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THE ROLE OF INTERACTIVE METHODS IN INCREASING THE EFFECTIVENESS OF MATHEMATICS LEARNING

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ABSTRACT

In this article, the role of interactive methods in improving the effectiveness of mathematical education, the use of effective methods and tools that are important in the formation of students' knowledge, skills and competencies in mathematics, and the use of methods aimed at the formation of thinking skills are discussed. A general analysis of theoretically based approaches is described.

Keywords: innovative thinking, efficiency, interactive method and tool, integrative approach.

It is known that the teacher served as a source of knowledge in the traditional education system. At the time, there were enough opportunities to train qualified personnel in this way as well. Why, at that time: firstly, the flow of daily information was not high; secondly, if we look at production, a specialist who has sufficiently mastered a profession can be professionally active in this field for 20-30 years without difficulty. Because the technology he was managing gave way to another new technology after 30-40 years.

At the end of the last century, at the beginning of the 21st century, the development of science and technology accelerated to such an extent that, as a result, yesterday's so-called new technology is replaced by technologies that are more perfect and more efficient than it today, which require their managers to acquire new knowledge. Therefore, at present, every teacher is required to make his students acquire theoretical and practical knowledge in fundamental subjects, as well as to continuously develop independent learning skills in them. Therefore, it is the demand of the time that both the teacher and the learner become subjects of the educational process.

The most optimal way to achieve this is the full application of modern educational methods directly and indirectly to the educational process, using interactive methods, which are considered modern methods of education.

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It is guaranteed that the above-mentioned educational goals can be achieved only through the joint activity of professors-teachers and students in the organization of the educational process in the training of pedagogical personnel with the help of new innovative technologies and interactive methods. Organization of the educational process in general education schools by pedagogical personnel trained on this basis based on innovative technologies and interactive methods:

•• during training, sufficient conditions were created for students to think independently, to strive for creativity and research;

•• ensures that learners consciously acquire the new knowledge they are learning and ultimately leads to the formation of a permanent motivation in them in relation to the subject being studied;

•• encourages students' aspirations to consciously choose a profession;

•• expands opportunities for differentiated, individual education. After all, the student who has reached the level of conscious choice of profession has a high tendency to further increase his knowledge;

•• achievement of the above leads to the fading of the desire to study for secondary special, vocational education or higher education system on a risky basis or only for a diploma, as a result of which the possibilities of training of qualified personnel are expanded.

In accordance with the above, solving the problems of the educational system will increase the possibilities of training competitive specialists who can take a suitable position in the market economy and compete in the labor market in the future. Let's look at the possibility of using the "Zig-zag" method below.

The "Zigzag" method occupies an important place in the teaching of mathematics, and the use of this method expands the possibilities of processing and assimilation of a large part of the new theoretical material studied by students in a short time. As a result, learners have:

• develop communication skills;

• the skills of analyzing the solved problem into parts are formed and developed;

• in the process of solving the problem, making a whole (synthesis), that is, defining the initial thoughts or ideas, determining the interrelationships between them, and making it a whole on this basis, skills and abilities are formed and developed;

• competences and skills of presenting the learned knowledge are formed and developed, etc.

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It is advisable to use the "Zig-zag" method in the following order:

1. Select the educational material and divide each of them into logically completed parts.

2. Form small groups based on the number of logically completed ideas (the number of group members should be the same as the number of parts (For example, if the educational material consists of 4 logically complete parts, the number of members in small groups should be 4)). Assign each member in these groups (their starting group) a number to study parts of the material and distribute the study material being studied.

3. Form "expert" groups. In this case, it is desirable to have the same number of participants in one group, and the task of the "expert" groups should be to study the material thoroughly and prepare to use the best presentation for their beginner groups.

4. Participants return to their original groups and exchange information. In this case, the task of each expert is to ensure that each member of the group for which he is responsible has a good mastery of the part of the studied material. As a result, each member of the group will have the opportunity to fully familiarize himself with the studied material.

As a result, students learn comprehensive theoretical materials that fully cover the essence of the subject.

Check forms:

- Expert presentation;
- Written works;
- Answers and questions;
- Test assignments.

For example: The possibilities of using the "Zig-zag" method are high when studying the following topics:

1. "Polygons" topic.

2. Topic "Trigonometric functions". The topic "Properties of operations on natural numbers" and h.

Tips for the teacher:

Note to teacher: Be prepared for noise in group learning activities. Allow enough time to work on your novice and expert teams. Be available to provide support and advice to groups as needed.

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In general, the appropriate and effective use of interactive methods in the teaching of mathematics in the conditions of modernization plays an important role in improving the effectiveness of mathematical education.

Interactive methods play a crucial role in improving the effectiveness of mathematics teaching by engaging students actively in the learning process and promoting a deeper understanding of mathematical concepts. Here are some key aspects of how interactive methods contribute to enhancing mathematics education:

Active Engagement:

Interactive methods encourage active participation from students rather than passive listening. Activities such as group discussions, hands-on experiments, and problem-solving sessions keep students engaged and focused on the subject matter.

Conceptual Understanding:

Interactive methods help students build a strong conceptual understanding of mathematical principles. Instead of rote memorization, students are encouraged to explore and discover mathematical concepts through activities that promote critical thinking and problem-solving skills.

Real-world Application:

Interactive methods often involve real-world applications of mathematical concepts. This helps students see the relevance of what they are learning and understand how mathematics is applied in various fields, making the subject more meaningful and interesting.

Individualized Learning:

Interactive methods allow for a more individualized approach to learning. Students can progress at their own pace, and teachers can tailor activities to address the specific needs and learning styles of each student, providing a more personalized learning experience.

Technology Integration:

Incorporating interactive technologies, such as educational software, simulations, and online platforms, can enhance the learning experience. Technology allows for dynamic visualizations, virtual manipulatives, and interactive exercises that make abstract mathematical concepts more accessible and concrete.

Collaborative Learning:

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Interactive methods often involve collaborative learning, where students work together on problem-solving tasks or projects. This promotes teamwork, communication skills, and the ability to explain mathematical concepts to peers, reinforcing their own understanding.

Immediate Feedback:

Interactive methods provide opportunities for immediate feedback. Whether through class discussions, quizzes, or interactive software, students receive prompt feedback on their understanding, allowing them to correct misconceptions and learn from their mistakes in real-time.

Increased Motivation:

Engaging and interactive lessons can enhance student motivation. When students find mathematics enjoyable and see its practical applications, they are more likely to stay motivated, persevere through challenges, and develop a positive attitude toward the subject.

Long-term Retention:

Interactive methods promote deeper learning, leading to better retention of mathematical concepts. When students actively participate in the learning process, make connections between different topics, and apply their knowledge in various contexts, they are more likely to remember and apply what they have learned in the long term.

In summary, interactive methods create a dynamic and participatory learning environment, fostering a positive attitude toward mathematics and helping students develop the critical skills necessary for success in the subject.

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