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CONCEPTUAL AND METHODOLOGICAL FOUNDATIONS OF IMPROVING COMPUTER SCIENCE TRAINING IN THE CONDITIONS OF DIGITAL TECHNOLOGY

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ABOUT ARTICLE

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Abstract: In the age of digital technologies, the knowledge of informatics has become extremely important, so the reform of the informatics education system, the use of innovative pedagogical and information-communication technologies in the teaching process, has become one of the urgent issues in education. The importance of using electronic textbooks, animations and video tools using modern pedagogical technologies to enrich the imagination in learning computer science is presented today.

INTRODUCTION

In all the decisions and legal regulations issued in the field of education in our country, it was determined to implement advanced pedagogical methods and technologies, information and communication technologies in the educational process, to abandon traditional educational methods, and to ensure the increase of hours of practical training and production practice.

Today, the teacher is one of the main subjects, a moderator, a facilitator in the implementation of all priority tasks set by the state in the process of educational reforms. Also, in recent years, a number of very important state documents on the acceleration and development of informatics education have been adopted, and it is required to implement all the urgent tasks defined in these documents.

In the bachelor's degree of all educational areas in the higher education system, educational courses such as "Informatics and information technologies", "Informatics and digital technologies", "Digital technologies in the multimedia space", "Network technologies" have been introduced. is being taught

based on the credit-module system. This subject is important in preparing students of all educational fields for their future profession.

The main results and findings

Circumstances that determine the quality of education related to the learning process: organization of the lesson at a high scientific and pedagogical level, conducting problem-based exercises, interesting organization of lessons in the form of questions and answers, use of advanced pedagogical technologies and multimedia guides, putting in front of them problems that encourage the listeners to think independently. . A clear definition of the concept of the development of educational technology in subjects and its implementation will give a positive result in increasing the effectiveness of education. The main conceptual approaches to the purpose of teaching science and the design of educational technology are as follows.

The purpose of teaching computer science is to provide students with sufficient knowledge to become a specialist as a future teacher of science, to find solutions to problems related to digital technologies encountered in the professional field, to teach future specialists how to solve problems in the field, to provide a methodical way to teach teaching forms, methods, and tools. It contains the basic theoretical and practical information needed by every professional.

Informatics includes a wide range of knowledge and skills that a future science teacher should acquire:

- computer communications, communication channel bandwidth, modulation and demodulation of signals, modems, network services, network topologies, data transfer protocols, network operating systems, local computer networks, intranet, internet networks and their history, internet services, an overview of internet resource creation programs and having knowledge;

- communication channel and communication processor; modulation and demodulation of signals, network services, bridges and gateways, network topologies, data transmission protocols, network operating systems, local computer networks and their management, intranet computer network, Internet services, organization of Internet and intranet inter-network union, creation of Internet interactive resources to have;

- organization of computer communications, modems and their configuration, creation of network services, work with data transfer protocols, work with network operating systems, organization of local computer networks; Working on an intranet computer network; use of global computer network services; must have the skills to create internet information resources.

The introduction of digital technologies into the educational environment encourages students to develop their skills necessary for their future activities along with professional competencies in the process of practical training based on the cognitive, convergent, divergent, metacognition system, based on digital technologies. In this regard, the introduction of digital technologies, which is considered one of the innovative processes in the teaching of informatics, serves to increase the effectiveness of the pedagogical process.

From August 7, 2017, in order to ensure the integrity and continuity of education, state educational standards for teaching informatics were developed and put into practice for all HEIs of our republic. However, the improvement of the Informatics teaching methodology, the current state of its organization, the need to build the activity of informatics teachers in the higher education system in a new context, including the need to further improve the organization of distance learning, show that the need for improvement should be researched as a process.

In order to ensure the implementation of the decisions issued by the head of our state in the field of education in recent years, as well as the formation of creativity and innovative competence in pedagogic personnel based on the content of the priorities set for the implementation of advanced and transparent organizational and legal mechanisms for the selection, training, retraining and improvement of the qualifications of leading personnel and implementation of a number of development tasks is provided. On the basis of this relevance, the continuous education system of our country, including one of the important aspects of ensuring pedagogical efficiency in the higher education process, the development of educational activities that serve to develop students' scientific competences based on the teaching of informatics is of great importance. It is impossible to prepare mature and competitive personnel that meet modern requirements without organizing the innovative pedagogical activities of the pedagogue.

In the 21st century, one of the factors of the development of society is digitization, which affects all areas of human life. With the formation of the information society, fundamental changes are taking place in the field of education. Currently, modern digital educational environment is implemented as a priority in Uzbekistan within the framework of the national project "Electronic development of education". At the same time, as a result of the analysis of the current state of the teacher training system, there are a number of problems that may have a negative impact on the digitization of education:

- firstly, the lack of capacity of some teachers to work with modernized technical devices, IT programs, software;

-secondly, the actual technical capabilities of pedagogical universities training teachers often lag significantly behind the technical equipment of modern schools;

- thirdly, future teachers are not involved in working with specialized electronic educational resources, etc. In order to study these problems, we began to determine the nature of the modernized technologies of the last ten years among information and communication technologies and their role in the teaching of informatics, to study the pedagogical aspects of the use of digital technologies in the pedagogical activity of an informatics teacher.

Using the resources of the digital educational environment in the teaching of computer science (for example, the use of modern mobile devices, gadgets, interactive equipment, podcasting, screencasting, STREAM and augmented reality technologies, as well as software for universal authoring teaching methods using web services, mobile applications and alternatives) the organization of the pedagogical process is considered important, and the lack of the above-mentioned components in didactic processes is an important problem. The mentioned issues set the tasks of training pedagogic personnel who can adapt to professional activity in the conditions of digitization.

Based on scientific developments, field experience, the importance of digital technologies was studied, and issues of influence on the theory and practice of computer science education were studied. In particular, it became clear that the researches of foreign scientists show methods of using existing educational content and approaches to creating independent mass media.

It should be noted that in foreign literature, the use of digital technologies in the educational process is one of the issues that have been actively discussed since the beginning of the 2000s.

Issues of media in education and their influence on the theory and practice of teaching In 2005, with the support of the European Commission of Education, in the analysis of the best examples and preliminary observations of results: the following classification of "methods of using digital tools in the educational process" is presented:

1. Use of available digital tools: sort, record short video recordings; continuous digital technologies (documentary, educational, etc.); search for pedagogically valuable digital tools; access to online media libraries with educational resources;

2. Creation of independent media (by teachers and students): graphic representation of a certain topic and creation of video material; creating presentation and streaming video of events outside the audience; presentation of a short video clip;

3. Creating short videos by editing and processing long videos; create longer streaming videos for pedagogical purposes;

4. Filling the «Virtual media library» with video recordings (the teacher and students use their resources together).

It is worth noting that at present, a number of studies have been conducted and this work is ongoing to investigate the problems of teaching informatics in HEIs related to modern education.

As for the field of computer science education, the effectiveness of the digital technologies in question is beyond doubt. For this purpose, the lesson process should be organized rationally, the teacher should increase the interest of the students and encourage their activity in the educational process, divide the educational material into small parts and open their content by brainstorming, working in small groups, debate, problem situation, orienting it is necessary to use methods such as text, projects, role-playing games and to encourage learners to do practical exercises independently.

If training is improved using innovative pedagogical technologies in the teaching of computer science in higher education, the subject will be interesting, clear, understandable and easily conveyed to students.

In the event that it is emphasized that the educational task of the computer science teaching process consists in the formation and development of knowledge, skills, qualifications and competencies of students, it is worth saying that the completeness, depth of their knowledge as a result of training,

acquisition of systematicity, understanding, consistency and practicality

is important. Such cases indicate that the educational process of teaching informatics is methodologically correctly organized.

In the process of teaching informatics, the formation of practical skills and competencies and competence of students based on the theoretical knowledge acquired by them is also of particular importance.

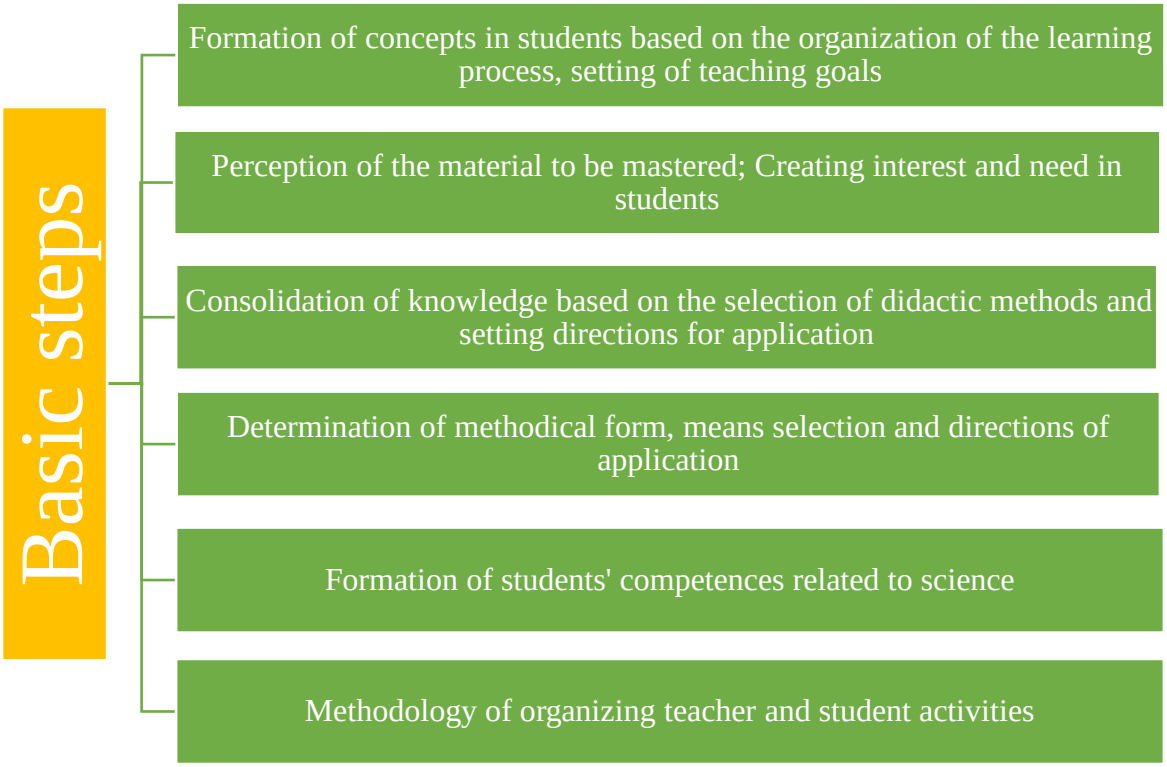
The educational task of teaching informatics is expressed in the formation of spiritual-ethical and aesthetic ideas, behavior and outlook of a person during the educational process. The educational nature of computer education is reflected, first of all, in the content of education. The second factor of education in the teaching process is the relationship between the teacher and the students, the

psychological environment in the group, the interaction of the participants in the learning process, and the teacher's guidance of the students' cognitive activities.

The developmental task of the computer science education process is reflected in the development of the student's thinking, sensory and movement areas, emotional-volitional, intellectual areas of the person. It is expressed in the dynamics of the skills of working with digital technologies, the ability to apply the received and acquired knowledge in life.

In the process of teaching informatics, the student is taught to know how to mentally develop, methods of mental activity, analyze, compare, classify, observe, draw conclusions, distinguish important signs of objects, determine the purpose and methods of activity, and develop the competence of checking its results.

Teaching computer science is carried out in several stages. In particular, teaching is the process of planned learning of educational materials by the student under the guidance of the teacher. This process can be divided into components (or components) that consist of a cognitive stage. A student must go through these stages on the way to knowing from not knowing, mastering from not being able to, and developing skills. The training process consists of several main stages (Fig).



Picture 1. Stages of teaching informatics in higher education institutions

Knowledge of a particular character of students for each stage

activity is characteristic. This activity is separate by the teacher

requires leadership.

As you know, the subject of cognitive activity is considered a student. Therefore, in the center of education with socio-pedagogical foundations lies his personality, consciousness, attitude both to the world under study and to his partners in cognitive activity: students and teachers who organize and direct his education. This issue has become equally relevant at all times. In the process of teaching informatics, the concept of cognitive activity of the student plays a special role when it comes to the activities of the student. The student's cognitive activity is manifested in his intellectual reasoning in the process of cognition, in the performance of general and individual tasks. These characteristics not only guarantee that students receive a high level of knowledge, but are also acarticular for their vital activity, that is, the formation of the student's personality, his active attitude to practice, to life.

The study is specially organized to know the surrounding world and it is a special kind that the teacher leads. The essence of this process – knowledge, skills formation of qualifications and competencies, academic disciplines it is about mastering the content and developing the powers of cognition.

The process of practical application of knowledge, skills and abilities of Education requires a gradual and consistent increase in final Independence.

When organizing the perception of the studied (or subject to study) material by students, the teacher, taking into account their life experience and level of preparation, creates a general idea of the material, explains and shows it in advance in its entirety. Understanding the studied material is a gradually deepening process that provides its understanding based on a general idea of the studied object. The consolidation of knowledge, the formation of skills and abilities requires assimilation, consolidation and improvement in the process of perception and acquisition of educational material. Reading, like all the main types of human activity, is connected with his unearthly and self-knowledge of the surrounding world.

These two sides of the educational process (teaching and learning) are one goal:

training using various means and techniques of Education

the material may have merged with the purpose of Capture.

When teaching informatics, the cognitive activity of the student and its structure plays an important role. Teaching activities, or teaching, will consist of managing the educational activities of students and will find expression in organizing them for classes, guiding their attention, thinking, behavior, etc., consistently putting their activities in front of them with increasingly complex tasks, such as checking them.

Educational activity, or reading, is a complex process of acquiring knowledge, skills and abilities that requires the intellectual, volitional and physical effort of students, as well as their development

stimulates. Without the guidance of the teacher towards a reasonable goal and the active conscious participation of students, there can be no positive results in the educational process. Another distinctive feature of the cognitive activity of the student is his rejection character. Since both the purpose and content and methods of the student's cognitive activity are included in the program, the educational process in which the student is involved is diverse; the power of the subject (student) can go with its activity, independence, varied expenditure. In some cases, its process is imitative reproduction, in others it is exploratory, in the third it is creative

can have character. It is the nature of the denial of the process of activity – the last result of which is acquired knowledge, skills, qualifications and

influence on the character of competencies.

S. S. While researching the features of the use of one of the digital technologies, STREAM technology in the process of teaching, Arbuzov comments: "a set of methods for preparing, broadcasting and storing audiovisual data from a personal digital device and a webcam screen during Distance Learning using modern telecommunications services on the Internet," he describes.

As a result of the adoption of regulatory documents by a number of our governments in our country in the field of Computer Science and Information Technology Training, great attention was paid to the study of this area, since the effectiveness of education is determined not only by progress, but also by the rise in the level of study of Information Technologies, obtaining

The educational and cognitive activity of students on the basis of digital technologies is a process of acquiring knowledge, qualifications, skills, competencies from Informatics and is a combination of scientific, technological, organizational activities aimed at the cultivation of new personnel.

The acquisition of competencies by students on the basis of Information Technology provides a wide range of conditions and opportunities for radical improvement of the system of training specialists.

In our country, much attention is paid to the development of Information Technologies, their introduction into all areas of activity, the formation of these skills in computer science classes. In order to ensure the development of our country, the widespread introduction of digital technologies in the development of information and communication and technological innovations in the educational system, including computer science classes in higher education, as in every field, is becoming a necessary requirement today.

The rapid development of information and communication technologies requires the development of new methods, forms and technologies for teaching online educational courses, training modules for undergraduate programs.

Using modern telecommunications services on the internet, audio is understood as a set of methods for preparing, broadcasting and storing digital information from the screen of a personal digital device and webcam.

Despite the fact that a number of advanced experiments in teaching Informatics have been accumulated under the development of digital technologies, there are also some contradictions in the field. Exactly:

- The fact that in relation to the activities of the teacher, the Reserve, which is the most unique necessary for modern societies, is considered as a wealth, that is, the basis on which "human capital" is built, but in some higher educational institutions there is not enough attention to the organization of the teacher's activities in the field of Computer Science;
- Conflicts between one of the important aspects of ensuring pedagogical efficiency in the educational process - the depreciation of the existing material and technical base with efforts aimed at improving the forms of training;
- The tasks of digital technologies are reflected in the increase in the need for the development of students ' skills to work with information on the basis of the transfer of information by the user;

Elimination of inconsistencies between innovations in the field and their inclusion in the educational environment in the teaching of Informatics and Information Technology, etc.

The main idea of using digital technologies in teaching computer science and information technology is to perform the following sequence of actions.

It is important to prepare materials for the training course, configure the necessary equipment, programs and services, conduct organizational activities on the basis of information technologies in Real time, communicate among the participants in the training in the mode of group conversation. At this point, students are required to form their logistics competencies, that is, to develop by them the ability not only to solve operational problems, but also to design business models for mastering knowledge for consumers of logistics services of various categories, as well as to manage their dynamic processes using engineering tools. In the conditions in which today's digital technologies are entering various fronts, students are required to have as future specialists the ability to draw up business plans, popularize them in the field of marketing. In this regard, there is a need to develop logistic competencies in them.

When teaching computer science and information technology, it is also important to develop the ability to record, store information obtained from the internet through strim technologies, edit them, and broadcast them back again.

The paradigm of teaching knowledge-oriented Informatics is considered as a way of mastering knowledge in order to form optimal competencies of educators.

The teaching of Informatics and information technology relies on the following criteria:

– availability of the opportunity in the educational process of selection of educational programs according to the abilities and interests of students;
- to achieve mutual cooperation in the professional formation of the individual;
- the acquisition of pedagogical education as a fundamental feature, that is, the achievement by students of the assimilation of invariant knowledge, which provides the basis for the creative development of the individual in changing conditions;
- the formation of Education, which is able to fully respond to the needs that arise in the labor market and social processes and are constantly changing, based on this, the education of professionally flexible specialists;
- continuity of education, the ability of a particular program to be taught at one stage or another of education or to be able to continue training in an educational institution of another type;
- equivalence of education, that is, its level in accordance with the state educational standard, national culture and mentality, as well as international norms.

Today, the process of innovative improvement of the activities of the educational system is underway, modernization of it based on the requirements of the time is being introduced.

CONCLUSION

Thus, the teaching of Informatics in higher education is reflected in the cognitive activity of the student-being a subject of the educational process. Therefore, in the center of education with socio-pedagogical foundations lies his personality, consciousness, attitude both to the world under study and to his partners in cognitive activity: the teachers who organize and direct his education. This issue has become equally relevant at all times.

In the process of teaching Informatics, when it comes to the activities of the student, the concept of his cognitive activity plays a special role. The student's cognitive activity is manifested in his intellectual reasoning in the process of cognition, in the performance of general and individual tasks. These features not only guarantee a high level of knowledge of the students, but are also effective for their vital activity, the formation of their personality, its active attitude to practice, to life.

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