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Integration Of Mathematics And Computer Sciences In The Educational Process.

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ABSTRACT

In the article under discussion, integration, which is one of the methods of learning for students, i.e. teaching in the state of mutual connection of related subjects, is envisaged.

Keywords:

Integration, modeling, interactive tutorials and games, programming language, simulation.

In order to improve the quality of education and radically change educational processes, today, in addition to the training of qualified pedagogues, work is being carried out that is convenient and easy for the learner to understand. Along with this, the facilitation of subjects and the creation of textbooks and programs adapted to modern technologies have become today's demand. The integration of mathematics and computer science in the educational process consists of guidelines and methods used to ensure the interconnection between their indicators and goals. This integration allows students to learn and use mathematics and computer science in the same subjects as children. The following areas will be of great importance in the integration process:

1. Coding and Math: Computer Science and Math are used to teach students the basic principles and concepts of coding. For example, variables, functions, algorithmic views, programming languages, and other mathematical concepts are widely used in coding.

2. Mathematical Algorithms and Programming: Mathematics and computer science students work together to learn the fundamentals of constructing, using, and programming mathematical algorithms. It is very helpful in learning algorithmic thinking and programming fundamentals.

3. Modeling programs and mathematical modeling: Computer science classes focus on mathematical modeling and creating modeling programs. They allow learning about mathematical organization and mathematical modeling.

4. Learning math skills with the help of technologies: It allows learning and mastering math skills with the help of interactive textbooks, programs, online information, and interactive games.

5. Development and projects: The integration of mathematics and computer science allows students to learn the basics of creating projects and programming, creating mathematical modeling programs and learning programming languages.

The integration of mathematics and computer science helps students learn and master mathematical skills in connection with the fundamentals of programming. This process increases students' ability to think more clearly, solve problems, and find innovative solutions[1].

The integration of mathematics and computer science in the educational process involves learning about the connections between these two disciplines and their use. This integration allows students to learn the basics of mathematics and learn to apply them in practice. Integration of mathematics and computer science is seen in the following areas:

1. Application of Mathematics to Informatics: Study of basic concepts and problems of mathematics in computer science classes, for example, understanding the basics of algorithms and programming languages.

2. Algorithmic thinking: The integration between mathematics and computer science is done according to the goals of algorithmic thinking and programming. It helps students solve mathematical problems, create programs, and solve practical problems using programs.

3. Mathematical modeling programs: Mathematical modeling programs play an important role in the integration of mathematics and computer science. These programs are used to identify, solve, and analyze mathematical problems and teach students the practical applications of mathematics.

4. Data analysis and statistics: Studying data analysis and statistics in computer science classes is important in integration with mathematics. This allows to use mathematical

methods in the analysis and interpretation of statistical data.

5. Higher - level programming: In Higher - level programming classes, the concepts and laws of mathematics are studied, for example, numbers and logical operations, algorithmic views, etc.

The integration of mathematics and computer science provides important opportunities for students to apply mathematical concepts, learn programming and analysis. It prepares them to work with information technologies, create quality programs and analyze data. As a result of integration, students master mathematics and informatics, help them solve innovative problems, and prepare them to use the latest technologies[2].

The integration of mathematics and computer science in the educational process shows the increasing interdependence of these two disciplines and their application together. This allows students to use their math skills in practice and in computer science classes. The following steps are important for successful integration:

1. Integrated classes: Combining math and computer science classes prepares students for use in math practices and computer science classes. For example, developing algorithmic thinking in math classes and learning programming allows you to apply theory learned in computer science classes.

2. Learning programming languages: To provide an opportunity for students to learn programming languages used to solve mathematical problems. Python, MATLAB, and other similar programming languages can be used to practice math exercises.



3. Use of modeling and simulation software: Modeling software and simulation technologies allow students to apply mathematical skills to practice. They help in creating mathematical models and visualizing the results.

4. Use of computer platforms: Computer platforms help students to practice mathematics. Platforms based on data analysis help in building mathematical models and learning mathematical skills.

5. Interactive tutorials and games: Interactive tutorials and games help students learn math and computer science skills in a fun and effective way. They play an important role in organizing mathematical activities interactively and motivating students.

6. Practical exercises and projects: Practical exercises and projects are important to develop and support mathematics and informatics skills in practice. They allow students to develop their skills in creating and programming mathematical models.

This integration process serves as a convenient and effective way for students to apply mathematics and computer science together and develop themselves in practice [3].

The integration of mathematics and informatics in the educational process is carried out in order to strengthen the relationship between the students of these two subjects and improve their mastery. In this process of integration, the adaptation of mathematics and computer science is observed, the explanation of interdependence, the use of mathematics in practice and problem science, and the use of computer science in mathematical programming and distance education. The following areas should be considered in this integration process:

1. Lesson plan and lesson preparation: In the integration of mathematics and informatics sciences, the lesson plan and lesson preparation show the issues of using informatics basics and tools, such as programming optional mathematical problems of students, creating algorithms, processing databases and statistical calculations.

2. Practical exercises and projects: It is very important to combine mathematics and

computer science in organizing practical exercises and projects for students. For example, in math classes, students can improve their mastery of a remote programming language.

3. Preparation of appropriate educational materials: In the preparation of educational materials, attention should be paid to the integration of mathematics and computer science. These materials should help in learning the basics of computer science and algorithms related to mathematical problems.

4. Interactive textbooks and online platforms: Interactive textbooks and online platforms are very effective for improving students' self-mastery in the integration of mathematics and computer science. These platforms enable joint learning and better understanding of mathematics and computer science lessons.

5. Teacher preparation: Teachers should be well prepared for successful implementation of the educational process in the integration of mathematics and computer science. They play a major role in co-teaching these two subjects and enhancing their mastery [4].

Summarizing the above, the integration of mathematics and informatics is very important in the joint learning of students' mathematical and informatics skills and their practical use. This integrative process ensures that students are able to think critically, solve problems, and apply informatics fundamentals to real - world problems.

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