

Use of New Innovative Methods in Teaching the Science of Information Technologies and Modeling of Technological Processes

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Abstract

This article is about the prospects of using innovative and information technologies in the education of students of the "Information technologies and modeling of technological processes" education in medical education, including the tools of information and communication technologies and their use in the educational process. Opportunities, the current development of information and communication technologies and their application, as well as promising directions of using information and communication technology tools in the educational process are highlighted.

Keywords: *innovation, interactive, modern educational technologies, information technology.*

INTRODUCTION

Today, all spheres of the life of New Uzbekistan have become a field of deep reforms. In this process, it is impossible not to emphasize the changes in the educational system, which is the basis of the social sphere. The beginning of the implemented reforms, first of all, in the field of education and training,

implies the incomparable role and importance of the education system, which is considered the most important link in human education in the process of globalization, in the life of our society. The attention paid by our state to the education system, in particular: the adoption of comprehensive measures related to the development of this sector in the following

years, the wide range of opportunities created for young people, indicate that the reforms aimed at the education system are at the state level.



In the address of the President of the Republic of Uzbekistan, Shavkat Mirziyoyev Miromonovich, to the Oliy Majlis in 2021 and to the people of Uzbekistan, "We have set ourselves the great goal of building the foundations of the Third Renaissance in our country. We need to create an environment and conditions that will educate Ulugbeks, Navoi and Babur. In this, first, development of education and training, establishment of a healthy lifestyle, promotion of science and innovation are the main pillars of our national idea and should serve. In order to achieve this goal, creating ample opportunities for our young people to set great goals and achieve them, and providing all kinds of support is the most important task for all of us. Only then will our children become a great and powerful force that will realize the age-old dreams of our people." In fact, today's youth are growing up at a time when information technologies are developing rapidly, their demand for knowledge, enthusiasm, intelligence, and the skills they expect from teachers and coaches are completely different from those of students 10-15 years ago. . The use of modern pedagogical technologies, interactive methods, and innovative information technology tools in the teaching of sciences takes a worthy place in

improving the quality of education. At the same time, it is important for students to be in a constant search for innovation, to think, to master their psychological relationships, and to act because of the formation of innovative ideas in others. The modern capabilities of innovative technologies are superior to the capabilities of traditional education in a number of indicators. When innovative educational technologies are used, a high level of interaction between the pedagogue and students is observed. It is precisely because of these aspects that the importance of using innovative and information technologies in the field of education is emphasized today.

This study reports the design and implementation of a modelling-based programming instruction for science majors and its effectiveness on programming and science learning. A modelling approach was proposed to provide guidance to students in implementing solutions for scientific problems in computer programming. This modelling approach includes five stages: (1) phenomenon description, (2) data modelling, (3) algorithmic modelling, (4) coding, and (5) verification and debugging. Authentic scenarios for science learning were adopted in teaching materials and problems to inspire students to learn both the scientific and programming aspects of the underneath phenomena. An empirical experiment to examine the effectiveness of the proposed instruction was conducted in a general education course at a university, and the results showed that students who engaged more in the modelling approach performed better in both the program implementation test and their final projects. In addition, students' feedback agreed with what we had expected the modelling approach would benefit students: they could connect abstract, real-world phenomena to programming variables and

logic by visualizing the phenomena in simulation and animation. Data modelling and algorithmic modelling also helped them analyze the variables in the problem space and propose a solution before coding. Because the proposed instruction provided opportunities to experience the capability of programming in solving scientific problems, high-programming-performance students also showed a greater interest in exploring science after the class.

A teacher working in the higher education system uses modern pedagogical technologies, methods of activating the educational process, and pedagogical methods that ensure the formation of quality knowledge, skills and competencies in the subjects taught. After studying the essence, purpose and tasks of modern pedagogical technologies, developing scientifically based information, practical guidelines, and mastering advanced pedagogical and information technologies, he introduces them to the educational system. It is known that the formation of a student as a person, expert, and citizen is one of the main tasks of higher education. A student should be ready for independent thinking, research, communication in the process of solving fundamental and vitally important problems in science, technology, culture and society. Such demand is an important socio-economic task in preparing competitive graduates for the modern labor market. Currently, there is an increasing need for highly qualified specialists with critical thinking skills in enterprises and organizations operating in our country.

Currently, the following general trends in world development, which determine the need for serious changes in education policy and education system, should be taken into account:

- acceleration of society's development;

- the transition to an information society, the emergence of global problems and growth;

- reduction of unskilled and low-skilled labor in the field of employment comprehensive measures and changes;

- increasing the role of human capital in the economic development of society.

The educational system is one of the main social institutions, an important sphere of personality formation, a historically formed system of educational institutions and their management bodies, which is responsible for educating the growing generation, preparing them for independent life and professional activity, and their education. Serves the purpose of meeting individual needs. One of the priority areas of modernization of the education system and an important task is the modernization of the management model of this system. Management of education in modern conditions is primarily management of the process of educational development. It will be necessary to create a unified system of education statistics and education quality indicators, as well as an education monitoring system.

Large-scale implementation of information and communication technologies in the educational process provides the following opportunities: - reduction of the time spent on searching for educational and scientific information by students and professors; - acceleration of changing the content of electronic educational literature based on the demand of the time;

- allocation of additional time for independent education of students.

Today, the interest and attention to increase the efficiency of education by using interactive methods (innovative pedagogic and information technologies) in the process of

teaching physical sciences is growing day by day. Classes using modern technologies are aimed at helping students find the knowledge they are acquiring, independently study and analyze it, and even draw their own conclusions. In this process, the teacher creates conditions for the development, formation, learning and upbringing of individuals and teams, and at the same time, he performs the role of manager and guide. In such an educational process, the student becomes the main figure. Equipping the educational process with multimedia tools ensures the use of didactic possibilities of video and audio information. With the help of hypertext systems, it is possible to organize references in the text itself, which makes it easier to search for the necessary information using keywords. Media systems allow not only text, but also images, digitized sound, pictures, cartoons and videos to be interconnected. The development of information and telecommunication networks makes it possible to access a large amount of information stored in different parts of the planet, and at the same time, it stimulates the development of distance education systems. The emergence of new technical and software tools that increase computer capabilities is gradually replacing the term "Computer technologies" with the term "Information technologies". This term refers to the processes of collecting, storing, processing, presenting, and using information using electronic means. Thus, informatization of education means providing students with opportunities to freely use information in databases, knowledge bases, electronic directories, archives, and encyclopedias. The modern "Pedagogical-psychological dictionary" describes the concept of media education as "study of mass communication in pedagogy by students". The main goal of media education is to prepare the new generation for life in modern information

conditions, to receive various information, to teach them to understand it, to understand its effect on the psyche, to learn the methods of communication based on new forms of communication with the help of technical tools and modern information technologies. In educational institutions that prepare future pedagogues, the situation of conducting work in the form of a very important traditional audience will be enriched with new content, because the time saved because of the use of information and communication technologies is very necessary to further improve the professional skills of students who are teaching pedagogues. Remains for personal communications. In addition, trainings conducted with the help of information technologies satisfy the desire of young people to express their attitudes to important life achievements and problems, and create an opportunity for them to think and justify their points of view. In order to solve the problems faced by the educational system in the innovative processes taking place at the present time, we need people who are able to absorb new information and independently evaluate the acquired knowledge, who can make the necessary decisions, and who think independently and freely. That is why the role and importance of modern teaching methods, interactive methods, and innovative information technologies in the educational process of educational institutions is incomparable.

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