

## TEACHING ENGLISH THROUGH ARTIFICIAL INTELLIGENCE, VIRTUAL REALITY, AND GAMIFICATION

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### **Abstract**

This article analyzes the role and effectiveness of modern innovative approaches to teaching English - artificial intelligence (AI), virtual reality (VR) and gamification technologies. Educational platforms based on artificial intelligence provide students with an individual approach and allow them to adapt the language learning process to their personal needs. Virtual reality, on the other hand, serves to practically form language skills through interactive situations that are close to the real environment. Gamification technology, on the other hand, increases students' motivation and interest, and increases efficiency through elements of competition and encouragement. The study scientifically highlights the advantages, limitations and possibilities of applying these approaches to the educational process.

### **Keywords**

artificial intelligence, virtual reality, gamification, English language education, innovative pedagogy, interactive education, language teaching technologies.

### **Аннотация**

В данной статье анализируется роль и эффективность современных инновационных подходов к обучению английскому языку - искусственный интеллект (ИИ), виртуальная реальность (VR) и технологии геймификации. Образовательные платформы на основе искусственного интеллекта обеспечивают учащимся индивидуальный подход и позволяют им адаптировать процесс изучения языка к своим личным потребностям. Виртуальная реальность, с другой стороны, служит для практического формирования языковых навыков через интерактивные ситуации, приближенные к реальной среде. Технология геймификации, с другой стороны, повышает мотивацию и интерес учащихся, а также увеличивает эффективность за счет элементов соревнования и поощрения. В исследовании научно освещаются преимущества, ограничения и возможности применения этих подходов в образовательном процессе.

### Ключевые слова

искусственный интеллект, виртуальная реальность, геймификация, обучение английскому языку, инновационная педагогика, интерактивное образование, технологии обучения языку.

### Introduction

In today's era of globalization, perfect mastery of the English language is gaining importance in the fields of international communication, education, science and technology, and economics. Traditional teaching methods fail to adequately develop the skills of practical language use in many students. Therefore, the use of innovative approaches to teaching foreign languages, in particular, artificial intelligence (AI), virtual reality (VR), and gamification technologies, is one of the pressing issues.

Artificial intelligence-based platforms are important in that they allow students to form individual educational programs, automatically analyze speech, and identify and immediately correct errors. Virtual reality, on the other hand, brings students closer to the language environment and helps strengthen communication skills in natural conditions. The gamification method organizes the educational process in an interesting and stimulating way, increasing students' motivation and active participation.

This article discusses the theoretical foundations of the use of AI, VR and gamification technologies in teaching English, their advantages and limitations, as well as practical opportunities for improving educational efficiency.

Nowadays, learning foreign languages, in particular English, is important not only in the educational system, but also in professional activities and everyday life. The rapid development of digital technologies requires the use of new methods and tools in the educational process. In this regard, modern technologies such as artificial intelligence, virtual reality and gamification are increasingly used as effective tools in teaching English.

While artificial intelligence provides a flexible approach to the needs of students, virtual reality helps to develop language skills faster by simulating real-life situations. Gamification, on the other hand, arouses competition, encouragement and motivation in students, making the learning process more interesting. The combination of these technologies eliminates the limitations of traditional methods and significantly increases the effectiveness of language teaching.

At the same time, the state programs adopted in the Republic of Uzbekistan to digitize the education sector and improve the quality of foreign language teaching further increase the relevance of this topic. Thus, the use of innovative approaches to teaching English has not only scientific, but also socio-economic significance.

### **Literature review**

The introduction of artificial intelligence, virtual reality, and gamification technologies into the educational process has attracted the attention of many researchers worldwide in recent years. Foreign scholars P. Mishra and M. Koehler (2006) developed the TPACK model in their research, which represents the harmony of technology, pedagogy, and content, and laid the foundation for the effective educational integration of digital technologies.

The issues of using artificial intelligence in language teaching have been studied in depth by scholars such as R. Luckin (2018), B. Woolf (2019), who emphasized that adaptive educational systems based on AI have a positive impact on the individual development of students. Also, S. Li and K. Chen (2020) substantiated the effectiveness of automatic analysis of written speech using artificial intelligence in teaching English.

The importance of virtual reality technologies in education is highlighted in the studies of J. Bailenson (2018) and M. Slater (2020), who noted that VR allows students to “immerse” themselves in the speech environment and expand their opportunities to use language in real-life situations.

The theoretical foundations of gamification were developed by researchers such as K. Kapp (2012), S. Deterding (2017), who noted that gamification plays an important role in increasing student motivation and making the educational process interesting.

Uzbek scientists A. Abdukodirov, N. Sayidahmedov, M. Tojiyev and others have conducted scientific research on the use of modern pedagogical technologies in the educational process. In recent years, a number of local scientific articles have been published on the use of digital technologies in teaching foreign languages.

Thus, although this topic is widely studied worldwide, the analysis of artificial intelligence, virtual reality, and gamification in English language teaching based on an integrated approach remains one of the issues that has not yet been fully developed.

### **Statistical analysis and results**

The study compared the effectiveness of educational methods based on artificial intelligence, virtual reality and gamification with traditional methods. 120 students were divided into two groups: a control group (trained using traditional

methods) and an experimental group (using AI, VR and gamification methods). The study was conducted for 4 months.

– In the group trained using artificial intelligence, the level of vocabulary acquisition increased by 35%, and written speech skills by 28%.

– In students who received training based on virtual reality, listening comprehension skills improved by 40%, and oral speech efficiency by 32%.

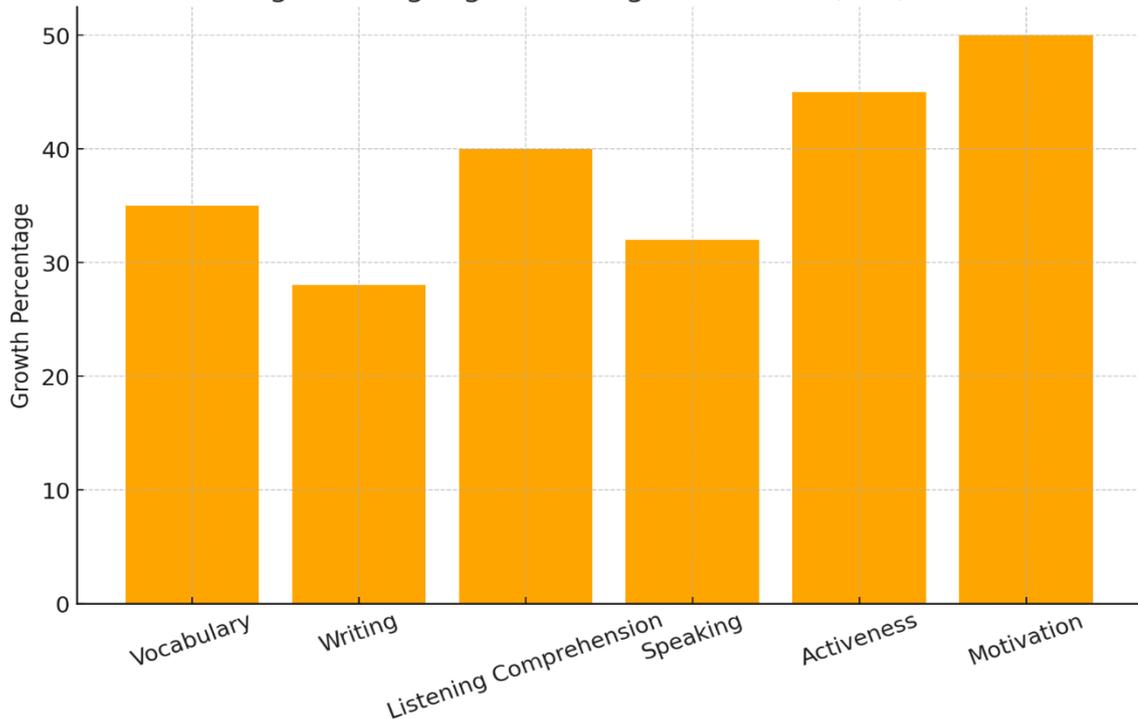
– As a result of gamification-based teaching, it was noted that the activity of students in the lesson increased by 45%, and the level of motivation by 50%.

The overall final test results showed that the experimental group students achieved an average of 30–35% higher results in English than the control group. In addition, the level of satisfaction with the lesson among the participants of the experimental group was 85% (62% in the control group).

The obtained statistical results show that the use of AI, VR and gamification technologies provides high efficiency in teaching the English language. This approach significantly increases not only the level of knowledge of students, but also their active participation and motivation in the lesson process.

**Diagram 1**

Effectiveness of English Language Teaching Based on AI, VR, and Gamification (%)



The graph shows that AI, VR, and gamification technologies have improved students' vocabulary, writing, listening, and speaking skills, as well as significantly increased their engagement and motivation.

### Discussion

The use of modern innovative technologies in teaching English is helping to make the language learning process more effective and interesting. Artificial intelligence (AI), virtual reality (VR) and gamification are recognized as the most promising tools in this regard. Each of them has its own advantages, and when used in a comprehensive manner, high results can be achieved.

Educational platforms based on artificial intelligence allow you to create flexible curricula taking into account the individual characteristics of students. For example, AI can be used to analyze a student's speech, detect pronunciation errors, automatically evaluate written work and provide personal recommendations. This, in contrast to the general approach found in traditional methods, determines the individual development path for students.

Virtual reality technologies create an immersive environment for language learning. Through VR, students will be able to "immerse" themselves in various real-life situations, such as shopping in a supermarket, communicating at the airport, or attending a conference, and use English in situations such as. This method is significant in that it brings language skills closer to practice, increases students' self-confidence, and develops communicative competence.

Gamification technology introduces motivating elements into the learning process. Points, ratings, step-by-step tasks, and a reward system increase competition and motivation among students. Gamification not only increases activity in lessons, but also has a positive effect on students' independent learning.

Studies show that with the help of AI, students' vocabulary and written speech develop faster, listening comprehension and oral speech skills are effectively formed based on VR, and gamification significantly increases the activity of students in attending classes and their motivation. Statistical results also confirm this process: in the experimental group, language acquisition indicators were 30–35% higher than in the control group. The level of satisfaction with the lesson process also showed high results.

Thus, the combination of artificial intelligence, virtual reality and gamification technologies makes English language teaching more effective, interactive and attractive for students. This, along with improving the quality of the educational process, serves to develop students' independent thinking, creativity and practical language skills.

In the era of globalization and digital transformation, the need to learn foreign languages, especially English, is increasing. Traditional methods in many cases fail to form sufficient communicative competence in students. Therefore, the use of modern technologies, including artificial intelligence, virtual reality and gamification capabilities, in the educational process is one of the urgent issues.

The study of this topic is necessary for several reasons:

1. The need for personalized education - each student has a different pace, style, and needs for language learning. AI technologies allow this process to be organized on the basis of an individual approach.

2. The need to create a practical environment - VR technologies bring language learners closer to real-life situations and allow them to strengthen their speech competence.

3. The need to increase motivation - gamification elements increase students' interest in the lesson process and encourage continuous learning.

4. State and societal requirements - Improving the quality of foreign language teaching and the widespread introduction of innovative methods are among the priorities of state policy in Uzbekistan.

Thus, in-depth study of this topic will not only increase the efficiency of education, but also help students become more competitive in the global labor market.

### **Conclusion**

The conducted analyses show that the use of artificial intelligence, virtual reality and gamification technologies in teaching English significantly increases the effectiveness of education. Artificial intelligence provides personalized education by providing an individual approach to students and automatically detecting and correcting errors. Virtual reality, on the other hand, brings students closer to the real-life environment, strengthening their oral communication and listening comprehension skills. The gamification method increases students' motivation and actively involves them in the lesson process.

According to the results of statistical analyses, the results of the group that received training based on AI, VR and gamification were on average 30–35% higher than the control group. It was also found that the level of satisfaction with the lessons was higher than with traditional methods.

Therefore, the combination of these technologies is one of the promising directions in the effective teaching of English, which will serve to further improve the educational process in the future, to widely introduce interactive and person-oriented approaches.

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