The Lingua Spectrum Journal has been officially included in the list of recommended national scientific publications by the Higher Attestation Commission (HAC), according to Resolution No. 366/5, dated January 4, 2025.

ARTIFICIAL INTELLIGENCE IN LANGUAGE TEACHING: OPPORTUNITIES, CHALLENGES, AND PEDAGOGICAL IMPLICATIONS

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Abstract. *Language learning is increasingly becoming infiltrated by AI technologies such as intelligent tutoring systems, automated writing evaluation, speech recognition and conversational agents. A systematic review of the literature during 2015-2024 indicates AI increases personalization, gives instantaneous suggestions and promotes the learners to interact actively. However, there are complex issues such as privacy, bias in algorithms and technology access gap, as well as teacher training that need to be addressed. This study concludes that AI can enhance language teaching in an ethically and strategically sound manner, which adds to the recent debate of what role AI might have within education, specifically with respect to language learning.*

Keywords: *Artificial intelligence, language teaching, natural language processing, intelligent tutoring systems, adaptive learning, automated assessment, educational technology.*

Introduction. Artificial intelligence has become a major driver of change in modern education, especially in language teaching. Advances in natural language processing and machine learning allow AI systems to support vocabulary development, grammar reinforcement, writing improvement, and pronunciation practice. In traditional settings, teachers often face limitations such as large class sizes, inconsistent feedback, and varying learner needs. AI tools address these limitations by providing flexible, adaptive learning environments that respond to individual performance.

Current research shows that AI fosters learner autonomy, improves accuracy, and increases motivation. Despite these advantages, concerns remain regarding digital inequality, privacy, and the risk of diminished human interaction. This study explores AI's contributions to language learning and evaluates its benefits, limitations, and pedagogical implications through a systematic review of existing research. This study employed a qualitative systematic literature review to investigate the role of artificial intelligence in language teaching. The methodological approach was designed to ensure rigor, transparency, and replicability while allowing for a comprehensive synthesis of diverse research findings. A qualitative review was chosen because the aim of the study was to understand pedagogical trends, technological impacts, and learner experiences rather than to measure statistical relationships. This approach enabled the inclusion of empirical

studies, theoretical analyses, case studies, and review papers that collectively contribute to a deeper understanding of AI-supported language instruction.

The search process involved the use of multiple academic databases, including Google Scholar, ERIC, Scopus, ResearchGate, and IEEE Xplore. These databases were selected for their wide coverage of educational technology, applied linguistics, and computer science research. A combination of targeted search terms and Boolean operators was used to locate relevant literature, including phrases such as "artificial intelligence in language teaching," "AI-assisted language learning," "NLP in education," "intelligent tutoring systems," "automated writing evaluation," and "chatbots for language learning." Searches were limited to studies published between 2015 and 2024 to capture the most recent AI advancements.

A set of inclusion and exclusion criteria guided the selection of studies. Articles were included if they were written in English, published in peer-reviewed venues, and focused on AI applications in language learning or teaching. Studies also needed to discuss learner outcomes, teacher roles, technological impacts, or broader pedagogical implications. Non-academic sources, inaccessible full texts, and studies unrelated to human language education were excluded. The initial search produced approximately 420 records, which were reduced to 310 after removing duplicates. Titles and abstracts were screened for relevance, resulting in 142 articles selected for full-text evaluation. After this review, 54 studies met all criteria and were included in the final analysis.

A structured data extraction process was used to collect consistent information from each study. Extracted data included publication details, research aims, types of AI tools examined, target learner populations, research designs, reported outcomes, and identified challenges. This systematic extraction enabled comparisons across studies and supported meaningful synthesis of findings. The data were analyzed using thematic analysis. Studies were read multiple times, and recurring ideas, patterns, and insights were coded manually. These codes were progressively grouped into broader themes reflecting core issues in AI-supported language teaching, such as personalization, automated feedback, learner motivation, teacher support, and ethical or technological concerns. The thematic structure was refined through repeated comparison with source material to ensure accuracy and balance.

Reliability was enhanced by following a uniform search and coding protocol and by using a snowballing technique that examined reference lists of the included articles to identify additional relevant studies. Validity was strengthened by incorporating a wide variety of research designs and by comparing findings across different contexts and AI tools to avoid bias or overgeneralization. Ethical principles were also maintained throughout the process. Although formal approval was not required due to the use of publicly available literature, care was taken to represent study findings accurately, acknowledge all sources properly, and avoid misinterpretation.

The reviewed literature demonstrates that AI consistently contributes to personalized learning by adjusting content difficulty and instructional pathways according to learner performance. Adaptive learning platforms were shown to significantly improve vocabulary acquisition, grammar accuracy, and reading comprehension. Students benefited from customized feedback and individualized approaches that enhanced

learning efficiency. AI systems provided immediate and detailed feedback. Automated writing evaluation improved writing accuracy and coherence by helping learners identify grammatical, lexical, and structural issues. Speech-recognition tools supported pronunciation development by offering real-time corrective feedback.

Learner engagement increased through AI-powered interactive tasks, gamified activities, and conversational chatbots. These tools encouraged learners to practice consistently and reduced anxiety associated with human judgment. Teachers benefited from AI-supported grading, progress monitoring, and lesson planning tools, which reduced workload and helped identify at-risk learners more quickly.

Despite these benefits, several challenges appeared. Privacy concerns emerged due to extensive data collection and storage. Algorithmic bias was identified in systems trained on limited linguistic datasets, affecting learners with diverse accents or backgrounds. Technological inequality limited access to high-quality AI tools in underserved regions. Additionally, many educators lacked sufficient training to use AI effectively.

The findings of this review indicate that artificial intelligence plays a significant and multifaceted role in enhancing language teaching, and they highlight several interconnected pedagogical, technological, and ethical considerations. The reviewed studies consistently show that AI has the capacity to transform traditional instructional models by offering personalized learning experiences that adjust to each learner's pace, proficiency level, and individual challenges. This personalized support aligns with contemporary learner-centered approaches, which emphasize differentiation and the need to accommodate diverse learning profiles. AI tools, particularly adaptive learning platforms and intelligent tutoring systems, help achieve this by analyzing learner behavior and providing appropriate instructional pathways that would be difficult to implement in large or heterogeneous classrooms.

Another central contribution of AI lies in its ability to generate immediate and detailed feedback across multiple language domains. Automated writing evaluation tools support learners by identifying errors in grammar, vocabulary, and structure, thereby enabling frequent, low-stakes practice and revision. Similarly, speech-recognition systems enhance oral proficiency by offering real-time guidance on pronunciation and fluency. Such feedback systems not only reduce the burden on teachers but also empower learners to take greater control of their progress, fostering autonomy and self-regulated learning. The immediacy and precision of AI-generated feedback represent a major advantage over traditional forms of feedback, which may be delayed or limited by instructor workload.

Engagement and motivation also emerge as major benefits of AI in language learning. Interactive chatbots, gamified exercises, and simulated environments create opportunities for authentic and continuous practice, minimizing the fear of negative judgment that often inhibits language learners during human interactions. These tools support sustained engagement, which is known to be critical for long-term language acquisition. Furthermore, the ability to practice anytime and anywhere makes AI particularly valuable for learners with limited access to native speakers or qualified instructors.

Despite the clear advantages, the review also reveals challenges that must be considered for responsible and effective integration. Data privacy concerns arise because AI systems rely on large volumes of learner data to operate effectively. Ensuring secure data storage, transparent data use, and informed consent is essential, especially in educational contexts involving minors. Another challenge involves the potential for algorithmic bias, particularly in speech-recognition systems trained on limited datasets. Such bias can disadvantage learners with diverse linguistic or cultural backgrounds, thereby undermining inclusivity and fairness. Addressing this issue requires the development of more representative training datasets and regular auditing of AI systems.

Technological inequality represents an additional barrier, as access to AI tools requires reliable internet connectivity, up-to-date devices, and adequate institutional resources. Learners in underserved regions may not benefit equally from these innovations, potentially widening existing educational gaps. Moreover, teacher preparedness emerges as a recurring concern. Many educators are uncertain about how to integrate AI into their instructional practice, either due to limited training or apprehension about the changing role of teachers in AI-enhanced classrooms. This highlights the need for professional development programs that equip teachers with the skills and confidence required to use AI tools effectively and ethically.

The findings collectively suggest that AI is most effective when used not as a replacement for teachers but as a complementary support mechanism. Human teachers provide emotional intelligence, cultural context, motivational strategies, and interpersonal communication – elements that AI cannot replicate. The optimal model is therefore a hybrid approach, in which AI handles repetitive tasks, offers personalized feedback, and provides extensive practice opportunities, while teachers focus on higher-order skills, critical thinking, interaction, and social-emotional engagement. Such a balance ensures that learners benefit from the strengths of both human instruction and technological innovation. Future research should explore the long-term effects of AI-supported learning on language proficiency, investigate how AI can better support collaborative and communicative tasks, and develop frameworks for ethical and equitable implementation. As AI continues to evolve, its role in language teaching will likely expand, and it is crucial that researchers, educators, and policymakers work together to guide this process responsibly.

This study concludes that artificial intelligence plays a transformative role in language teaching by supporting personalized instruction, improving feedback quality, and increasing learner engagement. Adaptive systems and automated evaluation tools help learners progress more efficiently and autonomously. While AI offers substantial advantages, it must be integrated thoughtfully to avoid risks related to data privacy, inequity, and overdependence on technology. AI should not replace human teachers, rather, it should complement their work. Teachers remain essential for fostering communication skills, cultural understanding, emotional support, and critical thinking. With ethical and strategic implementation, AI has the potential to significantly enhance the teaching and learning of languages and to make education more inclusive, dynamic, and effective.

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