UDC 378:004.946:81’243
DOI https://doi.org/10.32782/tps2663-4880/2026.45.2.20

VIRTUAL REALITY IN FOREIGN LANGUAGE LEARNING: OPPORTUNITIES AND CHALLENGES

ВІРТУАЛЬНА РЕАЛЬНІСТЬ У ВИВЧЕННІ ІНОЗЕМНИХ МОВ: МОЖЛИВОСТІ ТА ВИКЛИКИ

Makukhina S.V.,
orcid.org/0000-0001-6269-8406
Senior Lecturer at the Department of Public Administration, Law and Humanities
Kherson State Agrarian and Economic University

The article examines the specific features of implementing virtual reality technologies in the process of foreign language learning in higher education institutions. The study analyzes contemporary research on VR integration into language education and refers to the concept introduced by Jaron Lanier, who coined the term “virtual reality.” It also highlights the practical experience of leading universities such as Duke University, University of Wisconsin-Madison, and Cornell University, which actively integrate immersive technologies into their educational practices. The article argues that virtual reality creates an interactive three-dimensional learning environment that ensures a strong sense of immersion and enhances the development of linguistic, communicative, and intercultural competences. Particular attention is paid to the opportunities for modeling professional situations, practicing academic and business communication, and increasing students’ motivation. VR technologies enable learners to combine theoretical knowledge with practical experience, thereby facilitating the acquisition of sustainable communicative behavior patterns in real-life contexts. At the same time, the study identifies several challenges related to VR implementation, including technical limitations, high equipment costs, risks of cyber sickness, possible social isolation of learners, and the need to align VR content with pedagogical objectives and curricula. The importance of hybrid learning models that combine virtual and traditional classroom activities is emphasized as a way to preserve social interaction and emotional support in the educational process. In conclusion, the article states that the use of VR technologies meets contemporary educational requirements, contributes to individualized learning, and expands access to high-quality educational resources. The future development of educational VR largely depends on improving technical infrastructure, methodological frameworks, and ensuring the broad accessibility of VR as an innovative educational product.

Key words: virtual reality, foreign language learning, immersive technologies, interactive environment, communicative competence, blended learning.

У статті здійснено комплексний аналіз теоретичних засад і практичних аспектів використання технологій віртуальної реальності у процесі вивчення іноземних мов у закладах вищої освіти. Розглянуто передумови активного впровадження VR у сучасний освітній простір, зумовлені цифровізацією суспільства, зростанням вимог до професійної підготовки фахівців та необхідністю формування іншомовної комунікативної компетентності в умовах глобалізації. Проаналізовано зарубіжний досвід інтеграції VR у мовну освіту, зокрема практики Duke University, де реалізовано віртуальні лекційні аудиторії з ефектом телеприсутності, University of Wisconsin-Madison, який розробив інтерактивні заняття для вивчення іспанської мови, а також Cornell University, де створено VR-застосунки для розвитку мовних і культурних компетентностей. Узагальнення цього досвіду дало змогу визначити основні напрями використання VR у навчанні іноземних мов: моделювання професійно орієнтованих ситуацій спілкування; формування навичок академічної та ділової комунікації; розвиток міжкультурної компетентності; створення умов для імітації автентичного мовного середовища. Обґрунтовано, що застосування VR-технологій сприяє підвищенню мотивації студентів, активізації їх пізнавальної діяльності та індивідуалізації навчального процесу. Віртуальне середовище забезпечує безпечні умови для відпрацювання складних або стресових ситуацій (публічні виступи, переговори, участь у конференціях), формуючи впевненість і готовність до реального професійного спілкування. Окреслено низку проблем і викликів, пов’язаних із використанням VR у мовній освіті. Наголошено на доцільності впровадження змішаних моделей навчання, які поєднують традиційні аудиторні заняття з віртуальними інтерактивними середовищами з метою збереження емоційної підтримки, живого спілкування та групової взаємодії. Підкреслено, що віртуальна реальність має значний потенціал для модернізації іншомовної освіти, забезпечує формування практико-орієнтованих навичок, розширює доступ до якісних освітніх ресурсів і відповідає вимогам безперервного навчання протягом життя.

Ключові слова: віртуальна реальність, іншомовна освіта, інтерактивне навчання, імерсивні технології, комунікативна компетентність, змішане навчання.

Problem statement. The constant development of humanity requires the application of new technologies in life and work. Virtual reality plays a huge role in this. It is used in the automotive industry, shipbuilding, geology, medicine, art, aviation, tourism, and other fields. Virtual reality in education is a completely new approach to presenting and learning new material in higher education institutions. Participants in the virtual system can be located in different parts of the world, but at the same time interact with each other to practice the language they are learning, as well as

get acquainted with the culture and traditions of the people whose language they are learning.

Analysis of recent research and publications. It should be noted that many contemporary authors have researched the use of virtual reality tools to improve language skills when learning foreign languages. R. Darke analyzed the characteristics of innovative education, in particular, the gamification of foreign language learning using virtual reality.

S. Bebko viewed virtual reality as a tool for learning foreign languages, drawing attention to its potential for creating interactive educational environments.

In his work, G. Lyzak analyzes foreign and domestic experience in the use of immersive technologies for learning foreign languages, highlighting the differences between foreign experience and the specifics of implementation in Ukrainian educational institutions.

Despite the large number of studies on the use of immersive technologies, questions remain open regarding the problems and challenges posed by virtual reality tools in the process of learning foreign languages.

The aim of this study is to examine the peculiarities of using virtual reality technologies in the process of learning foreign languages, as well as to identify the challenges that hinder their further implementation and development.

Presentation of the main material. The spread of integration of virtual reality tools into the process of learning foreign languages has an impact on the educational process. This innovative approach is used to improve the effectiveness of learning and engage students by giving them the opportunity to "immerse" themselves in an interactive virtual environment to improve their language skills. Technological progress and scientific research confirm the effectiveness of this method, which contributes to its growing popularity among educational institutions. Virtual reality is an artificial universe created by technical means and transmitted through the senses familiar to humans. Computer systems provide visual and sound effects that immerse the user in an imaginary universe behind the screen.

The term "virtual reality" (VR) was first introduced by computer programmer J. Lanier in 1988 and was defined as "a combination of high-speed computers, advanced programming techniques, and interactive devices designed to make computer users feel they have stepped into another world, a world constructed of computer data." Today, virtual reality is defined as a world created by technical means that is conveyed to a person through their senses: sight, hearing, touch, and others. Virtual reality simulates both the influence and the reactions to that influence [1, c. 54]. To create a convincing set of realistic sensations, computer synthesis of virtual reality properties and reactions is performed in real time; this is a human-machine interaction technology that immerses the user in a three-dimensional interactive information environment.

The virtualization of education systems has been actively pursued in developed countries over the past decade. There are three main factors driving this trend:

− increasing requirements for the level of workforce qualifications in connection with technological improvements in modern production and the service sector; the transition of industry to small-batch production with rapid model changes, which requires the rapid retraining of personnel in many companies;

− there is a growing awareness in society of the value of quality education as a personal and national asset. Therefore, the education system has begun to search for new forms of learning. One of them is distance learning using VR elements. The virtualization of education opens up fundamentally new opportunities for solving two of the most important and pressing problems of our time: increasing the accessibility of quality education (including for people with physical disabilities);

− blended the continuity of the educational process throughout human life, which is already a universally recognized requirement proclaimed in UNESCO documents.

Virtual education is a process and result of interaction between subjects and objects of education, accompanied by the creation of a virtual educational space, the specifics of which are determined by these objects and subjects, and, accordingly, the existence which is impossible outside the communication of teachers, students, and educational objects, or, in other words, the virtual educational environment is created only by those objects and subjects that participate in the educational process, and not by visual aids or technical means, no matter how innovative they may be.

It should be noted, that virtual reality is as a set of technical tools that immerse a person in a virtual 3D scene, the model of which is created using a computer, allowing the user to feel as if they are present in another world. Europe and the USA are the leaders in implementing VR in language education. For instance, Duke University and Cisco have opened a unique virtual lecture hall for students, equipped with Cisco TelePresence technology. This technology provides a virtual connection with a "telepresence" effect,

allowing students to communicate with professors and scientists from various countries. The University of Wisconsin-Madison developed a series of virtual lessons for students learning Spanish on the ARIS (Augmented Reality for Interactive Storytelling) platform. Researchers at Cornell University (USA) created an Oculus application to develop linguistic and cultural competencies in Japanese language learners. Additionally, the Mondly VR app by the Romanian company ATi Studios – available for Daydream and Cardboard – offers virtual language learning for various languages, including Ukrainian [2, с. 86].

Ukrainian education is still taking its first steps toward using this technology. In our opinion, the potential of VR for language education is only beginning to unfold. We believe that language learning is a potential area for the application of VR technology and a very promising direction. There are already more than 20 free apps available on Google and Apple markets that can be integrated into lessons.

The Internet offers popular VR platforms for language learning, such as AltspaceVR, EngageVR, The Wild, Spatial, ENGAGE, Mondly VR, Rumii, Anyland, NeosVR, High Fidelity, and Bigscreen Slack (this platform hosts a course from the Leading Teams in the Digital Era program by Hyper Island), Virtual Speech, PanoLingo from ITgenerator, and others, which allow users to acquire knowledge in a new, exciting, dynamic format and engage them in an educational communication environment with a sense of presence.

At the same time, effective activity in an artificial learning environment is ensured by interactivity, which allows for the formation of knowledge, communication skills, and abilities. Thus, conditions are created for gaining experience and transferring it to activities in a professional environment [3, с. 64].

The use of VR technologies in the process of learning foreign languages has a number of opportunities and advantages, such as immersive learning, visualization of complex concepts, individualization of learning, and stimulation of interest in learning. However, it also carries certain risks, such as technical problems, risks of non-use due to high cost, distraction from the main material, heterogeneity of content, as well as risks of privacy and security breaches, which require careful consideration and resolution. VR content can be viewed through a variety of devices, such as VR content can be viewed through a variety of devices, such as screens, special glasses, portable gadgets, mobile phones, and various headsets. AR technology devices should eventually function similarly to mini-computers – modern smartphones. They are equipped with a processor, GPS, flash memory, RAM, Bluetooth/Wi-Fi for measuring speed, angle, direction, spatial orientation, etc.

The main components required for setting up a virtual environment and creating augmented reality applications can be divided into two categories: software and hardware. The most common means of immersion in virtual reality is specialized helmets/goggles that are worn on the head. The principle of operation of such a helmet is quite simple. A display located in front of the eyes shows video in 3D format. A gyroscope and an accelerometer attached to the housing track head movements and transmit data to a computing system, which changes the image on the display based on the sensor readings [4, с. 138]. Consequently, the user can "look around" inside the virtual reality and feel as if they are in the real world. To ensure the image is high-definition and remains in focus, special plastic lenses are used. The following VR formats are distinguished in education:

− face-to-face learning – the transfer of empirical material through VR in semantic learning (virtual technologies offer interesting opportunities for the transfer of empirical material;

− distance learning – group classes with a sense of presence and social interaction (in distance learning, students can be located anywhere in the world, as can the teacher);

− blended learning – the opportunity to be remotely present in the classroom, see what is happening, and interact with real students and teachers (if circumstances prevent them from attending classes, students can do so remotely);

− self-education – any of the developed educational courses can be adapted for independent study.

The virtual educational environment is a creative environment in which learning is possible if students have high internal motivation, are emotionally uplifted, and have a positive, optimistic attitude. A necessary condition for learning in a virtual educational environment is the implementation of a person-oriented educational paradigm without the need to absolutize teaching methods.

With the introduction of the latest technologies into the educational process, VR demonstrates significant potential for improving the quality of education. Presenting information in the form of virtual objects and scenarios makes it possible to create an immersive educational environment that helps engage learners and perceive material more effectively.

Based on the fact that VR technology involves working out the interaction between the user and objects and other people in real time, it can be

assumed that by modeling professional situations that a foreign student studying a non-native language may encounter, it is possible to develop various scenarios, program several options for the development of events, and thus "play out" the communicative behavior of a future specialist; create specific stressful conditions, such as speaking at a scientific conference or conducting negotiations, in order to feel confident in such situations in real life. VR applications for learning foreign languages allow you to immerse yourself in the environment rather than just "imagine" it, and practice your skills. Modern Modern natural language recognition and interval repetition algorithms in such apps simplify learning.

Using VR to immerse themselves in various realistic environments for language learning, students experience different life situations. The experience they gain shapes their behavior patterns. Immersed in the atmosphere of professional life, students understand how and what to say, what to do, and how to behave in order to avoid awkward situations. With this approach, the line between theory and practice is blurred, and as a result, the necessary skills are acquired faster and more efficiently.

Despite the widespread use and successful implementation of VR tools in the process of learning foreign languages, there are still certain challenges and problems that deserve scientific attention. In this context, attention should be paid to the factor of social isolation. When learning foreign languages, students often miss the spontaneous discussions and group activities that are characteristic of the traditional educational process. The individual-centered focus of VR modules makes group projects and conversation practice difficult. The virtual experience often lacks important nonverbal cues, such as facial expressions and body language, which are an important aspect of effective communication. The results of some studies have shown that students often lack emotional support from teachers and classmates, which leads to feelings of isolation. To overcome these problems, educational institutions may consider hybrid learning models that combine VR with traditional classroom activities, including group activities and interaction with classmates, to improve the social aspect of language learning in VR and reduce feelings of isolation among students [5, c. 11].

It is also often pointed out that integrating virtual reality into existing language teaching programs creates problems in terms of reconciling the experience of using it with educational goals and teaching methods without disrupting the educational process. Teachers must ensure the proper sequence of VR activities in the educational program, which contributes to the development of language skills, grammar, vocabulary, and cultural awareness. Adherence to methodological consistency is important and requires teachers to adapt virtual reality content to pedagogical approaches such as communicative language teaching or task-based learning.

It is also important to highlight the risks of developing "cyber sickness," which refers to the discomfort and dizziness that some people experience when using virtual reality technology. Some students may find it difficult to work with VR content for long periods of time, which can lead to reduced learning effectiveness and a negative experience. Teachers should be aware of this issue and consider ways to mitigate its impact. They can limit the duration of virtual reality sessions, take breaks, or offer alternative learning activities for students who feel uncomfortable.

Conclusions. Thus, thanks to VR technologies, the application of which contributes to the creation of conditions for gaining practical experience and transferring it to professional activity, the requirements of modern education are being met, and opportunities are emerging to provide large amounts of information in new ways. The use of VR technologies in education is not only a new trend in the field of education, but also a new way of learning.

The educational VR environment simulates specialized professional niches for organizing training with practice and contributes to the formation of communication skills and can be used, in particular, in the field of teaching foreign languages for academic and professional communication. The future of educational VR will largely be determined by how quickly VR becomes a widely available technological educational product.

The prospect for further research lies in the theoretical description of the practical application of virtual reality for learning English, which encompasses the entire global community, becoming a global, worldwide, multi-ethnic, and multicultural conglomerate.

BIBLIOGRAPHY:

1. Васюкович О.М. Інноваційні технології навчання у вивченні професійної англійської мови у вищих технічних навчальних закладах Європи. *Наукові записки.* 2020. № 191. С. 52–55.

2. Вятчанін Є., Горбатовський Д. Використання віртуальної реальності в освітньому процесі та профорієнтаційній роботі на прикладі програмного продукту VRAnalytics. *Освітологічний дискурс.* 2020. № 1 (28). С. 81-93.

3. Загородня О., Ворначев А., Горюнова М. Тренди у вивченні іноземних мов в епоху пандемії. *Актуальні питання іноземної філології.* 2022. № 16. С. 60–66.

4. Некрилова О. Л. Застосування віртуальної реальності в навчанні іноземних студентів мови академічної та професійної комунікації. *Академічні студії.* Серія «Гуманітарні науки». 2021. № 4. С. 136–141.

5. Lan, Y.-J. Immersion, interaction, and experience-oriented learning: Bringing virtual reality into FL learning. *Language Learning and Technology.* 2020. Vol. 24. No. 1. P. 1–15.

Дата першого надходження статті до видання: 26.02.2026
Дата прийняття статті до друку після рецензування: 30.03.2026
Дата публікації (оприлюднення) статті: 07.05.2026