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AI-BASED LISTENING FOR STUDENTS WITH DIFFERENT LEARNING STYLES: A MULTIMODAL ANALYSIS

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Abstract: This study investigates the effectiveness of Artificial Intelligence (AI)-based listening instruction in catering to different learning styles among Uzbek EFL students. Recognizing that learners process information differently—visually, auditorily, kinesthetically, or through reading and writing—the research explores how AI tools with multimodal features can personalize the listening experience and enhance comprehension. Eighty secondary students were grouped according to dominant learning styles and engaged with tailored AI-supported tasks using platforms such as Listenwise, Google Read Along, and ChatGPT-based listening prompts. Quantitative results showed significant comprehension gains in all groups, with auditory and visual learners outperforming others, while kinesthetic and read/write learners made steady progress through task-based and transcript-supported features. Qualitative data highlighted increased motivation, learner autonomy, and engagement, especially when tools offered multimodal input. Although technological and localization challenges were noted, the findings affirm that AI listening tools, when used thoughtfully, promote differentiated instruction, foster inclusivity, and enhance listening outcomes for diverse learners. The study advocates for teacher training and the development of localized AI content to ensure broader accessibility and pedagogical alignment in Uzbekistan's EFL context.

Keywords: Artificial intelligence, listening comprehension, learning styles, multimodal learning, Uzbek EFL learners, adaptive instruction, digital pedagogy, ChatGPT, personalized learning, educational technology.

AI-based listening instruction has emerged as a powerful tool in addressing the diverse learning needs of English as a Foreign Language (EFL) students. In the Uzbek educational context, where classrooms often consist of learners with varying cognitive preferences and learning styles, the use of artificial intelligence presents a transformative opportunity to personalize and diversify the listening experience. This study investigates how AI-supported listening tools affect students with different learning styles—visual, auditory, kinesthetic, and read/write—through a multimodal analysis focused on comprehension outcomes, learner engagement, and instructional adaptability.

The study was conducted among 80 secondary school students in Tashkent, divided into four groups based on a learning style inventory. Each group engaged in AI-enhanced listening activities tailored to their dominant modality. Visual learners used tools with video transcripts and illustrated dialogues; auditory learners accessed audio-focused chatbots with voice feedback; kinesthetic learners performed task-based listening with AI guidance in interactive environments; and read/write learners interacted with AI tools that included transcript-based

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comprehension and note-taking features. All students used AI platforms such as Google Read Along, ChatGPT-integrated listening tasks, and Listenwise with multimodal feedback functions.

Over six weeks, students participated in listening comprehension tasks followed by reflective journals and quizzes. Quantitative analysis showed overall improvement across all groups, but with varying degrees of effectiveness. Auditory and visual learners showed the highest gains, suggesting a strong alignment between AI features and these modalities. Kinesthetic learners benefited from interactive, movement-based activities (e.g., VR simulations and voice-controlled games), although some technological limitations restricted consistent engagement. Read/write learners preferred AI features that allowed repeated review and transcription editing, leading to steady but slower progress.

Qualitative data from focus group discussions revealed that students valued the flexibility and autonomy offered by AI tools. Many reported increased motivation due to the ability to control pacing, select themes of interest, and receive immediate feedback. Students with mixed learning preferences expressed appreciation for multimodal integration—such as audio accompanied by images or interactive transcripts—which allowed them to engage through more than one modality simultaneously.

A key insight from the study was that AI's multimodal capacity supports differentiated instruction without requiring separate lesson plans for each learning style. By embedding audio, visual, textual, and interactive elements in a single interface, AI platforms can cater to multiple preferences, enhancing inclusivity. Furthermore, the data suggested that students with previously lower listening scores, particularly among kinesthetic and read/write learners, closed the gap more quickly when given access to adaptive, feedback-rich environments.

However, the study also identified challenges. Some AI tools lacked localization or contextual relevance to Uzbek learners, leading to occasional confusion or disengagement. The digital divide also impacted students' access to AI-based instruction, especially those without personal devices or stable internet. Additionally, some teachers were unsure how to match AI content with specific learning styles or how to interpret analytics provided by the platforms.

Despite these limitations, the findings demonstrate that AI-based listening instruction significantly enhances learner outcomes when implemented with sensitivity to learning styles. Teachers are encouraged to use AI tools not as replacements but as supplements to existing curricula, offering students varied pathways to achieve listening proficiency. Providing training for teachers on multimodal AI integration and developing localized AI resources are crucial steps for long-term success.

In conclusion, AI-supported listening tools offer an effective solution for addressing the diverse learning needs of Uzbek EFL students. Their multimodal features enable tailored engagement, increased motivation, and improved comprehension for learners with different styles. When thoughtfully implemented, these tools hold the potential to transform listening instruction into a more equitable, personalized, and engaging experience for all learners.

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