

**ARTIFICIAL INTELLIGENCE AS A TOOL FOR PERSONALIZING
FOREIGN LANGUAGE LEARNING IN HIGHER EDUCATION
INSTITUTIONS**

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Abstract. The thesis explores AI as a tool for personalizing foreign language teaching in higher education. It analyzes key technologies — intelligent tutoring systems, adaptive platforms, NLP tools, and chatbots — that individualize learning paths, provide feedback, and adjust task difficulty. Evidence shows AI-driven personalization boosts engagement, performance, and self-efficacy while easing teachers' workload. Risks include reduced human interaction, data-privacy concerns, and the need for teacher training. AI proves an effective auxiliary tool when combined with sound pedagogy and teacher support.

Keywords: artificial intelligence, personalized learning, foreign language education, higher education institutions, adaptive learning systems.

The rapid digitalization of higher education has made the search for effective instruments of learning personalization one of the most pressing issues in contemporary pedagogy. Foreign language acquisition is a field in which individual

differences among learners — in prior proficiency, pace, motivation, and cognitive style — are particularly pronounced, which makes uniform instruction increasingly inadequate. Artificial intelligence (AI), owing to its capacity for large-scale data analysis and real-time adaptation, has emerged as one of the most promising tools for addressing this challenge in higher education institutions [1; 6].

The relevance of the problem is further heightened by the conditions in which Ukrainian higher education currently operates. Prolonged instability caused by war, together with recurring disruptions to the educational process, has intensified the need for flexible, resilient, learner-centred approaches to foreign language teaching. As shown by Poznansky et al., integrating adaptive AI systems into foreign language teaching can substantially increase the resilience of the educational process to such challenges while supporting the development of future teachers' professional and metacommunicative competence [5].

The purpose of this study is to analyze artificial intelligence as an instrument for personalizing foreign language learning in higher education institutions, to characterize the main technological mechanisms of such personalization, and to identify the principal pedagogical benefits and challenges associated with their implementation.

AI technologies underlying the personalization of foreign language learning. Contemporary AI-based personalization relies on several interconnected technologies. Natural language processing (NLP) enables machines to analyze and generate human language, forming the basis for automated feedback, machine translation, and speech-recognition tools used to correct pronunciation and grammar in real time [3, p. 283]. Intelligent tutoring systems (ITS) and adaptive learning platforms — exemplified by Duolingo and Rosetta Stone — dynamically modify the content and difficulty of tasks according to a learner's demonstrated progress [3, p. 285]. Deep-learning architectures such as Long Short-Term Memory (LSTM) networks and Transformer-based models power personalized recommendation and automated-scoring systems capable of analyzing individual learning-behaviour data

[1]. Generative AI tools, most notably large language models such as GPT, are increasingly used to produce individualized materials and conversational practice scenarios adapted to a learner's level and interests [2, p. 174].

Mechanisms of personalization in the educational process. The pedagogical value of these technologies lies in the mechanisms through which they individualize instruction. AI-driven recommendation systems analyze study time, exercise accuracy, task difficulty, and learner preferences to predict which resources are most likely to support a given student's progress, effectively creating an individualized learning trajectory [1]. Automated scoring and feedback systems provide instantaneous responses to students' written and spoken output, allowing learners to correct errors without waiting for a teacher's intervention, thereby fostering autonomy and self-regulated learning [1; 6]. Adaptive difficulty adjustment keeps tasks within a learner's zone of proximal development, avoiding both frustration and disengagement [1]. The Artificial Intelligence-Enabled Intelligent Assistant (AIIA) framework developed by Sajja et al. illustrates how such mechanisms can be integrated into a single system combining natural-language interaction, personalized content delivery, and continuous assessment [6].

Empirical evidence of effectiveness. Bai reports that an LSTM-based personalized recommendation system increased students' average exercise-completion rate by 8.5% and accuracy by 8%, while a Transformer-based automatic scoring system reduced teachers' weekly grading workload by 38.5% and raised student satisfaction with feedback from 3.2 to 4.2 on a five-point scale [1]. Such findings confirm that personalization mechanisms increase student engagement while allowing teachers to redirect time toward higher-value activities such as individual mentoring and course design [1; 6]. Comparable positive effects on motivation, accessibility, and skills development have been reported in the Ukrainian higher-education context, where AI-supported foreign language teaching has enhanced learning efficiency even under conditions of institutional disruption [5].

Challenges and limitations. Despite these benefits, integrating AI into foreign language teaching raises pedagogical and ethical challenges. Researchers emphasize the risk of diminished human interaction and the difficulty AI systems face in assessing higher-order skills such as creativity and pragmatic competence [6]. Concerns about the collection and protection of learners' personal data require institutions to establish clear ethical frameworks for AI use [1]. The successful adoption of AI-based tools also depends on teachers' digital literacy and readiness to integrate these technologies methodologically; without adequate professional development, AI's potential for personalization may remain largely unrealized [2, p. 175]. Ukrainian scholars note that the effectiveness of generative tools such as GPT depends on combining AI-generated materials with teacher-guided instruction rather than replacing it [4, p. 18].

Conclusions. The analysis confirms that artificial intelligence is an effective and increasingly indispensable instrument for personalizing foreign language learning in higher education institutions. Through intelligent tutoring systems, adaptive platforms, deep-learning-based recommendation and scoring systems, and generative AI tools, language education can be tailored to each learner's pace, proficiency, and psychological needs, yielding measurable gains in engagement, accuracy, and autonomy while reducing teachers' workload. At the same time, AI cannot substitute for the pedagogical expertise and communicative authenticity that only human teachers provide. Successful integration — particularly under the conditions currently faced by Ukrainian universities — therefore requires a balanced, teacher-guided approach and systematic professional development for language educators. Further research should focus on the long-term pedagogical effects of AI-driven personalization in the Ukrainian higher education context.

References:

1. Bai Y. Exploring the role and impact of artificial intelligence in personalized foreign language teaching. *Discover Artificial Intelligence*. 2025. Vol. 5. Article 318. <https://doi.org/10.1007/s44163-025-00546-9>.

2. Martynyuk O. Applying the Potential of Artificial Intelligence in Foreign Language Acquisition. Strategic Innovations of Social Communications and Foreign Philology in Crisis Times: collection of scientific papers of the I International Scientific and Practical Conference (1 June 2024) / ed. by M. Nabok. Sumy: Sumy State University, 2024. P. 172–176.

3. Mudra O., Tonenchuk T., Danylovych O. Artificial Intelligence in Foreign Language Education: Transforming Teaching and Learning. *Актуальні питання гуманітарних наук*. 2025. Вип. 84, т. 2. С. 281–286.

4. Opryshko N., Taranenko V. Promising Directions of Artificial Intelligence Application in Foreign Students' Language Training. *Theory and Practice of Teaching Ukrainian as a Foreign Language*. 2025. Issue 19. P. 12–20.

5. Poznansky R., Pryimak L., Apelt H., Savchuk N., Kopchak L. Transforming Foreign Language Education: The Role of AI-Based Adaptive Learning Systems in Enhancing Personalized Learning Amid Global Instability. *Metaverse Basic and Applied Research*. 2025. Vol. 4. Article 179. <https://doi.org/10.56294/mr2025179>.

6. Sajja R., Sermet Y., Cikmaz M., Cwiertny D., Demir I. Artificial Intelligence-Enabled Intelligent Assistant for Personalized and Adaptive Learning in Higher Education. *Information*. 2024. Vol. 15, No. 10. Article 596. <https://doi.org/10.3390/info15100596>.