

## THE ROLE OF DIGITAL TECHNOLOGIES IN TEACHING OF PHYSICS

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***Abstract:** In the article, the problem of digital technologies, the rapid development of the digital infrastructure of educational institutions, the training of personnel with modern digital competencies, the updating of specialties and educational fields taking into account the trends in the labor market, the formation of educational programs based on flexible educational trajectories, the development of the concept of continuous education, as well as , the processes of introduction of artificial intelligence systems in the educational environment are covered. Also, studies aimed at the introduction of digital technologies, which allow planning concrete steps to improve the educational system and change the work of educational institutions, have been carried out and suggestions have been formulated.*

***Keywords:** digital technologies, educational system, online education, distance education, digital transformation, digital learning environment.*

### **Introduction**

In recent years, this work in our country began with teaching programming to schoolchildren, and during this time the digitalization of education became an integral part of education policy. Aiming to speed up the country's scientific and technical development and socio-economic development, the task of developing computer literacy of the population and introducing digital technologies into the educational process was further advanced into the educational system. The role of modern technologies in the process of improving national education is increasing year by year, their introduction serves to modernize and develop education, as well as to increase the quality of training of future specialists and to bring education to science. At the same time, such technologies require a revision of existing approaches to educational activities, as well as an analysis of their impact on society and individual

social groups. In this regard, studying the digitalization of education and its social consequences seems to be a very relevant area of scientific research.

The field of education is one of the most rapidly developing, promising sectors that are important in the country's development and require modern information technologies and digital resources. Today, innovative technologies in the field of education and digitized resources are widely used. This is one of the priority directions for further improving the quality of education and teaching efficiency. Education consisted of mental work, activity and creative thinking of teachers and students is a multifaceted and complex process. Improving the effectiveness of the lesson is inextricably linked with the establishment of the educational process on a scientific basis and the practical application of new pedagogical technologies. The main goal of organizing innovative activities in higher education institutions is to ensure consistency of cooperation between teachers and students and to establish it in a specific goal-oriented manner. The use of information and digital resources in the educational system will help you to be more productive. This allows to improve the quality of learning and create convenience for students.

Physics is one of the most complex subjects. Pupils and students acquiring knowledge in this subject require good knowledge of other subjects as well. For example, laws of electrolysis include chemistry, distance measurement from geometry, time of a city from geography, and other such sciences. Therefore, unique innovative pedagogical and methodological approaches are necessary in teaching physics. Today, the level of students' and students' knowledge of the competencies they should acquire in physics is not satisfactory. If there are 25 students in one class, only 20-25% of them are taking the set qualification. It can be seen that there are some shortcomings in the teaching of physics in accordance with the requirements of the time. In order to solve the above problems, it is necessary to perform the following tasks:

- to provide modern educational and laboratory auditoriums in all schools and professional educational institutions by digitizing physical science auditoriums and educational-laboratory equipment;
- application of the knowledge, skills and qualifications acquired during the educational process in physics education in independent practical activities, choosing a profession, being able to engage in social relations, forming competencies needed in the labor market;

➤ to direct the development of students' talents, to achieve the ability to apply science and technology development, engineering, mathematics and physical knowledge to everyday life, and to form national, universal human values in them;

➤ education of students' design-oriented creativity by connecting practical activities through observation, critical thinking and logical analysis, inquisitive mind, problem-solving, and innovation skills.

Therefore, taking into account that physics is an experimental science, it is necessary to digitize demonstration equipment, laboratory processes and other educational equipment based on foreign experiences. Digital resources are a set of educational information objects that are used by students for the purpose of mastering educational materials and are presented in several forms. What do digital resources actually mean? Through interactivity, students' understanding of the content of scientific knowledge, opportunities to perform interesting assignments and tasks will be expanded, and the opportunity to study in any part of our country will be the same. Digital resources are useful for science teachers, such as physics or other natural sciences, who do not need to conduct complex laboratory and hands-on activities live, but can instead explain through ready-made simulations or animations. Traditional textbooks are limited in their ability to convey complex physics experiments to the student in an understandable way. In order for the student to understand from the textbook, the teacher's constant support is necessary. The degree of flexibility of the digital teaching system is high due to the processing of digital resources, enrichment, implementation of achievements in teaching physics and many other possibilities. Distance learning can also be delivered professionally online via Zoom, Microsoft Teams, or other platforms [2].

Developing digital technologies are having a positive impact on the education sector. However, since the Internet speed is not high in remote areas of our country, it is difficult for educational institutions in this area to access educational materials in digital form. Therefore, it will be necessary to provide them with the necessary digital content package. In addition, students may not be able to use computers, as a result of which their interest in science fades very quickly. Readers don't need simple manuals or static PDF literature, they need engaging, accessible, and high-quality interactive content. Today, young people spend most of their time in the digital world. In such a process, teachers' role is to show students that the Internet

is also a place where they can find the learning resources they need to learn. In our time, results are as important as time. Another task of schools and professional educational institutions is to teach students to work. Digital learning resources help to achieve this goal.

Teachers are often limited in their ability to experiment in the classroom. Normal teaching methods are not very understandable for students. It requires the visualization of complex physical processes in laboratory and hands-on activities to make lessons more interesting and understandable, and for teachers and students to conduct endless laboratory activities. To solve this problem, it is necessary to develop methodological bases and requirements for preparation of simulations of physical laboratories and experiments included in textbooks.

Interactive visual simulations filled with step-by-step experiments and workflows should be created to make virtual labs and hands-on activities more accessible. This form is more convenient, interesting and helps to consolidate knowledge. Teachers who want to make subjects understandable and interesting for students spend a lot of time searching for digital materials such as videos, pictures and interactive exercises. Therefore, it will be necessary to create national contents that provide them with digital learning resources. Virtual laboratories are a collection of interactive electronic resources for teaching science. Such ready-made interactive electronic resources can be easily adapted to the curriculum even when the requirements of state educational standards change [3].

### **Conclusion**

Computer simulation of various physical experiments has become an integral part of the virtual learning environment. Although the organization of the educational process in physics traditionally includes laboratory activities, the number of hours allocated to this type of work is constantly decreasing. In addition, the usual set of laboratory work is very limited, the instruments are often obsolete, and students are not interested in working with them. In such circumstances, virtual physical facilities and laboratories are preferred. Its various aspects are being actively discussed by teachers and experts in the field of information technologies in our country and abroad.

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