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DEVELOPMENT OF STUDENTS' THINKING IN INFORMATICS LESSONS

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Annotation:this article presents the fact that the use of new technical means for teaching Informatics, including the achievements of Informatics in order to ensure interdisciplinary continuity in the current period of rapid penetration of computer and other information technologies, is one of the pressing issues and issues in solving them.
Keywords:techniques, computer, optimization, applications, modeling, algorithm, spreadsheet.

Nowadays, the use of a computer in computer science lessons is working well. Being able to make a good profit from a computer from the school period largely determines the success of the future professional training of current students. The computer becomes an electronic intermediary between the teacher and the student. So, new problems arise before the computer science teacher, who will have to master new techniques and develop new teaching methods based on the use of a modern information learning environment. In computer science classes, the following methods can be used to develop students ' thinking:

Development Of Algorithmic

Thinking Logical problems are solved (e.g. number sequences, problems with conditional operators). To construct algorithms and represent them by code.Formation of software thinking by drawing block-schemes.Practical Training expansion practical assignments in programming languages such as Scratch, Python, C++. Creating projects through robotics and working with Arduino. Giving basic insights into artificial intelligence and data analysis. Development of Independent Thinking Project-based teaching-giving students the task of creating an independent project. Solving real-life problems (for example, creating a website, building a database). Teaching code writing and debugging processes. Fostering logical thinking IQ tests and regular solving of logical puzzles.

Development of software thinking through mathematical and logical issues. Teaching to write short and effective programs through code golf or hacking exercises. Encourage teamwork to organize hackathons and programming competitions. Establishing work on projects with the team.Solving problems together through exchange of ideas and discussions. Through these methods, not only the knowledge of students in Informatics increases, but also their logical, analytical and creative thinking develops. What methods are becoming more effective in your lessons? The use of Information Technology in the lesson is a difficult and responsible issue, since it depends on the existing technology of conducting the lesson and its effective use of study time in the lesson is associated with computer equipment and software. As digital educational resources, digital photos, video clips, static and dynamic models, virtual reality and interactive modeling objects, voice recordings, symbolic objects and business graphics, text documents and other educational materials will be necessary for the organization of the educational process. In the process of teaching Informatics and Mathematics, digital educational resources can be used in various forms: presentations; ready-made educational and visual programs; project activities; research activities; extracurricular activities. Through the skillful use of a computer in the lesson,

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the teacher is able to present large volumes of information in an interesting and visual way. In classes using a computer, the mood of students rises, interest in science increases, concentration is concentrated. When teaching classes with digital content, the teacher can cover many additional materials. Students themselves participate and learn in the development of presentations in Informatics classes, and can contact their teacher to use it in mathematics classes. At the same time, they develop an aesthetic taste for their design. This approach is useful for communication between the teacher and the students, which is useful for developing skills in working as a couple, a group, among students, in particular, in a team. Thus, the use of digital educational resources in the lesson makes it possible to note the positive aspects:

- taking into account the individual characteristics of students;
- development of creative abilities of students;
- strengthening interest in science
- ensure high-quality assimilation of application material.

Modern digital technologies provide new tools for the development of universities and other educational institutions around the world. Digitization provides an opportunity to share accumulated experience and knowledge that allows people to learn more and make more decisions in their daily lives. Among the interesting digital innovations, it should be noted the rapid adaptation of online education, which is manifested in the form of the development of mixed education and the active development of MOOC (Massive on-line open course) online courses. The dynamics of the development of online education is evident, in particular, with the growth of existing online courses, the number of which has doubled every year. Now more than 4,200 courses are offered from more than 500 universities. The emergence of a growing online segment of educational services can radically change the landscape of this area: in addition to the number of courses offered and the doubling of the number of students every year, according to some estimates, the estimated cumulative income of the MOOC market has increased fivefold by 2020.

Additional areas of application of digital technologies in education are the development of digital libraries and digital university campuses, which are carried out by many universities in America, Europe and Russia. Thanks to digitization, today everyone can access information that was previously available only by specialists and scientists. The world of education and science has become global, now it is almost impossible to find a student, teacher or scientist who did not go to foreign universities within the framework of academic mobility programs. In the process of unprecedented changes, many universities are trying to find their place on the global map of Science and education, while maintaining their unique qualities and competitive advantages. The application of computer techniques to educational institutions provides a wide way to optimize the teaching process. In the next decade, the use of computers in the teaching of mathematics was carried out in several main directions. These include computer-aided knowledge assessment, development and development of teaching programs of various types, development of mathematical games related to knowledge, etc.The following methodological recommendation provided feedback. Another aspect of computer accessibility in mathematics teaching is the modeling of certain learning situations. The purpose of using modeled programs is to visualize when other methods of teaching are used, to ensure that materials that are difficult to bring to the eye are comprehensible. With the help of modeling, it is possible to provide information to students in graphic mode in the form of computer multimedia. Therefore, they tend to have a

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deep study of mathematics and to show a significant degree of independence in the learning process. To solve a mathematical problem that arises in many cases quickly and with a given accuracy, a professional mathematician is required to know a certain algorithmic language and programming at the same time as his profession. To this end, in the 90s of the 20th century, mathematical systems were created that had much more facilities for mathematicians. It is possible to make various numerical and analytical mathematical calculations using special systems, starting with simple arithmetic calculations, and making graphs in addition to solving differential equations with a private derivative.

Methodology for the use of modern Information Technology in the teaching of Mathematical Sciences. One of the pressing issues is the use of new technical tools for teaching mathematics, including the achievements of computer science in order to ensure interdisciplinary continuity in the current era of the rapid introduction of computer and other information technologies. The application of computer techniques to educational institutions provides a wide way to optimize the teaching process. In the next decade, the use of computers in the teaching of mathematics was carried out in several main directions. These include computer-aided knowledge assessment, development and development of teaching programs of various types, development of mathematical games related to knowledge, etc. Another aspect of computer accessibility in mathematics teaching is the modeling of certain learning situations. The purpose of using modeled programs is to ensure that when other methods of teaching are used, imagination makes the materials that are difficult to bring to the eye understandable. With the help of modeling, it is possible to present information to students in graphic mode in the form of computer multimedia. Nowadays, interest, attention to the widespread use of innovative technologies, pedagogical and Information Communication Technologies in the educational process is gaining momentum day by day. One of the main reasons for this is that in traditional education, students are taught to acquire only ready-made knowledge, while in elementary education, modern technologies teach them to search for the knowledge they are acquiring, independently study and analyze, and even draw conclusions themselves. The teacher creates conditions for the development, formation, knowledge and upbringing of the individual in this process. The professional potential and level of education of the teacher of mathematics, child psychology, knowledge of the modern methodology of primary education, and the teacher's continuous independent work on himself should be aware of all the innovations in the science, be able to share their experiences with experienced Methodist-teachers with advanced methodologies, demonstrate effective teaching methodologies.

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