

RESEARCH ARTICLE**Artificial Intelligence and English Listening Skills: An Empirical Study of EFL Learners**

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Abstract:

Listening comprehension is a fundamental component of English language proficiency and plays an important role in academic, professional, and social communication. However, English as a Foreign Language (EFL) learners frequently experience difficulties in understanding spoken English because of unfamiliar accents, rapid speech, limited vocabulary, connected speech, pronunciation variations, and insufficient exposure to authentic listening materials. The emergence of Artificial Intelligence (AI) has introduced new possibilities for supporting English listening development through speech-recognition systems, intelligent tutoring applications, AI-powered language-learning platforms, conversational agents, and generative AI tools. This empirical study examines the potential effectiveness of AI-assisted learning in improving English listening skills among EFL learners. The study proposes a pre-test and post-test research design in which undergraduate EFL learners participate in AI-supported listening activities involving authentic audio materials, interactive comprehension tasks, vocabulary support, and automated feedback. Listening performance can be measured through standardized or researcher-developed comprehension tests before and after the intervention. The study also considers learner perceptions regarding motivation, confidence, engagement, and usefulness of AI-based listening activities. The proposed study is expected to provide evidence concerning the role of AI in enhancing listening comprehension and learner autonomy. The findings may contribute to the development of technology-enhanced English language pedagogy and provide practical recommendations for integrating AI into EFL listening instruction.

Keywords: Artificial Intelligence, English listening, EFL learners, AI-assisted language learning, listening comprehension, speech recognition, language education

1. Introduction

Listening is one of the most frequently used language skills in everyday communication. In academic contexts, students need to understand lectures, presentations, discussions, interviews, and multimedia materials. In professional contexts, effective listening is necessary for meetings, instructions, workplace conversations, and communication with colleagues and clients.

Despite its importance, listening comprehension is often difficult for EFL learners. Unlike written language, spoken language occurs rapidly and cannot always be processed at the learner's preferred speed. Learners may have difficulty recognizing familiar words when they are pronounced within connected speech. Differences in accent, intonation, rhythm, and speech rate can further increase comprehension difficulties.

Traditional listening instruction generally includes audio recordings, comprehension questions,

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vocabulary exercises, and teacher explanations. Although these methods are valuable, students may have limited opportunities for individualized practice. Artificial Intelligence offers new possibilities for addressing these limitations. AI-powered language-learning systems can provide adaptive listening activities, speech recognition, automated feedback, vocabulary assistance, transcripts, and interactive conversations. Learners can repeat listening activities and receive assistance according to their individual needs.

The present empirical study focuses on the effectiveness of AI-assisted learning in developing English listening skills among EFL learners.

2. Objectives of the Study

The study aims to:

1. examine the effectiveness of AI-assisted activities in improving English listening comprehension among EFL learners;
2. identify changes in learners' listening performance after AI-supported instruction;
3. examine learners' perceptions of AI-assisted listening activities;
4. investigate whether AI-supported practice increases learner confidence and engagement.

3. Research Questions

The study addresses the following research questions:

1. Does AI-assisted instruction improve English listening comprehension among EFL learners?
2. What changes occur in learners' listening performance following AI-supported practice?
3. How do EFL learners perceive the usefulness of AI-based listening activities?
4. Does AI-assisted listening practice influence learners' confidence and motivation?

4. Methodology**4.1 Research Design**

A quasi-experimental pre-test and post-test design can be employed. The participants can be undergraduate students learning English as a Foreign Language.

A suitable design may involve an experimental group receiving AI-assisted listening instruction and, where feasible, a control group receiving conventional listening instruction.

4.2 Participants

The study may involve undergraduate EFL learners from a higher education institution. Participants should be selected based on clearly defined inclusion criteria, such as comparable English proficiency and regular participation in English language courses.

The final paper should report the actual number of participants, academic discipline, age range, proficiency level, and demographic characteristics.

4.3 AI-Assisted Intervention

The intervention can be conducted over a defined period, such as six to eight weeks.

AI-supported activities may include:

- AI-generated listening comprehension questions;
- speech-recognition exercises;
- interactive listening dialogues;
- vocabulary clarification;
- transcript analysis;
- pronunciation and accent exposure;
- AI-generated summaries;

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- conversational listening tasks.

Learners can listen to short English passages and respond to comprehension questions. AI tools can subsequently provide immediate feedback and explanations.

4.4 Research Instruments

The study can employ three major instruments.

Listening Comprehension Test: A pre-test and post-test can be used to measure learners' listening performance.

Learner Questionnaire: A Likert-scale questionnaire can examine students' perceptions of AI-assisted listening activities.

Interview or Open-Ended Responses: Selected learners can provide qualitative feedback concerning their experiences.

5. Data Collection Procedure

The study can begin with a pre-test designed to establish participants' initial listening comprehension levels.

Following the pre-test, the experimental group participates in AI-supported listening activities. Students listen to selected materials and complete comprehension tasks using AI-based tools.

Activities can gradually increase in complexity. Initial activities may focus on identifying key information, while later activities may require inference, summarization, and critical interpretation. At the end of the intervention, participants complete a post-test comparable to the pre-test. A questionnaire can also be administered to examine learner perceptions. Where interviews are included, selected participants can discuss the advantages and challenges they experienced during AI-assisted learning.

6. Data Analysis

Quantitative data from listening tests can be analysed using descriptive and inferential statistics.

Possible statistical measures include:

- mean;
- standard deviation;
- percentage improvement;
- paired-sample t-test;
- independent-sample t-test, where appropriate;
- effect size.

If an experimental and control group are used, their pre-test and post-test performances can be compared.

Questionnaire responses can be analysed using descriptive statistics, while qualitative responses can be examined thematically. Importantly, the final manuscript should report only the statistics obtained from the actual study.

7. Results and Discussion

The results section should present the actual pre-test and post-test findings after data collection.

A suitable presentation can include a comparison of mean listening scores before and after the intervention. If the post-test scores are substantially higher than the pre-test scores and statistical analysis confirms significance, the findings would provide evidence supporting the effectiveness of AI-assisted listening instruction.

The discussion should consider possible explanations for improvement. AI-supported learning may

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provide learners with greater exposure to spoken English, repeated listening opportunities, immediate feedback, and individualized support. These features can help learners identify unfamiliar vocabulary, recognize speech patterns, and develop strategies for understanding spoken English.

Learner questionnaire responses may also reveal increased motivation and confidence. AI tools can provide learners with opportunities to practise independently without the pressure of performing immediately in front of classmates.

However, AI should not be considered a complete substitute for teachers. Listening comprehension involves interpreting accents, emotions, cultural references, pragmatic meanings, and authentic interaction. Teacher guidance remains important in helping learners interpret difficult material and develop effective listening strategies.

8. Challenges

Several challenges should be considered when implementing AI-assisted listening instruction. First, AI speech-recognition systems may not accurately recognize every accent or variety of English. Second, AI-generated explanations may occasionally contain errors. Third, students may become dependent on transcripts or automatic translations rather than developing independent listening abilities. Privacy is another important issue when learners use voice-based AI systems. Institutions should establish appropriate guidelines concerning data protection and responsible technology use. Access to appropriate devices and internet connectivity may also influence students' ability to participate in AI-supported learning.

9. Pedagogical Implications

The study has several implications for English language teaching.

AI can extend listening practice beyond classroom hours and provide learners with individualized opportunities for repeated exposure.

Teachers can use AI to create differentiated listening activities according to proficiency level. Beginners can receive slower speech and vocabulary support, while advanced learners can work with authentic lectures, interviews, and discussions.

AI can also support formative assessment by identifying areas where students experience difficulty. However, classroom activities should continue to include authentic human communication. AI-supported listening should therefore be integrated into a broader communicative language-learning framework.

10. Conclusion

Artificial Intelligence has significant potential to support the development of English listening skills among EFL learners. AI-powered tools can provide adaptive listening materials, repeated practice, immediate feedback, vocabulary assistance, transcripts, and interactive communication opportunities.

An empirical investigation using pre-test and post-test measures can provide valuable evidence regarding the effectiveness of AI-assisted listening instruction. In addition to listening performance, learner motivation, confidence, and perceptions should be examined to obtain a comprehensive understanding of the educational value of AI.

The effectiveness of AI ultimately depends on appropriate pedagogical integration. AI should function as a supportive learning resource rather than a replacement for teachers or authentic human interaction. A

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blended approach combining AI-supported practice, teacher guidance, peer interaction, and authentic listening materials may provide the strongest learning environment.

Future empirical research should therefore investigate the long-term effects of AI-assisted listening, differences across proficiency levels, the influence of different AI technologies, and the extent to which improvements in AI-supported practice transfer to real-world English communication.

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