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AUGMENTED REALITY TECHNOLOGY: NEW LEARNING OPPORTUNITIES

Akmetova Ayazhan
ayazhan_akhmetova@mail.ru
1-year master student in "Foreign Languages: Two Foreign Languages"
L.N.Gumilyov ENU, Nur-Sultan, Kazakhstan
Supervisor – G.N. Dukembay

The current stage of development of the educational system can be characterized by qualitative changes in its content, structure, introduction of new approaches, techniques and technologies into the educational process. This industrial revolution in the very near future will completely transform people's lives. Even today, more and more sophisticated "smart" equipment, modern robots, are entering our everyday life. Many processes and functions that were previously performed by humans are transmitted to robotics before our eyes, as a result of which many people are released from traditional industrial labor [1].

Currently, augmented reality is widely used in various fields, such as media, when broadcasting sports matches, for example, the yellow line showing the player's position in the "offside", in military technologies, for example, the augmented reality is embedded in the pilot's helmet so that see the world with augmented information for the convenience and ease of use of the aircraft, without being distracted by individual devices on the panel. In computer games, in recent years, a sharp jump in the development of augmented reality technology has increased the number of games using this technology. For example, applications that mimic terrorists on the display of a smartphone with a working camera – the user's task is to shoot them using the touch screen, and augmented reality is used in many other areas, such as printing, barcode recognition, medicine, and so on.

To modern children need a modern approach. Formed clip thinking in students, a decreasing concentration of their attention, require innovative approaches to presenting information. One of the brightest and most effective educational solutions is the use of augmented reality technology in explaining new material, project activities and much more.

The technology allows the teacher and the student to be completely independent in the choice of script and content: the user decides which image will come to life and what exactly will appear on it. It is mainly used as various kinds of simulators, as well as to demonstrate the processes, phenomena and objects, which are impossible or extremely difficult to show in real reality. For example, if it is important for a teacher to show the peculiarities of the interaction of sodium and water, s/he creates a project with a visual explosion: the student will spend the experiment with their own hands, and everything will be done without sacrifice.

Using the possibilities of augmented reality in education, it is possible to visually reproduce processes that are difficult or almost impossible to recreate with the means of the real world and simply make the learning process fascinating and understandable. With this technology, students can stand out in the exhibition space or make the museum exhibition lively and fascinating. Augmented reality can add expressive animation to static pages of the book, turn reading into an exciting game and an interesting adventure along with the heroes of the work, as well as simplify playback of audio and video content attached to a paper book. In the classroom, students can use smartphones when showing children how the world works using Google Earth and web albums like Picasa and Instagram [2].

However, in almost all areas of learning, augmented reality technology is still rarely used. At the same time, all the forces of the education system are turned to the electronic-informative educational environment. Although almost every school room is equipped with computer equipment, projection equipment, electronic educational resources, the Internet. However, the capabilities of this technique are either not used at all or are used occasionally. And the views of the teacher and the student, like many years ago, are addressed to the educational literature of the printed form.

The computer revolution in the past few decades has led to the fact that in some countries, including Kazakhstan, schools and universities have drastically lagged behind the product of information technology, which have long found their place in routine life. So far, thanks to paper-based textbooks, a pupil or a student acquaints with certain topics of the curriculum tactilely and scientifically, in rare cases, visually. One can imagine how the process of perception and memorization of educational material would improve thanks to the technology of augmented reality. It is these modern interactive technologies that bring in the process of learning bright three-dimensional images, the game element, intensify the interaction of participants in the educational process, developing spatial thinking and skills of project activities. Thanks to augmented reality, endless opportunities are open for students to learn new things.

The technology of augmented reality, above all, is necessary in school teaching practice. E-textbooks, which are currently being compiled on a mandatory basis, as an annex to a textbook in paper form are mostly digitized copies with minimal interactivity. At the same time, computer visualization is little used to draw attention to the discipline, to increase the interest of schoolchildren, to demonstrate examples that children seem to be difficult or boring [3].

Anyway some universities have recently introduced into the general curriculum a subject called “Modern teaching aids”, for the reason that our society needs to train well-educated and highly moral people [4]. And among the studied technical means, at this point in time, devices are very relevant, the principle of action of which is based on augmented reality technology. The use of augmented reality technology in the process of teaching disciplines is possible in both the natural and humanities.

The relevance of introducing augmented reality technology into the educational process is that the use of such an innovative tool will undoubtedly increase the motivation of students in studying computer science and other disciplines, as well as increase the level of information assimilation, synthesizing various forms of presentation. A huge advantage of using augmented reality technology is its visibility, informational completeness and interactivity [5].

The effectiveness of the educational process depends entirely on the level of its organization. The required level can be achieved with a clear, consistent, logically related construction of all elements of the activities of the teacher and students [6].

The rapid growth of augmented reality technology and new methods for their implementation lead to the need for their implementation in everyday life, making the world more informative. The movement of images is one of the significant problems, which arises as a result of changes in light, colors, scales, viewing angles. The problem of disambiguation, when designing three-dimensional objects on flat images, also affects the final results. Also, the color and brightness of individual pixels depends on various factors that are difficult to predict, such as: light sources and their location, shadows, and radiation intensity and color

One of the cornerstones of AR-technology are markers, on the basis of which the addition occurs. Currently, most applications use QR codes or 2D images as a fixed target for orientation, however, the development of the technology is moving towards using the anchor point of existing objects, which makes the problem of their recognition all the more urgent. This is evidenced by the fact that, according to the same study, one of the first released applications with augmented reality, Google Goggles, designed just to get information about the real object that the camera sees at the moment, hardly distinguishes between these objects.

Another significant problem in this area is the realistic location of objects. Suppose an application created to show what furniture will look like in an apartment’s environment, often places this furniture as if it is several centimeters above the floor, or partially embedded in a wall. This happens because one camera of a mobile device, even in combination with a gyroscope, cannot determine the location of objects relative to each other, as does the eye of a person with binocular vision, and therefore cannot provide the depth of perception.

Most of the smartphones that are now freely available, were created as universal, in their development did not take into account augmented reality. This explains the unstable operation of augmented reality applications on such devices.

The situation is more complicated with specialized devices. Here, the main contentious issues are their usability and the principle of their management. The level of development of computer components at the moment is such that increasing the performance of the device increases the price, and often the size of the device. The issue of interaction is also quite problematic, since manual control negates the need for wearable technology, such as smart glasses, and the use of voice commands does not justify itself in every real-life situation.

Adjacent to the last misconception is that AR kills live communication and alienates people from each other. But the same thing was said about mobile phones, messages, social networks. However, those who consider the use of new technologies as an escape from reality forget about their advantages: mobile communication makes it possible to connect with a person on the other side of the planet, and social networks can enrich remote communication with various types of content and activities.

In conclusion, we note that the achievements of modern information technologies in the field of computer graphics, animation, reconstruction and reproduction of various complexity levels

of processes make it possible at a new level to realize the visualization of the objects, processes and phenomena under study.

When using AR technologies, the maximum educational effect is achieved: motivation is enhanced, cognitive activity is activated, training is intensified, more useful information is assimilated, and the stored information is better store.

However, at the moment there is no single methodology for the use of augmented reality technology in the educational environment. There are no well-developed applications yet, despite the fact that augmented reality is a real way of moving forward, not only because we live in the age of information technology, but because augmented reality, both for a student and for an ordinary person, is the most effective way of knowing the surrounding environment and space.

Literature

1. Schwab K. The Fourth Industrial Revolution // What It Means and How to Respond Foreign Affairs (2015). Available at: https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution (accessed 25 March 2019).
2. Dopolnennaya real'nost' – eto budushchee? (Is Augmented Reality the Future?) (2018). Available at: https://kudavlozitdengi.adne.info/dopolnennaya-realnost/ (accessed 25 March 2019).
3. 20 primerov dopolnennoj real'nosti v obrazovanii (20 examples of augmented reality in education) (2013). Available at: http://arnext.ru/articles/20-ar-eksperimentov-v-obrazovanii-2353 (accessed 25 March 2019).
4. Zejnalov G.G. Innovative context of modern education. Uchebnyj ehksperiment v obrazovanii [Educational experiment in education], 2011, no. 1, pp. 4-12. (in Russian)
5. Dopolnennaya real'nost' v obrazovanii (Augmented reality in education) (2013). Available at:https://sites.google.com/site/relarn2010/glavnaa-stranica/tezisy-relarn-2013/petrova-oksana-dopolennaa-realnost-v-obrazovanii (accessed 25 March 2019).
6. Evtihov O.V., Adol'f V.A. Modern view of the educational environment of the university as a pedagogical phenomenon. Vestnik KGPU imeni V.P.Astaf'eva [Bulletin of the KSPU], 2014, no. 1, pp. 30-34. (in Russian