A SYSTEMATIC LITERATURE REVIEW OF ARTIFICIAL INTELLIGENCE IN LISTENING SKILL

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Abstract. The rapid advancement of artificial intelligence (AI) has significantly transformed educational practices, including foreign language teaching and learning. AI-based technologies, such as intelligent tutoring systems, adaptive learning platforms, and conversational agents, offer new opportunities to support personalised, interactive, and autonomous language learning. However, research on the use of AI in developing foreign-language listening skills remains limited and underexplored. Therefore, this study aims to systematically review the potential of artificial intelligence as an educational tool in foreign language teaching and learning by focusing on three main objectives: (1) to identify the methodologies employed in previous studies, (2) to examine the characteristics of participants involved in AI-based listening skill studies, and (3) to analyse the impact of artificial intelligence in listening skill learning outcomes. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method was employed to identify and analyse relevant studies. Advanced searches were conducted in the Scopus and Web of Science (WoS) databases to ensure inclusion of high-quality empirical research. 22 papers were selected and analysed to answer the research questions. The findings revealed that AI technologies enhance learner engagement, provide personalised feedback, and support the development of various language skills, particularly listening comprehension. Exposure to AI-driven assessments demonstrated significant improvement in listening comprehension among EFL learners. Nevertheless, several challenges remain, particularly regarding pedagogical integration, ethical considerations, teacher readiness, and application to other languages. This review highlights the need for further research to strengthen the effective implementation of AI in foreign language education.
Keywords: *Artificial Intelligence (AI), listening skills, language education, systematic review*

Introduction

The field of language education is undergoing a significant transformation driven by rapid technological advance. AI has emerged as one of the most influential innovations in contemporary education, offering new possibilities for transforming teaching, learning, and assessment practices. Through intelligent tutoring systems, adaptive learning platforms, automated feedback tools, and conversational agents, AI is reshaping instructional practices and learner experiences. These technological capabilities enable AI to analyse learner behaviour, adapt instructional content, and provide immediate feedback, thereby enhancing learner engagement (Sun, 2025). In the context of foreign language education, AI plays a crucial role in developing a range of language skills, including listening, speaking, reading, and writing. Language education has long been regarded as a cornerstone of communication, cultural understanding, and personal development. In an increasingly globalised world, proficiency in foreign languages is widely recognised as an essential skill (Alqarni and Alhramelah, 2025). With the growing demand for effective and accessible language learning approaches to language instruction. Consequently, educators and learners continue to seek innovative pedagogical tools and methodologies to enhance language learning and address diverse learner needs (Alqarni and Alhramelah, 2025).

AI applications such as chatbots, speech recognition systems, and automated writing evaluation tools provide learners with opportunities to practice language skills in interactive and authentic contexts (Xiao, 2025). These technologies facilitate continuous assessment, personalised feedback, and adaptive learning pathways, thereby improving learning outcomes and increasing learner motivation (Tanir, 2025). Consequently, AI has significantly reshaped instructional practices and learner experiences across different language skill domains. While these technologies have demonstrated promising outcomes, existing research tends to emphasise general language performance rather than providing skill-specific insights, particularly in relation to listening. Among these skills, listening is a fundamental yet challenging component of foreign language acquisition. Listening requires learners to process spoken input in real time, interpret meaning, and respond appropriately, struggle to understand the audio and making it a complex cognitive process. AI technologies offer promising solutions to support listening skill development by providing rich audio input and interactive listening tasks (Sun, 2025). AI applications show the potential to bridge the gap between theoretical instruction and authentic language practical use. Learners can interact with AI-powered chatbots to practice listening and speaking, receive automated feedback on writing and pronunciation, and engage in simulated real-world communication scenarios (Xiao, 2025). Additionally, AI can track learners' listening performance and provide personalised recommendations to address individual weaknesses, thereby enhancing comprehension and retention (Tanir, 2025). By facilitating interactive, contextually relevant language use, AI enhances learners' exposure to meaningful input and communicative practice.

Despite its potential, the expanding body of AI-based language-learning applications poses challenges for educators and researchers in identifying effective, pedagogically sound implementations. While existing studies demonstrate positive impacts of AI on learners' performance, engagement, and listening comprehension, these findings are often based on short-term interventions and limited empirical evidence. Furthermore, the research methodologies used in previous studies, sample characteristics, and instructional designs make it difficult to establish a clear framework and draw consistent conclusions about the effectiveness of AI in developing listening skills. Therefore, a systematic review is necessary to examine and synthesise existing studies critically, identify key trends and gaps, and synthesise empirical findings. Specifically, this review seeks to address the following research questions: (1) What research methodologies have been employed in the previous studies? (2) What are the characteristics of participants (samples) who have been employed in AI-based listening skill studies? (3) What are the impacts of artificial intelligence on listening skill instructions and learning outcomes? The scope of this review encompasses AI applications used for teaching and learning any foreign language across various educational contexts, learner levels, and instructional settings. It includes studies focusing on different language skills, such as listening development and pronunciation, as well as learners of different age groups and proficiency levels. The significance of this review lies in its potential to provide a comprehensive understanding of the role of artificial intelligence in listening skills. By synthesising existing research, this review aims to inform educators, researchers, developers, and policymakers and support informed decision-making regarding AI integration in language education.

In summary, artificial intelligence is reshaping the landscape of foreign language teaching and learning, particularly in the development of listening skills. By examining

the pedagogical applications, impacts, and challenges of AI, this review contributes to a deeper understanding of its role in enhancing listening instruction. Ultimately, the findings are expected to guide future research and promote more effective and technology-enhanced language learning practices.

Materials and Methods

Identification

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method was employed to identify and analyse relevant studies. Advanced searches were conducted in the Scopus and Web of Science (WoS) databases to ensure inclusion of high-quality empirical research. The three fundamental elements of the systematic review technique were used to pick many pertinent papers for this investigation. In the first stage, keywords are selected, and related terms are searched for using dictionaries, thesauri, encyclopaedias, and previous research. The search strings for the databases Scopus and Web of Science in *Table 1* were generated after all pertinent phrases were selected. 164 papers were successfully retrieved from Scopus and 89 from WoS during the first phase of the systematic review procedure for the current study topic.

Table 1. *The search string.*

Database	Search string
Scopus	TITLE-ABS-KEY ("artificial intelligence" AND "listening skill") AND PUBYEAR > 2021 AND PUBYEAR < 2027 AND LIMIT-TO (LANGUAGE, "English") AND LIMIT-TO (PUBSTAGE, "final") AND (EXCLUDE (DOCTYPE, "bk") OR EXCLUDE (DOCTYPE, "re") OR EXCLUDE (DOCTYPE, "ch") OR EXCLUDE (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "ar"))
Web of Science (WoS)	TS = ("artificial intelligence") AND TS = ("listening skill")

Note. TITLE-ABS-KEY = title, abstract, and keywords; TS = topic; PUBYEAR = publication year; PUBSTAGE = publication stage; DOCTYPE = document type; bk = book; re = review; ch = book chapter; cp = conference paper; and ar = journal article.

Screening

After the articles were identified, the first screening stage involved thoroughly reviewing 253 papers; stage two was then initiated. A variety of thoughtfully crafted inclusion and exclusion criteria were used throughout the screening process. As the principal source of pertinent information, research publications, in particular, constitute a fundamental criterion that was considered. Therefore, no systematic reviews, reviews, book series, books, chapters, meta-analyses, or conference proceedings were included in the current investigation. Moreover, only English-language publications were eligible for assessment. It should be noted that the approach was developed for the most recent years (2022–2026), during which time a total of 142 articles were excluded based on particular criteria. The next stage involves removing duplicate papers. Duplicate papers were deliberately excluded from the initial screening to ensure that only original, unique materials were considered for further examination. 10 papers were eliminated from the initial round due to their duplicate content.

Eligibility

For the third phase, the eligibility evaluation, 111 papers were collected. At this step, we ensured each article met the inclusion criteria and was pertinent to the ongoing study

by carefully reviewing its title and key points. 79 papers were excluded from the analysis because their titles were irrelevant, their abstracts did not pertain to the research issue, or both, or they were not related to the study's objectives based on empirical data. 22 articles were therefore retained for additional review (*Table 2*).

***Table 2**. The selection criterion in searching.*

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2022-2026	< 2022
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press

Data abstraction and analysis

An integrative analysis was employed as one of the study's evaluation techniques to examine and integrate several research approaches (quantitative, qualitative, and mixed methods). Finding pertinent subjects and subtopics was the aim of the competence study. The collection of data marked the start of the subject's development. *Figure 1* shows how the authors meticulously examined 22 papers to identify assertions or details relevant to the current study. The authors then evaluated current, pertinent research on the application of artificial intelligence for listening skills. All of the research methods employed are being investigated. Following that, they worked together to answer the research questions using the data within the study's framework. A log was maintained throughout the data analysis to record analyses, findings and other concepts relevant to interpreting the data. After comparing the results, the authors searched for patterns and differences in the theme design process. Final tweaks were made to the developed themes to ensure consistency. The analytical selection to determine the authenticity of the issues and editing parts by expert Mohd Feham Md Ghalib, an expert in educational technology and media in the field of education. The expert review process finds it easier to ensure that each subtheme is unique, significant, and relevant.

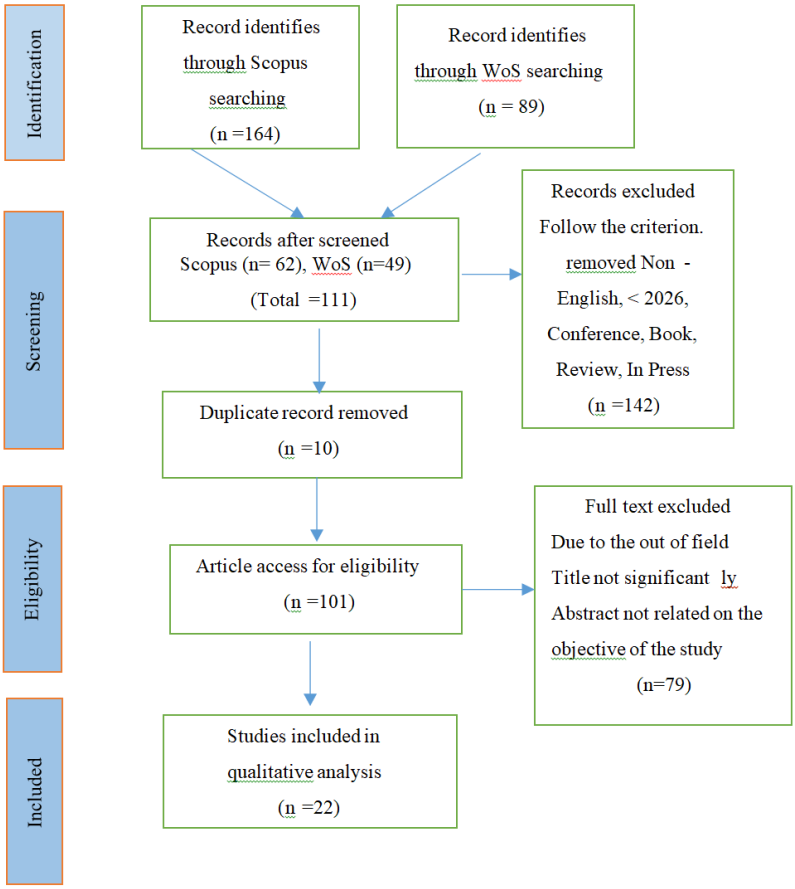

Figure 1. *Flow diagram of the proposed search study.*

Results and Discussion

We found 22 published papers from 111 in the recent years between 2022 and 2026 that were relevant to artificial intelligence for foreign language listening skill based on the search results. The results demonstrated how each examined work had a variety of aims and AI applicability. The research purpose, methodology, AI tools and impacts are presented in *Table 3*, which is a matrix of the investigations.

Table 3*. Summary of the selected studies.*

No	Study	Objective	Methodology	Sample	Findings
1	The Impact of Artificial Intelligence-Enhanced Mind Mapping on Second Language Learners' Listening Comprehension: Perspectives From Macau (Jiang et al., 2026)	To investigate the impact of ai-enhanced mind mapping on college students' english listening comprehension and their perceptions	Quantitative	41 First-Year English Learners Intermediate English Level University In Macau	Statistically significant improvements in listening comprehension
2	ChatGPT and the development of core language skills: An exploratory study of EFL college students (Al-Obaydi et al., 2025)	To explore the application of chatgpt, an advanced ai-powered chatbot, focusing on the development of core language skills speaking, reading, writing, listening, and	Quantitative	30 English As A Foreign Language College Students Iraq And Czech Republic	Students generally have positive attitudes toward using ChatGPT, finding it essential for developing their speaking (75%), listening (87%), and communication (75%)

		communication.			
3	A Study on the Innovation of Effective Mode of College English Listening Teaching Based on Swarm Intelligence Algorithm Computer Model (Sun, 2025)	To study effective english listening teaching mode in colleges and universities based on swarm intelligence algorithm, and develops a new efficient itemset mining (huim) algorithm-huim-spso	Quantitative	English Listening Skills Of College Students In China	Advantages of self-organization and adaptive iterative updating by simulating individual or group behaviour,
4	I am all ears: listening exams with AI and its traces on foreign language learners' mindsets, self-competence, resilience, and listening improveme nt (Abdellatif et al., 2024)	To explore the impacts of integrating ai-driven listening exams on foreign language learners' mindsets, self-competence, resilience, and listening skills among saudi arabian efl learners	Quantitative	57 Saudi Arabian EFL Learners	Exposure to AI-driven assessments showed significant enhancement in listening skills and reported improved self-competence, mindsets, and resilience.
5	The impact of AI-driven speech recognition on EFL listening comprehension, flow experience, and anxiety: a randomized controlled trial (Xiao, 2025)	This randomized controlled trial explored the effects of employing ai-driven methodologies on enhancing listening comprehension, flow experience, and alleviation of listening anxiety.	Quantitative	84 Chinese EFL University Students	The experimental group exhibited notable improvements in listening skill scorede creased levels of listening anxiety across all three assessment points. The control group showed moderate advancements marginal changes in listening anxiety over the same duration
6	The art of listening in the age of AI (Scudder, 2024)	To adopt a listening-centered approach to university instruction to subvert the dominant transmission model of education	Qualitative	Instructors In University	gives instructors the opportunity to listen to students' experiences and to learn about their needs and situations.
7	AI-enhanced informal digital learning of English: Effects on EFL students' cognitive, non-cognitive and oral proficiency skills (Ali, 2026)	To examine the effects of integrating artificial intelligence (ai) tools into informal digital learning of english (idle) to enhance cognitive and non-cognitive skills, as well as listening and speaking proficiency among english as a foreign language students	Mixed methods	120 Egyptian University Students	Significant advancements in cognitive skills, including the regulation of attitudinal needs, goal commitment, resource allocation and metacognitive skills AI-driven IDLE significantly enhanced speaking proficiency, listening skills showed more modest gains,
8	The synergy of generative AI and inquiry-based learning: transforming the landscape of English teaching and learning (Yeh, 2025)	To provide insights into how ai can enhance language teaching by personalizing content and supporting the development of communicative skills.	Qualitative	Thirteen In-Service Teachers	AI technologies empowered teachers to design interactive and adaptive learning materials and significantly improved students' listening and speaking skills.
9	AI-Enhanced PBL and Experiential Learning for Communication and Career Readiness: An Engineering Pilot Course(Mariño and Cabezuelo, 2025)	To implement the ai-pbl-clil model at universidad polit & eacute;cnica de madrid	Quantitative	120 Engineering Students At Universidad Polit & Eacute;Cnica De Madrid.	AI tools demonstrated superior performance compared to the control group in listening comprehension (98.79% vs. 90.22%) and conceptual understanding (95.82%

					vs. 84.23%).
10	Evaluating ChatGPT's Reliability in Second Language Acquisition (SLA): Insights on Language Skills and Technology's Role (Alhazmi and Muftah, 2025)	Explores the impact of chatgpt on enhancing english language skills such as grammar, vocabulary, writing, and comprehensive reading among virtual university, pakistan (vu) students.	Mixed methods	100 Students At Virtual University Of Abbottabad	Help learners in developing their reading, writing, speaking, and listening skills
11	The Effect Of Using Ai Applications To Develop Efl Listening Comprehension Skills Among University Students (Alrasheedi, 2024)	To determine how well university students' efl listening comprehe nsion skills may be developed by artificial intelligenc e (ai) technologies	Quantitative	First-Year Efl College Students	The experimental group students' EFL listening skills were enhanced using the Artificial Intelligenc e (chatbot and Duolingo)
12	The Effectiveness Of Artificial Intelligence In English Instruction For Speaking and Listening Skills: A Meta-Analysis (Jantakoon et al., 2025)	To examine the extent to which ai contributes to the development of english-speaking and listening skills	Quantitative	-	Need for further empirical studies in Arabic instruction to investigate its impact on listening comprehension
13	The Impact of AI-Supported Philosophy for Children (P4C) Activities on Primary School Students' Language and Thinking Skills (Cigerci and Cigdemir, 2025)	To investigate the effects of ai-supported philosophy for children (p4c) activities on the language and thinking skills of second-grade primary school students	Qualitative	Second-Grade Primary School Students	Students showed marked improvement in reading and listening over five weeks.
14	Evaluating AI-Generated Podcasts Versus Traditional Reading for Learning From Medical Articles: Protocol fora Mixed-Design Study Among Resident Physicians (Stadler et al., 2025)	This study aims to compare comprehension of medical research papers when learning via an ai-generated audio podcast versus traditional reading. This randomized trial will offer evidence on the effectiveness of ai-generated podcast summaries as a learning tool for medical literature.	Mixed methods	Physicians.	If listening to an AI-generated podcast yields comprehension comparable to or superior to reading the full article, it could validate an innovative, time-saving approach for busy medical trainees. If significant deficits are observed in the podcast group (especially for complex content), the findings will highlight the limitations of AI summaries and the continued importance of traditional reading for thorough understanding.
15	Unlocking the Impact of AI-Assisted Online Interactive Learning Environment in English Language Learning (Butarbutar et al., 2025)	To investigate the impact of online interactive learning environments (oile) integrated with ai technologies on students' english language learning (ell) skills, specifically focusing on reading, writing, speaking, and listening	Quantitative	EFL Learners	Potential of AI-assisted OILE to create engaging, interactive, and personalized learning environments that foster active participation.The data revealed notable enhancements listening comprehension , pronunciation accuracy.

16	Interactive system based on artificial intelligence and robotic arm to enhance Arabic sign language learning in deaf children (Nedjar and M'hamedi, 2024)	This paper introduces rsa, an interactive system designed for the recognition and simulation of letters in arabic sign language	Quantitative	Deaf Children	The system holds promising improvement in enhancing the acquisition of Arabic sign language skills for deaf children.
17	Effectiveness of Artificial Intelligence (AI) in language teaching (Torres and Kahveci, 2025)	This study examines the effectiveness of artificial intelligenc e (ai) in language teaching, particularly in english as a foreign language (efl) classrooms	Quantitative	EFL Learners	AI is more effective in face-to-face and blended settings than in fully online classrooms. AI is particularly effective for younger K-12 learners, suggesting tools are pedagogically optimized for foundational language learning
18	A Virtual Partner for Practising Speaking Arabic: ChatGPT (Tanir, 2025)	To study the potential capabilities of chatgpt in terms of arabic pronunciation, grammar, and vocabulary	Quantitative	Arabic Students	AI tools can simulate real-life conversational contexts and adapt to the user's responses, helping students become more engaged and personalized learning experiences. AI-supported educational tools present significant opportunities for teaching a rich and complex language such as Arabic
19	How Effective Is SUNO.AI In Enhancing Arabic Listening Skills? An Evaluation Of AI-Based Personalized Learning (Hijriyah et al., 2025)	Evaluates the effectiveness of suno.ai, an artificial intelligence (ai)-based learning platform, in enhancing arabic listening skills among	Quantitative Research And Development (R&D)	Second-semester students at the state islamic university of raden intan lampung.	Significant improvement in students' listening skills, with a 25% increase in post-test scores SUNO.AI can significantly enhance listening comprehension by offering adaptive learning experiences
20	Utilizing ELSA Speak And Busuu Apps To Enhance English For Professional Purposes Among Indian Students: An Education 4.0 Approach (Sri Dhivya et al., 2024)	To enhance professional english communication among students using the education 4.0 applications Elsa Speak and Busuu	Quantitative	Virudunagar district of Tamil Nadu, India	Significant improvement in the participants' listening, speaking, reading, and writing skills before and after the intervention
21	AI Integration In Pronunciation Instruction: Insights From Secondary School EFL Teachers (Chung, 2025)	Investigates vietnamese secondary school english as a foreign language (efl) teachers' beliefs about ai integration in english pronunciation teaching	Qualitative	24 EFL Teachers (four teachers per group) from three Vietnamese Secondary Schools	Teachers held both positive and negative beliefs regarding using ai in pronunciation. More engaging pronunciation activities enhanced support in communicative pronunciation tasks
22	Designing a Smart Voice Assistant Based on Artificial Intelligence to Develop Listening and Speaking Skills in English for Elementary School Students (Alqarni and Alhramelah, 2025)	Develop an AI-based smart voice assistant to enhance elementary students' English listening and speaking skills	Quantitative	Elementary school students	Smart voice assistants based on artificial intelligence significantly improved students' English listening and speaking skills.

RQ1: What research methodologies have been involved in the previous studies?

A systematic review of 111 studies from Scopus and Web of Science reveals that previous studies have used three primary research methodologies: qualitative, quantitative, and mixed methods. The overall methodological distribution indicates a clear dominance of quantitative studies, followed by mixed-method and qualitative designs. This pattern reflects a strong emphasis on measuring the effectiveness of artificial intelligence (AI) tools for language learning. Specifically, in enhancing listening skills, while still acknowledging the importance of understanding learners' experiences and contextual factors. Quantitative approaches were the most frequently employed, with many studies adopting experimental or quasi-experimental designs, such as pre- and post-tests, to evaluate the impact of AI-based tools on learners' listening performance. These studies often utilised structured instruments, including tests and questionnaires, to generate statistically significant and generalisable findings (Hijriyah et al., 2025). However, despite their strengths in providing objective and measurable outcomes, many studies were limited to short-term interventions, focusing primarily on immediate improvements rather than long-term learning sustainability.

Mixed-method studies also represented a substantial proportion of the reviewed literature. These studies combined quantitative data, such as survey results and test scores, with qualitative insights derived from interviews or open-ended responses. This integration enabled a more comprehensive understanding of both the effectiveness of AI tools and learners' and educators' perceptions, challenges, and experiences (Ali, 2026; Alhazmi and Muftah, 2025). The use of mixed methods contributed to greater validity through triangulation, although such designs were not consistently applied across all studies. In contrast, qualitative approaches were less dominant but still significant in exploring the complexities of AI integration in language education. These studies typically employed interviews, case studies, and thematic analysis to investigate learners' difficulties, engagement, and attitudes towards AI-supported learning environments (Yeh, 2025; Abdellatif et al., 2024; Scudder, 2024). While qualitative findings provided rich, in-depth insights, they were often constrained by small sample sizes and limited generalisability. Across the reviewed studies, several methodological limitations were identified. A considerable number of studies relied on short-term experimental or cross-sectional designs, which primarily captured immediate learning outcomes but did not address long-term effects. Furthermore, there was a noticeable lack of longitudinal and design-based research approaches, particularly those that systematically develop and evaluate instructional interventions over time. This gap is especially evident in studies focusing on AI-assisted development of listening skills.

Overall, the findings highlight a methodological imbalance in the existing literature. While quantitative studies dominate in assessing effectiveness, and qualitative approaches offer promising integrative insights, there remains a limited application of longitudinal and mixed method methodologies. This suggests a critical need for future research to adopt more comprehensive and rigorous designs, particularly those that integrate mixed-methods and longitudinal approaches, to better understand the effectiveness and sustainability of AI integration in language education.

RQ2: What are the characteristics of participants (samples) that have been employed in previous studies on the use of artificial intelligence in developing listening skills?

The analysis of studies indexed in Web of Science (WoS) and Scopus (2022–2026) reveals a clear highlight of AI-based listening skill research within specific geographical and educational contexts, involves studies in China, alongside selected studies from Southeast Asia, the Middle East, and Europe (Jiang, et al., 2026; Al-Obaydi et al., 2025; Sun, 2025). Across these contexts, the dominant focus remains on English as a Foreign Language (EFL), with participants largely comprising university-level learners at intermediate proficiency levels and possessing relatively high digital literacy, selected through convenience sampling in technology-rich environments(Jiang et al., 2026; Chung, 2025; Xiao, 2025). However, it raises concerns about the representativeness of the samples, as it limits diversity in educational levels, linguistic backgrounds, and learner needs. Consequently, the findings derived from these studies may be context-specific and not easily generalizable to broader or more varied learning populations. This trend highlights a lack of diversity in participant characteristics, particularly in relation to linguistic context, educational background, and access to digital resources. Notably, there is a very limited study of non-English language contexts, especially Arabic, Mandarin, Malay and other foreign languages, French and Korean, as well as learners from primary, secondary, and low-access technology educational settings. This imbalance points to a critical empirical gap in terms of population diversity and linguistic representation in the development of AI research for listening skill acquisition.

Furthermore, the alignment between participant characteristics and pedagogical frameworks remains insufficiently addressed in existing studies. Most research is conducted over short-term periods and primarily focuses on immediate learning outcomes, which may not accurately reflect long-term listening skill development. Given that listening is a complex and cognitively demanding skill, short-term improvements observed among intermediate learners may not translate into sustained proficiency gains. The lack of diversity in participant profiles, combined with limited consideration of instructional design and learning theories, suggests that current findings may overestimate the effectiveness of AI tools. Therefore, future research should prioritise more diverse and representative samples, there is also a need for longitudinal research designs that can better capture long-term learning outcomes. Importantly, future studies should ensure stronger alignment between AI technologies and pedagogically grounded frameworks to enhance both the validity and practical applicability of findings in AI-supported listening skill development.

RQ3: What are the impacts of artificial intelligence on listening skill instructions and learning outcomes?

Previous studies indicate that the use of artificial intelligence in language learning has generally had positive effects on learners' performance, motivation, and engagement. AI-based applications support personalised and self-paced learning by providing immediate feedback and adaptive learning pathways. These features contribute to improved learning experiences and increased learner autonomy. The evolution of AI tools has shifted from traditional speech recognition systems to more advanced generative AI technologies, such as AI-generated audio and conversational agents, highlighting a growing emphasis on personalisation and content generation. The analysis of previous studies indicates that listening skill research primarily focuses on basic listening comprehension, particularly the ability to understand main ideas and specific details. AI-based applications are commonly used to support pronunciation

recognition and interactive listening through conversational tools. Vocabulary development is also addressed within listening contexts(Jiang et al., 2026).

However, higher-order listening skills, such as active and critical listening, remain largely underexplored. In addition, aspects such as listening fluency and real-time processing are rarely examined. This suggests that existing studies emphasise the technical and functional aspects of listening rather than its cognitive and interpretive dimensions. The analysis reveals that various AI tools, including conversational agents, speech recognition systems, intelligent tutoring systems, and AI-enhanced multimedia platforms, have been widely applied in listening skill studies(Alhazmi and Muftah, 2025; Jantakoon et al., 2025). While these tools demonstrate positive impacts on learners' comprehension, engagement, and motivation, they are often implemented in isolation rather than within a structured instructional design framework. This highlights the need for integrated approaches that combine multiple AI tools to support the development of listening skills more effectively.

Future studies should focus on developing learning environments that promote deeper cognitive processing and authentic listening experiences. Overall, while AI shows strong potential to enhance language learning, the current body of research remains inconclusive due to methodological limitations. These include the dominance remaining limited by short-term interventions, fragmented use of AI tools, and the absence of a comprehensive instructional design framework, particularly in the context of Arabic language learning. Despite the promising impacts reported, there is no instructional design-based model or module to serve as a guideline and evidence for the sustained effectiveness of AI in language learning. Future research should focus on design and development methodologies and empirical evidence to provide more conclusive insights into the sustained impact of AI on language learning.

Conclusion

This study conducted a systematic literature review analysing 22 selected publications published between 2022 and 2026 to examine the application of artificial intelligence (AI) in developing foreign-language listening skills. The findings reveal that existing studies primarily address listening comprehension in language education, and artificial intelligence in listening skills remains underexplored. There are significant and positive outcomes from previous studies; the available evidence generally demonstrates positive impacts on learners' listening performance, engagement, and learning experiences. The findings highlight the importance of continued exploration and development to effectively implement artificial intelligence in foreign languages. From a pedagogical standpoint, this review underscores the urgent need for structured instructional design frameworks that integrate AI tools meaningfully into listening skill instruction, particularly for non-English languages such as Arabic. Educators and curriculum developers are encouraged to move beyond isolated AI tool usage and adopt theoretically grounded, design-based approaches that support sustained listening skill development. Policymakers should consider investing in teacher readiness programmes and ethical AI literacy to ensure responsible and effective implementation across diverse language learning contexts.

This study has some limitations that present opportunities for further investigation. First, the scope of this review was limited to the Web of Science (WoS) and Scopus databases, potentially excluding relevant research from other sources. Second, this

review focused specifically on AI applications in listening skills, which may not fully reflect the broader landscape of language learning research. Third, the selected studies were conducted in English language learning contexts, thereby limiting the generalizability of the findings to other languages and cultural settings. This indicates a need for more diverse, context-sensitive research in AI-assisted listening instruction. Moreover, selected publications were limited to 2022-2026, and the increasing volume of articles and rapid growth in this field made it challenging to conduct continuous searching. The criteria used to select publications may have excluded relevant studies published in other sources. Given the limitations identified, future research should broaden the scope of artificial intelligence to include other languages beyond English, such as Arabic, Mandarin, French, and Korean, and extend focus to speaking, reading, and writing skills. Future studies should investigate whether teachers and educators integrate AI as part of structured courses with an established pedagogical framework. Longitudinal and design-based research approaches are particularly needed to capture sustained learning outcomes and to develop evidence-based instructional models for AI-enhanced language education.

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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