. These interventions encouraged active engagement and promoted deeper reading strategies (Ruan et al., 2023). Overall, these findings highlight the adaptive and supportive learning environment that AI chatbots can offer, although the effectiveness of their feedback remains contingent on the sophistication of their language processing capabilities.

In addition to cognitive outcomes, the psychological effects of AI chatbot usage were central to 15 of the reviewed studies, revealing diverse emotional and motivational responses among learners. Several studies reported increased confidence, especially in speaking activities where learners could practice repeatedly without fear of social judgment (Yin & Satar, 2020). The non-threatening nature of AI interaction helped lower anxiety levels, particularly in oral communication tasks. Learners appreciated the ability to engage with chatbots at their own

pace, which helped reduce the stress commonly associated with language learning. Motivation and engagement also improved when chatbots included elements such as gamification, dynamic dialogue options, or visual cues (Zou, Wang, & Xing, 2022). These features made the learning process more enjoyable and stimulated sustained interaction. However, one study reported emotional disengagement resulting from repetitive and scripted chatbot responses, suggesting that continuous updates and personalization options are essential to maintain learner interest (Wang & Shao, 2021). Collectively, these psychological findings indicate that AI chatbots can provide emotional support and enhance learner motivation, though their long-term efficacy depends on maintaining rich and varied interactions.

Despite being less frequently addressed, ethical concerns associated with chatbot integration emerged as an important dimension in eight of the reviewed studies. Data privacy was a recurring theme, with several studies raising alarms about the lack of transparency in how user data is collected, stored, and used by AI systems (Kim, 2021). Concerns about compliance with educational data protection regulations were also highlighted. Additionally, biases in chatbot responses were noted, including instances of cultural insensitivity or inappropriate content, which stemmed from limitations in the training data or filtering mechanisms (Lee & Lim, 2022). This poses particular challenges in EFL contexts where accuracy and cultural appropriateness are crucial. Some studies warned of potential over-reliance on AI, cautioning that heavy dependence on chatbot interaction might hinder the development of interpersonal communication skills and pragmatic language use (Satar & Akcan, 2020). Furthermore, access and equity issues were raised, with observations that learners in rural or low-income areas may lack the infrastructure or digital literacy required to benefit from such technologies. These findings underscore the need for clear ethical guidelines and collaborative oversight in the development and deployment of AI-based tools in education.

The reviewed studies contribute meaningfully to existing literature on Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL). Unlike earlier technologies that primarily supported content delivery, AI chatbots introduce a shift toward interactive and adaptive language learning through conversational interfaces. This development aligns with socio-affective theories of language learning, which emphasize the importance of reducing anxiety and fostering confidence to accelerate skill acquisition. However, the ethical considerations raised mirror broader debates surrounding AI in education and echo calls for transparent, inclusive, and accountable AI systems, as emphasized by scholars such as Selwyn and Jandrić (2023).

The implications of these findings for EFL teaching and practice are substantial. AI chatbots hold considerable promise in enhancing both the cognitive and psychological aspects of language learning. For educators, these tools can serve as personalized learning assistants, particularly effective in supporting vocabulary acquisition, grammar practice, and spoken language development. For learners, chatbots offer a safe and accessible space to practice without fear of judgment or failure. Nevertheless, institutions must address ethical concerns through proactive regulation, clear data privacy policies, and measures to ensure equitable access. Ultimately, blended learning approaches that integrate chatbot use with human facilitation appear to be the most effective, combining the scalability and adaptability of AI with the human elements essential for meaningful language learning experiences.

CONCLUSION

This review looked at 43 studies from 2023 to 2025 about the use of AI chatbots in English as a Foreign Language (EFL) learning. It focused on how chatbots affect students' learning, emotions, and ethical issues. The results show that chatbots can help students improve

their language skills and feel more confident, but there are still some concerns that need to be addressed. Chatbots were found to help students learn vocabulary, grammar, writing, and practice speaking. They give quick feedback and create a comfortable space to learn. Students often felt less nervous and more motivated when using chatbots, especially in speaking tasks. However, some important problems were also found, like privacy issues, biased responses, too much dependence on AI, and limited access in some areas. Some studies had limitations. Many were short-term and didn't explore the long-term effects of using chatbots. Ethical issues were often not studied in detail. In the classroom, teachers can use chatbots to give students extra practice and support. Chatbots can help students who need more time or who are shy to speak. But teachers should be trained to use them properly, and chatbots should not replace real human interaction. Future research should look at how chatbots affect students over time, including their social and emotional development. More studies are also needed to better understand the ethical issues and to make sure all students, including those in low-resource areas, can benefit from this technology.

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