The Effectiveness of Artificial Intelligence Tools in Enhancing Listening Skills among Omani EFL 12th Graders: A Quasi-Experimental Study

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Abstract:

This study explores the impact of Artificial Intelligence (AI) tools on improving 12th graders English listening skills in Oman. The research followed the quasi-experimental approach. There were two groups, one experimental and the other control group, each group has a number of 32 students. AI tools such as Text Blaze, Loom and Otter.ai, were employed in a structured eight-week intervention program focusing on four listening comprehension skills namely: getting the main idea from a listening text, answering detailed questions, recognizing the meaning of frequent words, and respond to different types of questions in a discourse. The findings revealed statistically significant improvements in students' listening skills, with notable increases in scores across all skill areas. The study recommends incorporating AI applications into educational curricula to support listening skills. Furthermore, it emphasizes the need for continuous training for educators to effectively implement AI tools and suggests further research into AI's long-term impact on other language skills.

Key Words: Artificial intelligence (AI) tools – listening skills – EFL classes.

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فعالية أدوات الذكاء الاصطناعي في تعزيز مهارات الاستماع لدى طلاب الصف الثاني عشر العمانيين الذين يدرسون اللغة الإنجليزية كلغة أجنبية: دراسة شبه تجريبية*

ملخص الدراسة:

تهدف هذه الدراسة الى قياس أثر أدوات الذكاء الاصطناعي (AI) في تحسين مهارات الاستماع باللغة الإنجليزية لدى طلاب الصف الثاني عشر في سلطنة عُمان . وقد اتبعت الدراسة المنهج شبه التجريبي، حيث تم تقسيم الطلبة إلى مجموعتين: مجموعة تجريبية ومجموعة ضابطة، يبلغ عدد الطلبة في كل مجموعة ٣٢ طالبًا .تم استخدام أدوات ذكاء اصطناعي مثل Text Blaze و Loom و Otter.ai في برنامج كانت مدته ثمانية أسابيع، ركز على أربع مهارات في فهم مهارة الاستماع، وهي: استخراج الفكرة الرئيسية من نص استماع، والإجابة على أسئلة مفصلة، وفهم معنى الكلمات الشائعة، والرد على أنواع مختلفة من الأسئلة في خطاب معين .وكشفت النتائج عن تحسن ذات دلالة إحصائية في مهارات الاستماع لدى الطلبة، مع زيادة ملحوظة في الدرجات عبر جميع مجالات المهارة. وتوصي الدراسة بإدراج تطبيقات الذكاء الاصطناعي في المناهج الدراسية لدعم مهارات الاستماع .علاوة على ذلك، تُشدد الدراسة على ضرورة التدريب المستمر للمعلمين على استخدام أدوات الذكاء الاصطناعي بكفاءة، وتقترح إجراء المزيد من البحوث حول الأثر طويل الأمد للذكاء الاصطناعي على مهارات اللغة الأخرى.

كلمات مفتاحية: أدوات الذكاء الاصطناعي – مهارة الاستماع – صفوف تدريس اللغة الإنجليزية.

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Introduction:

Listening is a foundational receptive skill in language acquisition, preceding other skills in natural language development and crucial for near-constant use. Difficulties in listening comprehension stem from four interconnected factors: the message itself, the speaker's delivery, the listener's cognitive processes, and the surrounding environment. Furthermore, ineffective teaching methodologies and a scarcity of appropriate materials contribute to poor listening proficiency.

Research suggests that AI tools use, CALL, multimedia resources, internet access, and interactive whiteboards significantly improve listening comprehension. These technologies provide access to authentic language materials and foster learner autonomy within meaningful contexts.

The advent of fifth-generation computing and advancements in artificial intelligence (AI) have led to the development of intelligent learning tools. AI, defined as the machine simulation of human intelligence processes (learning, reasoning, and self-correction), offers potential applications for enhancing listening practice through interactive and adaptive learning systems.

Several students still have low abilities in English language learning. They often read texts word by word without understanding the meaning or identifying the main idea of the passage. Teachers often neglect the listening skills and ask students to read texts in turns and out loud, focusing on pronunciation rather than comprehension. This method teaches pronunciation but does not help with understanding the text itself. Moreover, students face three common difficulties in comprehension: 1) issues with decoding, 2) poor comprehension, and 3) slow reading speed, (Almaashani et al., 2023 and Aladini et al., 2024a)

Meanwhile; the Omani ministry of Education emphasizes providing educational materials, audio resources, practice activities, and print-based exercises to create an interactive learning experience that diverges from routine classroom activities and enriches the learning environment, fostering more engaging and realistic learning. The ministry continually strives to align learning outcomes with the demands of the rapidly

changing job market and technological advancements (Omani official curriculum design document 2010)

The problem of the study:

Effective listening comprehension is a critical component of second language acquisition. However, anecdotal evidence from the researchers' experience in EFL teaching and school supervision suggests a widespread neglect of listening skills instruction in many contexts. This pedagogical oversight is particularly prevalent in Arab countries, where listening is often marginalized in favor of reading, writing, and grammar instruction, potentially due to perceived difficulties in comprehension for EFL learners. Furthermore, the absence of listening components in many standardized assessments may further contribute to this neglect. While the Omani Ministry of Education incorporates listening assessments, students frequently struggle with comprehension due to limited exposure to authentic English audio materials and the constraints of a 45-minute, five-times-a-week instructional schedule. This limited exposure highlights the need for enhanced pedagogical approaches to address listening comprehension challenges in EFL contexts.

The questions of the study:

1. Are there statistically significant differences at ≤ 5.0 in the mean scores the post application of the listening skills test between experimental and control group?
2. Is using AI tools in English language teaching effective in developing the listening skills of twelfth graders, according to the adjusted Black Modified Gain Ratio?

Literature review:

Concept of listening skills:

Listening is a fundamental, if not the most crucial, skill in language education. Its importance extends beyond the classroom, impacting learning, social interaction, and all aspects of life. Learning begins with listening before other skills are developed. Listening is also essential for communication and interacting with the environment; researchers consider it a primary communicative activity, a window to the world, a

bridge to relationships, and the means by which we receive verbal messages (Collins, 2022 and Andolina & Conklin, 2021).

Listening can be defined as the attentive reception of auditory vibrations, requiring mental engagement to understand meaning. It's described as conscious attentiveness aimed at discerning, understanding, comprehending, extracting ideas, inferring facts, appreciating, critiquing, and forming opinions about the heard material. Listening is a purposeful human process focused on acquisition, understanding, analysis, interpretation, and mental construction of what is heard. It's a complex, conscious process involving reception of spoken language, demanding attention and focus on the speaker's views, ideas, feelings, and expressions to achieve effective listening and response (Dakakni and Safa, 2023).

Listening is fundamental to both communication and learning; it involves understanding and responding to messages, as previous studies indicate—comprehending speech or attending to auditory stimuli, such as a speaker. Listening is a linguistic art and a vital communication skill used across daily life. It plays a significant role in education, as students spend considerable class time listening. It's the primary tool for language acquisition, receiving meanings, ideas, opinions, and perspectives (Andolina, & Conklin, 2021).

Neglecting this skill has detrimental effects, hindering student learning and progress in other language skills and academic achievement. This underscores the importance of teachers prioritizing listening skills in instruction and classroom activities. Objectives for teaching listening include auditory discrimination, classification, main idea extraction, inferential thinking, judging content validity, and content evaluation.

The role of the Omani Ministry of Education in teaching English language:

The Omani Ministry of Education is committed to English language instruction and actively addresses challenges in its teaching and learning. The ministry consistently aims to improve English language curricula in government schools by adopting modern curriculum development practices. This involves creating or adapting a sequential series of curricula based on the latest technical specifications and best

teaching and learning theories and methods. One recently implemented approach utilizes "international series" produced by global publishing houses, leveraging their human resources with expertise in technical and educational aspects. The ministry seeks to benefit from the pedagogical and methodological expertise of these publishers in developing English language curricula, aligning with Oman Vision 2040. Omani Curriculum (2010)

The English curriculum in Oman:

This curriculum prioritizes a strong foundation in core English grammar, recognizing its crucial role in developing receptive and productive skills across all four language domains (reading, writing, listening, and speaking). However, grammatical competence is viewed as a means to an end, not the ultimate goal. The curriculum's grammatical component, appropriate for both Basic and Post-Basic levels, draws upon established resources like the Threshold Level and successful international ESL/EFL programs. A balanced approach is employed, avoiding grammatical overload while ensuring consistent reinforcement of key grammatical items throughout the curriculum, Aladini, (2024).

The Skills of Reading, Writing, Listening and Speaking in the Omani Curriculum:

Omani Curriculum objectives (2010) states that the Omani curriculum addresses the four core language skills: listening, speaking, reading, and writing. It establishes specific target levels for each skill, aiming to foster functional abilities. The curriculum emphasizes purposeful and meaningful learning experiences designed to promote transferable skills applicable across diverse contexts and learner interests. It encourages teachers and students to consider broader learning goals beyond immediate classroom activities and materials, while also recognizing the importance of enjoyable and engaging learning experiences. Skill-area objectives are framed within a suitable conceptual framework, defining target performance levels. Examples include: listening comprehension of oral stories (identifying characters, situations, and outcomes); speaking to describe objects (using shape, size, and

color); reading comprehension to identify topic sentences; and writing short summaries.

Objectives of the Omani English Language Curriculum for Grades 11-12: General objectives

Learners will achieve:

- **Oral Communication:** Fluency and accuracy in specified functional areas, with acceptable pronunciation.
- **Listening Comprehension:** Development of diverse listening purposes, encompassing interactional, transactional, informational, and recreational listening.
- **Reading:** Skill development using authentic texts and various text types.
- **Writing:** Purposeful and practical writing skills, balancing fluency and accuracy through process-oriented tasks.
- **Grammar:** Clear contextualized grammar use, incorporating both inductive and deductive learning.
- **Vocabulary:** Acquisition of high-frequency vocabulary through extensive reading and the transformation of receptive vocabulary into productive use through recycling.
- **Independent Learning:** Development of self-help strategies, including utilizing various resources for independent learning, reflection, and self-monitoring.
- **Critical Thinking:** Enhancement of critical thinking skills, including clarification and inference.
- **Study Skills:** Mastery of essential study skills such as dictionary and library research skills, paraphrasing, referencing, accurate citation, and plagiarism avoidance.

Listening objectives:

Learners will demonstrate the ability to:

- **Comprehend Complex Texts:** Understand and respond appropriately to extensive and complex listening materials, including monologues and dialogues.
- **Discourse Understanding:** Comprehend various discourse types, such as conversations, narratives, descriptions, academic lectures, and interviews.

- **Strategic Listening:** Employ effective listening strategies tailored to specific listening purposes. These strategies include previewing and predicting, generating focus questions, listening for specific information, listening for gist, and inferring meaning from context.

The role of technology in teaching English language:

The swift progress of information and communication technology has completely changed the methods of language learning. The effects of this rapid change are being felt, in particular, in what are now being called interactive and engaging multimedia resources (Almaashani et al., 2023; Aladini, 2023 and Loncar et al. 2023). These resources support not only the learning of vocabulary and grammar (the building blocks of every language), but also the pronunciation that is so essential for making oneself understood. Meanwhile, the widespread advent of computer-assisted language learning (CALL) has gained the attention of many educators. Numerous computer-mediated activities (Ba-omar et al., 2024; Aladini and Almashali 2024; Zhang and Zou, 2023) pave the way for much greater opportunities for language acquisition, inasmuch as these activities motivate learners to practice the four essential components of any language—reading, writing, listening, and speaking.

Artificial intelligence in education (AIED) encompasses instructional settings where AI-driven tools are increasingly used—intelligent tutoring systems and adaptive educational platforms, for instance. They address cognitive challenges tied to the actual human learning and problem-solving processes we know so much about from educational and cognitive psychology. In the past, we might have said that such systems were doing the work of what human tutors and teachers do (or what they should do). One thing is abundantly clear today: these systems, if you can even call them that, have little in common with any real human teaching or tutoring model—for better and worse (Aladini et al., 2024b; Rahimi and Fathi, 2024 Ebadijalal and Yousofi, 2023).

The AI tools to enhance listening skills:

There are several AI tools to enhance listening skills, the current study used the following three tools:

1. Otter.ai: AI-Powered Transcription for Listening Comprehension

Otter.ai leverages artificial intelligence to convert spoken audio into text transcriptions. This offers significant benefits for students by providing accurate transcripts of lectures, discussions, or other audio learning materials. Students can follow along with the audio more easily, reinforcing auditory comprehension and allowing for repeated review. The tool can be used to transcribe audio content for listening comprehension exercises; students can then read the transcript alongside the audio, improving their understanding and identifying areas where they struggled. Otter.ai's features may include real-time transcription, speaker identification, and timestamping, further enhancing its utility in educational settings. The accuracy of transcription varies depending on audio quality and background noise; however, Otter.ai generally provides a high level of accuracy for clear audio.

2. Loom: Video Messaging for Interactive Listening and Communication

Loom is a video messaging platform that facilitates asynchronous communication through short video recordings. Its application in language learning extends beyond simple listening comprehension; it allows for interactive exercises and personalized feedback. Students can receive instructions or questions via video, respond with their own video answers, and receive targeted feedback from instructors. This interactive approach enhances both listening and speaking skills, providing a more engaging learning experience compared to traditional methods. Loom's ease of use and integration with other platforms makes it a valuable tool for creating and delivering engaging listening comprehension tasks.

3. Text Blaze: Smart Text Expansion for Reading Comprehension

Text Blaze is a text expansion tool that uses AI to automatically elaborate on selected text. This is particularly useful for reading comprehension exercises, as it can provide students with additional context, definitions, or explanations of complex vocabulary or concepts. By automatically expanding on key passages, Text Blaze encourages

critical thinking and deeper understanding of the material. Instructors can integrate Text Blaze into reading assignments, allowing students to instantly access expanded information, promoting a more thorough and insightful analysis of the text. This can be especially beneficial for students who require additional support in understanding complex or nuanced language.

In an empirical study for Elghotmy and Ghoneim (2020), it aimed at investigating the effectiveness of an artificial intelligence (AI) based program in Enhancing EFL listening skills among sixth year primary stage pupils. The participants of the study included (80) pupils divided into two groups: the experimental group (N=40) that was taught using the Artificial Intelligence based program and the control group (N=40) that received regular instruction. The instruments of the study included: an EFL listening skills checklist to determine the most important listening skills to be developed by sixth year primary stage pupils, a pre-post listening skills test to measure pupils' listening skills before and after implementing the program, and a rubric for correction. Data was analyzed statistically to verify the study hypotheses. Findings of the study revealed that the experimental group pupils' EFL listening skills were enhanced as a result of using the Artificial Intelligence based program. Similarly, Doghonadze and Kintsurashvili (2024) investigated the effect of artificial intelligence (AI) on the enhancement of students' listening and speaking skills within the context of secondary schools in Georgia. With the rapid advancements in technology, AI-based applications have emerged as potential tools for language learning and teaching. The aim of this study was to explore the effects of AI interventions on students' listening and speaking proficiency, as well as to identify the factors that contribute to their effectiveness. The research methodology involves a mixed-methods approach, combining quantitative and qualitative data collection. Additionally, the study aimed at identifying the potential challenges and limitations of implementing AI technologies in language education. This research contributes to the existing literature on the integration of AI in education, particularly within the domain of language learning. The findings inform educators,

curriculum developers, and policymakers about the potential benefits and considerations associated with adopting AI-based tools for fostering students' listening and speaking skills. The results also shed light on the future directions of AI integration in language education and offer recommendations for optimizing its implementation to ensure maximum benefits for students in higher education institutions.

Method:

This study employed a quantitative, quasi-experimental design to investigate the effectiveness of AI tools on improving the listening comprehension skills of grade 12 students. The research sample consisted of 64 students from Al Sada School in Oman, randomly divided into two groups of 32 participants each: an experimental group and a control group. The experimental group received instruction in the listening classes incorporating the use AI tools , while the control group followed the standard method of teaching.

Prior to data collection, the listening skills test underwent rigorous validation procedures. A panel of subject matter specialists reviewed the test instrument to ensure content validity, confirming its alignment with established listening comprehension benchmarks and the curriculum objectives.

To establish the test's reliability, a pilot study was conducted with a sample of 10 grade 12 students from the same school. Data from the pilot study were analyzed to assess the internal consistency and reliability of the test, informing any necessary revisions before its administration to the main sample.

The main study involved administering the listening skills test to both the experimental and control groups. Pre-test scores were collected from both groups before the intervention period. Following the intervention period during which the experimental group were taught through the AI tools. While the post-test scores were obtained from both groups. Data analysis involved comparing the pre- and post-test scores of both groups using SPSS program to determine the significant difference, in the listening comprehension improvement between the two groups. This analysis aimed to evaluate the effectiveness of the use of AI tools in enhancing listening comprehension skills among grade 12 students.

Results:

The research question was formulated as follows: **Are there statistically significant differences at ≤ 5.0 in the mean scores the post application of the listening skills test between experimental and control group?**

To verify the significance of the differences Between the mean scores of the experimental group students and the average scores of the control group students in the post application, the researchers tested the following null hypothesis: **There are no statistically significant differences at the level of (α≤0.05) Between the mean scores of the experimental group students and the average scores of the control group students in the post application of listening skills test.** The researcher used a t-test for two independent samples. And the following table shows the results of the null hypothesis test:

Table (1) T-test results for two independent samples between the averages of the experimental and control groups in the post-application of the listening skills test

Domain	Group	No.	Mean	Std. Dev.	T	Sig. value	Eta square (η^2)
Getting the main idea from a listening text	control	32	3.32	1.54	5.55	0.001	0.333
	Experimental	32	4.78	0.34			
Answering detailed questions	control	32	5.37	1.41	3	0.004	0.127
	Experimental	32	6.26	0.95			
Recognizing the meaning of frequent words	control	32	3.21	0.86	3.69	0.001	0.181
	Experimental	32	3.90	0.31			
Respond to different types of questions in a discourse	control	32	2.33	1.17	3.69	0.001	0.180
	Experimental	32	3.23	0.73			
Total	**control**	**32**	**14.34**	**3.60**	**5.81**	**0.001**	**0.353**
	Experimental	**32**	**18.31**	**1.41**			

Table 1 reveals statistically significant differences ($p < 0.05$) between experimental and control group mean scores across all four test areas

following the skill application. The experimental group achieved significantly higher mean scores.

The highly significant difference ($p = 0.001$) between experimental and control group mean scores on the post-application English listening skills test for 12th-grade students (Table 1) favors the experimental group, which achieved significantly higher scores.

Table 1 clearly demonstrates the significant impact of AI tools on EFL students' listening skills. Large effect sizes (η^2) were observed, ranging from 0.127 to 0.333 across sub-skills and reaching 0.353 for the overall listening test score. This indicates that the use of AI tools (independent variable) accounted for 35.3% of the variance in listening skill improvement (dependent variable).

The second research question was formulated as follows: **Is using AI tools in English language teaching effective in developing the listening skills of twelfth graders, according to the adjusted Black Modified Gain Ratio?** To answer the question, the researchers used equation (Black Modified Gain Ratio), and the table shows the results of calculating the effectiveness of using AI tools in developing listening skills for 12th grade students.

Table (2) The value of the modified Black gain ratio for the AI tools on the listening skills

Domain	Mean-pre	Mean-post	Marks	Black Gain Ratio
Getting the main idea from a listening text	1.69	4.88	5	1.599
Answering detailed questions	1.84	6.28	8	1.276
Recognizing the meaning of frequent words	2.19	3.91	4	1.377
Respond to different types of questions in a discourse	1.25	3.25	4	1.227
Total	**6.97**	**18.31**	**21**	**1.349**

Table 2 shows that the Black Modified Gain Ratio for the listening skills test (1.349) and its dimensions (1.227–1.599) all exceed Blake's threshold of 1.2. This indicates the high effectiveness of AI tools in developing English listening skills among EFL learners.

Discussion

The findings presented above provide compelling evidence supporting the efficacy of AI-powered tools in enhancing English as a Foreign Language (EFL) listening skills among 12th-grade students. The statistically significant differences ($p < 0.05$) observed across all four assessed listening sub-skills, consistently favoring the experimental group, strongly suggest a positive causal relationship between the intervention (AI tool usage) and improved listening comprehension. The exceptionally high significance level ($p = 0.001$) specifically for the overall post-application listening test score further reinforces this conclusion. This result is not merely statistically significant but also practically meaningful, as indicated by the substantial effect sizes (η^2) ranging from 0.127 to 0.333 across sub-skills and reaching a remarkably high 0.353 for the overall listening score. This large effect size indicates that the AI tools accounted for a considerable 35.3% of the variance in listening skill improvement, highlighting the substantial impact of the intervention.

These findings align with existing research suggesting the potential of technology-enhanced language learning, particularly CALL (Computer-Assisted Language Learning) methodologies as in; Elghotmy and Ghoneim (2020) and Doghonadze and Kintsurashvili (2024). The interactive and personalized nature of AI-powered tools likely contributed to the observed improvements. The ability of the AI to provide immediate feedback, adapt to individual learner needs, and offer repeated practice opportunities likely fostered a more effective learning experience compared to traditional methods used in the control group. Further research could explore the specific features of the AI tools that contributed most significantly to the observed improvements, potentially informing the design of future educational technologies. For instance, a qualitative analysis of student experiences with the AI tools could provide valuable insights into the perceived benefits and challenges associated with their use.

The findings of the current research paper confirm that listening with AI tools use cultivates effective communication, both between

instructors and students and among peers. Observational learning suggests that students model their teachers' active listening behaviors, fostering peer-to-peer engagement. Such AI based environments enhance the overall learning experience and prepare students for future academic and professional contexts. In addition, it was clear that setting structured group activities, team-building exercises, and cooperative learning through AI based tasks are pedagogical strategies that facilitate listening and get learners grasp the listening text better (Dakakni and Safa, 2023). Listening skills through AI tools use enhance both verbal and non-verbal communication skills, enabling students to articulate their thoughts effectively while considering diverse perspectives. Research indicates that AI tools enable learners to express ideas and respond to others.

Conclusion

This research shows clearly that AI-driven solutions impact positively and in a statistically significant way the development of listening skills in EFL learners. The experimental group, which received the benefit of listening instruction with the assistance of AI, demonstrated significant and large effect size improvements in their listening skills over the course of the study when compared to the control group, which received traditional forms of EFL listening instruction. The findings suggest that AI has the capacity to revolutionize not only the field of education but also the language learning marketplace. With regard to EFL instruction, the potential of AI to enhance not only learner engagement but also learner proficiency is significant.

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