

USING INFORMATION AND COMMUNICATION TECHNOLOGIES BY TEACHING MATHEMATICAL SCIENCES IN PEDAGOGICAL UNIVERSITIES

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Abstract

The article examines the influence of information and communication technologies on the educational process of higher education. Based on the strategic tasks of the Higher Education Development Concept until 2030, the possibilities of modern forms of educational process organization and digital technologies were analyzed. The purpose of the ideas put forward in the article is to effectively use ICT opportunities and increase the quality of education.

Keywords: Higher education, information and communication technologies, digital technologies, quality and efficiency of education, Internet.

Introduction

Today, creating the digital industry of the future requires starting the digital transformation of the country by increasing the level of human capital development, digital transformation in education at a rapid pace.

Today's classrooms are very different from a decade ago, and classrooms are equipped with computers, iPads, tablets, smart boards, and other types of educational technology. As in other parts of the world, the seven-screen generation of the digital generation - television, computer, tablet, phablet, smartphone and smartwatch - has appeared in Uzbekistan. As a result of having such a dense digital environment and constant interaction with it, the thinking and information processing processes of today's students are fundamentally different from the previous thinking and information processes. The digital generation cannot and should not be taught the way our parents learned. Blackboard and white chalk cannot be used to teach this generation. Changing the blackboard to white and the chalk to a marker doesn't change anything, it's not the way to motivate today's students to learn and develop the skills to succeed in the job market.

It is necessary to adapt the educational system to the digital generation through mass and effective use of innovative educational technologies and didactic models based on information and communication technologies. At the same time, it is necessary to actively use the approach based on research in the educational process, and with this, it is possible to develop the skills of students in scientific research and to form their creative abilities and creative thinking based on IT competence. Information and communication technologies are not a solution to all problems in the education system, but a tool for making lectures and seminars informative and



interactive for the digital generation. It should also be noted that teachers retain the main role in the interactive learning process focused on the needs of students.

Decree No. PF-6079 of the President of the Republic of Uzbekistan of October 5, 2020 on the approval of the "Digital Uzbekistan - 2030" strategy and measures for its effective implementation "electronic education for the higher education system to further improve its resources, as well as to ensure the use of domestic and global educational resources" [1], October 8, 2019 "On approval of the concept of the development of the higher education system of the Republic of Uzbekistan until 2030" PF-5847 "introduction of digital technologies and modern methods into the educational process, individualization based on digital technologies, development of distance education services, wide implementation of webinar, online, "blended learning", "flipped classroom" technologies" [2] and the determination of such tasks requires the implementation of a number of works within this direction.

Analysis of literature on the topic

To date, a number of scientific studies have been conducted on digitizing the higher education system of our country, introducing modern information and communication technologies into the educational process, providing students with modern knowledge, and improving computer literacy. In particular, by Academician S.S. Gulyamov and Associate Professor M. Abdullaev, digitalization of the higher education system, introduction of new directions and disciplines in digital economy technologies, reform of the education system by using cloud technologies, modern methods of teaching, including the effective use of interactive whiteboards and tablets, the use of artificial intelligence technologies [3], the necessity and advantages of using digital technologies in distance education for students, and statistics on the use of distance education and the use of digital technologies and distance education The need to introduce new generation systems of education, that it is faster, easier and cheaper to learn new skills or subject-related materials through the distance education system, is covered in detail. Also, in our country, studies were conducted on the problems that hinder the effective implementation of distance education using digital technologies and their solutions [4].

By S. Allayarova, the role of information and communication technologies in improving the quality and efficiency of the higher education educational process in Uzbekistan, the interdependence of information and communication technologies and advanced pedagogical technologies in the educational process, promising trends in the field attention is focused on the analysis of the dynamics of reforms and the possibilities of modern forms of organization of the educational process and digital technologies are analyzed [1].

Many problems of traditional education are being solved by distance learning, online courses, mobile and electronic learning resources. It is appropriate to mention the scientific results of some world-renowned scientists and researchers. As a historian of science, education and technology, David Franklin Noble has researched the possibilities of distance education, its achievements and shortcomings [3].

Another technologist, Bob Johnston, says that any results of scientific and technical progress should not be limited, but should be used effectively [2]. His main idea is that modern education should not hinder young people's interest in IT technologies, but it is necessary to teach them



to use these tools rationally. We also support Bob Johnston's approach. Because young people determine their life goals and positions by means of current news and achievements. They created their lives through science.

In the researches of the mentioned authors, it is recognized that positive progress in the implementation of ICT in the educational system is realized through independent education and requires a conscious approach of students to learning and learning a profession. We also support their opinions and emphasize that the presence of any high technology cannot contribute to the education of the necessary person for the era if there is no conscious (purposeful) approach to it. People should always keep in mind that information and communication technologies are a means to achieve the goal.

Research methodology This article covers the comparative analysis of the research conducted in recent years on the implementation of ICT and innovative approaches to the education system, identification of problems, implementation of observations, and digital technologies that should be applied to the educational process. is the development of scientifically based proposals and recommendations.

Analysis and Results

When it comes to the world experience in the use of ICT in social structures, since 2005, at the end of each year, the World Telecommunication (ICT) Indicators Symposium, which analyzes the indicators of the use of electrical communications (ICT) around the world (World telecommunication/ICT) Indicators Symposium (WTIS) [2] The Symposium was held for the sixteenth time in 2018 by the World Telecommunication Bureau in Geneva, Switzerland is to determine the rating of the use of ICT, which serves to provide all types of communications. [9] In the conclusions of the symposium, figures on the application of ICT in the socio-economic sphere are presented. The figures show that the possibilities of using ICT in our country are growing, but this growth is much lower than in other developing countries[10]. There are a number of factors that contribute to the fact that these indicators are not at the level of demand. Among these, the speed, price and other important features of the Internet in our republic are not at the required level. This is due to financial opportunities, the quality and quantity of existing material and technical equipment not being able to meet the needs of the population and the requirements of the times. Nevertheless, the implementation, expansion and popularization of ICT in education continues.

According to the researchers, no field can be as important as education for the development of the state. The concept of the development of the higher education system of the Republic of Uzbekistan until 2030 envisages the implementation of several measures to introduce digital technologies and modern methods into the educational process [2]. In particular, the issues of individualization of educational processes based on digital technologies, development of distance education services, wide implementation of webinar, online, "blended learning" and "flipped classroom" technologies [2] were discussed. It is known that "blended learning" and "flipped classroom" technologies are forms of educational process organization, in which the student's creative and systematic thinking, ability to make independent decisions, and the formation of skills and competencies related to the organization of scientific activity. there is.



At the same time, these forms of education are based on independent education, in which the ability to self-organize, to not stop developing, to clearly define one's goals, and to see one's perspective is formed. The current trends of development require a person to receive continuous education (Life long education). For this, it is necessary to be a human-researcher. The important features of research in the 21st century are shown in the following:

- creating information;
- search for information;
- information sorting;
- assimilation of information.

The correct and appropriate use of the above "blended learning" and "flipped classroom" technologies will serve to form and develop these qualifications and skills of higher education subjects. These technologies cannot be implemented effectively without ICT. In this regard, the ICT competence of professors and students has a special place in higher education.

The development of information and communication technologies has led to the emergence of electronic education. Electronic education (English Electronic Learning, E-Learning for short) means getting an education by means of information and electronic technologies. UNESCO defines e-learning as follows: E-Learning is learning with the help of the Internet and multimedia.

E-learning includes:

- independent work with electronic materials on television, DVD, mobile phone, personal computer and other means;
- get advice, direction and assessment from experts (teachers) who are geographically (regionally) far away by engaging in remote communication;
- creating communities of users of social networks that have started virtual education activities;
- ability to deliver electronic educational materials on time and during the day (standards of electronic educational materials, special means of distance education), etc. The cited "blended learning" and "flipped classroom" technologies are one of the means of organizing electronic education.

Conclusions and Suggestions

In general, expanding the scope of ICT implementation in higher education is the demand of the times. According to world experts, the need for IT specialists will increase in the future. Therefore, the head of our state put forward the proposal to implement the "One million programmers" project in his Address to the Oliy Majlis dated January 24, 2020. Therefore, we should also try to train qualified personnel who are in high demand by applying ICT, despite the existing shortcomings and obstacles, without breaking away from world development.

Based on the above, we make the following suggestions: - in order to keep pace with the times in the way of education and vocational training, it is necessary to massively develop the competencies of using information and communication technologies in all citizens of our country; - every family in our republic should have at least one laptop. This proposal builds on our first proposal. We think that the time has come for parents to feel their responsibility in



carrying out this work. After all, the investment spent on education and knowledge always pays off; - supporting the effective use of information and communication technologies, in particular, innovative approaches to teaching, creativity of exemplary professors and teachers engaged in scientific-pedagogical activities in the higher education system, training them when such talent is observed giving freedom in the organization of classes, introducing incentives when high performance is observed; - based on the internal capabilities of each higher education institution (including branches in remote areas), it is necessary to implement effective methods and means of using information and communication technologies in the organization of the educational process. In this regard, it is appropriate to regularly organize events for young researchers-researchers aimed at solving local problems, such as competitions for startups and innovative projects, and to organize their support.

One of the important issues in the implementation of the national personnel training program in our republic is the training of specialists with deep knowledge in the field of ICT for agricultural sectors. Information technologies help to solve a large number of problems related to planning, forecasting, analysis and modeling of agricultural processes. High-efficiency technologies of information gathering and processing are used in practice as a means of achieving goals by coordinating production processes.

Decision No. PQ-3832 of the President of the Republic of Uzbekistan dated July 3, 2018 "On measures to develop the digital economy in the Republic of Uzbekistan" was adopted, further improving the state management system based on modern information and communication technologies, introducing the digital economy and in order to create conditions for ensuring the development, with this decision, the National Project Management Agency under the President of the Republic of Uzbekistan was designated as the competent body in the field of introduction and development of the digital economy, and a number of tasks were assigned to it [1].

The use of digital technologies in the educational process of the Tashkent State Agrarian University is one of the most urgent issues in order to fulfill the tasks defined in this decision. The subject "Using information technologies in agriculture" is one of the subjects of particular importance in fulfilling the above-mentioned tasks.

This subject allows students to master the skills of using information bases and modern information technologies in planning and effective management of agricultural production. The main goal of teaching science: to form students' ideas about the use of information technologies in agriculture, to master the theoretical foundations of science for use in their professional activities, and to receive practical innovations and continuous education on the basis of modern education and information technologies is to improve one's professional skills independently. The task of the science of information technologies is to teach how to work with technical and software tools of a computer. It is to strengthen the skills of using and working in information technologies and systems, information communication technologies.

"Information technologies in agriculture" training is conducted in the form of lectures and practical training. We can recommend the following topics for organizing lecture sessions.

- Objectives and tasks of the science "Information technologies in agriculture", theoretical foundations of information;



- Technical and software support of information processes in agriculture and their development processes;
- Use of practical programs in solving agricultural issues;
- Computer graphics and design in agriculture;
- Basics of programming in agriculture, basics of using S++ programming language;
- Information systems, their role in managing agricultural processes;
- Use of databases and their management systems in agriculture;
- Network technologies in working with information in agriculture;
- Web technologies in agriculture;
- Electronic management system in agriculture;
- Use of information security and information protection methods in agriculture.

Providing the management system with information on time allows the decisions to be made in the management process to be implemented within the specified period. The transmission of information about the activities of enterprises and organizations to the top management levels and the circulation of information between its organizational systems is carried out with the help of information technology. Information is necessary to make the right decision. Providing the management system with information is one of the most important tasks. Because the efficiency of the management system depends in many ways on the supply of information.

In conclusion, it should be noted that the issue of using digital technologies in agricultural management will always remain relevant.

Creating an electronic textbook in the Macromedia Flash environment With the development of technology and the presence of the Internet, electronic textbooks have become a consistent part of the educational process. They provide an opportunity to learn interactively, which makes the learning process more interesting and effective. One of the tools for creating such scientific materials was the Macromedia Flash environment.

In this article, we will look at how to create an electronic textbook using this popular program. What is Macromedia Flash? Macromedia Flash was designed to replace Adobe Animate for developing new applications and animations. However, many of Flash's features and tools can be used to create e-textbooks. This environment allows creating interactive animations, audio and video materials, as well as user interaction with the content [1].

Creating e-textbooks in Macromedia Flash can be a fun and effective way to learn. There are several steps that will help you create an e-textbook:

Phase 1: Planning and Design. Before you start creating your tutorial, it's important to plan ahead. Determine the goals of the textbook, the audience you want to reach, and the topics you want to cover. Then develop the structure of the textbook, determine the order of the materials and make an outline. You should also think about the design of the textbook. Flash provides a wide range of possibilities for creating creative interfaces and animations. However, it should not be overdone - the interface should be clear and students should be able to use the material independently.

Step 2: Create content. Creating content in Macromedia Flash is a process that involves creating animations, interactive elements, video, and audio files. You can draw objects directly in Flash,



import raster and vector images, as well as audio and video files. Uses timelines and structure for content.

Step 3: Add interactivity. One of the main features of Flash e-textbooks is interactivity. You can add buttons, elements, sound boxes and more. To do this, use actions and scripts available in the Flash environment. For example, you can create a button that switches pages, shows hidden text, or starts an animation.

Step 4: Application: The textbook is distributed to the target audience. This can be done through various distribution methods such as e-mail, social media or hosting services[3].

Macromedia Flash integrates a custom programming language, Action Script, to make these software modules easier to learn.

The creator of e-textbooks independently manages the inserted clips, for this it is possible to write a small program using the built-in program Action Script, but it is not necessary to have skills in Macromedia Flash, if a good programmer, a web with interactive elements sites can be created

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