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INTEGRATING ARTIFICIAL INTELLIGENCE IN ENGLISH LANGUAGE LEARNING: A SYSTEMATIC LITERATURE REVIEW

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Abstract:
The rapid development of Artificial Intelligence (AI) has had a significant impact on education, particularly in English language learning. AI offers more adaptive, personalized, and interactive learning approaches that can be tailored to individual learner needs. This study aims to systematically review empirical literature on AI integration in English language learning published between 2021 and 2025. Using the Systematic Literature Review (SLR) method and following PRISMA guidelines, a total of 23 articles from Crossref and Google Scholar were analyzed based on educational level, type of technology used, and learning outcomes. The findings reveal that AI is most widely applied at the secondary and university levels, with chatbot technology being the most dominant. The main impact of AI integration includes improved language skills (speaking, writing, reading, listening), enhanced learning motivation, automated feedback, and flexible learning. The study concludes that AI contributes positively to the effectiveness of English language learning, although challenges such as infrastructure readiness and teachers' digital competence still need to be addressed for optimal implementation.

Keywords:
Artificial Intelligence; English Language Learning; Chatbot; Personalized Learning; Systematic Literature Review

INTRODUCTION

Artificial Intelligence (AI) has become one of the technological fields that has experienced rapid progress since its emergence in the mid-20th century (Sianipar et al., 2024). In its early stages, AI development focused on creating systems capable of mimicking human cognitive processes through the application of symbolic logic and explicitly defined algorithms. Although the technology at the time had significant limitations, the conceptual foundations established became the main foundation for subsequent AI developments (Erison et al., 2024). With increasing computing capacity and the availability of big data, the AI paradigm shifted to automated learning models such as machine learning and deep learning, which enable systems to learn autonomously from data and generalize to new situations (Wibowo, 2025). These developments have broadened AI applications, including in English language education, where AI plays a

role in creating more personalized, adaptive, and data-driven learning experiences (Sulaeman et al., 2024).

In the realm of English as a Foreign Language (EFL) learning, AI integration shows significant potential in improving the effectiveness and quality of the teaching and learning process (Arham & Basri, 2025). Various AI-based technologies such as Natural Language Processing (NLP), intelligent tutoring systems, interactive chatbots, and speech recognition technology have been implemented to support the development of language skills, including speaking, writing, reading, and listening (Sari et al., 2025). The use of these technologies allows for real-time feedback, the creation of personalized learning paths, and the presentation of more adaptive and immersive learning experiences (Kusumawati et al., 2025). Thus, AI not only enriches learning methods but also increases learner engagement and motivation in a dynamic and contextual language learning.

The implementation of AI in English learning enables the creation of personalized learning materials tailored to the needs and abilities of each student (Talenta et al., 2024). AI technology can analyze learner profiles, identify weaknesses in language skills acquisition, and dynamically adjust the difficulty level of the material (Razilu, 2025). Moreover, the system can provide rapid, specific, and personalized feedback to enhance individual performance (Khojin & Syaifullloh, 2025). Educators also benefit from access to comprehensive, real-time learning data, allowing for more accurate monitoring and pedagogical interventions. This approach not only increases students' engagement in the learning process, but also enhances their motivation and understanding of English materials (Sundari & Prasetiya, 2024).

The implementation of AI-based technologies, such as chatbots for conversation practice and learning platforms that integrate NLP, has significantly revolutionized the approach to English learning (Abimanto & Mahendro, 2023). These innovations replace conventional methods with more immersive, adaptive, and contextual approaches. AI technology enables the creation of learning environments that mimic real-life situations, thus supporting the internalization of grammatical structures, vocabulary acquisition, and pronunciation more naturally and effectively (Mufidah, 2017).

Although the integration of AI in English language learning offers numerous potential improvements in educational quality, its implementation still faces significant obstacles (Rissi & Sinaga, 2025). One of the key challenges is the limited availability of technological infrastructure, educators' lack of digital competency, and the need to revise curriculum to align with technology-based approaches (Nurhakim et al., 2025). Moreover, ethical issues such as student data protection and system security are crucial concerns in the widespread implementation of AI (Widyasari et al., 2024). In addition, assessing the effectiveness of AI in English language learning is often hampered by methodological design limitations and a lack of adequate data (Arum, 2025).

Various studies have shown that the application of AI in English learning positively contributes to learning motivation, the effectiveness of the learning process, and the achievement of student learning outcomes (Awaliah, 2025). Research by Parn et al. (2025) revealed that the use of an AI-based adaptive platform can increase the inclusiveness and efficiency of learning. Moreover, research by Razilu's (2025) found

that AI-supported learning facilitates independent learning and reduces student boredom levels. In addition, a study conducted by Abimanto and Mahendro's (2023) confirmed that the integration of AI technology significantly increases student learning motivation in the context of English learning. However, these findings show significant variation, influenced by factors such as the implementation context, student characteristics, and the readiness and support of educational institutions.

With the rapid advancement of AI technology and its increasing application in education, a systematic review of the available literature is crucial to obtain a comprehensive overview of this topic. Therefore, this SLR examines scientific publications related to the integration of AI in English language learning between 2021-2025, analyzing AI developments, the forms of AI technology, and the impact of its implementation on the effectiveness of English language learning.

METHOD

This study employs the Systematic Literature Review (SLR) method, a systematic and structured research approach to comprehensively identify, evaluate, and integrate findings from previous studies to answer specific research questions (Bancong, 2025). In this study, SLR is used to deeply examine the process of AI integration in the context of learning English as a Foreign Language (EFL). This method was chosen because it can produce a robust summary of theory and empirical evidence through the integration of various relevant previously published studies.

During the review process, we followed Moher et al. (2009) Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and a customized checklist focuse on AI integration in English language learning. This study focused on both learners and educators involve in English language learning activities; direct applications of AI technologies such as chatbots or intelligent tutoring systems; enhancement of learners' language competency or motivation; and formal learning environments, such as schools or higher education institutions (Santosa et al., 2025). The following are the exclusive criteria for this study.

Table 1 Exclusion Criteria

Criterion	Description	Example
Not on the topic	This article covers other topics	(Zhang, 2022)
Not empirical	This article does not report an empirical study	(Chung & Choi, 2024)
Other language	This article is published in languages other than English and Indonesian	(Abdallah, 2024)
Not on AI	AI is mentioned in the abstract or used as a keyword, but more detailed text analysis shows that the empirical studies are not about AI	(Parker et al., 2023)
AI as a container term	AI is used as a collective term for other phenomena	(Ahuja et al., 2024)

Table 1 discusses articles that were excluded from the analysis if they did not meet several criteria, such as Zhang's (2022) research being irrelevant because it discussed mathematical problems in engineering, Chung and Choi's (2024) research being non-empirical because it was conceptual in nature, Abdallah's (2024) research being published in Arabic, Parker et al. (2023) research only mentioning AI in the abstract in the context of chatbot development without presenting an empirical study that made AI the main

focus of the analysis, and Ahuja et al. (2024) research because AI was mentioned without in-depth exploration.

Table 2 Result of Database

Keyword	Publication Year	Database	The Number of Articles
Artificial intelligence, *english language learning*, *EFL*, *chatbot*.	2021-2025	Crossref	7
		Google Scholar	16
Amount			23

Table 2 shows data collected through a literature search of two academic databases: Crossref and Google Scholar. Both platforms are widely recognized as sources of scientific references and are widely used in education and technology research. The search process was conducted using a combination of keywords such as Artificial Intelligence, English Language Learning, EFL, and chatbot. The search was limited to English-language articles published between 2021 and 2025 that had undergone peer review to ensure the validity and relevance of the study (Bancong, 2025).

The literature selection process in this study followed a systematic approach, applying the PRISMA diagram in Figure 1 to ensure transparency, replicability, and validity throughout the identification, screening, feasibility assessment, and final selection stages (Moher et al., 2009). In the initial search phase, 1,100 articles related to the integration of artificial intelligence in English language learning were identified. After a deduplication process eliminated one duplicate article, 991 articles remained for the screening phase. Furthermore, 893 articles were excluded for not meeting the selection criteria based on publication quality and topic suitability. Of the remaining 98 articles, further assessments were conducted for content suitability and relevance. Based on this process, 39 articles met the inclusion criteria, and the 23 articles deemed most relevant were included in the final analysis.

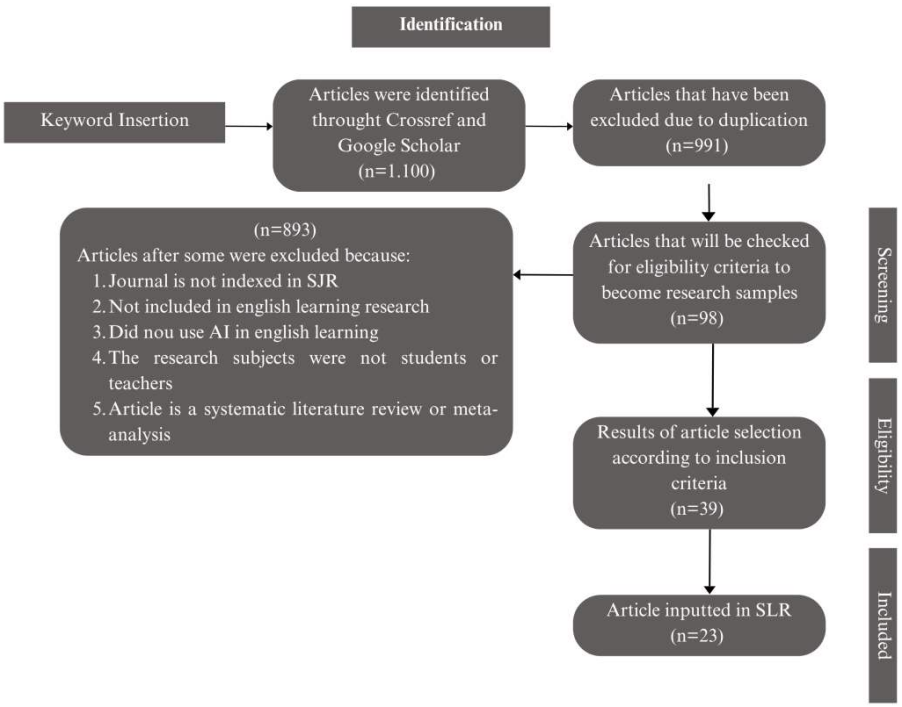

Figure 1 PRISMA Diagram

The analysis of selected publications in this study was conducted using a qualitative descriptive approach with the aim of exploring trends in AI integration in English language learning. This study analyzed AI integration published between 2021-2025 and formulated the following research questions:

1. What are the developments in the use of AI for English language education?
2. What forms of AI technology are being used, and what impact does their implementation have on the effectiveness of English language learning?

RESULTS AND DISCUSSION

Results

A summary of the data extraction results from the articles in this SLR includes: author name, article title, year of publication, and journal name. A summary of the data extraction results can be seen in Table 3 below.

Table 3 Summary of the Coding Data Results

Author	Title	Journal
Wahyuni, Dewi Sari (2022)	Integrated Classroom-Chatbot Experience: an Alternative Solution for English As Foreign Language Learners	English Language Education and Current Trends (ELECT)
Fauzi, Iwan; Hartono, Rudi; Widhiyanto, Widhiyanto; Pratama, Hendi (2022)	Mengatasi Anxiety dalam Berbicara Bahasa Inggris Melalui Pembelajaran Berbasis Web	Prosiding Seminar Nasional Pascasarjana Universitas Negeri Semarang
Karim, Sayit Abdul; Hamzah, Annisa Qotrunnnada Sofyana; Anjani, Nasywa Maudyna; Prianti, Juani; Sihole, Irene Gabriella (2023)	Promoting EFL Students' Speaking Performance through ELSA Speak: An Artificial Intelligence in English Language Learning	Journal of Languages and Language Teaching
Mardiah, Henny and Nissa, Khairun (2024)	Generation Z Students' Perspectives on Artificial Intelligence (AI) Technology in English Language Learning	Journal of Literature, Linguistics, and Language Teaching
Fitria, Tira Nur (2024)	Using ChatBot-Based Artificial Intelligence (AI) for Writing an English Essay: The Ability of ChatGPT, Perplexity AI, and ChatSonic	Journal of Language Intelligence and Culture
Fikri, Muslim (2024)	Critical Thinking in 21st Century Learning: The Impact of Artificial Intelligence (AI) on Teaching English as a Foreign Language (TEFL)-A Philosophical Perspective	Journal of English Language Learning (JELL)
Pratiwi, Dian; Yuniarti, Fatma; Nuryanti, Nuryanti (2024)	Implementation of Artificial Intelligence (AI) Technology in English Language Learning Through Puzzle Maker Media	Journal of English Educational Study (JEES)
Jegede, Olusegun Oladele (2024)	Leveraging Chatbot Applications to Enhance English Language Learning in Nigerian Secondary Schools	English Learning Innovation (englie)
Mandasari, Melati; Fussalam, Yahfenel Evi; Kurniawan, Ridho (2024)	Students' Perceptions of The Use of Artifical Intelligence (AI) in English Language Learning at STIA LPPN Padang	Journal of Language Education Development

Author	Title	Journal
Eisenring, Moh. Abraham Akbar (2024)	Artificial Intelligence (AI) Based English Language Learning: From Theory to Practice	Mekongga: Journal of Community Service
Mohammadkarimi, Ebrahim (2024)	Exploring The Use of Artificial Intelligence in Promoting English Language Pronunciation Skills	LLT Journal: A Journal on Language and Language Learning
Akbarani, Rizqi (2023)	The Use of Artificial Intelligence in English Language Teaching	International Journal of English Learning and Applied Linguistics (IJELAL)
Anggraini, A and Faisal, F (2024)	The Use of Artificial Intelligence Based Technology in English Language Teaching	Golden Ratio of Data in Summary
Rosmayanti, Vivit (2024)	Students Attitudes Toward the Use of Artificial Intelligence Tools in English Language Learning	Linguistics and English Language Teaching Journal
Rohmiyati, Yuli (2025)	Enhancing English Language Learning Through Artificial Intelligence: Opportunities, Challenges and the Future	DIAJAR: Journal of Education and Learning
Setyoningrum, Tri Yuli; Susanto, Dias Andris; Setiaji, Arso (2024)	Impacting Artificial Intelligent Chatbot in Flipped Classroom to Enhance Students' Speaking Competence	Applied Research in English Education
Shin, Dongkwang; Kim, Heyoung; Lee, Jang Ho; Yang, Hyejin (2021)	Exploring the Use of An Artificial Intelligence Chatbot as Second Language Conversation Partners	Korean Journal of English Language and Linguistics
Fitria (2021)	The Use Technology Based on Artificial Intelligence in English Teaching and Learning	ELT Echo: The Journal of English Language Teaching in Foreign Language
Kim, Hea Suk; Cha, Yoonjung; Kim, Na Young (2021)	Effects of AI Chatbots on EFL Students' Communication Skills	Korean Journal of English Language and Linguistics
Chien, Yu Cheng; Wu, Ting Ting; Lai, Chia Hung; Huang, Yueh Min (2022)	Investigation of the Influence of Artificial Intelligence Markup Language-Based LINE ChatBot in Contextual English Learning	Frontiers in Psychology
Wei, Ling (2023)	Artificial Intelligence in Language Instruction: Impact on English Learning Achievement, L2 Motivation, and Self-Regulated Learning	Frontiers in Psychology
ZhiChao, Yin (2023)	Applying Artificial Intelligence (AI) in a Tutoring System for Supporting Students' English Language Learning in Hong Kong Middle School	The Education University of Hong Kong Library
Moybeka, Adolfina M. S.; Syariatin, Nur; Tatipang, Devilito P; Mushthoza, Dina Amaliyah; Dewi, Ni Putu Juliani Lestari; Tineh, Sulfany (2023)	Artificial Intelligence and English Classroom: The Implications of AI Toward EFL Students' Motivation	Edumaspul: Jurnal Pendidikan

This SLR contains 23 research articles analyzing the use of Artificial Intelligence in English language learning. Table 3 above can be visualized in the following figure, based on the distribution of article publications from 2021-2025.

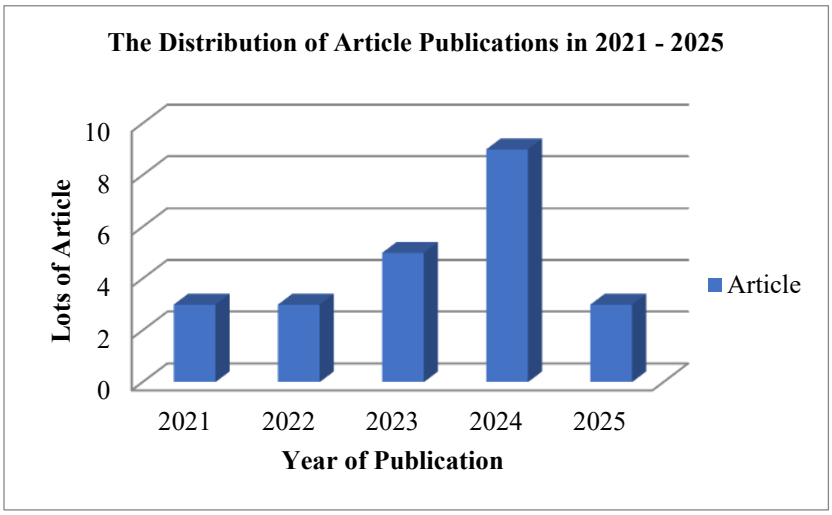

Figure 2 Databased on Publication Year of Article

Based on Figure 2, the distribution of published articles between 2021 and 2025 shows significant fluctuations. Three articles were published in 2021 and 2022, then increased to five in 2023, and peaked in 2024 with a total of nine articles discussing this research topic. However, this number decreased again to three articles in 2025. This indicates that interest in AI research in English language learning experienced a rapid increase in 2024 and still has the potential to grow in the coming years.

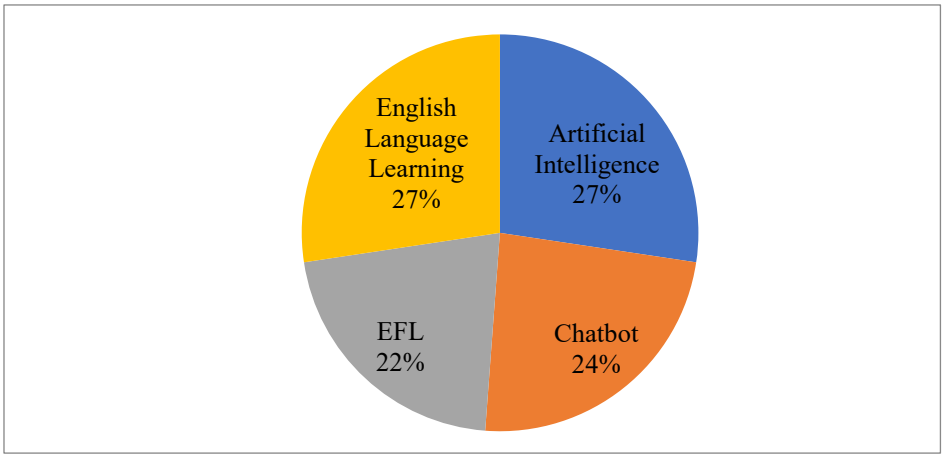

Figure 3 Article Keywords

Based on the data analysis in Figure 3, the most frequently discussed topics in research articles were Artificial Intelligence (27%) and English Language Learning (27%). These two topics reflect the primary focus of research on the integration of AI into the English language learning process. Furthermore, chatbots, as a form of AI implementation, accounted for 24% of the articles reviewed, demonstrating their crucial role in building more dynamic learning interactions. Meanwhile, the topic of EFL (English as a Foreign Language) comprised 22% of the reviewed articles, indicating the relevance of AI use in the context of teaching English as a foreign language.

Table 4 below discusses the level of education to determine the scope of development in the use of AI.

Table 4 Education Level Category

Education Level	The Number of Articles
College Students /University	8
Elementary School Students /Fifth Grade	1
Junior High School Students /Senior High School Students /XII Grade	10
General/Non-Formal	4
Amount	23

Table 5 below discusses the types and forms of technology used.

Table 5 Technology Category

Technology		The Number of Articles
Chatbot	Chatbot, ChatGPT, Mitsuku, Tutor Mike, LINE Chatbot, AI-based chatbot	12
Language learning application	Duolingo, ELSA, Orai, Hello English	4
Writing and paraphrasing tools	Grammarly, Quillbot, Paraphrasing Tool, Plagiarism Checker	2
Automatic translator and pronunciation	Google Translate, Text-to-Speech, Speech Recognition, ASR	1
Virtual assistants and conversational AI	Replika, Andy, Google Assistant, Perplexity, Ask AI, ChatSonic	1
AI tutoring or feedback platform	AI-based tutoring system, AI-assisted learning platform	2
Other educational applications	Puzzle Maker	1
Amount		23

Meanwhile, Table 6 discusses the impact or influence on English learning.

Table 6 Impact on the Effectiveness of English Learning

Impact or Influence	The Number of Articles
Improve language skills (speaking, writing, reading, listening)	11
Increase learning motivation and self-confidence	5
Provides automated feedback and personalized learning	2
Facilitate access to information and efficiency of the learning process	2
Improve pronunciation, enunciation, intonation	1
Facilitating independent and flexible learning	1
Reducing teacher burden, increasing engagement and adaptability	1
Amount	23

Discussion

Developments in the Use of AI for English Language Education

The use of Artificial Intelligence in English language learning has experienced significant development in recent years, particularly with the increasing demand for technology-based and personalized learning. A review of 23 scientific articles reveals that the use of AI is not limited to higher education but is also beginning to expand into primary and secondary education. Ten articles examined junior high or high school students, eight articles focused on university or college students, and the remainder were spread across elementary school (1 article) and general or non-formal education (4 articles). This is consistent with research by Razilu's (2025), which shows that AI technology is beginning

to be integrated into various English language learning contexts, indicating a shift in approach from conventional methods to more adaptive and digital learning systems.

This development is supported by the readiness of technological infrastructure and increased digital literacy among students. College students have proven to be a group quite ready to embrace new technologies in learning, including AI. Research by Awaliah (2025) and Imawan and Sya (2025) indicates that college students are better able to access, evaluate, and utilize AI technology to support language learning activities, such as writing essays or improving vocabulary. Meanwhile, at the junior high and senior high school levels, the presence of AI helps teachers manage more interactive classes and allows students to practice language skills through digital media such as chatbots and learning apps (ZhiChao, 2023). This aligns with findings by Razilu (2025), who emphasized that the effectiveness of AI in learning depends on the suitability of the technology to the characteristics of students at each level.

The use of AI has also expanded into non-formal education and self-directed learning. Articles discussing general users, such as Mohammadkarimi's (2024) research, show that AI provides a flexible alternative for learning English without the constraints of space and time. This presents a significant opportunity for the general public or students who are not covered by the formal education system. Technologies like Google Assistant, an AI-based conversational application, enable personalized and practical learning processes, particularly in improving speaking fluency and contextual understanding (Perdana, 2024). In other words, the development of AI utilization has expanded access to English learning across levels and contexts.

Forms of AI Technology and Their Impact on the Effectiveness of English Learning

The integration of Artificial Intelligence in English language learning has shown a growing variety of technological forms that have a direct impact on the effectiveness of the teaching and learning process. One of the most dominant forms found in this study is chatbots, with 12 of the 23 articles discussing their use. Chatbots such as ChatGPT, Mitsuku, Tutor Mike, and LINE are able to simulate human conversation, creating realistic and adaptive interactions for students. Siregar et al. (2025) stated that the use of chatbots as conversation partners significantly improves students' speaking skills in EFL contexts. Text and voice-based interactions allow students to practice in a safe and responsive environment, which indirectly increases their confidence in using English.

With the growing demand for mobile-based and personalized learning, language learning apps like Duolingo, ELSA Speak, Orai, and Hello English have become popular. These apps combine AI technology with adaptive features and gamification to maintain learner engagement. Aly (2025) demonstrated that ELSA significantly improved pronunciation and intonation, while Duolingo proved effective in strengthening vocabulary and language structure through a challenge-based approach. The impact is not only visible in linguistic aspects, but also in increased student learning motivation due to its fun and interactive approach (Rahman et al., 2024).

Other technologies that contribute to effective learning include writing aids like Grammarly and Quillbot, AI-based tutoring platforms, and automatic translation and pronunciation technologies. Imawan and Sya (2025) found that Grammarly provides

instant and specific feedback that helps students understand grammatical errors and correct them independently. Meanwhile, technologies like ASR (Automatic Speech Recognition) and Google Translate can help improve pronunciation and structural understanding in the context of self-directed learning (Wijayanto & Santiana, 2024). Therefore, these technologies continue to demonstrate a positive impact on students' literacy skills and learning efficiency.

Based on its impact, AI technology used in English learning has been shown to significantly improve students' language skills. Eleven articles in this study reported improvements in speaking, writing, reading, and listening. Mohammadkarimi (2024) stated that AI-based training in pronunciation consistently improved students' phonetic accuracy. Furthermore, adaptive feedback-based AI platforms, such as those developed by Razilu (2025), enable personalized learning materials, making the learning process more relevant and tailored to individual needs.

AI's impact extends beyond cognitive aspects to affective dimensions of learning. Five articles indicate that the use of AI technology increases student motivation and confidence. Research by Wijayanto and Santiana (2024) suggests that engaging with chatbots and virtual assistants helps students feel more comfortable communicating in English. Nurhakim et al. (2025) add that AI-based approaches enhance students' emotional engagement and create more meaningful learning experiences, particularly when the technology is able to respond contextually to their needs.

AI plays a role in optimizing learning efficiency and flexibility. AI systems also provide automated feedback, facilitate self-directed learning, and even reduce teacher workload (Rochmawati et al., 2023). With an adaptive learning system, students can access materials at any time, according to their individual learning pace. This research reinforces the understanding that the form and characteristics of AI technology significantly influence the effectiveness of English learning, including skills, motivation, and learning flexibility.

CONCLUSION

A systematic review of 23 articles shows that the use of Artificial Intelligence in English language learning has experienced significant development, particularly at the secondary and tertiary levels. The most dominant technologies used are chatbots, followed by language learning apps and writing aids. AI integration has been shown to improve language skills, learning motivation, and enable adaptive and personalized learning. However, its implementation still faces obstacles such as limited infrastructure, low teacher digital competency, and issues of data ethics and privacy. Furthermore, most research is still descriptive and has not explored long-term effectiveness. Therefore, further research could focus on developing AI-based collaborative learning and strengthening learning independence.

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