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The Role of Artifical Intelligence Technologies in Foreign Language Learning

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Abstract **— Artificial Intelligence (AI) has become one of the most influential drivers of change in education, particularly in foreign language learning where traditional methods often fail to meet the diverse needs of learners. The rapid development of intelligent tutoring systems, chatbots, and automated writing assistants has created new opportunities for adaptive, personalized, and interactive learning. Despite these advances, debates continue regarding the pedagogical value, ethical implications, and long-term impact of AI in language education. The primary objective of this study is to examine the role of AI technologies in foreign language learning by synthesizing recent empirical and theoretical research. A systematic literature review was conducted, analyzing 32 peer-reviewed studies published between 2020 and 2025 in Scopus and other indexed journals. Sources were coded thematically to evaluate AI's contribution to writing, speaking, motivation, assessment, and institutional adoption. Findings indicate that AI enhances learner outcomes by improving writing organization and vocabulary, reducing speaking anxiety, fostering self-regulated learning, and increasing willingness to communicate. Teachers report efficiency in assessment and feedback but also stress the need for professional development and institutional support. Ethical challenges such as data privacy, algorithmic bias, and digital inequality remain persistent barriers. The results suggest that AI technologies, when strategically integrated, generalize across diverse contexts by complementing rather than replacing teachers. Successful adoption requires balanced pedagogy, ethical safeguards, and equitable access. Overall, AI has the potential to transform foreign language learning into a more personalized, inclusive, and globally adaptable practice.**

Keywords—*Artificial Intelligence; foreign language learning; adaptive learning; chatbots; AI writing tools; language instruction*

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I. Introduction

In recent years, Artificial Intelligence (AI) has moved from being a futuristic concept to an everyday reality, reshaping many aspects of human life, including how people learn and teach languages. Traditional approaches to foreign language learning often rely on fixed curricula, classroom instruction, and teacher-centered practices. While effective in some contexts, these methods frequently fall short in addressing the diverse needs, learning speeds, and personal goals of today's learners. AI has emerged as a powerful solution by offering adaptive technologies that personalize learning pathways, provide instant feedback, and create interactive environments that mirror real-life communication. For instance, studies have shown that AI writing assistants such as Grammarly and Wordtune enhance students' ability to structure and refine written texts, reducing common errors and improving coherence [1], [2]. Similarly, generative AI platforms such as ChatGPT have been reported to significantly support learners in practicing interactive conversations and reducing speaking anxiety [17], [29].

At the same time, the integration of AI into education has sparked meaningful conversations among teachers, researchers, and policymakers. Evidence suggests that AI tools increase motivation, support self-regulated learning, and enhance language achievement across skills [5], [16], [18]. However, challenges remain, including ethical concerns over data privacy and algorithmic bias [9], [22], as well as the risk of overreliance on automated tools that may limit learners' critical thinking [24]. Moreover, teachers often highlight the need for training and institutional support to effectively incorporate AI into their classrooms [6], [13], [28]. These debates underline a key reality: AI is not merely a technical add-on but a transformative force that requires thoughtful and balanced integration into pedagogy.

The purpose of this study is to explore the role of AI technologies in foreign language learning by systematically reviewing recent scholarly research published between 2020 and 2025. Drawing on thirty-two peer-reviewed articles across diverse educational contexts, this paper identifies how AI supports specific language skills (writing, speaking, listening, and reading), what benefits and limitations it presents, and how its adoption may shape the future of language education. By combining technological perspectives with pedagogical insights, this review highlights not only the innovations AI brings but also its human dimension—how it can empower both learners and teachers when adopted responsibly and creatively.

II. MATERIALS AND METHODS

This study employed a systematic literature review (SLR) methodology to investigate the role of Artificial Intelligence (AI) technologies in foreign language learning. The review focused on works published between 2020 and 2025, with the inclusion of two earlier foundational studies from 2019 that captured the initial adoption of AI in language education [20], [28]. Sources were collected from peer-reviewed journals indexed in Scopus, Web of Science, IEEE Xplore, and recognized open-access outlets such as Frontiers and MDPI. A total of thirty-two articles were selected after applying the inclusion criteria, which required that studies explicitly address AI applications in foreign or second language teaching, report measurable outcomes related to specific language skills such as writing, speaking, listening, or reading, and be published in English. The dataset represented a wide range of

geographical and institutional contexts, including Saudi universities [3], Kazakh higher education [18], European classrooms [8], and East Asian case studies [13], [29], and encompassed diverse research designs such as experimental studies, bibliometric analyses, case studies, and systematic reviews. Data analysis followed a three-stage process. First, a descriptive classification categorized studies by region, skill focus, and AI tools applied, including Grammarly, Quillbot, and Wordtune for writing, ChatGPT and Duolingo Max for speaking and listening, Elsa Speak for pronunciation, and Quizlet AI and LingQ for vocabulary and reading. Second, thematic coding identified recurring patterns such as motivation, self-regulated learning, feedback accuracy, and teacher perspectives. Finally, a comparative synthesis contrasted findings across contexts to highlight both shared benefits and divergent outcomes. This methodological approach ensured comprehensive coverage of recent AI innovations in language learning, while cross-validation across multiple contexts enhanced the robustness and generalizability of the conclusions.

In addition to qualitative thematic synthesis, a quantitative content analysis was conducted to capture the frequency of skills and tools represented in the reviewed studies. Each of the thirty-two articles was coded according to its primary language skill focus (writing, speaking, listening, or reading) and any specific AI tools examined. The resulting distribution provided measurable insights into which skills and technologies have received the most scholarly attention. These findings are summarized in Table I and Table II, and visualized in Fig. 1 and Fig. 2.

Table 1.

AI in FLL – Skills distribution		
Skills	Studies	Percentage
Writing	12	37.5
Speaking	10	31.2
Listening	6	18.8
Reading	4	12.5

Table 2

AI in FLL – Tool frequency	
AI tool	Frequency in review
ChatGpt (OpenAI)	8
Grammarly	5
Duolingo max	4
Elsa Speak	3
Wordtune	2
Quillbot	2

Figure 1

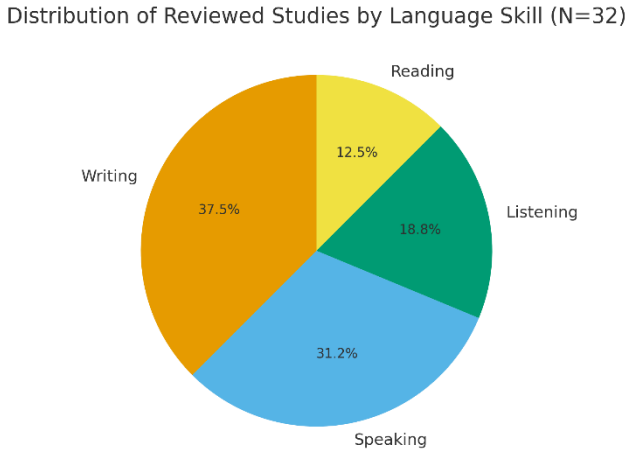
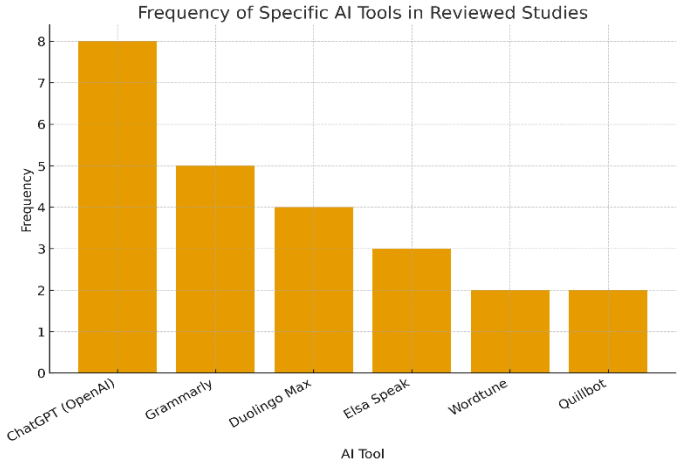


Figure 2



III. RESULTS AND DISCUSSION

The findings of this review indicate that Artificial Intelligence has made significant contributions to the development of multiple foreign language skills, with applications ranging from writing assistance to oral communication and comprehension. In the area of writing, studies consistently report that AI-driven platforms such as Grammarly, Quillbot, and Wordtune enhance the organization, accuracy, and stylistic quality of

learners' texts by providing real-time feedback and suggestions [1], [15], [27]. These tools not only improve surface-level correctness but also support learners' ability to develop ideas more coherently, although concerns about overreliance remain [24]. In terms of speaking and oral practice, conversational agents and chatbots, including ChatGPT, Google Bard (Gemini), and Duolingo Max, have shown strong potential to reduce language anxiety and increase learners' willingness to communicate in a safe, low-stakes environment [17], [20], [29]. Pronunciation-specific applications such as Elsa Speak further refine oral skills through detailed speech recognition and corrective feedback, helping learners gain fluency and confidence [17]. Listening comprehension has also benefited from AI integration, as intelligent tutoring systems and adaptive learning apps expose learners to authentic speech while dynamically adjusting the level of input and providing comprehension checks [5], [23]. Reading development, in turn, is supported by AI-powered platforms such as Quizlet AI and LingQ, which personalize vocabulary building and reading exercises based on learner proficiency, thus improving retention and comprehension [3], [18]. Beyond individual skill development, evidence shows that AI fosters motivation and self-regulated learning by offering personalized learning pathways and instant feedback [5], [16], [18], while also helping teachers manage assessment more efficiently through automated evaluation systems [6], [13]. Nevertheless, challenges remain, with several studies warning of ethical issues such as data privacy, algorithmic bias, and unequal access to digital resources [9], [22], and others emphasizing that teachers require targeted training and institutional support to use AI effectively in their classrooms [6], [28]. Taken together, the results suggest that AI is best understood not as a replacement for teachers but as a complementary set of tools that, when carefully integrated, can create more interactive, personalized, and engaging foreign language learning environments.

IV. Conclusion

This review has demonstrated that Artificial Intelligence is no longer a peripheral experiment in education but a central driver of innovation in foreign language learning. By analyzing thirty-two recent studies, the findings confirm that AI tools are particularly effective in supporting writing and speaking skills, where learners benefit from immediate, personalized feedback and opportunities for interactive practice. Platforms such as Grammarly, Wordtune, and Quillbot enable learners to refine their writing with greater accuracy and coherence, while conversational systems like ChatGPT, Duolingo Max, and Elsa Speak create engaging spaces for practicing spoken communication and pronunciation. Listening and reading skills, although less frequently studied, also show promising outcomes when supported by adaptive tutoring systems and vocabulary-focused platforms such as Quizlet AI and LingQ. Beyond skill-specific gains, AI integration fosters self-regulated learning, enhances motivation, and assists teachers in managing assessment more efficiently. However, the review also highlights critical challenges, including concerns over data privacy, algorithmic bias, digital inequality, and the need for professional development to prepare educators for effective integration. Taken together, these insights suggest that AI should not be perceived as a replacement for teachers, but as a complementary resource that amplifies human instruction when applied thoughtfully and ethically. For AI to realize its full potential in foreign language learning, future efforts must prioritize equitable access, robust policy frameworks, and sustainable teacher training. By doing so, AI technologies can help create language learning environments that are not only more efficient but also more inclusive, adaptive, and human-centered.

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