TRANSNATIONAL JOURNAL OF SCIENCE AND HUMANITIES

BERLIN STUDIES

ENTWICKLUNG DER KREATIVEN UND WISSENSCHAFTLICHEN FÄHIGKEITEN DER SCHÜLER MIT MODERNEN BILDUNGSTECHNOLOGIEN

Tulkin Rasulov, Gulomjon Kurbonov
Staatliche Universität von Buchara

Anmerkung: Der Artikel bietet eine vergleichende Analyse wichtiger Aspekte moderner pädagogischer Technologien und Methoden im Bildungsprozess, von ausländischen Wissenschaftlern zitierte Tarife und Forschungsarbeiten. Das Hauptziel der Studie besteht darin, den Lernprozess vollständig vom traditionellen System zu befreien, den Lernprozess auf der Grundlage moderner Technologien vorzukonzipieren und das erwartete Ergebnis zu antizipieren. Als Ergebnis wird angestrebt, die Zeitproduktivität zu erhöhen und das Bildungsniveau der Kenntnisse, Fähigkeiten und Fertigkeiten der Schüler in kurzer Zeit zu bestimmen. Es ist beabsichtigt, die kreativen und wissenschaftlichen Fähigkeiten der Schüler durch den Einsatz visueller Methoden bei der Erläuterung der Themen der praktischen Ausbildung, der Schaffung von Problemsituationen, Diskussionen, dem Austausch von Schülerideen, der Entwicklung kreativer Aktivitäten und der Bildung unabhängiger Denkfähigkeiten zu entwickeln.
Schlüsselwörter: Pädagogische Technologie, moderne Bildungstechnologien, digitale Technologie, Computermetapher, „Charkhpalak (Wasserrad)"-Technologie, „Insert"-Methode, „Podiumsdiskussions"-Methode, „verbale Imagination"-Methode.

DEVELOPING STUDENTS' CREATIVE AND SCIENTIFIC SKILLS WITH MODERN EDUCATIONAL TECHNOLOGIES

Tulkin Rasulov, Gulomjon Kurbonov
Bukhara State University

Abstract: The article provides a comparative analysis of important aspects of modern pedagogical technologies and methods in the educational process, tariffs cited by foreign scientists and research work. The main purpose of the study is to fully rid the learning process from the traditional system, to pre-design the learning process on the basis of modern technologies and to anticipate the expected outcome. As a result, it is aimed to increase time productivity and determining the level of formation of students' knowledge, skills and abilities in a short period of time. It is intended to develop students' creative and scientific skills by the use of visual methods in explaining the topics of practical training, the creation of problem situations, discussions, sharing students' ideas, developing creative activity, the formation of independent thinking skills.
Keywords: pedagogical technology, modern educational technologies, digital technology, computer metaphor, "Charkhpalak (water-wheel)" technology, "Insert" method, "Panel discussion" method, "Verbal imagination" method.

INTRODUCTION.

In order to master the general professional subjects in the educational process, we can first of all consider the use of digital technologies, the teaching process between teachers and students as an important tool in achieving the set educational goals. At the same time, the pedagogical relationship between teachers and students is carried out mainly through digital technologies. Digital technologies improve the course of the educational process, the relationship from a pedagogical (teacher and student) point of view with the help of technical and software tools and ensure the educational independence of students. This, in turn, will radically improve the quality of education, the full implementation of the established curricula by students; increase the personal interest of students. This allows for the organization of lessons according to the needs of students and leads to the flawless implementation of important educational work, such as a liberal approach in the process of objective and unified assessment of knowledge.

In order to achieve our main goals in the education system, it is necessary to provide teachers with sufficient knowledge in their specialty and teaching aids. The teacher is required to be in line with the development of world science and to be able to use modern information technology in their professional activities. A high level of pedagogical competence requires the use of digital technologies in the development of science and education. At the same time, it is a guarantee that the professional skills of the trained personnel will be at the level of modern requirements.

We know that the use of digital technologies in education has accelerated the development of science, as well as the formation of new opportunities for teaching. In his research on the use of digital technologies in teaching, Yu.V.Logvinenko emphasizes the following [1]:

The use of information technology in education can be divided into three didactic levels:

- the degree of solution of traditional pedagogical problems;
- the level of solving new problems by informing the public;
- The level of creation of a new model of teacher education.

Educational activity serves as process of cooperation of educational subjects with them in the pursuit of a set goal. This is solved by tasks such as learning, developing and nurturing the individual. Researchers V.S.Stepanova and I.B.According to Mironova, education is a teaching-methodological course organized over a period of time to form a certain cultural, general, professional skills and competencies. At the same time, in terms of teaching methods, students have to implement knowledge, instructions, practical work, course work, all control work, qualification work which is based on textbooks and manuals on the basis of programs for mastering general professinal subjects. From a scientific point of view, it is based on the interests of students, to bring them up as a harmoniously developed person by focusing on spiritual, moral and research work [2].

Students' interest can be explained by the introduction of digital technologies into the system, as well as the simplification of the relationship between the object of

education and the subjects and implemantation directly. At the same time, the main idea of the mutual relationship in education is the delivery of a mature and well-rounded person, in which the teacher has to use digital technology wisely in the teaching of general subjects.

From the above, we know that today in the training of mature professionals in higher education is used digital technologies and modern pedagogical technologies. It is planned to regularly improve their professional skills, using the experience of their application in the educational process. At the same time, the main task of scientific research is the implementation of effective innovative methods by using them.

LITERATURE ANALYSIS.

Many Uzbek and foreign scientists have conducted research on the pedagogical basis of the study of general professional sciences on the basis of digital technologies. These studies continue to this day because of the diversity of applications of digital technologies in the teaching of other sciences. In turn, if science itself is made up of digital technologies, the question naturally arises as to whether we will use it in our teaching. We will try to find answers to these questions through the researchs given below.

In his research, A.A.Verbitsky stated that the basic social, personal values and principles of the human soul, all mental processes of the soul are considered as an integral unit of the body, and the correct formation of these units is the realization of goals. Emphasizes that it serves as an important tool in the realization of the state of movement of man to the heights with the help of established psychological programs. From a pedagogical point of view, digital learning performs through large calculations in solving very little-known misunderstandings and scientific problems in the human eye for the development of human thinking. [3].

In his research, A.A.Verbitsky explains the emergence and development trends of the digital educational process as follows:

I think that the emergence of digital education in the world and its "intoxication", including in Russia, over time has occurred under the influence of almost four objective factors:

• claims that advances in cognitive science, the human brain, and the mechanisms by which computers process information are the same ("computer metaphor");

• technologically programmed approach to the management of the educational process in education;

• the emergence of the personal computer industry, various digital devices and the equipment needed for them;

• all of these products are sold and the education system is seen as an endless market [3].

In their research, O.I.Voinova and V.A.Pleshakov argue that with the notion that "we are already living in the era of cyber socialization of society," man has to live in harmony with the digital age.

The authors describe cybersocialism as "a set of qualities that enable an individual to organize life in cyberspace in the context of performing various social functions, not independently, but as a subject of network communities" [4]. In today's era of globalization, it can be explained by the fact that humanity is forced to adapt psychologically to the digital age and the stages of development are accelerating as a result of the application of digital technologies.

According to the American scholar P.Norton, when the theory of digital education did not emerge, its integration into traditional education would have exacerbated the shortcomings of both. Today, computer-based learning systems have been developed for learning on a traditional basis, requiring the use of computer emergency capabilities on a new basis. It is cited inevitably based on learned factas a powerful virtual tool to help people understand many phenomena. It should not be forgotten that it also has the property of enslaving by managing the mind which has a set of skills [5]. These scientific approaches are now tasked with being more pedagogically and psychologically relevant in the development of digital education-based learning systems and perfectly delivering each piece of information to the user by analysing.

MAIN PART.

In our study, as a result of studying and analyzing the scientific work of scientists, we introduced the definition of the pedagogical basis of teaching the subject "Numerical Methods" on the basis of digital technologies as follows.

Educational bases:

- formation of cultural and scientific attitudes of students to digital education;
- enriching students' knowledge of their professional skills;
- creating opportunities for students to learn individually;
- formation of students' imagination and skills about the virtual world;
- interdisciplinary integration during the classes process;
- teach students to self-diagnose and draw conclusions from their knowledge;
- to increase students' interest in the classes process;
- meaningful and effective organization of independent study of students.

Pedagogical bases:

- be able to form a culture of working with digital technologies;
- teach them to sort out all the information and to make the right decision;
- broaden their understanding of knowledge and skills;
- teach time management.

An indisputable aspect of the pedagogical justification of teaching the subject "Numerical Methods" on the basis of digital technologies is that it is a society that is evolving and digitalizing in line with the times. We need to keep in mind that in a digital society, the psychological impact of the flow of information is very

important, it also has the ability to determine the degree to which a person will be able to form cognition and thinking in life. In the process of education, we need to fully shape or adapt the process of digitization to the requirements of the times.

The analysis of the above-mentioned research means that "Pedagogical technologies", "Modern educational technologies" are the content of the educational process, which reveals the essence of the educational system, ensuring the optimization and improvement of educational processes. The main content of our research work is aimed at this, taking into example the educational process in the field of information systems and technologies(by industries and sectors) in higher education institutions, and conducted experimental classes. During the experimental lessons, the level of formation of knowledge, skills and abilities of students was determined using "Pedagogical technologies", "Modern educational technologies".

Achieving the goal based on the above research is to know in advance how to achieve the intended plan by digitizing the teaching process, to improve the knowledge and skills of future young staff. Today, the importance of the computer in the field of education, which is one of the didactic tools, is invaluable. It focuses on issues ranging from administrative management to control of the education system, from the organization of the study of academic subjects to the organization of individual classes of students.

One of the advantages of using programs is the optimality of the didactic tool. At the same time, the ability to create an electronic form of data creates more creative skills in future professionals. Based on them, if electronic complexes, e-learning developments are developed and put into practice, students will have enough skills, as well as the ability to work independently and become a subject of the educational process. In this research work, the above-mentioned didactic methods, forms of modern educational technologies, as well as didactic software teaching aids were effectively used.

Research Information systems and technologies (by sectors and industries) on the example of the subject "Numerical methods", experimental work was carried out in groups.

Methodology
The mechanism of carrying out experimental work

The purpose of the experiment: to establish students of Information systems and technologies (by sectors and industries) to use modern pedagogical technologies in the educational process, to determine the level of effective use of pedagogical conditions that the development of factors that encourage them to study independently.

In order to determine the effectiveness of the experimental work, students were assigned to the groups "Control" and "Experiment" on an equal basis. In the experimental group, practical activities were organized on the basis of the proposed methodology, which helps to ensure the formation of the level of use of modern pedagogical technologies by students, and in the control group, the traditional educational work was carried out.

67 students (33 experiments, 34 control groups) in the field of information systems and technologies (by industry and industry) participated. Assessment of students' knowledge was based on a 100-point rating system.

The experiments were conducted in accordance with state educational standards and educational objectives.

In the experimental work, the teaching process in the "control" group was organized in the traditional way. In this type of lesson, the teacher is active, that is, he lectures, the students act only as listeners. Students memorized what they heard and answered the questions at the end.

In the "Experiment" group, the teaching process was conducted in an unconventional way, designed on the basis of pedagogical technologies. In this case, the teacher is purposeful and meaningful on the basis of teaching technologies, pre-planning the topic. In classes of this form, the student is at the center of the learning process.

During the experiment, trainings were organized based on "Charkhpalak (water wheel)" and FSMU technologies, as well as methods such as Insert, Panel Discussion, and Verbal Imagination. Teaching aids were used to explain the topics to the students of Information systems and technologies (by sectors and industries) of practical training in the subject "Numerical Methods", problem-solving situations were created, discussions were held and students' opinions were shared. The purpose of such an approach is to increase the creative approach in students, forming creative thinking, the ability to work independently. During the experiment, the selection of goal-oriented content for the lesson, demonstration of methods of accurate and understandable delivery of teaching materials to students, analysis, improvement of students' ability to apply their knowledge in practice were carried out on the basis of instructions.

Description of the technologies used in the course:

"Charkhpalak (water wheel) " technology

"Charkhpalak (water-wheel)" technology aims to teach students to remember the topics covered, to think logically, to answer questions correctly and independently, and to self-assess, to evaluate objectively by the teacher in a short time, analyzing their knowledge on the topic.

This technology helps students to think logically in the classroom, to express their opinions independently, to evaluate themselves, to work individually and in groups, to respect the opinions of others, to choose necessary from many ideas.

The order of training is as follows:
- divide students into groups; introduce with requirements and rules;
- distribution of handouts to group members;
- tasks in the handouts are performed independently by team members;
- each group member writes the group number in the right corner of the handout they have worked on;
- in the left corner he draws any of his symbols;

- handouts are exchanged for other groups in the direction of "wheel rotation";
- materials studied and modified by new group members will again be exchanged between groups in the above-mentioned direction;
- the teacher reads the tasks given in the handout and together with the team determines the correct answers;
- each student identifies the differences in the answers marked with the correct answer, collects the required score and self-assesses.

"FSMU" technology

Each student will be given a 4-step written form of FSMU technology:

F- State your opinion;

S- Give a reason for your statement;

M- Give an example (proof) to prove your reason;

U- Summarize your thoughts.

First, students complete the assignments individually and independently, and small groups are formed. In a small group, each student reads and introduces his or her written answer, then the group members discuss it together, write the general answer, and defend it.

After a brief explanation of the technology to the students, the questionnaires are distributed and a time limit is set. Students approach the questions on the topic individually, individually and explain their opinion in the table. The results will be announced after the check is conducted by the researchers.

Fill in the problem table below

	Express your opinion on the issue raised.	
	Indicate the reasons for the problem.	
	Give reasons for the problems you cite.	
	Summarize your thoughts above.	

"Insert" method

In this method, students are divided into groups and they are named. After the teacher announces the new topic, each group is asked to make two comments on the new topic. All members of the group will be actively involved in this process. The ideas expressed are written one after the other on the board. At the end of the participants' activities, the teacher distributes a text covering the content of the new topic to them. Then the participants are given the task to get acquainted with the text and put the following characters in each line of the text:

Z - if the idea expressed by the groups is reflected in the text;

S - if the text contains an opinion not expressed by the groups;

D - if there are opinions in the text that contradict the stated ideas;

? - in case of misunderstandings in the process of reading the text.

Then the group members share their personal views with each other, and then the number of characters across the group is summarized. Through leaders, the amount of each character is explained and explained. The teacher writes the numbers recorded by the groups in the column with their names. Once the teacher has completed the idea of each group leader, it helps the students to correctly resolve and understand the conflicts and misunderstandings that arise.

Control and experimental groups were formed. Using the above technologies, trainings were conducted on the basis of "Panel discussion" and "Verbal imagination" methods, as well as digital technologies. 33 students were involved in the experimental group and 34 students in the control group. According to K. Pearson's criterion χ^2, the final stage indicators of the students of the experimental and control groups were compared. According to the final results, the quality of mastering by the students of the experimental group was 13% higher than that of the control group.

CONCLUSION.

In conclusion, the main purpose of our research is to liberate the educational process from the traditional education system, to improve the education system through the application of foreign experience, adapting higher education processes to modern requirements. The main task of our research is to develop conditions such as the study of information systems and technologies (by sectors and industries) on the example of educational processes, equipping lecture and practice rooms with modern equipment, adapting each student to an individual approach.

REFERENCES:

1. Logvinenko Yu.V. Didactic advantages of using new information technologies in the educational process // Vektor nauki. - 2010. - p. 106.

2. Stepanova V.S., Mironova I.B. On the definition of the concepts of "Education", "Educational activity", "Educational service" // Humanization of education. 2015. no. 1. URL: https://cyberleninka.ru/ (date of access: 08/16/2020)

3. Verbitsky A.A. Digital Learning: Problems, Risks and Prospects // Electronic scientific journal "Homo Cyberus". - 2019. – no. 1(6).

4. Voinova O.I., Pleshakov V.A. Personality and cybersociety: formation of cybersociality and classification of people according to the degree of integration into cybersociety // Electronic scientific journal "Homo Cyberus". - 2018. - no. 1 (4). URL: http://journal.homocyberus.ru.

5. Norton P. Computer Potential and Computer Educators: a Proactive View of Computer Education // Educational Technology – 1983. – Vol. 23. – no. 10. – P. 25-28.