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Methodology of Teaching Informatics in Cluster Systems

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ABSTRACT: The beginning of the 21st century is characterized by the informatization, globalization and technicalization of all spheres of society, which in turn determine the principles of further development of science, education, production and management on a global scale. The development of the economy in all countries, the expansion of companies in various fields, the need to improve information systems such as data collection, transmission, protection, efforts to increase production efficiency - all this requires the implementation of information and communication technologies in each country. are the main factors required of students. In this process, in-depth knowledge of informatics is required. This article collects information on the use of various modern methods in teaching informatics to students and introduces them to information and communication technologies, and analyzes the practice of secondary schools.

KEYWORDS: informatics, methodology, teaching, learning, information technology, improving, skills.

I. INTRODUCTION

There seems to be no alternative to computer and communication technology in addressing the development of technical civilization. In an informed society, where information is the most important and invaluable resource, a country's level of development is measured by its level of informatization. It should be noted that today information is considered to be the main product of the driving force, and information technology is an important tool for the activation and efficient use of information resources in society. Therefore, the issue of rapid development and improvement of information and communication technologies has become a strategically important issue in the country and around the world.

In today's world, the ability of every society and its institutions to collect, process, analyze and systematize information using modern information and communication technologies is an important evidence of social and technological progress. As a result of active use of information technologies and means of communication, the concept of information and communication technologies is used. [1]. The purpose of teaching methods of informatics and information technology is to educate future teachers to solve problems that arise in the teaching of informatics, to form the skills of independent learning process, methodological creativity, to solve problems, goals, objectives and content of science. generalization, explanation of the development of basic forms of classification, verification and consolidation of knowledge, explanation, verification and consideration of the effectiveness of the use of specific pedagogical methods depending on the age of students.

As you know, the main task of the subject "Informatics and Information Technology" is to acquaint students with some general ideas of modern information technology, the practical application of information technology and the role of computers in modern life. However, taking into account the didactic principles, it is necessary not only to give students a solid scientific explanation of the facts, but also to use a variety of interesting teaching methods. For example, it is natural for children to be interested in crossword puzzles, which are well-known and popular. The crossword puzzle is always a fun and engaging method for students. [2].

The content of Informatics is as follows:

- collection, transmission and processing of information;
- general description;
- hardware and software of information processes;
- types and forms of information technologies;
- modern information technologies and their structure;

- application of modern information technologies in the educational process and its importance;
- training and control programs and work with them;
- text and graphic information processing technologies;
- work with multimedia technologies;
- work with network technologies;
- work with Internet technology;
- establishment of distance learning, etc.

Interactive learning is a communicative learning process in which the teacher and the student interact in the process. The essence of interactive teaching is to organize the learning process in such a way that all students are involved in the learning process and have the opportunity to think freely, analyze and think logically. Interactive activities in the classroom involve the establishment and development of communicative communication that leads to mutual understanding, collaboration, and common but important control tasks for each participant.

In the process of learning using interactive methods, students learn to think critically, to solve complex problems based on the analysis of conditions and relevant information, to consider alternative ideas and to make informed decisions, to participate in debates, to communicate with others. To do this, the lessons include individual, pair and group work, research projects, role-playing games, creative work, work with documents and various sources of information. [3].

The goals and objectives of Informatics are:

- 1) to use the computer as an assistant in daily mental activity;
- 2) to provide knowledge about information culture and its importance;
- 3) formation of modern concepts of telecommunications, virtual reality, multimedia;
- 4) access to information technology;
- 5) issues of security in the use of information technology, legal aspects of the use of intellectual property and software, etc.

Modern information and pedagogical technologies used in teaching informatics.

The application of new pedagogical and information technologies in science education is expected to become more widespread. Only when theoretical knowledge is reinforced by experience and demonstration can deep knowledge be achieved. As a result, the program places a strong emphasis on practical and laboratory work. Students must learn the subject "Modern programming languages" by using sophisticated and modern teaching methods, as well as the introduction of new information, communication, and pedagogical technology. In scientific classes, pedagogical methods such as "Brainstorming," "Cluster," "Boomerang," "Scales," and others are employed. [4]. The subject is studied through textbooks, teaching aids, electronic resources, handouts, and virtual lectures. Practice and demonstration should be used to strengthen theoretical understanding. Computer technology is used in both practical and laboratory sessions.

Methodology of teaching informatics.

The study of informatics as a subject and the laws governing the process of teaching informatics to students of various ages is known as teaching methodology. In the second half of the twentieth century, methods for teaching computer technology as a science emerged, and in Uzbekistan since 1985. The introduction of the course "Fundamentals of Informatics and informatics" in secondary schools was a major factor.

The science of informatics and its progress are intrinsically related to informatics as a topic. As a result, the subject "Theory and Methods of Teaching informatics and Information Technology" is primarily based on the methodology of teaching informatics and information technology. He depends on general concepts of education and parenting in his conclusions. These ideas are known to have been created through pedagogy and didactics. Furthermore, teaching informatics and information technology employs the laws of physiology and psychology directly in its theory and approach. [5].

Goals and objectives of Informatics.

Given the specificity of informatics as a science, one of the main goals of education, its place and importance in the system of modern sciences, its importance in modern society, the goals of teaching "Informatics" can be defined as follows:

- Formation of computer literacy in students;
- Ensuring that students have a solid and conscious understanding of the basics of knowledge about the processes of processing, transmission and use of information;
- To explain to students the importance of information processes in the formation of a modern scientific view of the world, the importance of new information and communication technologies in the development of society.

The importance of the disciplines "Fundamentals of Informatics and Computer Engineering," "Informatics," and "Information Technology" taught in secondary schools, academic lyceums, and professional colleges of the younger generation, as well as the principles of their content, is taught by the future Informatics teacher. As well as comprehending their interrelationships with other fields. Future Informatics teachers should be well-versed in new information technologies, modern pedagogical software, and techniques of functioning in a society and educational information environment. [7]. The following knowledge is required of students taking the course "Methods of teaching Informatics."

- concepts of informatics and information technologies;
- the role of informatics and information technology in the life of every person and in the development of society;
- essence and didactic possibilities of technical and software means of informatics;
- new pedagogical and information technologies and their application in the educational process.

Methodical system of teaching.

Teaching system that is methodical. The premise that informatics is a science and, on the other hand, a topic should be used to define the content of the subject "Theory and techniques of teaching Informatics and Information Technology." The primary difference between Informatics and the subject of study is the extent and depth of their material. The Informatics curriculum offers students with information on informatics that is important for future practical activities and develops a coherent system of knowledge about informatics. Curricula and textbooks reflect informatics as a subject. Following the resolution of the question of the amount of instructional content contained in the informatics curriculum, it is necessary to determine in what order the training materials should be delivered to the students. One of the hallmarks of the course "Theory and techniques of teaching informatics and information technology" is that it teaches students the substance of informatics and its specialized scientific research methods, as well as how to decide methods and ways of obtaining practical knowledge and skills. On the basis of modern pedagogical and psychological research, these include techniques of studying the material and forms of training organization. To carry out successful informatics training, it is necessary to have an appropriate material base, a specially equipped computer room.

The subject "Theory and Methods of Teaching Informatics and Information Technology" The purpose of teaching informatics is:

1. To equip future teachers with knowledge, skills and abilities to creatively teach informatics and apply new pedagogical and information technologies in their practical activities;
2. Preparation of future teachers for the organization and conduct of various forms of classroom and extracurricular activities in the field of informatics;
3. To develop and deepen the understanding of future teachers about the ways and great prospects of informatization of education.

Students and pupils education system in informatics.

In recent years, the concept of senior-level profile education has been aggressively adopted in school education. Humanitarian, natural, physical, and mathematical profiles are all included into school teaching. The student's learning is further defined by the profile he or she selects. A physics and mathematics lyceum requires students to take mathematics, physics, and informatics as core topics. Because of the rapid development of information and communication technologies at the turn of the twentieth and twenty-first centuries, and their integration into the educational process, informatics is one of them.

Competence in this field of knowledge is becoming increasingly important in a variety of fields, including those not immediately related to informatics.

Without the newest breakthroughs in science and technology in the field of informatics, modern education would be inconceivable today. In this regard, informatics training is required in secondary schools of general education. Informatics is studied at various levels in specialized schools, ranging from basic to advanced. Studying ranges from

learning and refining basic office technology abilities to mastering the fundamentals of programming in modern visual environments. In-depth research of informatics and information and communication technologies (ICT) is determined by the physical and mathematical profile. The development of students' cognitive curiosity is one of the primary goals of studying the topic "Informatics and ICT" in general education. [8].

Of course, the desire to learn about computers is the primary motivation for studying informatics. He enchants children by revealing the secret of his power and demonstrating fresh possibilities. He is willing to be a friend and a helpful, and he can entertain and connect with people from all over the world. However, for most children, the computer becomes a household gadget every day, and its enigmatic halo, along with its motivational force, fades away. The right organization of cognitive activity based on generating the optimal level of complexity, on the active inclusion of students in the quest for new knowledge while doing various types of mental practical activities is critical in forming the motivation of students in the study of informatics. And one of the responsibilities of the informatics teacher in the modern school is to guide the activity.

Methods and methodologies.

The nature of these methods is not defined by their goals, strengths, or limitations, but classified according to 4 broad categories that are addressed in more details in the following sections:

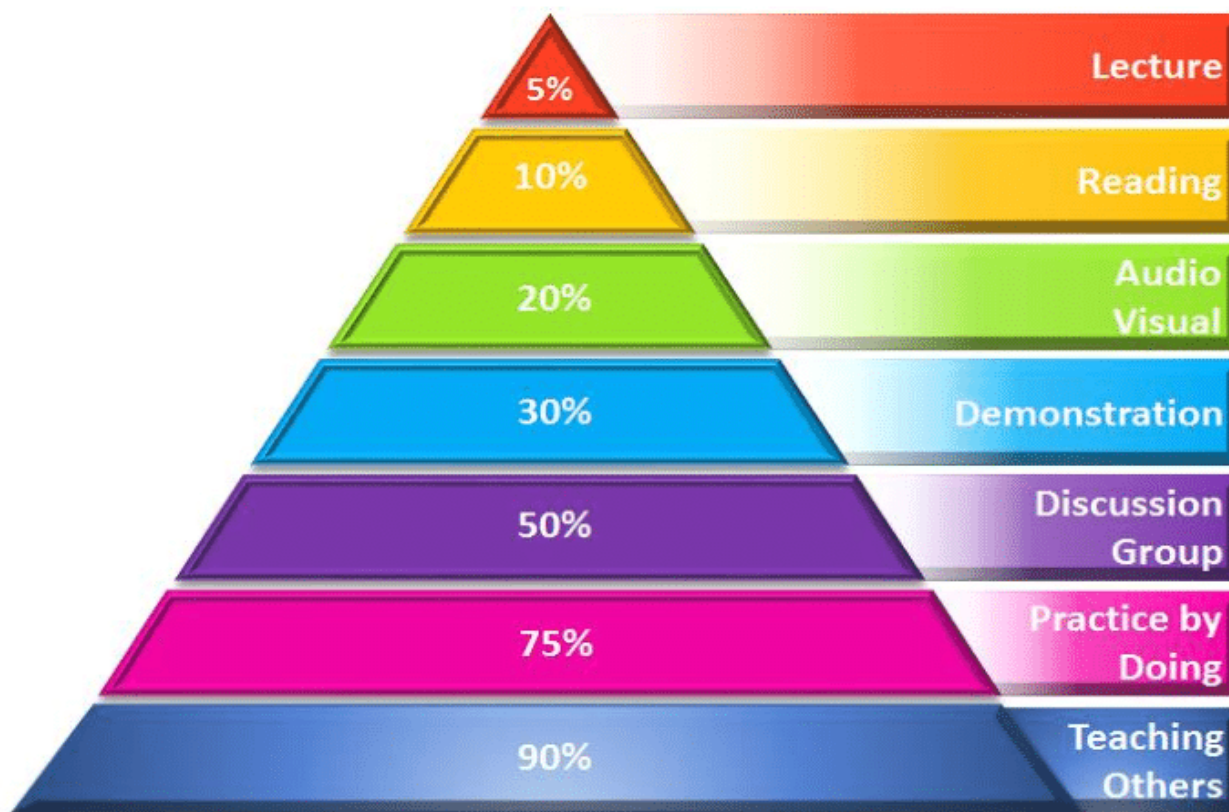
- Teaching methods and learning theories;
- Formal and non-formal teaching methods;
- Type of interactions involved in the teaching methods;
- Rank of teaching methods in the Learning pyramid.

Group communication in educational activities is of particular importance for the development of the child. It contributes to the creation of business, collective, interpersonal relations. In the process of communication, it is possible to supplement a common activity with individual interests and inclinations. Working in groups, students are responsible for the success of each, learn to help each other. The engagement of students in corporate communication during informatics lectures gives a high level of cognitive activity, which unquestionably improves the effectiveness of the learning process. [9]. The experience suggests that diverse groups, which include students with varying levels of topic knowledge, are more effective in the early phases of work, particularly in the 5th and 6th grades. Personal development in a social and creative sense, a sense of collectivism, responsibility and exactingness towards themselves and their group mates, mutual help, and a desire not to fail others occur more intensively in such groups. A group activity at the lessons of a informatics consists of the following elements:

1. Preliminary preparation of students for the implementation of group tasks, setting learning tasks, brief instructions;
2. Discussion and preparation of a plan for the implementation of a training task in a group, distribution of responsibilities;
3. Work on the implementation of educational tasks;
4. Monitoring the work and adjusting the work of the group and individual students;
5. Mutual verification and monitoring of the assignment in the group;
6. The message of pupils on a call of the teacher about the received results, the general discussion in a class under the leadership of the teacher, addition and correction, the additional information of the teacher and formation of final conclusions;
7. Individual assessment of the work of group and the class as a whole. The technology of learning in cooperation can largely be implemented in group work using computers and other technical means.

The training programs and computer models, virtual labs, and multimedia presentation creation are ideal for couples or groups of students working together. In this situation, the work participants can execute both jobs of the same type, as well as individual phases of the entire work, by mutually controlling or replacing one another. When working in pairs or groups, the same degree of technical abilities is not required, and the practical skills of the more "poor" students in this area increase as a result of collaboration. [10].

Figure 1



Step-by-step technology. This method allows students to think and memorize individually and in small groups on a topic that has been or should be covered, to recall the acquired knowledge, to generalize the collected ideas and to use them in writing, drawing, teaches to express in the form of a drawing. This method is written and presented to students individually or in groups. [11]. The purpose of the method: To teach students to think freely, independently and logically, to work as a team, to research, to summarize ideas and form a theoretical and practical

understanding, to influence the community with their own ideas, to approve it, as well as to teach students to apply the knowledge they have acquired in interpreting the basic concepts of the subject.

"I know. I found out. I want to know "method. The class is divided into five groups, the groups are named. The writing board is divided into three parts. The words "I know" are written at the top of the first paragraph, "I learned" at the top of the second paragraph, and "I want to know" at the top of the third paragraph. The teacher then asks the students what information they have on the topic and writes the comments in the "I know" section. This process will continue until the ideas are fully articulated by the groups. It is important to ensure that all members of the group are actively involved in this process. In the next step, students are given texts on the topic. This text contains the most basic concepts on the topic. After reviewing the text, students should think about what else they have learned about the topic.. Students share their findings based on their findings, which are recorded in a column called "Learned." In the final stage, the teacher asks the students what information they would like to learn about the new topic and encourages the students to think again. The groups will be asked for feedback in turn. Feedback from students is recorded in the "I want to know" column.

Brainstorming method. This method is widely used in solving problems on a particular topic, it allows participants to think broadly and comprehensively about the problem, as well as a certain ability to positively use their imagination and ideas. encourages the formation of skills. With this method of training, you will be able to find some original solutions to any problem. The Brainstorming method allows you to identify specific values within selected topics, while also selecting ideas that are alternative to them.

Personality-oriented learning is learning that is based on age-related features and individual personality characteristics. It is used the pedagogical technologies in the classroom taking into account the main type of activity characteristic of a certain age of schoolchildren. In grades 5-6 it is applied a complex of gaming and developmental technologies. For example, students are invited to play the role of one or another actor, for example, a formal performer of the algorithm. In grades 7-8, the optimal results are achieved in the process of using combinations of technologies in which ideas of collective and group learning are realized: collective and group independent learning, collective creative activity, level differentiation. In higher grades, the learning and the cognitive work becomes most important, therefore, technologies that implement the idea of individualizing learning and provide creative expression become effective: a pedagogical workshop, a project method, and problem-based learning. The project method allows schoolchildren to master the ability to build a chain: from an idea through goals, tasks, brainstorming to implementation and protection of their project. When completing a project, students use a plan that defines the criteria for the project. To increase the motivation of the educational process, the use of the project method is one of the most successful methods for teaching informatics.

The project method is a flexible model of organization of the educational process, focused on the self-realization of students by developing their intellectual and physical capabilities and creative abilities in the process of studying educational material. When studying informatics, students perform various projects, such as creating crossword puzzles, cartoons, educational and evolving games, etc. Lessons using interactive technologies, including multimedia presentations, allow students to visually absorb learning material. Multimedia presentations in informatics teaching provide: intensification of education, student activity, individualization of learning, development of independence, increased motivation and so on.

Thus, organizing the teaching of informatics based on innovative technologies ensures a higher quality of students' knowledge through clear planning of the lesson and increased motivation when studying the content of the subject. In the process of studying informatics, students form the ability to work with information to accomplish the assignment, master software at a higher level, learn to explore, put forward their ideas, analyze educational material. Work on the project encourages the student not only to study in depth any topic of the course, but also to master new programs and software products, using the latest information and communication technologies.

The use of various activities, such as: independent work with the choice of the level of complexity, the development of various tasks for classmates, writing test programs in various subjects allows you to increase the self-education level of students and interest in the subject. Modern pedagogical technologies in combination with modern information technologies can significantly improve the efficiency of the educational process; solve the educational institution's problems of educating a comprehensively developed, creatively free person.

Conclusions and results.

I would like to say that the use of interactive methods in the teaching of informatics helps to intensify the learning process of students and leads to an increase in the level of mastery of informatics. By using interactive methods in teaching students in groups, it is possible to improve their learning and independent thinking skills. In order to use these methods in informatics classes, it is necessary to know the specifics of teaching science. That is, once any informatics teacher has sufficient knowledge in his specialty, he learns the specifics of teaching the subject - the relevance of teaching the course, the reasons for teaching the subject, teaching methods and methods, teaching technology, how to organize lectures, seminars, practical classes in the classroom. It is a fact that many developed countries, which effectively use information and communication technologies in the organization of the educational process, are able to raise the educational process to a qualitatively new level. The information presented in this dissertation is the basis for thinking about the potential for effective use of information and communication technologies. Innovative technologies have great potential, especially in the implementation of organizational and methodological work, such as setting ambitious learning goals, encouraging students to learn independently, designing the learning process as a constantly evolving dynamic system. The study of the experience of the introduction of innovative technologies and a targeted approach to it, the humanization of the learning process, the transformation of the student from a weak object to an active subject, the focus on specific goals and the reproducibility of the learning process.

REFERENCES

1. N.D. Ugrinovic. Teaching the course "ICT Informatics" Grades 8-11: A Handbook. - Moscow: Binom. Laboratory of Knowledge, 2008.y 121-p
2. Ways to use advanced pedagogical and information technology in the educational process. Methodical manual.T. ; TDIU 2005.105 p.



3. I. Isokov, S. I. Kulmamatov. Innovative Technologies in Informatics Teaching. 2012-y 45-46. p
4. Tolipova J. Gafurov A. T. Non-traditional forms of educational process. Methodical manuals. T, 1994, 237-p
5. M. Mamarajabov. "Practice of designing and planning informatics lessons on the basis of interactive teaching methods. Associate Professor of Informatics and its teaching methods." TDPU. 78-p



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