# THE DIDACTIC POTENTIAL OF VIRTUAL REALITY TECHNOLOGIES

**Samijon Alikulovich Panjiyev**
the senior teacher of Karshi engineering-economics institute
E:mail: informatika@qmii.uz

## ABSTRACT

The importance for education in our society is growing day by day. The education and production system is becoming a part of society. The problem of providing educational institutions with methodological tools is of great relevance and importance in the learning process. This article emphasizes the importance of higher education in the education system, that at the present stage, virtual reality technologies used increasingly in education, and about ways to manage students' learning activities: open or closed control. There are a number of prerequisites for the active use of virtual reality technologies in education. Depending on the specifics of a specific problem, various types of interactivity and immersion levels used in virtual reality systems. Volumetric visual information in virtual reality systems implemented with various means of three-dimensional computer graphics. The modern progress of computer technology allows you to create very realistic virtual environments that make it possible effectively immerse yourself in volumetric virtual reality. The degree of immersion of a person in virtual space substantially depends on the level of organization of the interface in the virtual reality system. The modern progress of computer technology allows you to create very realistic virtual environments that make it possible effectively immerse yourself in volumetric virtual reality. The didactic potential of virtual reality technologies can be described both through the didactic properties and through the didactic functions of these technologies. From the point of view of pedagogy, such influences form the ability to analyze, synthesize, abstract and generalize, “spatial vision” (vision of the image depth), contribute to the development of a tendency to holistic perception. Virtual reality technologies have the same didactic functions as computer technologies, because they have a common didactic property - interactivity. Today, modern educational institutions should prepare personnel for life in the information society, in which the main products of production are professionalism, knowledge and information.

**Keywords:** pedagogical technology, professional activity, scientific and practical problems, new technologies, educational technologies, interuniversity cooperation, virtual reality technologies, types of interactivity, virtual reality systems, virtual discourse, three-dimensional virtual environment, didactic potential of virtual reality technologies, spatial vision, reactive virtual reality.

## INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

At the current stage, virtual reality technologies increasingly used in education. Virtual reality systems designed for learning are a stage in the development of educational and teaching tools. They differ from educational software, which became widely used in educational institutions at the end of the 20th century, in the presence of three-dimensional display of computer-generated video information, significantly higher software and algorithmic software, better computer technology and the use of a number of new information subsystems (tactile sensation, speech subsystems communication, etc.).

In a number of studies, significant expectations placed on virtual reality technology. It is alleged that, with their help it is possible to realize the well-known dream of mankind about the realization of a wide range of cognitive and creative processes within the framework of mass educational practice: from internal dialogue to the formation of a new reality based on the display of new sensations in it, the formation of various modes of action (operational, verbal, linguistic ), penetration into details and holistic images of objects of the past and future.

In the formation of such cognitive and creative processes, the fundamental role is played by both the essence of knowledge and the possibility of systematizing it, as well as individual characteristics of a person in the processing of knowledge (including imagery), the sociocultural specificity of society, as well as its psycho-physiological characteristics. The main effect of knowledge and creativity in the virtual world created due to the interaction of a person with the subjects and objects of this world, a sense of their characteristics.

As you know, the didactic system of V.P. Bespalko understood as the type of management of the teaching of a schoolchild or student. Moreover, there are two possible ways to manage the learning activities of students: open or closed control. With open control, monitoring, control and correction of training carried out according to the result achieved over a relatively long period of training, for example, several classes or a whole semester. This is a typical picture of traditional education. In closed or cyclic control, tracking, control and correction of students' activities carried out after each stage of the algorithm for the functioning of the educational element. Such teaching management is not found in traditional teaching, since such activity in the classroom is physically unbearable for the teacher, and the teaching aids that he uses (textbook, audio-visual tables and devices) are not suitable for this purpose. In addition, teaching management can take into account the individual characteristics of each student (directed process) or subordinate individuality to group averaging's (scattered process). If the control is carried out by the teacher, then it is called manual; if management is entrusted with technical means, then it is called automatic.

Thus, three oppositions: "open - closed", "directed - scattered", "manual - automatic" characterize one or another process of teaching control.

According to V.P. Bespalko, despite the isolation of management, the non-adaptiveness of the training program for an individual student (scattered information process) does not allow to obtain the quality of mastering the subject higher than in a small group. The reason for this, according to the author, is the lack of knowledge of programmers about the achievements of modern pedagogy. From his point of view, the creators of computer-based training programs simulate traditional learning based on their own experience of being in a regular school without using the didactic capabilities of information technology.

V.P Bespalko focuses on the fact that with proper programming of training in accordance with the universal functioning algorithm, it would be possible to get any quality of training on modern computers. From his point of view, the requirements of modern pedagogical science are met by the adaptive program management system for learning, designed to "adapt" to the characteristics of the cognitive activity of an individual student (his abilities, motivation, preparedness, etc.). Moreover, as the main reason why this system still does not really exist, the lack of proper psychological and pedagogical support for creating adaptive training programs is called.

The hypothesis that virtual reality technologies are capable of becoming a kind of "bridge" for

the transition from diffused control of learning to directed seems very likely. This, in our opinion, is evidenced by a number of prerequisites that determine the active use of virtual reality technologies in education.

The first premise includes the possibility of creating a highly informative three-dimensional color image on a personal computer monitor, allowing the user to comfortably perceive dynamically changing volumetric scenes of virtual space, which are characterized by high spatial-temporal resolution.

The second prerequisite is the ability to provide feedback in a virtual educational environment in the form of adequate perceptual responses - tactile and sound, corresponding to visual information received through the visual channel of perception.

The third important prerequisite is the possibility of organizing interactive user interaction with the virtual environment. In the framework of interactive interaction, the user can actively influence the state of the virtual environment and the processes taking place in it. At the same time, the information flows entering a person through visual, tactile, sound and other channels adequately reflect the results of the mentioned interaction.
Depending on the specifics of a specific problem, various types of interactivity and immersion levels used in virtual reality systems.

The following types of interactivity are distinguished:

- “flight into virtual reality”, realizing the freedom of movement and review;
- “reactive virtual reality”, realizing interaction with virtual objects with complete freedom of movement and their predictable reaction;
- “virtual discourse” that implements voice and operational communication with objects of virtual space.

Volumetric visual information in virtual reality systems is implemented through the use of various means of three-dimensional computer graphics. Its capabilities are such that the user has feelings that give him reason to believe that he is in a realistic three-dimensional virtual environment (and not in the environment where he really exists at a given time), that he can successfully physically interact with the three-dimensional virtual environment used for educational purposes.

The degree of immersion of a person in virtual space substantially depends on the level of organization of the interface in the virtual reality system. Currently, a number of studies distinguish three levels of immersion in virtual reality:

- full immersion by means of special technical means (head-up display, gloves, etc.);
- volumetric image using a stereoscopic monitor or projector and special glasses;
- through the window of a standard or liquid crystal computer monitor or projection device.

The modern progress of computer technology allows you to create very realistic virtual environments that make it possible to effectively immerse yourself in volumetric virtual reality. It became possible to visualize complex information structures synthesized by a computer in three-dimensional space and interact with their models in various ways, including through voice commands and sign language. As a means of communication between a user and a computer, various input-output devices may be used.

The modern progress of computer technology allows you to create very realistic virtual

environments that make it possible to effectively immerse yourself in volumetric virtual reality. They allow you to form a three-dimensional image of virtual space in real time on a regular personal computer using special glasses and traditional means of input / output of information.

With stereo audio accompaniment of virtual reality systems, a sufficiently high realism of a three-dimensional image is provided. However, in such systems, freedom of movement and view of space is limited, the set of possible spatial objects is insufficient, the structure of space is simplified, etc. This is due to the fact that these systems are focused on the existing level of computer technology and software.

The didactic potential of virtual reality technologies can be described both through the didactic properties and through the didactic functions of these technologies.

It is known that "the didactic properties of a particular teaching tool are understood as the main characteristics, the features of this tool, distinguishing them from others, essential for didactics both in terms of theory and practice. These characteristics of teaching aids should be considered their natural qualities, which can be used for didactic purposes."

"The didactic functions of teaching aids is an external manifestation of the properties of teaching aids used in the educational process to achieve the goals.
From this point of view, we can state the following.
Virtual reality technologies have, on the one hand, didactic functions common to computer communications, on the other hand, they have specific didactic functions due to the didactic properties of virtual reality as such.

Virtual reality technologies have the same didactic functions as computer technologies, because they have a common didactic property - interactivity.
Interactivity when working with any electronic learning tool opens up the possibility of solving the following didactic tasks:
- differentiation of education;
- intensification of educational and cognitive activities of students;
- the organization of students' independent activities to close knowledge gaps.
In the process of training using information technology, it is practically possible to implement such didactic tasks as:
- Joint activities of students in small groups of cooperation;
- Exchange of views, discussions, and consultations of the teacher in the process of educational activities (for example, on-line).

These didactic functions inherent in virtual reality technologies can be considered common to all computer educational technologies.

At the same time, as a kind of computer technology, virtual reality technology also has its own didactic potential. Due to the fact that virtual reality technologies are in a stage of rapid development, it is not possible to describe their didactic functions in an exhaustive way, however, some of them can be indicated now, based on an analysis of the constituent elements and general principles of virtual technologies.

From the point of view of pedagogy, such influences form the ability to analyze, synthesize, abstract and generalize, "spatial vision" (vision of the image depth), contribute to the development of a tendency to holistic perception.

The use of virtual reality technologies in educational practice opens up new methodological possibilities in the process of forming skills in carrying out activities for the design of the subject world, performing artistic activities, creating abstract images and concepts, providing the learner with a tool for modeling the objects being studied, phenomena both surrounding reality and those which are in reality irreproducible. Such technologies, representing knowledge of the world in a multisensory form and realizing the types of interaction and immersion levels necessary in a particular application, allow not only to acquire new knowledge, but also to develop interpretative abilities and creative activity of a person.

**REFERENCES**

1. Panyukova, C. B. The concept of the implementation of personality-oriented learning using information and communication technologies / C.B. Panyukova. M.: Publishing House of the Russian Academy of Education, 1998. - 120 p.
2. Rodin, A.B. Virtual Event / A.B. Rodin // Virtual realities. Proceedings of the laboratory of virtualistics. M., 1998 .P- 122-126.
3. Schroeder, R. Possible Worlds. The Social Dynamic of Virtual Reality Technology / R. Schroeder. Oxford: Westview Press, 1996. - 203 p.
4. Woolley, B. Virtual Worlds. A Journey in Hype and Hyperreality / B. Wool-ley. Oxford, Cambridge: Blackwell, 1992. - 274 p.
5. Ratner, V.A. Virtual reality and control systems / V.A. Rat-ner // Nature. 2002. No. 1. P-67-74.
6. Shadiev R.D. Methods and Forms to Ensure Understanding in Educational Process. Eastern European Scientific Journal. DOI 10.12851/EESJ201805. www.auris-verlag.de