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### **TRANSFORMING FOREIGN LANGUAGE LEARNING THROUGH ADAPTIVE AI TECHNOLOGIES**

AI has revolutionized language education by offering advanced digital tools, but its integration into humanities teaching remains a challenge. Effective implementation requires full digitalization, including a supportive digital environment, tech-savvy educators, and willingness from all participants to incorporate AI into learning.

Researchers have extensively studied the use of AI tools in education, particularly in foreign language learning: G. Dizon analyzed intelligent personal assistants used to improve language skills [1]. L. K. Fryer compared the abilities of chatbots and human partners [2]. E. Kochmar focused on personalized learning in intelligent tutoring systems [3]. S. Pokrivcakova considered teacher preparation for AI integration [4]. L. Tavabi investigated AI-driven empathetic responses [5], and S. C. Tsai examined statistical and deep learning in education [6]. Focusing on these studies and practical experiences, we will analyze the applications, benefits, and limitations of AI in foreign language education.

The implementation of AI in higher education, both in Ukraine and abroad, occurs at institutional and systemic levels. This process involves key stages such as data collection, analysis, visualization, in-depth evaluation and generation of outcomes. AI tools are not only used for routine tasks but also contribute to transformative educational changes.

AI plays a significant role in foreign language learning by enabling personalized and interactive experiences. Natural Language Processing techniques like tokenization, lemmatization, and part-of-speech tagging help analyze text and speech. Machine translation models, such as OpenAI's GPT, enable real-time comprehension, while speech recognition enhances pronunciation accuracy. Named entity recognition helps identify key phrases, making language learning more efficient.

Reinforcement learning (RL), which allows AI models to learn through trial and error, helps adapt lesson difficulty based on user performance. Platforms like Duolingo employ RL to tailor lesson plans dynamically. Deep learning further supports language learning through neural networks, improving speech and text generation.

Recommendation systems apply collaborative and content-based filtering to suggest lessons, quizzes, and vocabulary based on user progress and interests. Sentiment analysis ensures that learning remains engaging by adjusting lesson difficulty according to user emotions. Speech processing algorithms refine pronunciation tools by mapping speech signals to phonetic units, providing real-time feedback. Gamification, integrated with AI, further enhances motivation and engagement in platforms like Duolingo.

Large Language Models (LLMs), such as GPT, significantly impact foreign language teaching by generating instructional materials, quizzes, and exercises. They simulate interactive conversations, supporting immersive language practice. LLMs also facilitate translation, making foreign language content accessible, and enable the development of bilingual teaching materials. These models assess comprehension, generate questions, evaluate answers, and personalize tutoring by analyzing user interactions and preferences.

LLMs support language modeling by predicting and generating grammatically accurate word sequences. They aid learners in sentence construction, vocabulary expansion, and writing improvement. Their speech recognition and synthesis capabilities offer pronunciation feedback and simulate native speakers' accents. AI-powered chatbots, integrated into messaging platforms, provide language-learning opportunities outside formal education [2]. Intelligent Personal Assistants further enhance accessibility through mobile devices and smart home devices, offering language-learning interactions in daily life.

The development of smart tutor models integrates AI with personalized education. These tutors, more advanced than simple bots, analyze student progress, provide social interaction, and adapt materials based on individual needs. Smart tutors function as mentors, tracking students' emotional states and engagement levels. They help form study groups, assist in grading, and suggest relevant materials [3].

Smart tutors possess adaptability, interactivity, feedback mechanisms, and progress monitoring capabilities. They tailor content to students' needs, analyze digital footprints to identify strengths and weaknesses, and track learning achievements to help educators refine their teaching approaches [5].

AI-Based Learning Systems integrate diverse AI technologies, including chatbots, smart tutors, and personalized recommendation systems. These platforms provide students with targeted consultations, customized coursework, and proficiency assessments. They also incorporate metacognitive scaffolding, offering structured feedback and adaptive support. AI algorithms dynamically update course content by analyzing new data sources, ensuring relevance and accuracy.

Despite AI's advantages, challenges remain, including data privacy concerns, digital inequality, and algorithmic bias. Some educators highlight the negative impact of AI on language learning, as chatbots rapidly generate text, potentially hindering students' productive language skills. Instead of banning AI, teachers should integrate it into curriculum design, creating AI-based assignments and assessment models that balance automation with skill development.

While AI enhances learning efficiency, foreign language education requires a nuanced approach that considers students' personal traits, emotions, and cultural backgrounds. Many researchers argue that AI cannot fully replace human educators in fostering emotional intelligence and intercultural communication. Unlike technical and natural sciences, the methodological foundation for AI implementation in humanities education is still developing. However, AI remains a crucial tool for supporting personalized, engaging, and effective language learning experiences.

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**УКРАЇНСЬКІ ВЧЕНІ ПРО РОЗВИТОК ОСВІТИ І ПЕДАГОГІЧНОЇ НАУКИ  
У РЕСПУБЛІЦІ ПОЛЬЩА (ЗА МАТЕРІАЛАМИ БІБЛІОГРАФІЧНОГО ПОКАЖЧИКА  
“ОСВІТА І ПЕДАГОГІЧНА НАУКА УКРАЇНИ І ПОЛЬЩІ. 2005–2024”)**

Результативна міжнародна співпраця є потужним джерелом для генерування наукових знань, обміну інноваційними освітніми практиками та створення інформаційних ресурсів. Давні зв'язки пов'язують Республіку Польщу та Україну. Республіка Польща була однією з перших країн, які визнали незалежність України та допомагали у вирішенні економічних, соціокультурних, наукових та освітніх проблем.

За роки незалежності нашої держави помітним явищем стала плідна співпраця науковців-педагогів України і Польщі. Її започатковано у 1999 р., коли директор Інституту педагогіки психології професійної освіти АПН України академік І. А. Зязюн і доктор хаб., професор Ф. Шльосек (тоді ректор Вищої школи педагогічних умінь та управління в Риках, нині професор Інституту педагогіки Академії спеціальної педагогіки імені Марії Гжегожевської) ініціювали