



## APPLICATION OF INTERACTIVE TEACHING METHODS IN MATHEMATICS LESSONS

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### Annotation

The article explores the process of applying interactive teaching methods in mathematics lessons. It is concluded that a math teacher becomes an active participant in the educational process. Interactive methods allow you to conduct classes with greater spontaneity, emotional recovery due to the absence of complex electronic and mechanistic technologies and tools. Interactive learning has a positive effect both on improving the quality of knowledge and on improving students' performance and interest in the subject. Students learn to apply their knowledge in new situations, learn to use them in practice and to extract them. 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, math lesson, math teacher.

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 of elements of new content and new educational technologies into the practice of the school. Interactive methods contribute to solving this problem, 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.

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 diversity of social interactions at various levels: interpersonal, group, institutional.

Interactivity is the ability to interact or be in a dialogue mode with someone or something. The works of T.I. Dolgaya, A.A. Zhurin, E.O. Ivanova, T.V. Ilyasov, V.V. Krasilnikov, A.V. Osin, N.A. Savchenko, V.S. Toiskin are devoted to the study of the concepts of "interactivity", "interactive learning", "interactive learning tools". The study of the correlation of these concepts allowed us to conclude that interactivity is a fairly broad concept in terms of content, reflecting the nature and degree of interactive interaction of subjects of the information and educational environment.

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

The term "interactive interaction" is widely used in both domestic and foreign pedagogical literature. In the narrow sense of the word (in relation to the user's work with software in general), interactive



interaction is a user's dialogue with the program, i.e. the exchange of text commands (requests) and responses (invitations). With more advanced means of conducting a dialogue (for example, if it is possible to ask questions in any form, using a "keyword", in a form with a limited set of characters), it is possible to choose options for the content of the educational material and the mode of operation. The more opportunities there are to manage the program, the more actively the user participates in the dialogue, the higher the interactivity.

According to A.V. Rozhko, an interactive learning method is a method that ensures the emergence of a dialogue, that is, an active exchange of messages between the user and the information system in real time [4]. The main tasks of such interaction are: improvement of the information and educational learning environment; organization of the information exchange process; development of the teacher's facilitation activity; identification of individual points of view of the trainees.

Interactive technologies apply techniques and methods that make the lesson unusual, more intense and interesting, master the educational material qualitatively and include the motivational sphere of the student. Interactive work can be used both in lessons of mastering the material and in lessons on the application of knowledge, in special lessons, as well as instead of a survey or generalization. Forms of interactive work can be group, pair, etc. Since in a small group the student is in more favorable conditions than in front-line work, work in pairs is often used, which consists in the fact that all children have the opportunity to speak out, exchange ideas with their partner, and only then announce them to the whole class. Examples of such work are discussion of the solution of a text problem, brainstorming on the study of new material, analysis of mathematical dictation, etc. The teacher is required to be able to quickly distribute students into pairs, give a task and evaluate the results of the pair's work.

The next method of teaching mathematics, which is used to develop the ability to communicate in a group, the ability to convince and lead a discussion, is the "two – four – all together" method. It consists in the fact that students are given a hypothetical situation and 1-2 minutes to think about an individual answer or solution. The students then pair up and discuss their ideas with each other. Then there is a statement by everyone in the pair and a general discussion, it is mandatory that the couples must come to a consensus on the answer. Then the teacher combines the pairs into fours at his discretion and a further search for an answer takes place, only now the whole four should come to a common decision. Thus, it is possible to smoothly move to a collective discussion of the issue and all children are actively working, discussing and at the same time actively assimilating the material.

In this regard, it can be argued that interactive teaching methods are a multifunctional tool of the educational process. Their use in combination with various computer programs expands the didactic possibilities of using these tools in the educational process [1].

The research of B.S. Gershunsky, E.S. Polat, L.G. Sandakova, S.A. Hristochevsky, E.N. Yastrebtseva, S.V.Kuzmin in the field of information and communication technologies in education shows that with interactive educational interaction, the management style of the teacher and the teacher changes. The teacher acts as a facilitator, who not only performs the role of a leader and leader, but also becomes a participant in group dynamics. Facilitation includes the direction of the process of information



exchange, mutual enrichment of experience, as well as optimal perception and assimilation of educational material.

In interactive educational interaction, techniques and methods are widely used, which largely repeat the methods used in traditional pedagogical practice. According to T.N. Noskova [3], ISO allows them to be strengthened, as feedback intensifies, the spatial-temporal boundaries of interactions expand. The main didactic properties of interactive teaching methods are presented in the form of a table.

**Table №1**

<b>Didactic properties</b>	<b>Characteristic</b>
Multimedia	the ability to present information in text,
Mobility	graphic and video format
Instrumentality	availability of universal combined Internet access necessary for the organization of the educational process,
Interactivity	regardless of geographical location and equipment used to connect to the Internet
Adaptability	availability of necessary services (tools) to create an information educational environment and search, storage,
Informative value	processing of information
Integrativity	availability of necessary services (tools) for organization
Motivation	of interaction between the subjects of the educational process

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 qualitative achievement of the set didactic goals, and makes it possible to organize training in a modern information and educational environment in accordance with the requirements.

The idea of interactive learning acquires a completely new quality using computer technology. Here, interactivity is achieved through the special organization of training computer programs, as well as the use of such technical training tools as an interactive whiteboard, an interactive tablet and an interactive testing system. One of such 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 teacher and student and a constant exchange of information between them. Working with an interactive whiteboard, the teacher is always in the center of attention, facing the students and maintaining constant contact with the students of the class.



The teacher, reasoning out loud, commenting on his actions, gradually engages students in a discussion and encourages them to write down their ideas on the blackboard, thereby allowing them to understand the material being studied meaningfully. The information on the interactive whiteboard becomes the focus of attention for the whole class. Thanks to the clarity and interactivity, all students in the classroom are involved in active work, perception sharpens, concentration increases, understanding and memorization of the material improves, speech skills acquired in the classroom are consolidated and improved.

Mathematics is characterized by the abstraction of objects, and research activity with mathematical content is mainly of a mental nature. With the help of tasks on an interactive whiteboard, it is possible to make the studied processes, difficult to understand, visible and visual. When teaching mathematics, tasks performed on an interactive whiteboard are most suitable for developing the research ability to determine the effect of changing conditions on changing 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. Their use together with other models allows students to observe the process of change and record its result. Completing tasks is aimed not so much at applying existing knowledge as at discovering new ones, at generalizing knowledge.

The provision of 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 to reproduce 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.

The use of multimedia in the field of education is already quite successful today and has the following directions: video encyclopedias; interactive guides; simulators; electronic lectures; personal intellectual guides in various scientific disciplines; systems for self-testing the student's knowledge; modeling the situation to the level of full immersion, etc.

Multimedia can be used in the context of a variety of learning styles and perceived by a variety of people: some teachers prefer to learn by reading, others by listening, others by watching videos, etc. In addition, the use of multimedia allows students to work on materials in different ways, for example, the teacher himself decides how to study materials, how to use the interactive features of the application, and how to implement collaboration with his fellow students.

Thus, a math teacher becomes an active participant in the educational process.

Interactive methods make it possible to conduct classes with greater spontaneity, 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 improving the performance of students, their interest in the subject. The students are getting older from year to year. They are no longer able to work at the reproductive level, but to create. Thanks to the technology of cooperation,



they become more independent, more active, more sociable and are 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, make friends, be merciful, attentive to each other – this is also the result of educational cooperation. Interactive learning helps a child not only to learn, but also to live. Thus, interactive learning is undoubtedly an interesting, creative, promising direction of pedagogy.

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# Academica Globe: Inderscience Research

**ISSN:** 2776-1010

Volume 4, Issue 1, Jan., 2023