

APPLICATION OF AR TECHNOLOGY IN EDUCATION

Mamajanova Svetlana Valentinovna

Teacher at Kokand State

Pedagogical Institute

ABSTARCT

Augmented reality (AR) is one of the cutting-edge technologies making its way into the educational space, providing unique opportunities to enhance learning and enrich learning experiences. This article provides an overview of the current application of augmented reality technology in education, discussing its benefits and potential.

Keywords: augmented reality, education, immersive learning, innovation, interactive learning, AR technology integration, digital skills, trends in education

INTRODUCTION

Modern education is undergoing significant changes under the influence of rapidly developing information technologies. One of the key innovations that is rapidly making its way into classrooms and curricula is augmented reality (AR) technology. Augmented reality provides unique opportunities to enrich educational experiences by providing interactive and engaging learning experiences.

MATERIAL AND RESEARCH METHODS

Analysis of existing educational and methodological literature related to the use of AR technologies in education. This analysis made it possible to identify the main approaches and methods used in educational practice; comparison of traditional teaching methods with modern interactive technologies; assessment of the opportunities that augmented reality technology provides in the context of learning. This included exploring different scenarios for using AR in classroom and extracurricular situations.

RESEARCH RESULTS AND DISCUSSION

Augmented Reality (AR) is a technology that allows you to add virtual objects and information to the user's real environment. It differs from the reality of reality, which does not create a completely artificial environment, but complements the existing one. In the world of education, AR technology can be used to enrich the learning process and create interactive learning tools. Augmented reality is one example of immersive learning. Immersive learning is an innovative approach to learning that integrates technology with traditional teaching methods to provide a more realistic and stimulating environment for growth. It focuses more on the learning experience rather than the learner's right or wrong answers [6].

Immersive learning uses an artificial or simulated environment through which the learner can become fully immersed in the learning process. Immersive learning allows you to control your results by connecting them to real-life experiences, but in a safer environment. In addition to increasing their level of engagement, it also increases their motivation as they gain control over

the virtual world, they are in. Another interesting feature is that it provides a highly interactive environment for users, both virtually and physically [4].

There are several types of augmented reality:

Marker augmented reality (Marker-based AR):

Based on the use of markers or images in the real world.

AR apps recognize markers and add virtual objects or information on top of them.

Markerless Augmented Reality (Markerless AR):

Does not require special markers to work.

Based on recognizing real world objects such as structures and locations to place virtual objects.

Projective Augmented Reality (Projection-based AR):

Uses the projection of virtual images and objects directly onto physical surfaces in the real world.

Typically used to create interactive projections on walls, tables and other surfaces.

Superpositional augmented reality (Superimposition-based AR):

partially or completely replaces the original representation of an object with an augmented representation of the same object.

Often used in mobile applications related to navigation and tourism.

Each of these types of AR has its own characteristics and applications, and the choice depends on the specific goals and tasks that you want to solve using augmented reality [1].

The relevance of using augmented reality technology in the education system can be justified by the following reasons [8]:

The scope of application of augmented reality technology is limitless: virtual tours and navigation, product demonstration and advertising, testing and promotion, construction and design, entertainment, training, etc. Augmented reality allows you to implement virtual 3D models, animations and information in scientific textbooks. This makes technical materials more interesting and understandable for students. For example, when studying anatomy, students can use smartphones or tablets to see internal organs in 3D and study their structure in more detail.

AR technologies make it possible to create virtual excursions and practical classes that were previously unavailable to students. For example, historical sites, museums, or laboratories may be remote from the environment, causing students to lose their physical presence.

AR technology also ensures the creation of interactive lessons in which students can interact with virtual objects and scripts. This makes the learning process more fun and helps improve understanding of the educational material.

The use of augmented reality in education brings a number of beneficial results. Firstly, it helps to increase student motivation. Interactive and engaging lessons make learning more engaging. Secondly, it promotes better learning of educational material due to visual and tactile impressions [3].

In addition, AR technology contributes to the development of creativity and analytical thinking in students. They can imagine and experiment with virtual objects, which helps develop critical thinking.

A group of analysts from ABI Research claims that by 2024 the global AR/VR market will grow to 7-8 billion US dollars. And this, according to experts, is just the beginning.

Examples of using AR in teaching

- AR training for gall bladder surgery was successfully tested at Yale University.
- A study “The Impact of Augmented Reality on Academic Activities” was conducted in Beijing. The children were taught the same discipline, but one group was taught the classical method, and the second using AR. As a result, a test was carried out. The first group was 73% successful, and the second - 93%. In addition, the AR group showed a deeper understanding of the topic and better consolidated the acquired knowledge (according to the test results two weeks later).
- Google has been working on creating virtual tours of world attractions for several years now. For example, at the end of 2019, a virtual tour of the Palace of Versailles was launched, which was created using 132,000 photographs. There are also tours of the Bolshoi Theater in Moscow, Buckingham Palace in London and other cultural heritage sites. And their number will only grow every year.

Let's look at a few examples of mobile applications with AR technology:

- Geogebra (3D Calculator) - allows you to create geometric 3D objects and project them, using AR technology, into our world in order to explore these objects from different angles.
- Science in AR - the application allows you to study the planets of the solar system or even the entire system, projecting them onto any surface where the phone's camera is pointed.
- Pokemon GO is a game in which players can search, catch and battle virtual Pokemon that appear in the real world using a smartphone camera.
- Snapchat – uses AR filters and effects to add interesting and fun elements to photos and videos taken on the app.
- Quiver is an educational app for kids that allows them to color special designs and then bring them to life using AR.
- Lego AR-Studio is an app from Lego that allows children to build virtual structures using real Lego pieces and interact with them through AR.

To create your own educational content with AR elements, we can recommend the AR constructor – AR.Studio (<https://web-ar.studio/ru/>).

AR STUDIO

Продукты ▾ Направления ▾ Примеры ▾ Тарифы

RU ▾ Запрос демо

Войти

Начать бесплатно

Универсальная платформа по созданию AR & WebAR

Создавайте профессиональные проекты с дополненной реальностью любой сложности в несколько нажатий без кода и навыков в 3D

Начать бесплатно

Запросить демо >

Без ограничений просмотров. Полностью бесплатно.

The benefits of this online builder include:

Possibility of using convenient and simple templates.

The ability to open projects using augmented reality (AR) directly in the web browser, without the need to install additional applications.

Free use of the basic functions of the platform, which are enough for an initial acquaintance with this technology.

There are also several limitations to note when using this platform:

The free plan limits the creation of no more than 10 projects.

Requirements for smartphone operating systems: Android 8 and above, as well as iOS 14 and above.

In the context of education, this platform can be used to create exciting educational materials and presentations, create business cards for teachers and professors, develop educational quests and excursions that enrich the learning process [2].

CONCLUSION

New technologies require the acquisition of new skills, which become an integral part of education. In the traditional learning system, what is important is the amount of knowledge that can be retained, such as the ability to identify the history and creator of a building. However, in this day and age, it is equally important to be able to use technology to find this information, and the faster this happens, the better. In this context, augmented reality applications are of great interest [7].

In addition to other information educational technologies, such as Internet-oriented educational methods, distance learning, multimedia education, e-learning, and smart-education technologies [7], augmented reality technologies can also be distinguished .

The use of augmented reality technologies in education is a promising direction. It enriches technology materials, makes learning interactive and fun, and promotes skill development and understanding of course materials. A computer science teacher must constantly be in the field of digital transformation, as this is the most important feature of modern education. A modern computer science teacher must be able to plan and carry out educational and cognitive activities in the context of the widespread introduction of digital educational and methodological complexes, educational simulators, virtual laboratories and AR/VR modules. Since these modern tools serve the development of digital literacy of students, the formation of their information culture and scientific worldview [5]. The introduction of augmented reality into education makes the learning process more effective and attractive for students.

REFERENCES

1. Kochetkova O.A., Pudovkina Yu.N., Varlashina S.Yu., Nazemnova N.V., Gusarova M.N. Augmented reality as an innovative technology for organizing the educational process in computer science // Modern problems of science and education. – 2020. – No. 5;
2. Mamajanova S.V. Informatics and digital technologies // textbook for undergraduate students in the field of Mathematics and Informatics 2023.
3. Kokh I.A. Using augmented reality technology // Information technologies in education and science ITON-2023

4. Valentinovna, Mamadjanova Svetlana. "Augmented Reality Technologies In Education." Eurasian Journal of Learning and Academic Teaching 20 (2023): 60-62.
5. Azevich A.I. Models of using immersive learning technologies in the activities of computer science teachers // Bulletin of RUDN University. Series: Informatization of education. 2021. No. 2. URL: <https://cyberleninka.ru/article/n/modeli-ispolzovaniya-immersivnyh-tehnologiyobucheniya-v-deyatelnosti-uchitelya-informatiki> (date of access: 09/28/2023).
6. Grinshkun A.V., Levchenko I.V. Possible approaches to the creation and use of visual means of teaching computer science using augmented reality technology in primary school // Bulletin of RUDN University. Series: Informatization of education. 2017. No. 3. URL: <https://cyberleninka.ru/article/n/vozmozhnye-podhody-k-sozdaniyu-i-ispolzovaniyuvizualnyh-sredstv-obucheniya-informatike-s-pomoschyu-tehnologii-dopolnennyrealnosti-v> (date of access: 09/28/2023).
7. Taran Victoria Nikolaevna Application of augmented reality in teaching // Problems of modern pedagogical education. 2018. No. 60-2. URL: <https://cyberleninka.ru/article/n/primenenie-dopolnennyrealnosti-v-obuchanii> (date of access: 10/27/2023).