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## Interactive Method of Teaching Mathematics

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**Abstract:** The article studies the process of using interactive teaching methods in mathematics lessons. It is concluded that the mathematics teacher becomes an active participant in the educational process. Interactive methods make it possible to conduct classes with greater immediacy, emotional uplift due to the absence of complex electronic and mechanistic technologies and tools. Interactive learning has a positive impact both on improving the quality of knowledge and on increasing the efficiency of students, their interest in the subject. Students learn to apply their knowledge in new situations, learn to use it in practice and independently extract it. They learn to communicate, make friends, be merciful, attentive to each other; this is also the result of educational cooperation.

**Keywords:** interactive methods, interactive board, mathematics lessons, knowledge, new educational technologies, tools, teaching methods.

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The changes taking place in our society have created real prerequisites for the renewal of the entire education system, which is reflected in the development and introduction into the practice of the school of elements of new content, new educational technologies. The solution of this problem is facilitated by interactive methods, which are not something new, but are not widely used in the real educational process, and sometimes even fall out of the teacher's arsenal.

Presentation of the main material of the article. For a more complete understanding of the essence of interactive teaching methods, it is necessary to understand the term "Interactivity". Interactivity (from the English interaction - interaction) is one of the key categories of sociological analysis, describing the variety of social interactions at various levels: interpersonal, group, institutional.

Interactivity is the ability to interact or be in dialogue with someone or something. T.I. Dolgoi, A. A. Zhurina, E. O. Ivanova, T. V. Ilyasova, V. V. Krasilnikova, A.V. Aspen, N.A. Savchenko, V. S. Toyskina. The study of the relationship between these concepts led to the conclusion that interactivity is a fairly broad concept in content, reflecting the nature and degree of interactive interaction between subjects of the information and educational environment.

The emergence of interactive teaching methods provides such new forms of learning activities as registration, collection, accumulation, storage, processing of information about the studied objects, phenomena, processes, transfer of sufficiently large amounts of information presented in various forms, control of the display of models of various objects on the screen, the phenomenon, and processes.

The presented properties and functions of the interactive learning tool show that it has a number of advantages that can make the learning process more effective, ensure the

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qualitative achievement of the set didactic goals, and make it possible to organize training in a modern information and educational environment in accordance with the requirements of the State Educational Standard of the Republic of Uzbekistan.

The idea of interactive learning acquires a completely new quality with the use of computer technology. Here, interactivity is achieved through a special organization of educational computer programs, as well as the use of such technical teaching aids as an interactive whiteboard, an interactive tablet and an interactive testing system. One of these new interactive technologies in teaching mathematics is currently the use of an interactive whiteboard, which makes it possible to use various learning styles: visual, auditory, kinesthetic, providing live interaction between the teacher and the student and the constant exchange of information between them. Working with an interactive whiteboard, the teacher is always in the center of attention, faces the students and maintains constant contact with the students in the class. The teacher, speaking out loud, commenting on his actions, gradually involves students in the discussion and encourages them to write down their ideas on the board, thereby allowing them to meaningfully understand the material being studied. The information on the interactive whiteboard becomes the center of attention for the entire class. Thanks to visibility and interactivity, all students in the class are involved in active work, perception is sharpened, concentration of attention is increased, understanding and memorization of the material is improved, and the speech skills acquired in the classroom are consolidated and improved [2].

Mathematics is distinguished by the abstractness of objects, and research activities with mathematical content are predominantly of a mental nature. With the help of tasks on an interactive whiteboard, you can make the processes being studied, difficult to understand, visible, visual. When teaching mathematics, tasks performed on an interactive whiteboard are most suitable for developing the research ability to establish the impact of changing conditions on a change in an object, they are good because they allow the student to see how the data, they enter affects the situation, what changes they lead to. The main difference between such models is that they can be dynamic. Using them in conjunction with other models allows students to observe the process of change and capture its outcome. The performance of tasks is aimed not so much at the application of existing knowledge, but at the discovery of new ones, at the generalization of knowledge.

Providing interactivity is one of the most significant advantages of multimedia tools, that is, the ability to "present" both texts and images (including moving ones), as well as play sound and music. An important difference between multimedia technology and any other technology is the integration in one software product of various types of information, both traditional - text, tables, illustrations, and actively developing: speech, music, animation. A very important aspect here is the parallel transmission of audio and visual information. This technology implements a new level of interactive communication between a person and a computer, where the user can move from one object to another, organize a question-and-answer mode.

In practice, three types of verbal interactive interaction of students are used: 1) cooperation of students in developing a common goal; 2) combining information known to different participants; 3) transfer of information from one participant to another (tasks such as "following instructions" are possible). In experiential teaching of interactive interaction in mathematics lessons, we used tasks that involve "information inequality". These tasks can take many forms: find differences with questions, fill in a lack of information, one has information that the other does not have - fill in, trainees have different beliefs - a consensus needs to be developed, there are different evidences that it is important to bring together and

compare.

Here is a list of methods that meet the goals and objectives of interactive teaching of mathematics: creative tasks, role-playing and educational games, competitions, performances, warm-ups, POPS - formula, project method, computer presentations, debates, discussion, aquarium, problem solving, brain assault, trainings, cluster [3].

Case-study (case method, method of specific situations) is a teaching technique that uses a description of real situations. Students must analyze the situation, understand the essence of the problems, propose possible solutions and choose the best of them. Cases are based on real factual material, or are close to the real situation.

"PJES - formula" (position - justification - example - consequence). It helps students to clarify their thoughts and to formulate and present their opinion in a clear and concise manner. The PJES formula teaches you to briefly express your thoughts and not deviate from the topic [1].

The Critical Thinking strategy also considers some interactive methods, such as cluster, cinquain, comparison chart, puzzle, etc. Depending on the content of the training material, the level of training of the group, various teaching methods are used.

Cluster - an association of several homogeneous elements, which can be considered as an independent unit with certain properties.

In the methodology, a cluster is a map of concepts that allows students to freely reflect on a topic, makes it possible to assess their knowledge and ideas about the object being studied, and helps develop memory.

A cluster is a way of graphic organization of the material, which makes it possible to visualize those thought processes that occur when immersed in a particular topic.

What are the steps in creating a cluster?

Stage 1 - in the middle of a blank sheet, a keyword or phrase is written, which is the "heart" of the idea, topic.

Stage 2 - students write down everything that they remember about this topic. As a result, words or phrases are "scattered" around, expressing ideas, facts, images suitable for this topic. Everything that the students name is recorded, nothing is eliminated

Stage 3 - systematization is carried out. After reading the textbook, the teacher's explanation, students begin to analyze and systematize the studied material. Chaotic records of association words are combined into groups, depending on which side of the content this or that recorded concept or fact reflects. Unnecessary, erroneous is crossed out.

Stage 4 - as you write, the words that appear are connected by straight lines with the key concept. Each of the "satellites" in turn also have "satellites", new logical connections are established. The result is a structure that graphically reflects our thoughts, defines the information field of this topic.

Visually look at the cluster on the topic "Quadratic Equations" – figure.

You can also create a cluster when reading the educational material on your own. This allows you to comprehend what you read, and the teacher has the opportunity to determine the correctness of the establishment of cause-and-effect relationships using the compiled cluster and, if necessary, provide individual assistance to students.

It is also possible to use the cluster at the control stage, by inviting students to fill in the

connection diagrams already prepared by the teacher for the controlled material. Filling in such a cluster requires the student to clearly state the facts and the main provisions of the studied material.

Cinquain (from French cinquains, English cinquain) is a poem consisting of five lines.

- The first line is one keyword (concept) that defines the content of the senquain.
- The second line - two adjectives that characterize this concept.
- The third line - three verbs showing the action of the concept.
- The fourth line is a short sentence in which the author expresses his attitude.
- The fifth line is one word, usually a noun, through which a person expresses his feelings, associations associated with this concept. Compiling a syncwine requires the student to briefly summarize the educational material, information, which allows reflection on any occasion, and possibly in the classroom on any subject. Approximately made up a syncwine on the topic "Function":

1. Function.
2. Rational, even, (odd).
3. Increases (decreases), has a domain of definition, has a derivative.
4. A rational function is continuous at every point of the domain of definition.
5. Graph.

It is possible that syncwines in mathematics are not always distinguished by grace and full compliance with the requirements of the French pentalene, but their creation maintains a high level of cognitive interest and contributes to the student's mental activity.

A comparative diagram is a universal method of activating students in educational activities, allowing them to learn how to find common and different things in the objects under study, to learn how to find parameters that can be used to conduct a detailed analysis of two or three concepts (models) under consideration.

Puzzle (a riddle) is a well-known children's game of collecting pictures from uneven parts.

The execution of tasks according to this method is based on the game. In educational practice, the studied (or controlled) material is written in parts on separate cards, but each card should contain information to search for the next one. The student must collect all the cards according to the material indicated by the teacher.

In mathematics classes, it can be used when working with formulas, when solving equations and problems. The "puzzle" method contributes to the formation of attention, concentration, the ability to collect and analyze the information received.

Educational "puzzle" can be made with students at any stage of learning the material, in any age group. It can be individual or collective work [2].

The use of multimedia in the field of education today is already quite successful and has the following areas: video encyclopedias; interactive guides; simulators; electronic lecture halls; personal intellectual guides in various scientific disciplines; student self-testing systems; simulation of the situation up to the level of complete immersion, etc.

Multimedia can be used in the context of a wide variety of learning styles and be perceived by a wide variety of people: some educators prefer to learn through reading, others through listening, still others through watching videos, and so on. In addition, the use of multimedia

allows teachers to work on materials in different ways, for example, the teacher decides how to study the materials, how to use the interactive features of the application, and how to collaborate with his fellow students.

Findings. Thus, the mathematics teacher becomes an active participant in the educational process. Interactive methods make it possible to conduct classes with greater immediacy, emotional uplift due to the absence of complex electronic and mechanistic technologies and tools. Interactive learning has a positive impact both on improving the quality of knowledge and on increasing the efficiency of students, their interest in the subject. The students are getting older every year. They are able to work not at the reproductive level, but to create. Thanks to the technology of cooperation, they become more independent, more active, more sociable and able to work at a higher level. Students learn to apply their knowledge in new situations, learn to use it in practice and independently extract it. They learn to communicate, be friends, be merciful, attentive to each other - this is also the result of educational cooperation. Interactive learning helps the child not only learn, but also live. Thus, interactive learning is undoubtedly an interesting, creative, and promising area of pedagogy.

So, the interactive method is the interaction of the student and the teacher, their joint work, creative activities and the process of interaction. The beginning of the history of the development and use of interactive teaching methods falls on the 20s of the XX century, and in Uzbekistan since 2007. Since that moment, many technologies of the interactive method have been used, we have given some of them that are currently widely used, but at the same time, to say this is the limit of the development of the interactive method is not objective, as technology is always updated and therefore, it changes every time teaching methods. From this we can conclude that the teacher, as a universal owner of the direction, must have all the latest methods.

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