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Research Article

EFFICIENCY OF THE IMPLEMENTATION OF MODERN VIRTUAL PROGRAMS FOR TEACHING BIOLOGY

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ABSTRACT

In order to ensure the effectiveness and quality of education, the leading medical educational institutions of the world pay attention to solving the issue of modernizing the content of education based on a competent approach aimed at developing creative and logical thinking, the ability to independently explore, the ability to apply knowledge, skills and abilities in practice. Such urgent tasks as improving the quality of education through the introduction of modern virtual programs in medical education.

KEYWORDS

Medical biology, general genetics, methodology, virtual program, innovations, modern technologies, competencies, education.

INTRODUCTION

The 20th century was marked by great achievements in the field of education, which formed the basis of both colossal social transformations and scientific and technological progress, characteristic of 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

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education and the change in its status are accompanied by an aggravation of problems in this area, which testify to the crisis of education and the need for its modernization [4].

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 the action and be "super advanced".

THE MAIN RESULTS AND FINDINGS

Main part: At present, there is a growing interest in finding ways to modernize national education in Uzbekistan, taking into account world trends. Such serious changes also affect the system of teaching biology, and these trends require the modernization and improvement of the methods of teaching biology. The main directions of modernization in the teaching of biology are: visibility, accessibility, the connection between theory and practice, and the strength of students' knowledge. These changes have a huge impact on all levels of education: schools, colleges and institutions of higher learning. At the present stage, one of the most important documents of change is the "Strategy for the modernization of general education in Uzbekistan" [1].

The "Personnel Training Program" and the "Law of the Republic of Uzbekistan on Education" [2, 3] are aimed at modernizing the education system, including changes and improvements in the state educational standard, which involves the training and education of comprehensively developed and highly qualified specialists that meet the requirements of international standards.

Recently, the interest of students in the study of biology has been declining. And this is a pity, because biology, as a natural science discipline, provides knowledge about the world around us, forms the correct perception of the world around us, and this determines the behavior and activities of an individual in society. It plays a significant role in shaping the student's scientific worldview. One of the founders of the scientific methodology of teaching natural science, A.Ya. Gerd, emphasized the vital importance of biology for the education of a scientific worldview. His views were supported by A.N. Beketov,

K.A.Timiryazev, K.F.Rulier, A.P.Bogdanov, K.Baer.

From this point of view, it is understandable why this problem worries researchers of our time and the past. It is known that even the founders of scientific pedagogy Ya.A. Komensky, I.F. Herbert believed that it is impossible to have complete knowledge if a schoolboy or student is not interested in the subject being studied. The same approach was emphasized by

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the great teacher K.D. Ushinsky, since "interest is the main internal mechanism for successful learning" [5].

Thus, among all the motives of educational activity, the most effective is cognitive interest and the accumulated pedagogical experience makes it possible to judge the possibility of posing the problem of interest in the learning process. The decline in interest in the study of biology is primarily due to the use of much older visual materials, 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 solve 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 computer ones, at various stages of the educational process.

Recently, a forum dedicated to "Virtual Reality and Digital Technologies" was held in our capital Tashkent. Heads and experts from more than 150 educational institutions from six countries took part in the Russia-Uzbekistan educational forum and discussed innovations in the field of education. The experts shared their experience in introducing innovative technologies and methods in the teaching of seven main subjects: chemistry, physics, geography, computer science, biology and the Russian language. "For example, today we are talking about immersive technologies. These are virtual reality technologies that are planned to be used in the educational process. 3D glasses allow you to immerse yourself in any didactic environment. For example, if a geography lesson discusses the topic of studying seascapes and landscapes, then the student can put on these glasses and swim in the sea and stop at one of the islands. During the study of biology, the student can move through the blood vessels. This is the technology of the future, defined today. Such prospects unite us with our Uzbek colleagues, "said RAO Corresponding Member, Professor of the Russian State Pedagogical University named after A.I. A.I. Herzen Julia Komarova.

The main value of information technologies is that they allow creating an incomparably bright multi-sensory interactive learning environment with practically unlimited possibilities for the teacher and the student.

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 a 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.

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For example: when preparing students in biology, it is directly determined by the ability of the teacher to use all the various forms, methods and means available to him, which allows students to "immerse themselves" in the content of biological science. This ensures that the learning process has many intensive features. At present, the reduction of program time for excursions organized in the field of biology draws the attention of teachers to innovative forms of organizing lessons. Among such forms, not the last place is occupied by virtual programs and didactic tools for studying biological objects or phenomena.

Currently, the concept of virtuality (lat. virtualis - possible) is understood as a world without physical embodiment, referring to the 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. The Virtual Learning Environment is a set of technical resources designed to give students control over distance learning and lesson learning.

The analysis of special literature showed that the problems of organizing the educational process in various educational institutions were studied by many scientists, including: Sergeev I.S. [6], Savelieva E.F. [7], Abdulgalimov R.M., Rizakhanov M.A., Abdulgalimova G.N. [8], Slastenina V.A. [9], Inogamova D.R., Fayzullaev S.S. [10], Ibatulina L.F. [11] and others.

However, the system of learning with the help of virtual programs has not been fully studied by scientists. How do they affect students, how long and in what sequence can this program be used in accordance with the physiology of a student or schoolchild? In what lessons is this program more effective, it can be a virtual program based on convenient communication, aimed at organizing personal motivational cognitive activity of students.

The organization of the study required the use of appropriate theoretical and empirical methods. We used the following theoretical methods of analysis: generalization and systematization, psychological, pedagogical and individual methodological sources, scientific data on the nature of the problem under consideration. Among the empirical methods, priority was given to questionnaires and interviews with students, and the productivity of students was studied through direct and indirect observations at various stages of the biology teaching process.

To determine and form the pedagogical experience conducted at the Tashkent Medical Institute (TashMI), the theoretical provisions regarding the essence of the virtual program in biology were taken as a basis. Leading teachers of biology from other higher educational institutions of the city of Tashkent, such as the Nizami Pedagogical University, the European Medical University, the International University of

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Chemistry, were also involved in conducting individual stages of the experiment.

Thus, the total number of attracted students was 120 people, and teachers - 23 people. At the experimental stage of the study, the following tasks were solved:

1) selection of educational material for inclusion in the virtual program and development of creative (effective) research tasks for students;

2) to determine the effectiveness of the developed materials for conducting a virtual program as a method of forming students' cognitive interest in the study of biology.

The peculiarity of the experiment was to determine the significance of virtual educational programs for students. It was carried out through a survey on the topic "The use of virtual programs in the daily practice of a teacher." At the same time, many biology teachers limit their use of information and communication technologies to such methods as showing electronic presentations, as well as searching and analyzing the necessary information on the Internet. Some teachers have an idea about virtual programs, but do not plan to use them in their practice. Only a few teachers surveyed expressed their willingness to introduce virtual learning programs into the process of teaching biology and shared their experience in their implementation.

As part of the formative experiment, three versions of virtual programs on biology were developed and tested on such topics as "The Cell and Its Structure", "Protein Synthesis", and "Ecology". Consider the algorithm for organizing this type of educational system:

- preparation of computer/projection equipment, availability of software and access to the Internet;
- include a virtual tour in the calendar-thematic plan for the study of "Biology", taking into account the cognitive characteristics of students;
- defining the goals and objectives of the lesson, posing a problematic issue, which is the basis for creating a problematic situation;
- selection and analysis of available literature / electronic sources of information to identify problem areas in the lessons;
- selection of visual objects to determine the possibility of their study during the lesson, then scanning, audio recording necessary to create a complete virtual image of the studied objects or events;
- preparation of creative tasks aimed at the effective assimilation of biological material and the development of students' interest, the selection of didactic tools, teaching methods.

The effectiveness of virtual learning is determined by the availability of appropriate equipment and functionality and its availability:

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- computer equipment, monitor, keyboard, optical mouse as part of the system unit;
- peripheral equipment - stereo speakers, headphones (if necessary), printer, scanner, video camera, document camera, microphone, multimedia projector;
- interactive whiteboard compatible with computers and peripheral equipment;
- access to the worldwide network "Internet";
- software, including: Windows XR, Total Commander file manager, Microsoft Word text editor, Microsoft Office distributions, Microsoft Power Point, Photoshop, Windows Movie Maker.

Modeled from the point of view of the formation and development of the cognitive interest of students, the virtual curriculum begins with an introductory conversation that allows you to determine the goals and objectives of this stage of studying biology. Before the start of the lesson, the teacher uses the technique of creating a problem situation by formulating one or more problematic questions. One of the prerequisites is the creation and maintenance by the biology teacher of a stable positive emotional background, for which quizzes, games, competitions and their elements are included in the content and structure of the lesson.

The positive side of the virtual program is achieved by the inclusion of practical tasks for students in it, which makes the process of mastering and consolidating the material much more effective [12].

All virtual programs are based on the principles of a rational combination of various forms of independent cognitive activity of students with the ability to perform tasks of an individual, pair, group or frontal nature. Learning outcomes include completed text tables developed by students, logical diagrams, as well as maintaining a glossary. At the final stage of the virtual learning lesson, reflection was organized by presenting reports with the obligatory formation of conclusions and generalizations.

Thus, the use of virtual programs and didactic tools for the study of biological objects or phenomena, as well as the use of virtual programs and didactic tools in the classroom after virtual programs, is implemented in the last lessons of each department for better assimilation of biological material and to increase cognitive interest. For this purpose, control work was carried out in a traditional or test form, interviews and questionnaires were organized. The organized pedagogical experiment makes it possible to emphasize that the quality of student training increases with the systematic use of virtual biological programs and didactic teaching aids against the background of constant positive cognitive interest.

However, the teacher must remember one drawback of this form of teaching biology - visiting the virtual world does not contribute to the personal sensory perception of teaching objects and phenomena of wildlife [13].

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Therefore, the success of students in achieving their goals in the process of biological training is largely determined by creative tasks prepared by the teacher for independent cognitive activity.

Conclusions: Modernization processes in the system of general education provide for the formation of students' cognitive interests, expressed in their readiness for active educational and cognitive activity, self-development and improvement. In such a situation, it cannot be said that the educational paradigm can lead to the manifestation of negative factors in the process of biological training of students, which is expressed in a significant time limit for preparing the final control in biology. As a result of this phenomenon, the number of hours of laboratory and practical work will be reduced, excursions will be replaced by the study of the theoretical foundations of biology.

The real way out of this situation is the use of virtual programs in the educational process, which are easier to organize because they are accessible and do not require financial investments. The organization of virtual biological laboratories, excursions and classes increases students' interest in science, contributes to the formation of basic biological concepts, supports the intellectual development of students in the process of self-mastering the material (even with the possibility of multiple viewing). due to the increased complexity, which is especially important when studying biology, it saves the teacher's time.

CONCLUSION

Concluding this pedagogical experience, it should be noted that in the course of the study: firstly, ways were proposed to improve the biological preparedness of students through the systematic use of virtual programs in the study of biology; secondly, the methodological conditions for using the possibilities of virtual programs and didactic textbooks in teaching biology are determined.

Approbation of the developed materials showed that almost 100% of students are in favor of making virtual classes an integral part of the educational process, since they develop interest in the study of biological materials, as a result, the quality of biological training improves.

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