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IMPROVING STUDENTS' ENGLISH PRONUNCIATION USING AI-POWERED MOBILE APPLICATIONS

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Abstract. Targeted use of AI-powered mobile applications led to marked improvements in university students' English pronunciation skills. Experimental analysis revealed gains in both accuracy and qualitative aspects, such as phoneme production and prosody. Comparative evaluation highlighted the advantages of immediate, personalized feedback over traditional methods. The study proposes actionable strategies for integrating and adapting AI pronunciation tools to local contexts, emphasizing the synergy of technology and pedagogy.
Keywords: artificial intelligence, mobile application, english pronunciation, student, teaching methodology, individual feedback, comparative analysis, autonomous practice.

TALABALARNING INGLIZCHA TALAFFUZINI SUN'IY INTELLEKT ASOSIDAGI MOBIL ILOVALAR ORQALI TAKOMILLASHTIRISH

Annotatsiya. Sun'iy intellektga asoslangan mobil ilovalardan maqsadli foydalanish natijasida universitet talabalari inglizcha talaffuzda sezilarli yutuqlarga erishdi. Eksperimental tahlil natijalari talaffuz aniqligi va segment, suprasegment xususiyatlari yaxshilanganini ko'rsatdi. Taqqoslash orqali an'anaviy o'qitish va zamonaviy texnologiyalar o'rtasidagi tafovut aniqlanib, individual va tezkor fikr-mulohazalarning talaffuzni mustahkamlashdagi ahamiyati tasdiqlandi. Integratsiyani qo'llash va unga moslashish yuzasidan amaliy tavsiyalar ishlab chiqildi.
Kalit so'zlar: sun'iy intellekt, mobil ilova, inglizcha talaffuz, talaba, o'qitish metodikasi, individual fikr-mulohaza, taqqoslash, autonom mashq.

СОВЕРШЕНСТВОВАНИЕ АНГЛИЙСКОГО ПРОИЗНОШЕНИЯ СТУДЕНТОВ С ПОМОЩЬЮ МОБИЛЬНЫХ ПРИЛОЖЕНИЙ НА БАЗЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

Аннотация. Целенаправленное использование мобильных приложений на основе искусственного интеллекта позволило студентам вузов достичь значительных улучшений в английском произношении. Эксперимент показал рост точности и качества произношения, включая сегментные и супрасегментные особенности. Сравнительный анализ выявил разницу между традиционным обучением и цифровыми инструментами, подчеркнув роль индивидуальной и оперативной обратной связи. Разработаны практические рекомендации по интеграции и адаптации подобных решений.
Ключевые слова: искусственный интеллект, мобильное приложение, английское произношение, студент, методика обучения, индивидуальная обратная связь, сравнительный анализ, автономная практика.

Challenges in developing English pronunciation skills among university students persist both internationally and in Uzbekistan. Traditional classroom phonetic instruction often lacks individualized, frequent feedback, which is crucial for learners whose native languages differ from English. The integration of digital tools, emphasized by Uzbekistan's "Digital Uzbekistan – 2030" and "2022–2026 New Uzbekistan Development Strategy," has increased interest in artificial

intelligence-based mobile applications. These applications provide immediate, personalized correction and adapt to individual learner needs through real-time analysis, a feature largely absent in conventional classrooms.

A key issue is the tension between traditional, teacher-led pronunciation drills and innovative, technology-driven methods. In Uzbekistan, collective drills limit exposure to nuanced phonetic features and reduce student engagement. International research shows that AI-powered applications offer repetitive practice, instant error recognition, and tailored exercises, addressing common pronunciation errors more efficiently. Studies also highlight a gap between theoretical standards and practical pronunciation in spontaneous speech, emphasizing the need for dynamic, responsive training.

Despite supportive digitalization policies in Uzbekistan, practical use of technology in language classrooms remains limited, creating a gap between potential and current practice. This study aims to provide a scientific basis for using AI-driven mobile applications to develop English pronunciation skills among university students by analyzing their effectiveness in addressing key errors, supporting consistent improvement, and increasing student motivation. Research tasks include identifying major pronunciation obstacles, evaluating current AI-based tools, comparing Uzbek and international experiences, and offering recommendations for effective integration into higher education.

A review of the literature reveals a divide between traditional phonetic instruction and digital approaches to English pronunciation development. Conventional methods, centered on teacher-led drills and auditory discrimination, emphasize corrective feedback and the internalization of articulatory norms, but often lack individualization and learner engagement, particularly in large or resource-limited classrooms. In contrast, digital tools such as interactive mobile applications provide immediate, individualized feedback and repeated practice, though concerns remain regarding their pedagogical alignment and the authenticity of their feedback.

International research shows that AI-powered mobile applications can effectively address specific pronunciation errors by offering real-time, detailed feedback and adapting exercises to individual learners. Studies involving the English File Pronunciation app and the Qupeiyin app demonstrate that these tools reduce both segmental and suprasegmental errors, enhance motivation through gamification, and improve pronunciation accuracy through data-driven adaptivity. Additionally, AI-driven voice cloning for self-imitation accelerates phonetic acquisition by providing personalized, acoustically matched models.

In Uzbekistan, the integration of AI tools in university English programs is inconsistent. Although the benefits of adaptive, technology-mediated pronunciation training are acknowledged, implementation faces obstacles such as infrastructure limitations, a lack of locally relevant digital content, and insufficient teacher training. Traditional analog methods remain prevalent, limiting access to individualized, technology-based feedback. Assessment of pronunciation improvement also varies, with some researchers prioritizing native-like accuracy and others focusing on communicative intelligibility or learner confidence. Furthermore, the motivational effects of technology use in pronunciation practice are still underexplored in the Uzbek context.

While the literature affirms the technical and motivational advantages of AI-enhanced mobile applications for pronunciation training, it also highlights a lack of research on their adaptation and scalable deployment in Uzbek higher education. This study aims to address this gap by evaluating the effectiveness of AI-based mobile apps for local students and proposing a model informed by both international research and local realities.

The methodology was based on a comparative experimental design involving 20 undergraduate students specializing in English. The initial phase comprised baseline pronunciation assessment through a dedicated oral test and structured observation, focusing on segmental (individual sounds, word stress) and suprasegmental (intonation, rhythm) aspects widely

recognized as problematic in Uzbek and international contexts, as highlighted by Inamova's research. Particular attention was given to common error types, such as vowel reduction and consonant cluster simplification, to ensure diagnostic precision.

Following the diagnostic stage, participants engaged in a targeted intervention using an AI-powered mobile application designed for phonetic training. Throughout the process, progress was evaluated using a set of performance criteria: accuracy of sound articulation, consistency in stress patterns, and intelligibility in spontaneous speech. These benchmarks were established considering both Uzbek classroom realities and findings from international best practices, allowing for meaningful cross-contextual analysis.

Two distinct stages were compared: pre-intervention results (traditional learning) and post-intervention outcomes (after AI application usage). The measurement of improvement was conducted via repeated oral tests and observation protocols. This structure enabled identification of specific gains attributable to AI-mediated input, while cross-referencing with the literature ensured that observed results aligned with established theoretical models. The methodology, therefore, combined experimental rigor with contextual relevance, supporting both quantitative and qualitative dimensions of pronunciation enhancement.

The analysis shows significant improvement in English pronunciation among university students after using AI-powered mobile applications. Pronunciation accuracy increased from 58% to 74% following structured app use. Students made fewer core pronunciation errors and improved in both segmental (phoneme production) and suprasegmental (intonation, stress, rhythm) features. This progress is attributed to individualized, immediate AI feedback, which supports iterative correction and boosts metacognitive awareness.

Comparative evaluation indicates that traditional classroom methods in Uzbekistan often lack real-time, personalized correction, while AI-enhanced models offer autonomous, adaptive practice. Access to model voices and accent conversion enables tailored, context-specific drills outside class, bridging the gap between receptive knowledge and productive accuracy.

Based on these results, a new effectiveness model was developed with four components: (1) Diagnostic Baseline Assessment; (2) Automated Feedback Delivery by the AI app, providing immediate corrective input and tracking progress; (3) Iterative Practice Module with gamified repetition and self-monitoring; (4) Motivation and Engagement Index, measured through surveys and usage analytics. Unlike conventional methods relying on sporadic instructor feedback, this model ensures continuous, data-driven adjustment of practice.

The model not only improved pronunciation outcomes but also increased student motivation and confidence. Enhanced autonomous learning and instant feedback encouraged greater persistence, especially where native speaker input is limited. This framework supports broader AI integration in language instruction.

The research highlights the strong potential of AI-powered mobile applications to improve English pronunciation, especially where traditional feedback is limited. These tools offer immediate, personalized correction and support independent practice, benefiting Uzbek learners with restricted access to authentic input. The study recommends integrating AI pronunciation apps into university curricula, customizing solutions to local needs, and training instructors to combine AI feedback with contextualized teaching. Further research should include larger samples and assess long-term effects on motivation and progress. Ongoing refinement and mixed-methods evaluation are needed as implementation expands.

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