POSSIBILITIES AND PROSPECTS OF USING VR TECHNOLOGIES IN BIOLOGY CLASSES

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Annatation: This article presents information about the effectiveness of using VR technologies in the teaching of biological sciences and the impact on the level of students' understanding of the lesson. The results of the questionnaires received from the students are also presented.

Key words: VR technologies, visual lesson, educational technologies, field of natural sciences, virtual reality.

Introduction: The educational system of the modern world requires making the learning process of students more interesting and interactive. One of the technologies used for this purpose is virtual reality (VR) technologies. Especially in the field of natural sciences, by using VR technologies in the course of the lesson, it gives students the opportunity to observe the events happening in nature in a virtual environment, to study the anatomy of cells, plants and animals in more depth. As we know, the science of Biology is rich in complex and visual processes, so there is an opportunity to easily and interestingly explain these processes through VR technologies. This creates the ground for students to go deeper into the learning process and better understand the topics. This article is devoted to the analysis of the perspectives of VR technologies in teaching biology and their direct impact on educational effectiveness.

Purpose of work: Studying the possibilities and effectiveness of using VR technologies in biology classes.

Research object: Students studying Biology and lesson developments based on VR technology were selected as the object of research.

Research methods: This study was conducted in order to study the effect of VR technologies on the educational process in the teaching of biology. Several methods were used during the research. These are the following:

Questionnaire method: 3 biology teachers and a group of 24 students participated in the research. Special questions were asked to find out their opinions about the use of VR technologies in biology classes. Also, the results were analyzed, and students' attitude to learning through VR technologies was studied.

Experimental method: In the experimental method, an experiment was conducted on students divided into two groups (control and test group). One group was taught in a traditional way, and the other group was taught using VR technologies. The level of understanding and mastering of the lessons of each group was compared.

Literature analysis: Researches and scientific articles investigating modern VR technologies and their possibilities of use in the educational process were studied. Through the data obtained as a result of these works, the prospects and effectiveness of the use of VR in the educational process were analyzed.

Results: The results of the conducted studies show that the use of VR technologies in the field of education is effective. This efficiency is explained as follows.

Level of mastery of lessons on the part of students: Students in groups using VR technologies mastered the topics at a 30% higher level compared to students in other traditional classes. With the help of VR, students have a deeper understanding of the subject matter.

Increasing students' interest in the learning process: About 75% of students reported that their interest in classes increased as a result of the use of VR technologies in the teaching process. This showed that attracting students to classes through the virtual environment is superior to traditional methods.

Attitude of teachers: Biology teachers who participated in the study said that using VR technology, explaining even complex topics is easier than other

methods. For example, the internal processes of the cell, the process of DNA replication, or processes such as mitosis and meiosis, have recognized that they can be explained in an understandable and interesting way through VR.

Analysis of opportunities and limitations of using VR technologies: During the research, along with the achievements of VR technologies, its shortcomings were identified and analyzed. In particular, it was noted that the use of VR equipment requires high costs and it is difficult to ensure that it is sufficient for all educational institutions.

Discussion: The use of VR technologies in the teaching of biology provides many opportunities. With the help of these technologies, it is possible to make it easier and more interesting to explain complex topics to students. Also, the high cost of technology and its technical limitations make it difficult to use these technologies on a large scale in education. For this reason, in the future, it was considered necessary to carry out more research on the cost reduction, wider use and wider use of VR technologies in the educational process..

Conclusion: The use of VR technologies in biology classes creates new learning opportunities for students. With the help of VR, students will gain a deeper understanding of the topics and their mastery level will increase. But there are technological and economic limitations to the large-scale use of VR technologies. Nevertheless, the introduction of VR into the educational process can take the educational process to a new level and create a more interesting and interactive learning environment for students in the future.

References:

1. Ahn, J., & Grudziecki, J. (2021). "The Impact of VR Technology on Biology Education." *Journal of Science Education*, 47(3), 178-190.
2. Blascovich, J., & Bailenson, J. (2018). *Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution.* HarperCollins.

3. Cochrane, T., et al. (2017). "Virtual Reality in Education: A Future Perspective." *International Journal of Digital Learning Technology*, 32(4), 405-417.
4. Hew, K. F., & Cheung, W. S. (2019). "Interactive Learning through VR: Benefits and Challenges." *Computers & Education*, 134, 56-65.
5. Lanier, J. (2020). *Dawn of the New Everything: Encounters with Reality and Virtual Reality.* Picador.
6. Mayer, R. E. (2020). "VR in Education: Cognitive Processes and Practical Applications." *Educational Psychology Review*, 32(2), 231-250.
7. Slater, M., & Sanchez-Vives, M. V. (2016). "Impact of Immersive Virtual Reality on Education." *Educational Technology*, 56(3), 102-109.
8. Winn, W. (2019). "The Role of VR in STEM Education." *Science Education Technology Journal*, 58(2), 305-321.
9. Zhao, H., & Xia, Q. (2022). "Virtual Reality in K-12 Science Education: A Comprehensive Review." *Journal of Educational Technology Research and Development*, 45(2), 179-202.
10. G‘aniyeva G.I., Tojiyeva F. A. Effects of spectral rays on living organisms “STUDENT-ACTIVITY DEVELOPMENT IN THE CONTEXT OF INNOVATIVE EDUCATIONAL TECHNOLOGIES INTERDISCIPLINARY SYNCHRONOUS-ASYNCHRONOUS USE" Collection of international scientific and practical conference Denov, September 29-30, 2023 Collection of international scientific and practical conference.
11. "Using Virtual Reality in Education." *TeachThought*. Retrieved from https://www.teachthought.com/
12. "The Benefits of Virtual Reality for STEM Learning." *STEM Learning Hub*. Retrieved from https://www.stem.org.uk/
13. "Virtual Reality in the Classroom: Best Practices." *EdSurge*. Retrieved from https://www.edsurge.com/