PEDAGOGICAL POSSIBILITIES FOR IMPROVING METHODS OF USING VIRTUAL PROGRAMS

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Annotation: *The rapid advancement of technology has revolutionized education, introducing virtual programs as powerful tools for enhancing learning experiences. This study delves into the pedagogical approaches and strategies that can optimize the utilization of virtual programs in educational settings. The research investigates various methods, such as immersive simulations, interactive platforms, and adaptive learning algorithms, and explores their potential to engage and motivate learners. Additionally, it scrutinizes the role of instructors in guiding and facilitating virtual learning experiences. By examining the synergy between pedagogy and virtual programs, this research aims to provide insights into effective instructional techniques that harness the full potential of digital resources, ultimately fostering more enriching and inclusive educational environments.*

Key words: *medical biology, general genetics, methodology, virtual program, innovation, modern technologies, competencies, education.*

The twentieth century was marked by enormous achievements in the field of education, which formed the basis of both the enormous social transformations and scientific and technological progress that characterized this century. In the modern world, radical changes are taking place in the field of education and the formation of a new educational system, the importance and quality of education is increasing. The expansion of the sphere of education and changes in its status are accompanied by an exacerbation of problems in this area, which indicate a crisis in education and the need for its modernization.

In the process of finding ways out of the crisis in the field of education, it is obvious that it is necessary not only to resist global changing processes, but also to effectively support progressive changes. The strategy for the transition of society to sustainable development puts forward an important requirement for education: it must be ahead of actions and be of a “super-advanced nature.”

Currently, there is growing interest in finding ways to modernize national education in Uzbekistan, taking into account global trends. Such serious changes also affect the system of teaching medical biology, and these trends require modernization and improvement of biology teaching methods. The main directions of modernization in teaching biology are: visibility, accessibility, connection of theory with practice and the strength of students' knowledge . These changes are having a huge impact on all levels of education: schools, colleges and higher education institutions [1,2].

At the present stage, one of the most important documents of change is the “Strategy for the modernization of general education of Uzbekistan”, the “Training Program” and the

"Law of the Republic of Uzbekistan on Education" aimed at modernizing the education system, including changes and improvements to the state educational standard, which implies training and education comprehensively developed and highly qualified specialists who meet the requirements of international standards [3].

Serious changes have also affected medical education. Currently, the system of higher medical education does not fully satisfy the needs of society based on the tasks assigned to medical universities, this is due to the unsatisfactory study of research on society and the state, a decrease in the quality of graduates, a conservative approach to the offer of modern scientific technologies and the slow introduction of innovative technologies into medical education , namely in fundamental subjects [4].

In this regard, there is an urgent need to review the content, structure and methods of assessment by specialists, ways to compare the modern and competitive labor market and objectively assessed achievements in higher medical research.

At the moment, one of the tasks of higher medical educational institutions is to develop the content and organize the educational process aimed at developing the professional competence of the future doctor, his civic perception, the emergence of culture and self-awareness, spirituality, initiative, independence, tolerance, the ability to successfully socialize in society and professional maturity. This concept allows the creation of a professional medical profile model with its structural components [5,6].

The use of computer technologies (virtual programs) in higher medical educational institutions is becoming a mandatory part of the educational process. The variety of possibilities for using computer technology, the scope of its perception not only for an interesting process, but also for changing the methodological support of the educational process is currently relevant [7].

Modern computer technologies associated with the introduction of such concepts as computerization of society, informatization of society, new information technologies, new electronic programs, virtual programs, smart boards in the educational process.

Thus, among all the motives of educational activity, the most effective is cognitive interest and the accumulated pedagogical experience allows us to judge the possibility of posing the problem of interest in the learning process. The decline in interest in studying biology is associated, first of all, with the use of much older visual materials and the monotonous use of textbooks, tables, and diagrams. The main form of cognitive interest is curiosity, and then interest in this topic develops passion. Cognitive interest activates the mental activity of students and directs it to solving various intellectual problems. One of the ways to increase students' interest in biology and deepen their knowledge is the use of modern information technologies, in particular computers, at various stages of the educational process.

Digital pedagogical technologies that were considered are promising directions in pedagogical didactics and ecosystem research, allowing to reveal the individual potential capabilities of students and the collective pedagogical potential of the community. These include blended learning, responsive learning, microlearning, native learning, flipped classroom, psychometrics and cyberproctoring, gamification,

virtualization and screencasting. During the period of restrictions on interaction and movement caused by lockdowns, blended learning becomes especially relevant.

The main importance of information technologies (virtual programs) is that they make it possible to create an incomparably vibrant multisensory interactive learning environment with almost unlimited possibilities for the teacher and student [8].

The advantages of information computer technologies over traditional educational technologies are numerous. In addition to a more illustrative, visual presentation of the material, effective testing of knowledge and all other possibilities, it includes various organizational forms in the work of students, methodological techniques in the work of the teacher. To solve these problems, each teacher must treat classes with a sense of responsibility and understanding and organize classes using various forms of educational activities and modern pedagogical technologies [9].

For example: when preparing students in biology, it is directly determined by the teacher's ability to use all the various forms, methods and means available to him, which allows students to "immerse" in the content of biological science. This ensures that the learning process has many intensive features. Currently, the reduction of program time allocated for excursions organized in the field of biology is attracting the attention of teachers to innovative forms of organizing classes. Among such forms, virtual programs for studying biological objects or phenomena occupy not the least place.

Currently, the concept of ***virtuality*** (Latin virtualis - possible) is understood as a world without physical embodiment, relating to constant reality as an independent and autonomous reality that exists only in the process of its creation and maintenance. To do this, the student must enter the virtual environment. A virtual learning environment is a set of technical resources aimed at providing students with control over distance learning and lesson mastery [10].

However, the system of training using virtual programs has not been fully studied by scientists. How do they affect students, for how long and in what sequence can this program be used in accordance with the student's physiology? At which lectures is this virtual program more effective and can be convenient in communication, aimed at organizing the personal motivational cognitive activity of students.

Let's look at some virtual programs in medical biology:

1 . The Virtual Cell is a web application that allows users to create and explore models of cellular processes in an interactive environment. This program can be useful for student teaching and research in the fields of molecular biology and cell biology.

2 . Proteopedia is a web application that provides information about protein structure and function in an interactive environment. This program can be useful for student teaching and research in the fields of molecular biology and biochemistry.

3 . Sim Bio Virtual Labs is a set of computer simulations that allow users to conduct virtual experiments and research in the fields of biology and ecology. This program can be useful for student teaching and research in the fields of biology and ecology.

4 . Parasite World is a web application that provides information about different types of parasites, their life cycles and their impact on human and animal health. This program may be useful for students, scientists and medical professionals who study parasites and their effects on health.

5 . Virtual Parasite is a program that allows users to explore the life cycles of parasites in an interactive environment. It contains 3D models of parasites and can be used for teaching and research in the field of parasitology.

6 . The eLearning course in Medical Parasitology is an online course that provides training in the field of medical parasitology, including the classification of parasites, their biology and pathogenicity. The course includes lectures, tests and practical assignments.

7. Parasite Interactive is a program that allows users to study parasites and their health effects through interactive games and simulations. This program can be useful for training and awareness in the field of parasitology.

8 . ToxoDB is a database that contains information about the genome and biology of various parasite species, including Toxoplasma gondii. It may be useful for research in the field of molecular biology of parasites and the development of new drugs.

These are just a few types of virtual medical biology programs, and there are many other programs and applications that can be useful in teaching, research and practical application in the field of medical biology to prepare highly qualified specialists.

In this study, we have explored the pedagogical possibilities for improving the utilization of virtual programs in the educational process. Various methods, including immersive simulations, interactive platforms, and adaptive learning algorithms, were analyzed. The research has demonstrated that these approaches can significantly enhance student engagement and motivation.

Special attention was devoted to the role of instructors in the successful implementation of virtual programs. It has been found that effective guidance and facilitation of educational processes using virtual tools play a pivotal role in achieving positive outcomes.

It is important to underscore that virtual programs offer substantial opportunities for creating richer, interactive, and inclusive educational environments. However, for their full potential to be realized, competent adaptation and integration into the educational process are essential.

Overall, this study emphasizes the significance of integrating virtual programs into modern pedagogical practice and provides a foundation for the development of effective strategies for their application in educational institutions.

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