

### Improvement of Students' Methodical Training Based on Virtual Technologies in the Process of Biology Education

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#### ABSTRACT

*Today, the use of 3D models and virtual technologies in teaching biology creates great opportunities for students. The article describes the advantages and effectiveness of using information technologies. During the lesson, the students talked about 3D printing projects, structurally oriented classroom activities, independent learning of information sources, interactive kinesthetic classroom activities, virtual laboratory, VR technologies, competence formation.*

Virtual education is the process and result of communicative interaction of subjects and objects in the field of virtual education []. Virtual training is available to everyone, and classes are held anywhere and at a time convenient for you. As a result, you choose the time of the lessons yourself.

Virtual reality technology is already successfully used in decision support and public administration, however, it should be noted that the term "virtual reality" is not a universally accepted term. Basically, this term is used to explain the accuracy of three-dimensional computer models. V. Karlson defines virtual reality as a "three-dimensional computer simulation" and "use of computer technologies to create a three-dimensional world effect." "Virtual educational technology" new multimedia tools and technologies, use of virtual reality technologies (virtual laboratory, simulators, virtual travel, excursion, etc.) in the educational process, mobile educational technologies, Internet and social networks, their possibilities and safety and improve their knowledge of open educational resources and their capabilities. Virtual education is a completely new level of the educational process. Teaching through virtual glasses ensures that you are only engaged in the learning process without being distracted by external factors. Such education allows the student to understand the subject and retain more information in memory. At the end of the educational process, each student acquires more information than what the teacher gave. And most importantly, the student has the opportunity to experience what he must learn.

Virtual reality glasses, VR and mobile helmets, headsets and manipulators are used in training.

Advantages of using virtual education.

1. Experience. Training for ten days. The use of virtual learning is used to approach the scientific experience. But you need to remember about the extra work and get the information in a standard way to better master the material.
2. Data transfer. Scenery is necessary to master certain knowledge. Therefore, in addition to the transmission of information, the landscape is used together with sound recording.

Two main themes are used for immersion in virtual reality:

- 1). A helmet (helmet) for immersion in virtual reality. The headset allows you to see not only what is in front of you, but also everyone and everything around you as clearly as possible. The surrounding world is reflected in 3D.
- 2). Glasses that are completely immersed in the atmosphere, you will get to know the fascinating world and subject without being distracted by external factors.

Positive features of using virtual education.

1. There is always an opportunity to learn new information in a virtual learning format through a computer while at home.
2. Modern students are so used to gadgets that it is better for them to receive all information through a cell phone, computer or tablet.

Types of VR learning.

- 1). Immerse yourself completely in virtuality. The ability to use technology with a computer is as visible as it appears before your eyes. Everything that happens seems real, and your actions happen with the scenery immersed in reality.
- 2). Immersion in virtual reality. It goes like project work. After finishing work, you can go into the project as much as possible, see all the flaws and fix them.

We can conclude that virtual learning is a modern education method for the modern age. You can study at your convenience while working. All information comes directly through your PC or virtual reality glasses, from which you can practice as much as you like. By choosing this method of development, you will learn to solve problems yourself without anyone's help. Learning is always fun and exciting. Debates, round tables, and press conferences organized as non-traditional forms of education are organized on important topics of a particular subject and serve to form students' ability to think independently, advance their opinion, justify it, and defend it. Clarity of purpose and active participation of teachers are important in the organization of such classes. Among them, significant results are being achieved in the application of software tools of information technologies to the educational process, the global Internet network, advertising, tourism and other fields. These works are presented as a website, virtual laboratory, virtual tours, e-textbook, commercials. Virtual education technology is important in the development of independent thinking activity of students. Also, conducting classes in the heart of nature or other educational facilities, conducting live communication in different places, organizing meetings, allowing students to directly apply the acquired knowledge and skills in practice and see the results with their own eyes. is one of the important tools that help to grow. It is necessary to use these non-traditional methods from time to time when students acquire important knowledge and skills. Virtual Reality Tools. The simplest way to enter a virtual entity is the computer screen, and you can work on this entity with the help of a mouse, keyboard, and joystick. Apart from these, other devices can be used to better feel the virtual existence. They are: glasses with different mirrors - this device helps to see the image in three dimensions (volume). There are also more complicated glasses, the principle of which is as follows: an image is sent through the screen to one eye of the glasses, the other remains dark. Then the

image is transferred to the next eye. , in this way the image is displayed sequentially and the illusion of a three-dimensional image is created on the screen of the glasses. Virtual existence helmet (Head Mounted Display) is a device designed to fully experience the invented virtual existence. To show the size of the image, there are two small screens inside the helmet, and the image is divided into two and a separate image is created for both eyes. This helmet allows you to visually see all the images in the 360-degree field, even when the head is hit, the image position changes accordingly. Virtual existence is an artificially created information environment, which is aimed at replacing the environment in the usual way with the information created on the basis of various technical means. Creating information visualization tools aimed at developing virtual reality tools for educational purposes can provide a pedagogical effect that cannot be achieved using other technical tools. Virtual existence is related to the concepts of immersion and interactivity. Immersiveness means that a person imagines himself in a virtual existence. Interactivity allows the user to interact with objects in the virtual world in real time and influence them. The use of 3D models in biology classes is creating great opportunities for students.

In particular,

- acquiring knowledge (about facts, concepts, biological and processes, laws, biological theories, methods of activity);
- formation of practical skills in working with natural and virtual objects;
- development of the entire system of knowledge processes (attention, perception, imagination, imagination, thinking, memory, speech);
- Development of analytical and synthetic methods of thinking using 3D models;
- formation of natural-scientific outlook and natural-scientific way of thinking, ability to algorithmize one's own activities;
- formation of socially valuable motives for learning (in particular, interest in learning);
- formation of social positive elements of behavior;
- development of voluntary and moral qualities of a person;

The theoretical foundations of the use of virtual educational technologies, psychological and pedagogical conditions, and the results of the practical analysis of the didactic possibilities of virtual education in improving the methodological training of biology students are discussed.

1. It is difficult to imagine the achievements in the field of education without virtual technologies. The use of virtual technologies in improving the methodological training of future biology teachers is considered as the future foundation of the education sector.
2. The form of virtual reality of the modern education system is an effective process.
3. Panoramic animated resources provide users with more information.
4. The use of panoramic images and animations in the field of Internet sites and advertising gives effective results.

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