

USING VIRTUAL AND AUGMENTED REALITY IN THE PROCESS OF TEACHING THE RUSSIAN LANGUAGE

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Annotation

This article is devoted to the study of the use of virtual (VR) and augmented reality (AR) technologies in the process of teaching Russian as a foreign language (RFL). The article examines the issues of studying the possibilities of using VR and AR to improve the effectiveness of teaching.

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In recent decades, technology has been actively penetrating all areas of human life, including education. Modern educational institutions strive to introduce innovative teaching methods that not only improve the quality of education, but also make the learning process more interesting and motivating for students. One of these technologies is the use of virtual (VR) and augmented reality (AR). These technologies have already demonstrated their effectiveness in various fields of science and industry, and are now increasingly used in pedagogy.

The use of VR and AR opens up new horizons in teaching languages, including Russian. These technologies allow you to create interactive learning environments that significantly improve the perception of the material, making it more accessible and visual. Virtual and augmented environments allow students to immerse themselves in artificially created situations that simulate real communication tasks, which is especially important when learning a foreign language. This contributes to a deeper understanding of language structures, expanding vocabulary and developing communication skills.

Virtual reality (VR) and augmented reality (AR) technologies have attracted the attention of scientists and educators for quite some time now. Their use in various fields, including education, makes it possible to increase student engagement in the learning process and provide them with a deeper understanding of the material.

Virtual Reality (VR)- is a technology that creates an artificial digital environment with which the user can interact. In this case, the surrounding real world is completely replaced by a digital simulation. Equipment for using VR includes virtual reality helmets, controllers and sensors that track the user's movements, providing full immersion in the virtual environment. According to Burdey (2017), virtual reality allows students not only to observe the process, but also to actively participate in it, which increases motivation and helps to better assimilate information. VR creates three-dimensional spaces where students can interact with objects, perform practical tasks, simulate real situations and thereby develop not only theoretical knowledge but also practical skills.

Augmented Reality (AR), in turn, is a technology that adds virtual objects to the real world while maintaining the visibility of real objects in the environment. AR superimposes virtual objects (3D

models, text or visual information) onto an image of the real world. As noted by Azuma et al. (2001), this interaction between real and virtual environments creates an additional dimension of information perception and is a powerful tool in the educational process, since AR allows students to access interactive educational materials while in the real world.

The main difference between VR and AR is the level of user immersion in the virtual environment. While VR completely isolates a person from reality, creating a new, digital environment, AR, on the contrary, expands the real world by adding digital elements. As Richard and Bowen (2018) note, this difference makes AR more accessible and less expensive to implement in educational institutions, as it can be used using regular mobile devices or tablets, while VR requires more expensive equipment.

Virtual and augmented reality have their own technological features that determine their use in the educational process. The equipment needed to create virtual reality includes helmets, glasses and controllers that provide the user with the ability to immerse themselves in a three-dimensional environment and interact with objects. The most popular devices today are Oculus Rift, HTC Vive and PlayStation VR. These systems are equipped with motion sensors that record the user's movements and transmit them to the virtual environment.

In terms of software, VR technologies are created using game engines such as Unity and Unreal Engine. These platforms offer extensive capabilities for modeling various educational scenarios, creating interactive learning programs and simulations. The software can also support multimodal interaction, allowing learners to use multiple senses simultaneously - vision, hearing and even tactile sensations, which significantly improves perception and memorization of the material. As Bowman et al. (2018) point out, the use of VR technologies allows for the creation of unique learning environments that may not be available in real life (e.g. excursions to inaccessible places or simulations of rare phenomena).

Augmented reality (AR) uses mobile devices such as smartphones and tablets to superimpose virtual objects onto real-world environments. The devices' cameras and special sensors track the object's position in the real world, allowing digital elements to be accurately displayed in the right places. Unity and Vuforia platforms are also widely used to create AR content, allowing developers to integrate 3D objects and text elements into real space.

An example of the use of AR in education is the Google Expeditions app, which allows students to take virtual field trips using mobile devices. With it, students can see virtual 3D objects that complement their learning of real objects or phenomena. According to researchers Lee et al. (2020), AR significantly increases engagement and improves the visualization of complex concepts, which is especially important for teaching complex topics.

The historical development of VR and AR began long before their popularity in the educational and commercial spheres. The concept of virtual reality was first proposed in the mid-20th century, when Morton Heilig created the first prototype of a device known as the Sensorama in 1962. This device provided the user with an audiovisual experience using 3D images and sound. However, the true development of virtual reality technology did not begin until the 1990s with the development of computing power and the emergence of the first commercial VR devices.

Early VR headsets, such as the Virtuality and the Nintendo Virtual Boy, were used primarily in entertainment. However, their limited technological capabilities prevented them from being widely used in other areas. It was only with the advent of more powerful computers and graphics processors in the 2000s that VR began to penetrate professional fields, including medicine, the military, and education.

As for AR, its development began somewhat later, with the development of mobile technology and high-resolution cameras. In the 1990s, AR began to actively develop as a means for military simulations and training. In the educational field, the first major wave of AR use began in the 2010s, when smartphones with ARKit (by Apple) and ARCore (by Google) support became available to a

wide range of users. This made augmented reality technologies more accessible to educational institutions.

Researchers such as Dede (2009) note that AR and VR have developed significantly in recent years due to the fact that technological platforms have become more accessible and easier to use. Reducing hardware costs and improving software have also contributed to their widespread adoption in educational processes. In addition, the popularization of VR and AR in the gaming industry has also influenced their perception as promising tools for learning.

Today, VR and AR technologies continue to evolve, offering ever-expanding opportunities for creating unique educational platforms. Educational institutions around the world are beginning to actively implement these technologies, seeing their potential to improve the quality of education, increase student motivation, and create more interactive and engaging teaching methods.

The Russian language is known for its complex grammar system, including cases, a variety of declensions, verb tenses, and other elements. Mastering the case system is especially difficult for students who do not have similar constructions in their native language. As Kholodova and Kapranova (2018) note,¹Students often get confused in the use of cases, which hinders their communicative effectiveness.

VR and AR technologies can help make grammar learning more visual and interactive. For example, AR can visualize case forms by associating them with specific objects or situations, helping students better understand grammatical structure and the context in which it is used. Virtual reality can create an educational environment where students can perform practical tasks, such as communicating with virtual characters, where the correct use of cases is key to successfully completing the task.

Learning vocabulary and cultural aspects also poses a significant challenge for Russian language learners. Many words and expressions in Russian have cultural and contextual features that may be difficult for foreign students to grasp. The cultural barrier is one of the reasons why students have difficulty mastering vocabulary and phraseology.

Thus, virtual and augmented reality are powerful tools for modernizing the educational process, creating unique conditions for learning and mastering complex concepts. The development of these technologies over the past decades shows their significant potential for changing the traditional approach to learning.

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