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TEACHING PATALOGICAL ANATOMY USING VR TECHNOLOGIES

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Abstract: This article reflects on innovative educational technologies and methods of using simulation tools in practical training in the teaching of Medical Sciences.

Keywords: VR, AR, MR(Mixed reality). innovation edicational enviroment, CGI reconstruction.

Being able to make the most of digital technologies gives people the opportunity to get an expanded and independent education. There are still neighborhoods in remote villages without internet access, and we do not even have neighborhoods with a large number of unskilled workers, low-education youth and adults, and limited financial opportunities coming from the area. The main reason for the digital discrepancy is the lack of access to information and the need to train workers, older people, people with disabilities, those whose capabilities are materially limited in high technology.

Virtual reality(VR) is a kind of similarity of the world around us, artificially created with the help of technical means and presented in digital form. The created effects are projected onto the human consciousness and allow you to experience sensations as close to real as possible.

In Augmented Reality (AR), you will be able to combine physical and virtual reality to effectively train employees, solve problems quickly, increase productivity and efficiency of collaboration, as well as take another step towards the future.

Mixed reality(MR) is the next wave in the field of computing environments, which stimulates the development of mainframes, PCs and smartphones. Mixed reality should become publicly available to consumers and businesses. It frees us from the limitations of working with screens, allowing us to use instinctive interactions with data at home and with our friends. Internet users, who number hundreds of millions in the world, already have interactions with mixed reality through portable devices. To date, most of the common mixed reality solutions in social networks are offered by mobile augmented reality. People may not even realize that the augmented reality filters they use on Instagram are examples of mixed reality.

Virtual reality is an innovative technology that, with the help of a special VR helmet and controllers, allows you to create the impression of being in another place. Over the past decade, these gadgets have become increasingly common not only in the entertainment industry, but also in medicine. With the help of virtual reality, doctors

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are opening up new opportunities in the diagnosis and treatment of common diseases, which was impossible with old technologies. The Medglobus team has made a selection of the 6 most interesting innovations that are used in the most progressive clinics in the world. Perhaps in a few years these inventions will become generally accepted.

VR in the field of education began its victorious offensive with the use of various simulators to demonstrate phenomena, processes and objects that are extremely difficult or impossible to visually present in real reality. They can view the smallest details of any part of the body using 360° CGI reconstruction.

Medical students study the structure of the body with the help of virtual reality, which allows analyzing the human body to the smallest detail, starting with the skeleton, nervous system, muscles and everything else. Such training offers unique opportunities and improves the quality of knowledge of future doctors. Doctors of surgical specialties can work out practical skills of operations and/or manipulations without the risk of making mistakes; psychiatrists – to see the world of patients with mental disorders; students of medical universities – to learn how to perform elementary procedures.

Virtual reality allows you to simulate the transfer in space and time, as well as to perform visual transformations of objects. VR applications can be used to simulate emergencies, accidents, or life-threatening situations, so that ambulance and emergency personnel can be trained to operate under high pressure and acquire valuable skills in a fairly realistic atmosphere. The “Virtual Heart” project was included in the curriculum of Stanford University students (USA), which allows them to study the anatomy of the heart and the mechanisms of its functioning by immersing themselves in VR.

In mid-September 2019, as part of a study, virtual reality technologies began to be introduced in one of the Oxford nursing homes to help patients suffering from dementia. At the same time, virtual reality pictures are created individually for each patient.

The team of the pilot project agreed with the employees of the nursing home and created a panorama of pictures from the past for patients with dementia. Several patients were sent to memories of their youth: to dance halls with rock and roll from the 1950s, to the church where they got married, on trips abroad. The patients described the sensations they experienced as “amazing” and added that they feel much more cheerful after such a shake. Scientists report that the use of VR technologies improved communication and cognitive abilities in more than half of the dementia patients who participated in the study.

In modern surgery, over the past few years, robotic devices have been performing high-precision operations under the supervision of a surgeon, including

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using VR technology, which provides the doctor with accuracy and efficiency. Before the operation, surgeons can use virtual reality technologies to simulate the course of the upcoming intervention, study three-dimensional models of internal organs, their topography relative to other anatomical structures.

There is evidence that the use of VR increases the accuracy and informativeness of surgical interventions. This is carried out at the decision-making stage in the preoperative and intraoperative periods, when a virtual model reproducing the anatomical features of the operated person is displayed with a special projector, or when the surgeon works in a helmet with Video See-Through technology.

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