Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

HARNESSING ARTIFICIAL INTELLIGENCE IN FOREIGN LANGUAGE EDUCATION: OPPORTUNITIES, CHALLENGES, AND FUTURE DIRECTIONS

[1]Achmad Fanani*
[1]Universitas Pesantren Tinggi Darul Ulum, Indonesia
[1]achmadfanani@fbs.unipdu.ac.id

[2]Maisarah Maisarah
[2]Universitas Pesantren Tinggi Darul Ulum, Indonesia
[2]maisarah@fbs.unipdu.ac.id

[3]Mukhamad Masrur
[3]Universitas Pesantren Tinggi Darul Ulum, Indonesia
[3]mukhamadmasrur@ft.unipdu.ac.id

*Corresponding author

Received : April 6, 2025 Revised : June 6, 2025
Accepted : June 25, 2025 Published : June 30, 2025

How to Cite (in APA Style):
Fanani, A., Maisarah, Masrur, M. (2025). Harnessing artificial intelligence in foreign language education: opportunities, challenges, and future directions. *Pioneer: Journal of Language and Literature*, *17*(1), 107-122. https://doi.org/10.36841/pioneer.v17i1.6489

Abstract: This study examines the opportunities and challenges of integrating Artificial Intelligence (AI) into foreign language learning through a structured review of relevant literature. The findings show that AI can enhance personalized learning experiences, provide valuable teacher support, and improve access to language resources. However, challenges such as data privacy concerns, algorithmic bias, and the digital divide remain significant obstacles. The study emphasizes the need for ethical AI design, ongoing teacher training, and policies that ensure inclusivity. Additionally, it stresses the importance of continuous evaluation and collaboration among educators, technology developers, and policymakers. This research contributes to a comprehensive understanding of AI's potential and limitations in transforming foreign language education, while advocating for balanced and responsible implementation.

Keywords: *artificial intelligence, foreign language learning, digital divide, ethical challenges*

INTRODUCTION

The 21st century has seen rapid technological advancement, with Artificial Intelligence (AI) emerging as one of the most transformative forces. Its adoption spans sectors such as healthcare, transportation, and education, where it is now considered a central driver of the Fourth Industrial Revolution. As nations strive to remain

competitive in the digital age, AI is increasingly viewed as a necessity. Educational institutions and governments around the world are investing heavily in AI for learning, teaching, and administration (UNESCO, 2023).

In foreign language education, AI offers promising opportunities to enhance teaching and learning. It enables personalized instruction, adaptive content delivery, real-time feedback, and automated assessment of writing and speaking (Akinsemolu & Onyeaka, 2025). During the COVID-19 pandemic, the integration of AI accelerated as schools relied on digital solutions for language instruction. Tools such as intelligent tutors, automated scoring systems, and speech recognition software played vital roles in supporting continuity and promoting inclusivity, particularly for learners requiring personalized assistance.

However, the adoption of AI in foreign language learning, particularly in developing contexts like Indonesia, presents both potential and challenges. While AI may help modernize English and other language teaching systems, barriers remain, such as inadequate infrastructure, limited access to digital tools, and a shortage of trained teachers capable of utilizing AI effectively (Crompton et al., 2024). Concerns also arise regarding AI's potential to weaken essential aspects of language learning, such as cultural immersion, emotional interaction, and human communication. Moreover, AI tools developed for global English users may reinforce linguistic bias and overlook local language identities.

Beyond technical issues, deeper concerns persist. Many educators lack the skills to apply AI tools meaningfully (Ng et al., 2023). Ethical questions related to data privacy, surveillance, algorithmic bias, and overdependence on automation are also significant. Students from marginalized areas often lack access to the digital resources necessary to benefit from AI, thereby widening the digital divide (Vesna, 2025). Additionally, in many countries, including Indonesia, the absence of clear policies and institutional strategies on AI usage in language classrooms causes confusion and limits its effective implementation.

In light of these challenges, a balanced investigation of both the benefits and barriers of AI in foreign language education is necessary. Such a study can inform educators, policymakers, and developers on how to implement AI tools that are relevant, ethical, and inclusive. As AI continues to evolve, language education must

adapt by combining technological innovation with pedagogical soundness and cultural sensitivity.

Several studies have explored the broader potential of AI in education. For example, Almelhes (2023), Liang et al. (2021), and Peña-Acuña & Durão (2024) emphasize that AI can create flexible, efficient, and personalized learning experiences. Jose & Jose (2024) and Xia et al. (2024) highlight AI's ability to promote inclusivity for students with special needs or those in remote areas. Kayyali (2024) notes how virtual and augmented reality, supported by AI, can enhance engagement and immersion. However, most of these studies address general education and do not directly examine foreign language learning, especially in culturally diverse or low-resource environments.

There is a notable gap in understanding how AI functions in real-world language learning settings, particularly where cultural and infrastructural differences shape educational experiences. Few studies (e.g. Wu & Annamalai, 2025) have explored how language educators and learners use, adapt to, or face barriers in applying AI tools. Comprehensive, context-sensitive analyses that consider both AI's potential and its limitations in language acquisition are still limited.

This study seeks to fill that gap by analyzing the dual nature of AI, its benefits and its risks, in foreign language education through a review of eight recent and relevant studies. It identifies the major opportunities AI offers, such as personalized support and expanded access, and the challenges it poses, including bias, inequity, and technical readiness. This review aims to provide practical insights for teachers, developers, and policymakers working toward ethical and effective AI integration in language classrooms.

The research is guided by two main questions: (1) What opportunities does AI present for improving foreign language education? and (2) What challenges must be addressed to ensure its responsible and equitable use? The goal is to provide a nuanced understanding of AI's role in foreign language learning that supports both technological advancement and educational equity.

Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

METHOD

This study used a qualitative approach through a structured literature review to examine the opportunities and challenges of implementing Artificial Intelligence (AI) in foreign language education. This method enabled a systematic analysis and synthesis of previous research, making it suitable for exploring emerging topics like AI in language learning, where empirical evidence remains fragmented (Mohebbi, 2024).

Eight key studies published between 2020 and 2024 were selected based on their relevance, recency, and contributions to discussions on AI in education, particularly in the context of language instruction. These include works by Almelhes (2023), Liang et al. (2021), Peña-Acuña and Durão (2024), Jose and Jose (2024), Xia et al. (2024), Crompton et al. (2024), and Celik et al. (2022). The selected studies address a range of AI-related themes such as adaptive learning, teacher assistance, automated assessments, data privacy, algorithmic bias, and digital competence. Although the number of studies is limited, eight was deemed sufficient for this review as thematic saturation was observed, with recurring patterns and perspectives across the selected literature. Additionally, the scope was shaped by the availability of recent, peer-reviewed studies specifically focused on AI in language education.

Sources were identified through systematic keyword searches in Google Scholar and ResearchGate, chosen for their accessibility and wide coverage of scholarly publications, using terms such as “AI in language education” and “AI assessment in EFL/ESL.” Only peer-reviewed journal articles, academic book chapters, and English-language conference papers were included, with careful consideration given to the varying quality standards of conference publications. The criteria for inclusion were: (1) relevance to AI use in language learning, (2) presentation of empirical findings or theoretical analysis, and (3) discussion of practical or pedagogical implications.

Thematic analysis was used to organize the literature into two main categories: opportunities and challenges. Subthemes under opportunities included personalized learning, reduced teacher workload, immersive learning environments, and broader access to language resources. Challenges included issues of data security, algorithmic bias, lack of infrastructure, ethical concerns, and limited teacher training.

For instance, Almelhes (2023) and Peña-Acuña & Durão (2024) discussed AI’s role in personalization and essay scoring. Jose & Jose (2024) and Xia et al. (2024)

emphasized AI's potential to expand access in underserved areas. Celik et al. (2022) and Xia et al. (2024) highlighted challenges like the need for ethical frameworks and educator involvement in AI design. To ensure credibility, findings were triangulated using a coding matrix to compare patterns across sources, strengthening the reliability and depth of the analysis.

FINDINGS AND DISCUSSION

Findings

Benefits of Artificial Intelligence in Foreign Language Education

Based on the review of eight major studies, the implementation of Artificial Intelligence (AI) in foreign language education offers a wide range of benefits that can significantly enhance the quality and efficiency of language teaching and learning. These benefits fall into several key categories: personalized learning, teacher support, automated assessment, administrative efficiency, immersive learning environments, improved access to language education, academic culture development, and integration of values-based or religious learning, as seen in Table 1.

Artificial Intelligence (AI) offers significant benefits for foreign language education, especially in areas such as personalization, teacher support, assessment, and learner access. A key advantage lies in AI's capacity to personalize instruction by adjusting vocabulary, grammar, speaking, and listening tasks according to each learner's proficiency level and learning style. This adaptability fosters learner engagement and helps reduce achievement gaps (Almelhes, 2023; Liang et al., 2021; Peña-Acuña & Durão, 2024). Moreover, real-time adaptation, as highlighted by Jose and Jose (2024) and Xia et al. (2024), has been shown to improve learning outcomes by addressing individual strengths and weaknesses.

AI also supports teachers by automating routine tasks such as lesson planning, test creation, and grading. This allows teachers to focus more on communication-based instruction and student interaction. As noted by Peña-Acuña & Durão (2024) and Celik et al. (2022), this reduces administrative workload. In addition, Xia et al. (2024) highlight that AI-powered tools like grammar checkers, speech evaluators, and chatbots can provide learners with real-time support, even outside of class time. One of the most impactful applications is AI-based assessment. AI systems can quickly and consistently

Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

evaluate writing, speaking, and comprehension tasks with accuracy and consistency. They provide immediate feedback on areas such as grammar and pronunciation, and help teachers identify learners needing extra support (Liang et al., 2021; Jose & Jose, 2024). These tools improve both formative and summative evaluation practices.

Table 1: Categories of AI Opportunities in Foreign Language Education

No.	Category	Summary of Opportunity	Sources
1	Personalized Learning	AI adapts content, level, and pace to learners' needs, boosting engagement and addressing diverse proficiency.	Almelhes (2023), Liang (2021), Peña-Acuña & Durão (2024), Jose & Jose (2024), Xia et al. (2024), Crompton et al. (2024)
2	Teacher Support	AI reduces teacher workload via automated planning, feedback, and assistance (e.g., chatbots, insights).	Almelhes (2023), Celik et al. (2022), Peña-Acuña & Durão (2024), Xia et al. (2024), Crompton et al. (2024)
3	Automated Assessment	AI scores essays and speech, tracks progress, and identifies struggling learners quickly.	Liang et al. (2021), Peña-Acuña & Durão (2024), Jose & Jose (2024), Celik et al. (2022), Crompton et al. (2024)
4	Administrative Efficiency	Automates scheduling, attendance, and portfolios; supports data-driven decisions in language programs.	Peña-Acuña & Durão (2024), Xia et al. (2024), Crompton et al. (2024)
5	Immersive Learning Environment	Offers VR/AR experiences and simulated conversations to enhance language use and cultural context.	Jose & Jose (2024), Xia et al. (2024)
6	Improved Access	Expands access to quality language learning through online, open-source platforms, especially in remote areas.	Almelhes (2023), Peña-Acuña & Durão (2024), Liang (2021), Xia et al. (2024)
7	Academic & Structural Development	Supports AI-informed curriculum design and promotes innovation in language teaching and research.	Crompton et al. (2024)
8	Values-Based Learning	Enables culturally and religiously contextualized content for language learning and intercultural competence.	Xia et al. (2024)

At the institutional level, AI enhances efficiency in managing student data, scheduling, and academic planning. Peña-Acuña & Durão (2024) and Crompton et al. (2024) report that AI supports decision-making through learning analytics that track student progress and engagement, allowing for more targeted curriculum development. Immersive technologies powered by AI, such as Virtual Reality (VR) and Augmented Reality (AR), offer engaging and realistic learning experiences. These tools let students practice language in simulated environments like virtual shops or cultural events, which enhances both communication skills and cultural awareness (Jose & Jose, 2024; Xia et

al., 2024). AI also improves access to language learning, especially for students in remote or under-resourced areas. It enables flexible, self-paced learning through online platforms and mobile apps. This democratizes foreign language education and provides equal opportunities for learners regardless of geographic or economic limitations (Almelhes, 2023; Liang et al., 2021; Xia et al., 2024). Furthermore, AI can strengthen academic culture and support curriculum development. Crompton et al. (2024) note that AI promotes collaboration, innovation, and evidence-based syllabus design through data analysis and shared platforms for peer learning and research. Lastly, AI can help integrate cultural and religious contexts into language learning. In religious or faith-based institutions, AI systems can adapt content to reflect learners' beliefs and cultural identities, enhancing both language proficiency and intercultural competence (Xia et al., 2024).

Challenges of Artificial Intelligence in Foreign Language Education

While the integration of Artificial Intelligence (AI) into foreign language education offers various benefits, it also presents several significant challenges that must be addressed to ensure responsible and effective implementation (Table 2). Based on the review of eight key studies, the main challenges include data privacy and security, algorithmic bias, limited access and digital inequality, ethical concerns, low digital literacy among language educators, resistance to pedagogical change, limited stakeholder involvement, and technical implementation issues.

One of the most pressing concerns in foreign language education is the risk of data misuse. AI platforms often collect learner data such as audio recordings, writing samples, and interaction patterns. Without clear regulations and strong data protection, this can jeopardize student privacy (Almelhes, 2023; Peña-Acuña & Durão, 2024; Xia et al., 2024). Jose & Jose (2024) argue that current systems lack adequate safeguards for learners' digital information. Another serious issue is algorithmic bias. AI tools trained on unbalanced datasets may favor native-like accents or dominant cultural norms, disadvantaging students from minority backgrounds (Liang et al., 2021; Celik et al., 2022; Crompton et al., 2024). Peña-Acuña & Durão (2024) stress that involving language educators in AI development is essential to ensure fairness and cultural relevance.

Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

Access to AI tools remains unequal. Many students, particularly in rural or underfunded areas, lack devices or internet access, making AI-based language learning inaccessible (Crompton et al., 2024; Liang et al., 2021). This growing digital divide further separates schools able to adopt AI from those left behind, calling for stronger infrastructure support and equitable policies. Ethical concerns are also increasing. AI tools may track learner speech, writing, or response behavior in ways that risk over-surveillance or limit creativity (Xia et al., 2024; Jose & Jose, 2024). Celik et al. (2022) highlight the absence of ethical frameworks in many settings, creating confusion among educators about how to use AI responsibly. Many teachers lack digital competence. Tools like AI chatbots, grammar correction, or pronunciation evaluation are underused due to limited training (Celik et al., 2022; Crompton et al., 2024; Peña-Acuña & Durão, 2024). Without proper support, language teachers may avoid or misuse AI technologies in the classroom.

Table 2: Category of AI Challenges in Foreign Language Education

No.	Challenge Category	Summary of Challenge	Sources
1	Data Privacy & Security	Risks of data misuse, lack of consent, and weak protection for student language data.	Almelhes (2023), Liang et al. (2021), Peña-Acuña & Durão (2024), Jose & Jose (2024), Xia et al. (2024), Crompton et al. (2024)
2	Algorithmic Bias & Injustice	Bias in accent, dialect, or scoring systems can lead to unfair outcomes.	Almelhes (2023), Liang et al. (2021), Peña-Acuña & Durão (2024), Jose & Jose (2024), Celik et al. (2022), Xia et al. (2024), Crompton et al. (2024)
3	Digital Divide	Unequal access to devices and the internet, especially in rural or underfunded schools.	Liang et al. (2021), Xia et al. (2024), Crompton et al. (2024)
4	Ethics in AI Use	Lack of clear guidelines; risks of surveillance and AI overreach in learning decisions.	Xia et al. (2024), Liang et al. (2021), Jose & Jose (2024), Celik et al. (2022), Crompton et al. (2024)
5	Digital Literacy & Competence	Many teachers lack skills or training to use AI tools in language teaching.	Celik et al. (2022), Crompton et al. (2024), Peña-Acuña & Durão (2024)
6	Resistance to Change	Teacher hesitation due to fear of replacement or preference for traditional methods.	Crompton et al. (2024), Celik et al. (2022), Xia et al. (2024)
7	Limited Stakeholder Involvement	Educators are often not involved in AI design; weak coordination among key actors.	Celik et al. (2022), Jose & Jose (2024), Xia et al. (2024)
8	Technical Implementation	Lack of standards and infrastructure to support AI in language education settings.	Almelhes (2023), Peña-Acuña & Durão (2024), Xia et al. (2024), Crompton et al. (2024)

Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

There is also resistance to change. Some teachers worry that AI will replace them or feel more comfortable with traditional teaching styles (Crompton et al., 2024; Celik et al., 2022). Increasing awareness and hands-on training could build more trust and openness to innovation. Moreover, many AI tools are developed without input from educators or learners, leading to designs that are impractical or culturally disconnected (Celik et al., 2022; Jose & Jose, 2024; Xia et al., 2024). Active collaboration between developers and stakeholders is crucial. Finally, schools often lack clear strategies for AI integration. Without infrastructure, training, or planning, implementation fails (Almelhes, 2023; Peña-Acuña & Durão, 2024; Crompton et al., 2024). To make AI a meaningful part of language education, technical standards and institutional readiness are essential.

Discussion

This study has explored both the benefits and challenges of using Artificial Intelligence (AI) in foreign language education. Drawing on a review of eight major studies, the findings suggest that AI offers significant opportunities to enhance the quality of language teaching and learning. Nevertheless, several critical challenges were also identified that may hinder its successful and ethical implementation. While these insights provide valuable contributions to understanding AI integration in language education, it is important to acknowledge that the relatively small sample size (eight studies) may limit the generalizability of the conclusions. In this section, the findings are examined in more detail, compared with previous studies, and discussed in relation to future practices in foreign language learning environments.

Benefits of AI in foreign language education

One of the most widely acknowledged benefits in the reviewed literature is personalized learning. In language learning, AI tools can adapt to individual learners' proficiency levels, vocabulary knowledge, and pronunciation accuracy, helping students progress at their own pace. The studies reviewed confirm that AI can make language learning more flexible and responsive to learner needs. This aligns with Lin et al. (2023), who found that AI-supported platforms can deliver customized language content, particularly beneficial for learners needing extra support.

Pioneer: Journal of Language and Literature
Volume 17, Issue 1, June 2025: 107–122
DOI: https://doi.org/10.36841/pioneer.v17i1.6489

Another critical benefit is support for language teachers. AI can handle repetitive classroom tasks such as grading vocabulary quizzes, checking grammar, and organizing speaking practice schedules. Celik et al. (2022) and Perks (2020) emphasize that AI reduces teacher workload, allowing more time for meaningful student interaction and communicative activities. These findings are consistent with Crompton et al. (2024), who noted that AI tools are increasingly being designed to support instructional planning and language feedback delivery.

Automated assessment is particularly useful in language learning. Tools that assess essays, pronunciation, and listening comprehension can provide instant, consistent feedback. Eglington and Pavlik (2022) and Xia et al. (2024) note that such assessments help teachers monitor learner progress and intervene early when necessary. This complements Hooda et al. (2022), who argue that data-driven feedback systems lead to more effective language acquisition and learner autonomy.

Studies also show that AI contributes to immersive and innovative learning environments. In language education, Virtual Reality (VR) and Augmented Reality (AR) can simulate real-life language use scenarios, such as virtual travel or cultural exchanges, providing a more immersive experience. AlGerafi et al. (2023) and Shankar et al. (2023) report that these tools help learners develop communicative competence in realistic contexts, supporting findings by Naseer et al. (2024), who highlight AI's role in increasing learner engagement and contextual understanding.

Improving access to quality language education is another key advantage. AI-powered language learning apps and platforms can reach students in rural or underserved communities who may not have access to trained teachers. Celik et al. (2024) found that AI reduces access barriers and supports self-directed learning. This aligns with Salas-Pilco, Xiao, and Oshima (2022), who describe AI as a tool for inclusive education, particularly for learners with disabilities or those in remote areas.

In addition, AI contributes to the development of academic culture and supports values-based learning in language education. Xia et al. (2024) show that AI helps institutions design adaptive language curricula and promote innovation. Alkhouri (2024) provides an important perspective on how AI can be used to deliver culturally or spiritually relevant language content, such as moral narratives or religious texts, which is particularly useful in faith-based educational institutions. This area remains

underexplored in prior research, which tends to focus on general academic contexts rather than specific contexts within them.

Challenges of AI in foreign language education

Despite its benefits, several challenges associated with AI in foreign language education were identified. The first is data privacy and security. AI tools that collect and analyze spoken and written learner data pose risks of misuse and breaches. Almelhes (2023) and Xia et al. (2024) found that many institutions lack strong data protection systems. Okulich-Kazarin et al. (2024) reinforce this concern, warning that privacy risks are heightened when learners' linguistic and personal data are not safeguarded.

Algorithmic bias is also a pressing issue, especially in pronunciation scoring, grammar correction, and language proficiency recommendations. Celik et al. (2022) and Peña-Acuña & Durão (2024) highlight that AI may unfairly penalize learners with non-native accents or from non-dominant linguistic backgrounds. Bell & Korinek (2023) similarly argue that unchecked algorithmic bias can reinforce inequality and hinder fair assessment in language classrooms.

The digital divide presents another significant barrier to equitable AI integration. Learners in under-resourced areas may lack access to essential devices or reliable internet, limiting their ability to benefit from AI-supported language tools. However, the divide is not solely material; it also includes disparities in institutional capacity and teacher readiness to adopt and implement new technologies. Crompton et al. (2024) and Liang et al. (2021) emphasize that wealthier institutions benefit more from AI, while poorer schools often struggle. This supports Bulathwela et al. (2024), who warn that without addressing both infrastructure and human resource challenges, AI may further widen educational opportunity gaps.

Ethical concerns also emerge in language learning settings. AI systems that monitor student progress or track pronunciation and writing behaviors may infringe on learner privacy or autonomy. Xia et al. (2024) and Jose & Jose (2024) stress the need for clear ethical guidelines. Crawford et al. (2024) echo this, arguing that AI use must not reduce human interaction, which is critical in language education for developing interpersonal and intercultural communication.

Another obstacle is low digital literacy among teachers. Many foreign language teachers lack confidence or training in using AI tools such as automated speaking

assessment or adaptive grammar exercises. Celik et al. (2022) and Crompton et al. (2024) found that teacher training in this area remains limited. Aljemely (2024) warns that AI initiatives may fail when teachers are not included in training or design processes.

Resistance to change is also noted, particularly among teachers who value traditional language teaching methods. Some worry that AI will replace their role or dehumanize the language learning process. Xia et al. (2024) describe how fear and skepticism can slow innovation. Kizilcec (2023) emphasizes the importance of building trust and understanding to foster acceptance of AI in the classroom.

Limited stakeholder involvement further complicates implementation. Many AI tools are developed without input from language teachers or learners. Celik et al. (2022) note that this results in tools that may be linguistically inappropriate or pedagogically misaligned. Alajlani et al. (2023) confirm that meaningful collaboration with educators is essential to ensure AI's effectiveness and relevance.

Finally, technical implementation issues remain a challenge. Some institutions lack a clear strategy for integrating AI into language programs. Benkhalfallah et al. (2024) and Xia et al. (2024) found that poor planning leads to failed or incomplete adoption. Leong (2019) similarly reported that without technical readiness, schools are unable to fully benefit from AI-based solutions.

Future directions in foreign language learning with AI

As Artificial Intelligence (AI) continues to shape the future of education, it is crucial to ensure its application in foreign language learning is fair, inclusive, and pedagogically meaningful. This study shows that AI can enhance language instruction through personalized learning, automated assessment, and immersive experiences. However, these advantages are accompanied by ethical concerns, infrastructure gaps, and training challenges. To maximize its potential, future research, policy, and practice must focus on the responsible integration of these elements. The following directions outline how AI can be developed and applied effectively in foreign language education.

A key priority is equipping language teachers with the digital skills to use AI effectively. Many educators remain unfamiliar with tools like automated essay scorers, pronunciation feedback systems, or grammar bots. Structured professional development

should train teachers not only in tool usage but also in ethical data practices and in integrating AI into communicative, culturally sensitive instruction.

AI systems must also be designed with fairness and inclusivity in mind. Bias in datasets can disadvantage learners who use non-standard dialects or accents. Developers need to work closely with teachers, linguists, and intercultural education experts to ensure AI tools support diverse learners. Ethical guidelines specific to language education, covering data privacy, transparency, and inclusivity, should be developed by relevant bodies such as ministries of education, national curriculum boards, and institutional ethics committees, and adopted at both institutional and national levels.

Bridging the digital divide is also essential. Students in under-resourced regions often lack access to the internet or devices needed for AI-based tools. Future policies must expand digital infrastructure and encourage affordable solutions through public–private partnerships. Research should also explore offline and mobile-friendly AI tools suited for low-resource settings.

Collaboration among stakeholders is critical. Many AI tools are developed without input from educators or learners, resulting in platforms that lack classroom relevance and are not tailored to the needs of learners. Involving teachers, curriculum designers, and students from the start ensures that AI tools support real needs—such as communicative competence and cultural awareness.

Clear implementation strategies are still lacking in many institutions. Language departments and ministries of education should develop roadmaps for AI integration, outlining clear goals, specific responsibilities, effective evaluation methods, and robust ethical safeguards. This can help move AI use from experimental to systematic and effective.

More research is also needed on AI's use in cultural and religious contexts. In Islamic schools, for example, AI could help personalize language instruction through moral or spiritual content. Understanding how AI can support culturally grounded language education will promote both relevance and inclusivity.

Finally, the use of AI must be continuously monitored and improved. Feedback systems, audits, and ongoing evaluation should be used to track learner outcomes, guide revisions, and ensure that AI remains pedagogically sound and ethically applied in language classrooms.

CONCLUSIONS AND SUGGESTIONS

Conclusions

This study has demonstrated that Artificial Intelligence (AI) offers a wide range of promising benefits for foreign language education. These include personalized instruction tailored to learners' proficiency levels, enhanced teacher support through automation, efficient assessment of speaking and writing tasks, expanded access for remote or underserved learners, and immersive learning experiences through tools like VR and chatbots. However, these benefits are accompanied by notable challenges, such as concerns over student data privacy, algorithmic bias against diverse language users, unequal access to digital infrastructure, limited AI literacy among teachers, and the absence of clear ethical standards for AI use in language classrooms.

Suggestions

To advance responsibly, language educators, technology developers, and policymakers must collaborate closely to ensure that AI serves primarily as a supportive tool, enhancing rather than replacing human instruction, while also recognizing its potential to fill gaps in contexts where qualified educators are unavailable. Future initiatives should prioritize bridging the digital divide, investing in digital and pedagogical training for language teachers, and designing AI systems that are both ethically sound and culturally responsive. With thoughtful planning, inclusive policies, and ongoing evaluation, AI can be harnessed to enrich language learning environments and promote more equitable, effective, and human-centered foreign language education for all learners.

REFERENCES

Akinsemolu, A. A., & Onyeaka, H. (2025). The role of artificial intelligence in transforming language learning: Opportunities and ethical considerations. *Journal of Language and Education, 11*(1), 148–152. https://doi.org/10.17323/jle.2025.22118

Alajlani, N., Crabb, M., & Murray, I. R. (2023). A systematic review in understanding stakeholders' role in developing adaptive learning systems. *Journal of Computers in Education, 11*(2). https://doi.org/10.1007/s40692-023-00283-x

AlGerafi, M. A. M., Zhou, Y., Oubibi, M., & Wijaya, T. T. (2023). Unlocking the potential: A comprehensive evaluation of augmented reality and virtual reality in education. *Electronics, 12*(18), 3953. https://doi.org/10.3390/electronics12183953

Aljemely, Y. (2024). Challenges and best practices in training teachers to utilize artificial intelligence: A systematic review. *Frontiers in Education, 9*, Article 1470853. https://doi.org/10.3389/feduc.2024.1470853

Alkhouri, K. I. (2024). The role of artificial intelligence in the study of the psychology of religion. *Religions, 15*(3), 290. https://doi.org/10.3390/rel15030290

Almelhes, S. (2023). A review of artificial intelligence adoption in second-language learning. *Theory and Practice in Language Studies, 13*(5), 1259–1269. https://doi.org/10.17507/tpls.1305.21

Bell, S. A., & Korinek, A. (2023). AI's economic peril. *Journal of Democracy, 34*(4), 151–161. https://doi.org/10.1353/jod.2023.a907696

Bulathwela, S., Pérez-Ortiz, M., Holloway, C., Greer, T., & Shawe-Taylor, J. (2024). Artificial intelligence alone will not democratise education: On educational inequality, techno-solutionism and inclusive tools. *Sustainability, 16*(2), 781. https://doi.org/10.3390/su16020781

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. *TechTrends, 66*(4), Article 3. https://doi.org/10.1007/s11528-022-00715-y

Crawford, J., Allen, K.-A., Pani, B., & Cowling, M. (2024). When artificial intelligence substitutes humans in higher education: The cost of loneliness, student success, and retention. *Studies in Higher Education, 49*(2), 1–15. https://doi.org/10.1080/03075079.2024.2326956

Crompton, H., Edmett, A., Ichaporia, N., & Burke, D. (2024). AI and English language teaching: Affordances and challenges. *British Journal of Educational Technology, 55*(6), 2503–2529. https://doi.org/10.1111/bjet.13460

Crompton, H., Edmett, A., Ichaporia, N., & Burke, D. (2024). AI and English language teaching: Affordances and challenges. *British Journal of Educational Technology, 55*(6), 2503–2529. https://doi.org/10.1111/bjet.13460

Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering, 2022*(1), 1–19. https://doi.org/10.1155/2022/5215722

Jose, J., & Jose, B. J. (2024). Educators' academic insights on artificial intelligence: Challenges and opportunities. *The Electronic Journal of e-Learning, 21*(5). https://doi.org/10.34190/ejel.21.5.3272

Kayyali, M. (2024). Immersive technologies: Virtual and augmented reality in higher education. In *Reshaping learning with next generation educational technologies* (Chapter 7). IGI Global. https://doi.org/10.4018/979-8-3693-1310-7.ch007

Kizilcec, R. F. (2023). To advance AI use in education, focus on understanding educators. *International Journal of Artificial Intelligence in Education, 34*(1). https://doi.org/10.1007/s40593-023-00351-4

Leong, W. Y. (2024). Transforming rural and underserved schools with AI-powered education solutions. *ASM Science Journal, 19*, 1–12. https://doi.org/10.32802/asmscj.2023.1895

Liang, J.-C., Hwang, G.-J., Chen, M.-R. A., & Darmawansah, D. (2021). Roles and research foci of artificial intelligence in language education: An integrated bibliographic analysis and systematic review approach. *Interactive Learning Environments*. Advance online publication. https://doi.org/10.1080/10494820.2021.1958348

Lin, C.-C., Huang, A., & Lu, O. (2023). Artificial intelligence in intelligent tutoring systems toward sustainable education: A systematic review. *Smart Learning Environments, 10*(1), Article 24. https://doi.org/10.1186/s40561-023-00260-y

Mohebbi, A. (2024). Enabling learner independence and self-regulation in language education using AI tools: A systematic review. *Cogent Education, 12*(1), Article 2433814. https://doi.org/10.1080/2331186X.2024.2433814

Naseer, F., Khan, M. N., Tahir, M., & Aejaz, S. M. H. (2024). Integrating deep learning techniques for personalized learning pathways in higher education. *Heliyon, 10*(12), e32628. https://doi.org/10.1016/j.heliyon.2024.e32628

Ng, D. T. K., Leung, J. K. L., Su, J., & Ng, R. C. W. (2023). Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world. *Educational Technology Research and Development, 71*(1), 137–161. https://doi.org/10.1007/s11423-023-10203-6

Okulich-Kazarin, V., Artyukhov, A., Skowron, Ł., & Wołowiec, T. (2024). Will AI become a threat to higher education sustainability? A study of students' views. *Sustainability, 16*(11), 4596. https://doi.org/10.3390/su16114596

Peña-Acuña, B., & Durão, R. (2024). Learning English as a second language with artificial intelligence for prospective teachers: A systematic review. *Frontiers in Education, 9*, 1–7. https://doi.org/10.3389/feduc.2024.1490067

Perks, S. (2020). AI could reduce teacher workload. *Physics World, 33*(8), 11. https://doi.org/10.1088/2058-7058/33/8/15

Salas-Pilco, S. Z., Xiao, K., & Oshima, J. (2022). Artificial intelligence and new technologies in inclusive education for minority students: A systematic review. *Sustainability, 14*(20), 13572. https://doi.org/10.3390/su142013572

Shankar, A. U., Tewari, V., Rahman, M., Mishra, A., & Bajaj, K. K. (2023). Impact of virtual reality (VR) and augmented reality (AR) in education. *Tuijin Jishu/Journal of Propulsion Technology, 44*(4). https://doi.org/10.52783/tjjpt.v44.i4.1014

Vesna, L. (2025). Digital divide in AI-powered education: Challenges and solutions for equitable learning. *Journal of Information Systems Engineering & Management, 10*(21s), 300–308. https://doi.org/10.52783/jisem.v10i21s.3327

Wu, X., & Annamalai, N. (2025). Investigating the use of AI tools in English language learning: A phenomenological approach. *Contemporary Educational Technology, 17*(2), Article ep578. https://doi.org/10.30935/cedtech/16188

Xia, Y., Shin, S.-Y., & Kim, J.-C. (2024). Cross-Cultural Intelligent Language Learning System (CILS): Leveraging AI to facilitate language learning strategies in cross-cultural communication. *Applied Sciences, 14*(13), 5651. https://doi.org/10.3390/app14135651