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| RESEARCH ARTICLE

Does AI-assisted Instruction Facilitate Listening and Speaking in Junior High EFL Classrooms?

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| ABSTRACT
This review examines studies published between 2018 and 2024 to assess how Artificial Intelligence (AI) has shaped listening and speaking instruction in junior high English as a Foreign Language (EFL) classrooms. Based on an analysis of 59 empirical studies across varied educational contexts, the review addresses two key questions: (1) What are the common learning outcomes associated with AI-supported instruction? and (2) What are the challenges of integrating AI into EFL teaching? The findings highlight three main areas of impact: improved pronunciation and speaking fluency through speech recognition technologies, greater learner engagement driven by gamified and adaptive tools, and the development of digital literacy skills. Despite these, several limitations persist, including the dominance of short-term studies, cultural and regional bias, a strong urban focus, and a general lack of teacher training. The review also underscores concerns around cultural and linguistic biases in AI systems, particularly regarding speech recognition.

| KEYWORDS
Artificial Intelligence; AI-assisted; Listening and speaking; EFL.

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1. Introduction

Artificial Intelligence (AI) has demonstrated significant potential in the instruction of English as a Foreign Language (Hong,2023). In conventional EFL classrooms, students usually don't have a lot of opportunities to interact frequently with teachers, and they only receive limited feedback. Therefore, the preferred personalized or tailored instruction cannot be fully applied, and teachers often fail to meet diverse learner needs (Zhang & Han, 2021; Liu, 2022). However, the emergence of AI tools, especially software that focuses on speech recognition and virtual speaking partners, can help address some of these issues. Through AI assistance, learners are empowered with freedom and courage to solve language problems by themselves, making the process of learning foreign languages more interactive and engaging. Thereby, easing the anxiety many students feel when speaking (Haristiani, 2019; Ru, 2024).

Despite growing interest in AI-assisted language learning, little is known about students' needs and their use of AI tools in junior high school contexts. Much of the research has focused on students at university-level or adults, however, studies on adolescents, a large group of learners who are undergoing rapid cognitive, social, and emotional development, have received far less attention (Demartini et al., 2024; Yu et al., 2022).

In this study, we focused on two key issues regarding the role of AI-assisted listening and speaking instruction for junior high EFL learners. First, we explored the common learning outcomes emerging from AI-supported listening and speaking activities in

junior high EFL settings. Second, we demonstrated the challenges, i.e., technical and pedagogical complexities, involved in integrating AI tools into EFL instruction.

2. Methods

We examined a range of studies published between January 2018 and May 2024 to get a current picture of how AI is being used to support listening and speaking in junior high EFL classrooms. Studies were pulled from eight major databases, covering both international and Chinese-language sources. Databases included Web of Science (WoS), Scopus, ERIC, IEEE Xplore, ProQuest, PsycINFO, China National Knowledge Infrastructure (CNKI), and Wanfang Database. Search terms were adapted for each database using Boolean operators and adjusted to fit different language conventions, e.g., ("Artificial Intelligence" OR "AI") AND ("EFL" OR "English as a Foreign Language"), ("listening-speaking" OR "oral proficiency") AND ("junior high school" OR "middle school"), (人工智能 AND 初中英语 AND 听说教学).

The search result initially turned up 1,243 articles. To be included in this review, studies had to meet several criteria. First, they needed to be empirical in nature, whether quantitative, qualitative, or mixed-methods, and report measurable outcomes related to the use of AI tools in junior high EFL settings. The focus had to be on learners aged 12 to 15 who were studying English as a foreign language. Each study also had to clearly describe the AI-based intervention it used, such as speech recognition tools or virtual chatbots. Only peer-reviewed journal articles and conference papers were considered. On the other hand, studies were excluded if they were non-empirical (such as theoretical papers or conference papers), focused on university or adult learners or lacked full-text access or complete data. After removing duplicates and studies that did not meet the criteria, 412 articles were left for screening based on their titles and abstracts.

To take a closer look at how AI is being used in junior high school EFL listening and speaking instruction, we followed a qualitative content analysis approach. The analysis was based on a close, manual review of empirical studies that were then coded by theme. For every study, the following details were recorded: a). Article number, title, and citation; b). Main research topic and background; c). Methodology and research design; d). Specific AI tools used (such as chatbots, speech recognition, or feedback systems); e). Key findings (e.g., impacts on pronunciation, interaction, motivation). Each study was read closely and annotated to identify patterns and recurring topic. In total, fifty-nine empirical studies were selected for in-depth analysis, along with 2 additional papers that provided useful theoretical or contextual background.

3. Effects of AI in Junior High EFL Listening-Speaking Instruction

Among the selected studies, three common themes were related to the impact of AI on listening and speaking instruction in junior high EFL classrooms, which are improved language skills, particularly in listening and speaking; enhanced student engagement and self-directed motivation; and the development of digital literacy, respectively.

3.1 Improving Listening and Speaking Skills with AI

It was reported repeatedly that AI-powered tools have made a noticeable impact on students' listening and speaking abilities, particularly through speech recognition technologies that provide real-time corrective feedback.

Studies consistently showed that apps like ELSA Speak, Duolingo, and similar platforms helped learners improve their pronunciation, fluency, and overall phonological accuracy. For example, Wei (2023) found that speech recognition tools helped reduce pronunciation errors. Compared with students in traditional classrooms, those who use AI-supported voice recognition tools reduced 41% errors in segmental pronunciation. For adaptive AI platforms that adjust task difficulty based on individual progress, it was found that students achieved a 29% improvement in speech proficiency scores (Junaidi, 2020).
Additionally, AI-based activities such as virtual role-plays, rather than live performance, improve oral proficiency by creating more authentic language learning experiences. Studies found that AI-assisted learning allowed students to practice language in more meaningful, real-world scenarios (Jiang et al., 2024; Sun, 2022).

However, there is also inconsistency regarding the accuracy of AI speech recognition tools. Data vary in terms of the accuracy of voice recognition across different accents. For example, while a study on ELSA Speak revealed that Mandarin pronunciation could be processed at an accuracy rate of 92%, its accuracy dropped to 77% when tested with speakers using a dialect. Similarly, the speech recognition in Duolingo showed an 88% accuracy with standard accents but only 63% when dealing with rural dialects. Therefore, the accent bias demonstrated in AI speech tools call for more culturally inclusive design so that these technologies can better support students from diverse linguistic backgrounds (Ru, 2024).

3.2 Learner Engagement and Self-Directed Motivation

AI tools have shown strong potential in boosting student engagement and motivation (Ali et al., 2023), particularly through gamified features and adaptive learning functions. Students could adjust task complexity in real time, e.g., adjusting listening speed, thereby ensuring appropriately challenging input and staying engaged without becoming frustrated or giving up. Studies by Hadian et al. (2023) and Yu & Yao (2024) found that platforms like Duolingo, which adjust task difficulty based on individual performance, help maintain students' interest by matching activities to their current skill level. After AI tools were introduced, task completion rates rose by 30%, and the amount of time students spent on the platform each week increased by 68%. This supports earlier findings by Liu (2020), who noted that students often extended their practice time by 20 to 30 minutes just to earn in-app rewards.

Students using AI-enhanced systems showed much higher levels of engagement than those in traditional settings. The groups using AI tools had an average engagement score of 16.8, compared to 10.8 in the control group, highlighting the motivating power of gamified features in online learning (Hadian et al., 2023). Interactive activities also saw a sharp rise, up by 87.5%, when features like badges and leaderboards were introduced (Yu & Yao, 2024). Moreover, Vadivel et al. (2023) found that gamified features help improve students' motivation and willingness to practice independently by reducing their cognitive load. Xu (2020) reported a 58% drop in speaking anxiety because of the gamified features embedded in AI tools, suggesting that game-like rewards could lower the psychological pressure of participation. Similarly, Xu (2020) showed that gamified elements and adaptive features also significantly boosted student engagement and motivation.

However, Lai et al. (2022) point out that too much focus on extrinsic rewards may actually weaken students' intrinsic motivation in the long run, as evidenced by Hadian et al.'s (2023) findings, in which students using non-gamified tools showed only minimal improvement in engagement (10.2%).

3.3 Building Digital Literacy

Beyond improving language skills, AI tools also play a crucial role in helping students build digital literacy, including learning how to interact with digital tools, working collaboratively with others online, and thinking critically about the information they encounter. For example, a study by Baskara (2023) found that students who engaged with AI tools (e.g., ChatGPT) demonstrated a 32% improvement in their ability to critically evaluate the truth of online information, in comparison with those who did not apply such tools. This suggests that exposing to AI-assisted interactions can enhance students' critical thinking ability and information literacy, which are key elements of digital literacy in the 21st century.

Moreover, AI-driven immersive technology like augmented reality (AR) and virtual reality (VR) has also shown evidence in supporting students' digital multimodal composition skills. In a study conducted by Cui et al. (2023), junior high school students who used AI-assisted VR storytelling platforms significantly outperformed their peers in traditional classrooms by 40% on assignments of synthesizing visual and written elements. Therefore, these tools have enabled students with more creativity, technical fluency, and cross-modal communication skills.

Taken together, these findings indicate that AI technologies could facilitate students' digital literacy by not only having shaped how they learn languages but having broadened the scope of digital competencies, skills that are becoming more important for academic success and future workplace requirements.

4. Limitations and Conclusion

In this review, we synthesized findings from 59 empirical studies published between 2018 and 2024 to explore the role of AI tools in junior high EFL listening and speaking instruction. Our study found three key outcomes in this regard, including improved phonological accuracy and speaking fluency through speech recognition technologies, greater learner engagement and self-motivation driven by gamified and adaptive tools, and the development of digital literacy skills, such as navigating online content and critically assessing information.

Despite these encouraging trends, several limitations persist. The overwhelming majority of studies reviewed were short-term, lasting 12 weeks or less, leaving open questions about the sustainable impact of AI on learners' language development. Without longer-term studies, it remains unclear whether the benefits of AI use are durable or whether issues like overreliance and diminished self-regulated learning could emerge over time (Bin & Mandal, 2019). Future research should therefore adopt longitudinal approaches to better understand how AI affects language learning in the long run.

The second concern is the issue of cultural and regional bias within AI systems, e.g., the recognition accuracy regarding standard accents vias dialect, which can affect the learning experience for students from diverse linguistic backgrounds (An et al., 2023).

Since some AI systems are developed with language-specific models that can limit their effectiveness in other cultural settings, future design should focus on more culturally relevant and locally adapted content.

Another concern is the geographic concentration of current research. Most studies were conducted in urban areas with rich resources, with limited attention to rural or underrepresented contexts. This urban bias could bring risks overlooking the challenges that learners in less connected regions face, especially in relation to limited infrastructure and AI tools' poor recognition of regional accents.

To effectively integrate AI tools in junior high EFL classrooms, besides teacher training, frameworks like AI-TPACK (Technology, Pedagogy, and Content Knowledge) can be helpful. Second, developers are also suggested to design culturally responsive AI platforms that are adaptable to diverse linguistic and cultural settings.

In sum, while AI holds strong potential for transforming junior high EFL instruction, its impact will depend on how thoughtfully it is implemented, how inclusively it is designed, and how rigorously it is studied.

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