

## THE SCIENTIFIC-THEORETICAL FOUNDATIONS OF USING ARTIFICIAL INTELLIGENCE-BASED BLENDED LEARNING METHOD

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**Annotation:** This article explores the scientific-theoretical foundations of using AI-based blended learning, highlighting its pedagogical value, technological underpinnings, and practical applications in modern classrooms. This hybrid approach has proven to be highly effective, especially in language learning and higher education, as it offers personalized, flexible, and interactive learning experiences.

**Keywords:** *Artificial Intelligence, Blended Learning, Higher Education, Language Teaching, Pedagogical Technology, Adaptive Learning, Machine Learning, Innovation in Education, Digital Tools, Learning Efficiency.*

In the digital era, the integration of Artificial Intelligence (AI) in education has brought transformative changes to teaching and learning practices. One such innovation is the application of AI within the blended learning method, which combines traditional face-to-face instruction with digital learning tools. Blended learning is rooted in constructivist learning theory, which emphasizes active knowledge construction through experience and interaction. The Zone of Proximal Development (ZPD) proposed by Vygotsky also supports blended learning by highlighting the role of scaffolding and guided instruction, both of which can be enhanced by AI tools. In addition, Bloom's Taxonomy aligns well with AI-based platforms that support different cognitive levels—from remembering and understanding to analyzing and creating.

AI brings several capabilities to education, such as:

1. Machine Learning algorithms that analyze student performance and adapt content accordingly.

2. Natural Language Processing (NLP) for grammar checking, translation, and automated feedback.
3. Speech recognition systems that aid in pronunciation practice and listening comprehension.

For instance, AI-powered platforms like Duolingo, Coursera, and ChatGPT use real-time learner data to personalize instruction, provide immediate feedback, and suggest learning paths based on individual needs.

When AI is integrated into blended learning, it enhances both the digital and traditional elements. For example:

- 1) Flipped classrooms can be supported by AI systems that deliver pre-class materials and assess understanding before face-to-face lessons.
- 2) Virtual teaching assistants powered by AI can answer student questions 24/7, allowing teachers to focus on more complex tasks.
- 3) Learning Management Systems (LMS) integrated with AI (e.g., Moodle with AI plugins) track progress, detect learning gaps, and suggest remedial materials.

At the Republic of Uzbekistan MG Public Security University, cadets undergo English language training using a blended model enriched with AI tools. Lessons incorporate: warm-up activities via gamified apps, vocabulary practice using AI-based flashcard generators, listening tasks powered by speech-recognition software, automated writing evaluations using tools like Grammarly, speaking practice through conversational bots and virtual role-play. This approach not only increases learner motivation but also ensures consistent language exposure and individualized feedback.

Despite its numerous advantages, AI-based blended learning also faces several significant challenges that must be addressed for effective implementation. One of the primary concerns is data privacy and ethics, particularly regarding the collection, storage, and usage of learner data by AI systems. Without robust safeguards, there is a risk of sensitive information being misused or inadequately protected. Another critical

issue is the digital divide, which refers to unequal access to digital devices and stable internet connections among learners, especially in rural or economically disadvantaged areas. This gap can hinder the equitable distribution of educational opportunities. Additionally, teacher readiness remains a persistent barrier, as many educators may lack the necessary training or confidence to integrate AI technologies into their teaching practices. Continuous professional development and support are essential to help educators adapt to this evolving landscape. Cultural sensitivity also poses a challenge, as AI tools are often developed within specific cultural and linguistic contexts that may not align with the local values, customs, or languages of the learners. These concerns highlight the need for comprehensive strategic planning, strong government support, and ongoing academic and technological research to ensure that AI-based blended learning is implemented ethically, inclusively, and effectively.

### Conclusion

The scientific-theoretical foundations of AI-based blended learning underscore its potential to revolutionize education, particularly in language instruction and professional military training. By merging pedagogy with technology, it enables personalized, efficient, and scalable learning. However, successful implementation depends on addressing ethical, infrastructural, and professional challenges. Continued innovation, teacher training, and evidence-based research are vital for maximizing the benefits of this educational paradigm.

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