

# USE OF VIRTUAL EDUCATIONAL TECHNOLOGIES IN THE DEVELOPMENT OF STUDENTS 'SKILLS IN THE FIELD OF IMMUNOLOGY

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**Abstract:** *This article discusses the use of virtual learning technologies in the formation of students' skills in the field of immunology and its possibilities, their advantages.*

**Keywords:** *immunology, biology, virtual learning technologies, computer, skill, shaping, individual.*

## Introduction

To increase the effectiveness of teaching biology in higher educational institutions, it is necessary to develop modern educational technologies, modern approaches to the use of elearning didactic resources.

In this regard, research is being carried out on the theory and practice of scientific and methodological training of biology teachers in our country Tolipova Zh.O., Usmanova M.S. Rakhimov, Research work on the formation of healthy lifestyle skills in teaching biology by Isabaeva M.M., improving future biology teachers in the preparation of innovative professional activities based on modular technologies and an integrated approach, as well as A study dedicated to improving the methodological system for assessing the level of formation of professional competencies of future biology teachers was carried out by Z.A. Mardanov, D.M. Elmuratova, S.F. Salimov.

As well as research on the development of methods of teaching biology in the context of the scientific community of students of the Commonwealth of Independent States N.P. Stepanova, investigation of the use of integral-modular methods of biological education in pedagogical universities S. B. Bakhvalova, research work on the methodology of teaching and research of students on in-depth study of biology T.A. Bepamyatnykh, research to improve the quality of teaching biology based on the organization of environmental activities of students N. B. Firsova, research work on a systematic approach to the study of the animal world in the biology course of grades 6-7 of the general education school A.A. Bogomolov, research on the formation of students' emotional-value attitude towards wildlife in the process of teaching biology Belyaeva E.N., a study aimed at building a system of reflective learning using an innovative educational and methodological complex for teaching biology was carried out by E.N. Arbuzova.

Despite the fact that within the framework of the research of the above scientists, research was carried out on methods to improve the effectiveness of teaching biology in the system of lifelong education and various approaches to the development of students' competencies, in his work, insufficient attention is paid to the use of computer technology, its practical and instrumental programs, as well as elearning resources to improve the effectiveness of teaching this subject. Today, a new type of information perception appears through the use of the global educational network, television, computer programs [1]. For future biology teachers studying in higher education, traditional sources of information, such as a textbook or a professor's speech, are losing their meaning, which leads to a decrease in interest in the learning process. If in the organization of the educational process of future biology teachers use e-learning resources, they will be able to work with information, develop independent research and creativity [2,3].

The relationship between professors and students will also change, an environment of cooperation will emerge, and an environment for problem-heuristic learning and differentiated learning, development-oriented learning will be created [4].

Therefore, the introduction of didactic e-learning resources is one of the most pressing issues of increasing the effectiveness of teaching biology in higher education, including "Immunology", the formation and development of students' creative abilities and competencies in this subject.

Research on this problem in the Commonwealth of Independent States, including on the methods of using information, communication and multimedia technologies in teaching biology E.A. Filippov, O. G. Petrov, on the method of using modern information and communication technologies in organizing homework in biology T.I. Krylova, research on the use of modern computer teaching technologies in teaching general biology to 9th grade students E.S. Smooth, A.S. on the methodology of complex application of traditional teaching aids and new information technologies in the course of general biology. Lysenko, Yu.A. on biology on the methodology of distance learning of children with disabilities and intellectual disabilities. Komarov, the research devoted to the methodology of the formation of cognitive learning movements in the process of teaching biology in the informational educational environment was studied by V.A. Smirnova.

In this regard, in order to increase the efficiency of the use of interactive software in biological education in our country, i.e. in pedagogical universities, improving the methods of using virtual teaching technologies in teaching microbiology, methods of improving the independent work of biology students in academic lyceums through information resources, grade 7 on improving the methodology of using electronic educational resources in teaching biology. Research work was carried out by Ergasheva G.S., Bakhodirova U.B., Ibodova M.N., Karakhanova L.M., Khasanova Sh.B.[5]

While the aforementioned pedagogical study focuses on the methodology for using elearning resources to improve the effectiveness of biology teaching in lifelong learning, in his work, the methodology of using electronic educational resources to improve the efficiency of teaching the subject "Immunology" in pedagogical universities was not specifically monograph.

Therefore, at present there is a need to improve the methodology of organizing lectures, practical classes and independent educational activities of students with the help of electronic educational resources in pedagogical universities on the subject "Immunology".

Immunology is one of the fields of science that determines the development of modern medicine. It has been 200 years since it was formed, but important discoveries in this area have been made in the last 40-60 years. In this short period of time, many functions of the immune system have been identified, showing that the classical concept of immunity is narrow. Research has shown that the immune system protects the body not only from external infectious factors, but also from internal factors that disrupt the body's homeostasis. Thus, immunity (lat. Immunitas, immunitatus - to get rid of something) is a state of the immune system that provides the body with protection against antigens of infectious and non-infectious nature. The science of immunology deals with issues of immunity.

The role and function of immunology in modern biology is very large [6]. Therefore, in-depth teaching of this science and the formation of students' skills in this science is one of the current problems of immunology education. To solve these problems, virtual learning platforms has been created for the science of immunology on the global Internet, deploying virtual learning technologies related to the science of immunology and using it in the educational process. High efficiency will be achieved through the use of virtual learning technologies in the formation of knowledge, skills and abilities of students in the field of immunology.

Virtual learning resources provide great convenience to professors and students in the learning process, which is a very convenient tool to save time and activate independent work on themselves. Virtual learning technologies for the global Internet are educational and scientific information aids placed in the global Internet in electronic form to complement quality teaching methods in the effective organization of the educational process. Therefore, the use of virtual learning technologies in the field of immunology is an important part of the knowledge and skills of university professors: the ability to use modern sources of information and communication, processing of information, the organization of personal learning information environment and important information integration in higher education .

The application of virtual learning technologies to the educational process of the science of immunology not only stimulates cognitive activity, but also their motivational, emotional and communicative environment.

The research shows that the formation of students' understanding of immunology is on demand, the widespread use of specific rules, laws, systems of aspects, means of consistency, factors and pedagogical conditions of pedagogical technology effectively affects the achievement of goals.

It is through such factors that it has a positive effect on their behavior, mentality, worldview and thinking. Based on the above, the question may arise, what should be the main focus in the formation of skills in the field of immunology in students? Who creates the main basis for the formation of students' skills in immunology?

According to the results of our research, the application and rational use of pedagogical-technological mechanisms in the formation of students' skills in immunology, as well as the experience gained in solving various oral, written, creative and technical problems of students in the formation of concepts in immunology is a decisive factor.

In order to develop skills in immunology in pedagogical higher education institutions, professors and students should be given the following tasks and requirements: training highly qualified personnel in the field of biology education so they could be able to demonstrate their creative abilities in our developing society; training of biology teachers, in high-level staff should be aware of modern and foreign developments in immunology and be ready for new changes in certain educational institutions; formation of professional outlook of future biology teachers; involvement of students in the process of formation as an individual in the field

of education; provide students with accurate information about the basic principles and responsibilities of professors and teachers in the introduction of new information technologies in the field of immunology; strengthening students' knowledge of theoretical and practical specialties, the formation of skills and abilities for independent work in solving major pedagogical and creative problems; generalization and classification of knowledge, skills, competencies in research; be able to apply the skills learned in the biological process, design and organize teaching in the disciplines of biology; formation of an independent personality in the processes of our society in the formation of theoretical and scientific knowledge in the field of immunology; to form knowledge and skills in the field of biology; to prepare students for independent work in higher education institutions.

V.A Krasilnikova [7] thought that modern means of communication and modern didactic possibilities of teaching computer technology allow to study in a new system aimed at the organization of educational processes.

There are two different ways to develop students' skills in immunology:

1. Individual - educational work is carried out in a single individualized program of all forms of methods.
2. Group work - students work in groups according to their capabilities, abilities, interests, working through different programs.

Virtual learning technologies simplify the structure of individual characteristics in students. When designing virtual learning technologies, individual characteristics are taken into account, which helps to select individual information in teaching and to consolidate the units of information in the direction that shapes the student's skills. Because a student's interest in different disciplines varies, it can help them find the optimal norm. The purpose is presented independently, the collection of additional information is more interesting, provides independent thinking in solving the problem, searching for the necessary information and highlighting the results of their work. The information in the given program should be focused on the student's independent acceptance and knowledge. The created virtual learning technologies will serve to further improve the quality of education not only as an additional aid in education, but also as a basic learning tool.

Today, universities are equipped with computer technology, which is connected to the global Internet, and it is possible to organize classes using virtual learning technologies and assess their knowledge online. In order to develop students' skills in the field of immunology, it is necessary to develop 3-D systematic virtual learning technologies in this field and apply them to biology education.

M.L.Kazaryan and M.A.Shahramanyan thought that 3-D modeling is the most up-to-date and promising technology and a modern tool for presenting educational resources in 3-D visual form [8].

One of the types of application of modern innovative pedagogical technologies in higher education is the introduction of 3-D systematic virtual learning technologies. At the same time, virtual education should have a truly educational and developmental significance. The introduction of 3-D systematic virtual learning technologies in the field of immunology is an important tool in shaping students' skills[9].

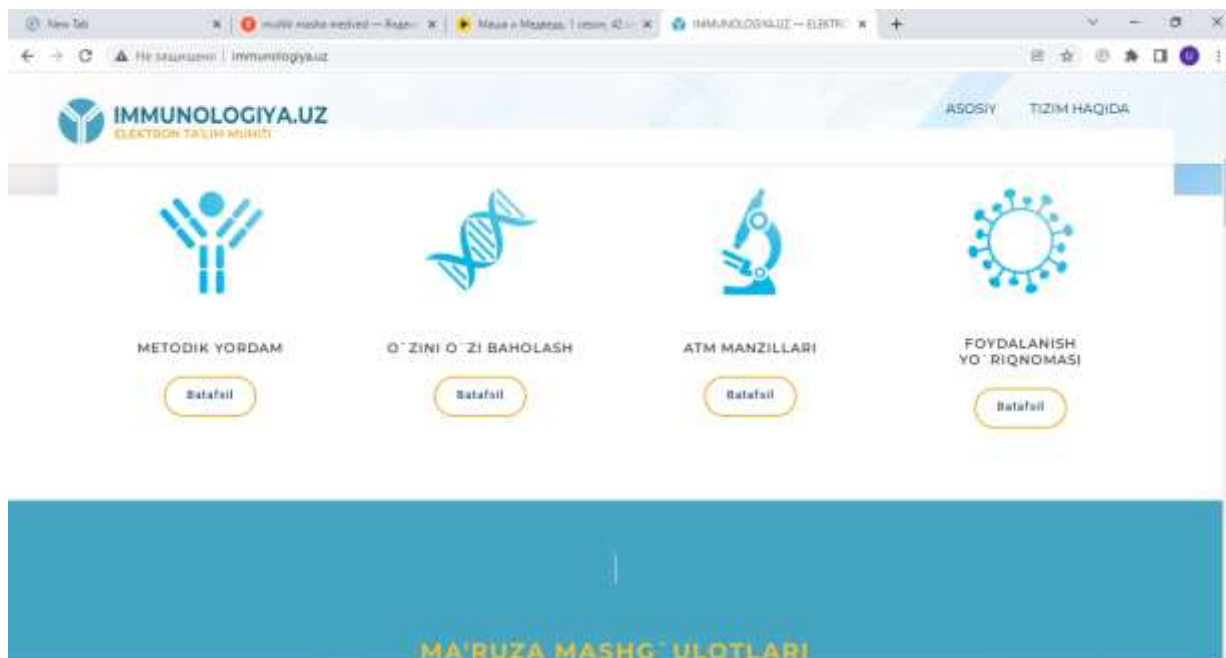
At the same time, modern computer technologies cover all spheres of human activity, including the science of immunology, and have created opportunities for modern education. One of these modern teaching methods is 3-D systematic virtual learning technologies, which have the following advantages: provide positive learning motivation; organizes the learning process rationally; develops independent research skills; ensures the effective organization of the process of monitoring the current, intermediate and final knowledge of students; increases students' interest in science in the educational process.

The use of virtual learning technologies in the science of immunology - prepares teachers of biology, helps them to think and act systematically, to be creative, to have leadership qualities, to develop their independent active skills.

They independently deal with scientific and methodological information on the subject of immunology, if necessary, consult with teachers and get acquainted with the results of individual knowledge. The use of virtual learning technologies does not mean writing it down, but rather teaching students to intuitively understand the rules of seeing different objects, processes, searching for the necessary information and working with them[10].

How the information given to the student is received through virtual learning technologies depends on the student's reactions. High efficiency can be achieved by providing the necessary information to the student without overdoing it. In this way, another feature emerges in the creation of virtual learning technologies - the ability of the student to receive individually. In the creation, the main focus should be on the unity of methods and the ability of the student to receive the information provided from the source. Virtual learning technologies create an active "dialogue" between the student and the subject. In teaching, the form, style, and content of the student should be appropriate, based on the individual characteristics of the student[11].

An important task of virtual learning technologies in the field of immunology is the creation of interactive scientific and methodological materials, which serve to increase the effectiveness of education. Teaching this subject using virtual learning technologies is a new stage in the use of computers for the education system today, and modern educational platforms for traditional and distance learning systems are being created and used.



This creates a wide range of opportunities for the organization of effective communication between students and students of educational materials in the network, as well as the independent study of biology.

Taking into account didactic, technical and organizational approaches in virtual education technologies, it envisages the activation and diversification of unlimited pedagogical impact, as it includes information in various electronic forms (pictures, drawings, tables, diagrams, audio and video files, virtual presentations)[12].

The most important task of professors and teachers of higher education institutions is the formation of students' skills in immunology. Educational resources on the virtual learning platform on the global Internet for students can be filled with graphics, animation, pictures, sound effects, textual information. In other words, a virtual learning platform reflects the compatibility of different means of presenting integrated information in a single content[13]. The exchange or combination of text, graphics, video, and audio presentations allows educational information to be conveyed in a form that is as clear and easy to master as possible. Presentation motivation allows the development of communication skills, the formation of new knowledge and skills.

One of the ways to develop students' skills in immunology is to use an independent type of education. The use of virtual learning platforms placed on the global Internet gives good results in the organization of independent learning. An important aspect of network education is that students can monitor their personal electronic portfolio, which is reflected in educational resources in the way of a forum, and make extend pedagogical changes to the extent of their independent activity.

Education for students based on virtual learning technologies is a complementary (auxiliary) tool for full-time education or science, and the process of independent learning is carried out under the guidance of a professor.

In conclusion, the importance and educational opportunities for the formation of students' skills in immunology in pedagogical higher education institutions is great.

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