# Cognition Through Interactive Teaching Methods in Primary Classes Development of Universal Teaching Activity

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Accepted: 05.21.2025 Published: 05.26.2025 https://doi.org/10.69760/portuni.0104003

**Abstract:** Modern society is developing dynamically. In the modern world, changes are constantly taking place in the social, economic and political spheres of life; norms and rules, value systems and moral rules are changing. In the article, having analyzed the trends of modern mathematical education, the features of their implementation in the learning process, we came to the conclusion that the use of modern educational technologies is especially important at the modern stage of development. The use of interactive technologies in teaching mathematics helps to maintain this trend. The use of interactive technologies allows you to diversify lessons, make them interesting and entertaining, which helps to maintain students' interest in education and cognition. The greater the interest of students in the subject, the higher the quality of their knowledge. Interactive technologies are also aimed at building interpersonal relationships in the classroom through educational interaction, contributing to the formation of universal learning activity of students, which is an important component of modern education. Lessons in which interactive technologies are used were selected due to the high interest of students in the learning process, which affected the level of mathematical preparation. Interactive teaching aids, as a mandatory component of the educational process, allow you to fully implement the requirements of the State Educational Standard of Primary General Education. Methodological recommendations help to choose the exact type of lesson in accordance with the sanitary and epidemiological requirements for the conditions and organization of teaching in general education institutions, and also allow the teacher, even at the stage of preparation for it, to effectively reflect the main points of the work program corresponding to the topic of the lesson, explaining its content in as much detail as possible. It allows us to assess the rationality of using interactive teaching aids at each stage of the lesson. As a result of our research, the goal was achieved and the tasks set were solved.

KEYWORDS; Methodological recommendations, Interactive, In teaching mathematics, Educational process

## INTRODUCTION

The reforms carried out in the education system are aimed at making the student a central figure in the educational process, so that the cognitive activity of primary school students is carried out by researchers-teachers, developers of applied programs and programs, administrative staff, that is, in the school, first of all, as in traditional education, conditions for the cognitive process should be created. Secondly, the efforts of the school should be aimed at the implementation of the social order - to

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prepare primary school graduates who can independently acquire the necessary knowledge, as well as skillfully apply it in practice to solve emerging problems, who are able to competently work with information, who are sociable, able to communicate in all kinds of social groups, able to work together in various areas and situations. New pedagogical and information technologies are called upon to help truly achieve the goals of education. It is impossible to separate one from the other, because only the widespread application of new pedagogical science technologies will allow us to change the paradigm of education, and only "Hypertechnologies" will allow us to most effectively implement the opportunities inherent in new pedagogical technologies. The role and importance of information as the most important factor determining the nature and direction of development of the pedagogical process is increasing. Traditional information methods - oral and written speech, telephone and radio communication - are giving way to interactive learning tools. [1, p. 4]. As can be seen, the period of application of information technologies and accumulation of experience has come to an end, and it is time to understand the didactic functions of electronic teaching aids and their application options in the classroom. How is the structure of a modern lesson changing and how are the methods of interaction between a teacher and a student changing? How not to get lost in the sea of electronic didactic teaching aids and how to choose the most effective ways to use them? The time has come to set and solve didactic problems in the educational process, use an interactive board, software for an interactive board, and special software for each subject [5, p. 12]. Using an interactive whiteboard can increase the motivation and activity of students in the classroom. Something new enters our lives, we cannot do without noticing it or not being aware of it, which means that we must learn to use the numerous opportunities that the information space, which is expanding to incredible sizes, gives us [2, p. 23]. The goal is to consider the possibilities of using interactive teaching aids in learning mathematics in primary grades.

The object of the study is the process of teaching mathematics.

The subject of the study is interactive teaching aids in mathematics lessons in primary grades (interactive whiteboard, interactive notebook, video clip, electronic presentations, QR code, digital camera, smartphone). To achieve the goal, the following tasks were set:

1. To study the theoretical foundations of the use of interactive teaching aids.

2. To organize a fact-finding research experiment in order to determine the types of interactive teaching aids used by the teacher in mathematics lessons.

3. Based on the results of the confirmatory experiment, develop methodological recommendations on the use of interactive teaching aids in mathematics lessons.

### **Research methods:**

1. Theoretical analysis of the literature on the research topic.

2. Method of collecting empirical data: observation.

3. Methods of interpretation and description of data: qualitative and quantitative analysis of the results.

Experimental base of the study: "Secondary comprehensive school No. 8" of the city of Nakhchivan. The first stage (September-November 2022) is the analysis of the literature on the research topic, the definition of the goal, object, topic and the setting of tasks. Preparation of a confirmatory experiment.

The second stage (December-February 2023) is the organization and implementation of a fact-finding experiment. Analysis and interpretation of experimental results. Development of methodological recommendations on the use of interactive teaching aids in mathematics lessons in primary grades.

The third stage (February - May 2023) Preparation of didactic material using didactic materials. Preparation of the text of the final specialty work. Currently, the development of education in Azerbaijan implies the orientation of the educational process to the education of students, the development of their individual abilities and interests. In connection with changes in educational standards, the main focus in training is on the formation of meta-subject and individual results simultaneously with subject results. At the same time, a systematic approach to activity should be used in training, aimed at the development of the student's personality through the implementation of various types of activities. The most effective achievement of the indicated educational effects is the organization of constant interaction between participants in the learning process. This is possible when conducting lessons using interactive technologies, including mathematics. With this approach, school education becomes closer to real life. Children are more inclined to participate in such activities, since they must demonstrate not only their knowledge, but also their ingenuity, creativity and personal abilities. When analyzing various scientific sources, the degree of study of problems associated with the use of interactive technologies in the process of teaching mathematics was revealed. Something new enters our lives, we cannot do it without noticing or being aware of it, which means that we must learn to use the numerous opportunities that the information space, which is expanding to incredible dimensions, gives us [8, p. 23]. The aim is to consider the possibilities of using interactive teaching aids in learning mathematics in primary grades. The object of the study is the process of teaching mathematics. The subject of the study is interactive teaching aids in mathematics lessons in primary grades (interactive board, interactive notebook,

## METHOD, RESEARCH AND RESULTS

An experimental verification study was organized in educational institution No. 8 of Nakhchivan city. The purpose of the confirmatory experiment is to determine the types of interactive teaching aids used by teachers in mathematics lessons in primary grades.

Tasks:

- 1. Visit mathematics lessons with a primary school teacher in December 2022;
- 2. Determine the types of interactive teaching aids used by the teacher in mathematics lessons;
- 2. Analyze and interpret the results and the data obtained;

3. Based on the results obtained, prepare a lesson plan in mathematics together with the teacher: According to the calendar-thematic planning of lesson topics for December 2022:

- 1. Relative position of figures in space (3 hours);
- 2. Multiplication and division by 2. Half a number (3 hours);
- 3. Multiplication and division by 3. A third of a number (3 hours);
- 4. Multiplication/division by 4. A quarter of a number (3 hours);
- 5. Multiplication by 5 (1 hour);

6. Multiplication by 5. Problem solving (3 hours).

During my teaching experience, I attended 16 mathematics lessons to determine their interactivity. Analyzing the data presented in Table 1 and Figure 1, we conclude that the teacher most often uses the following types of interaction in mathematics lessons: presentation – 87.5%; less often interactive whiteboard – 43.75%; very rarely video lessons – 25%.

N₂	Lesson dates	Lesson topic	Interactive learning tools		
			Introduction	Video lesson	Interactive whiteboard
1	2.12.22	Relative arrangement of figures on a plane	+	+	
2	5.12.22	. Relative arrangement of figures on a plane	+		+
3	6.12.22	. Relative arrangement of figures on a plane	+		
4	7.12.22	Multiplication and division by 2. Half of a number	+		
5	9.12.22	Multiplication and division by 2. Half of a number		+	
6	12.12.22	. Multiplication and division by 2. Half of a number	+		+
7	13.12.22	Multiplication and division by 3. One-third of a number.		+	
8	14.12.22	Multiplication and division by 3. One-third of a number.	+		+

Table 1 – Types of interaction

End of Table 1 – Interactive Types

$\mathcal{N}_{\mathcal{D}}$	Lesson dates	Lesson topic	Interactive learning tools		
			Introduction	Video lessons	Interactive whiteboard
9	16.12.22	Multiplication and division by 3. One-third of a number.	+		+
10	19.12.22	A quarter of a number multiplication 4 division	+		
11	20.12.22	A quarter of a number multiplication 4 division	+		
12	21.12.22	A quarter of a number multiplication 4 division	+	+	+
13	23.12.22	5 multiplication	+		
14	26.12.22	5th multiplication Problem solving	+		
15	27.12.22	5th multiplication Problem solving	+		+
16	27.12.22	5th multiplication Problem solving	+		+
PLUG			87,5%	25%	43,75%

Conventional designations:

The "+" sign is the interactive used in the lesson. Analyzing the data presented in Table and Figure 2, we conclude that what types of interactive are used in the lesson: presentation at stage I – 12.5%, stage II – 25%, stage III – 18.75% and stage IV – 31.25%; video lesson at stage IV – 18.75% and stage VI – 6.25%; interactive board at grade V - 12.5% and grade VI - 3.13%. In this reflection, the teacher does not use interactive teaching aids.



Figure 1 – Types of interactive learning tools

Nº Darsin	Stages of the lesson							
201011	Ι	II	III	IV	V	VI	VII	
1			t	v				
2				t		L		
3				t				
4				t				
5						V		
6		t			t			
7				V				
8		t				L		
9			t			L		
10				t				
11				t				
12			t	v	L			
13	t							
14		t						
15	t					L		
16		t				L		
PLUG	t- 12,5%	t-25%	t 18,75%	v- 18,75% t- 31,25%	L -12,5%	v- 6, 25% L- 3,13%	-	

Conventional designations:

"t" sign - Presentation. "v" sign - Video tutorial.



"L" sign - Interactive whiteboard.

When visiting primary schools, we did not see any new ISOs in mathematics teaching. I suggested that the teacher prepare a lesson plan using a QR code, smartphone and digital camera.

Lesson notes

Topic: Multiplication/division by 5. The fifth part of a number.

Lesson objectives: to introduce the concept of "one fifth of a number"; to teach how to find one fifth of a number using division; to improve the skills of constructing geometric figures; to develop the ability to analyze and compare.

Tasks:

1. To teach how to find one fifth of a number and apply this knowledge when solving problems;

2. To consolidate knowledge about the multiplication table and division by 5;

3. Continue to develop students' skills in organizing themselves and working at a certain pace.

Equipment: digital camera, computer, smartphone, interactive whiteboard, didactic materials.

- Stage of the lesson	lesson Lesson progress	
- Organizational moment	<ul> <li>- The long-awaited bell rang, the lesson begins.</li> <li>I add, subtract, multiply the ideal. I know mathematics and that's why I love it.</li> <li>- Hello, children! Sit down.</li> <li>- Look into each other's eyes, smile, wish your friend a good working mood for the whole school day.</li> </ul>	
Mental arithmetic	Image: Students are given a task encoded with a QR code.         The encoded task: . Guess the pattern and continue the series of numbers: a) 99, 78, 57,,,;         b) 15, 30, 45,,,;         c) 1, 11, 23, 37,,;         e) 87, 76, 65,,,;         c) 7, 76, 65,,,;         d) 12, 24, 36,,,;         e) 87, 76, 65,,,;         d) 12, 24, 36,,,;         e) 87, 76, 65,,,;         e) Think about what needs to be changed in the text of the task so that the expression 9 – 6 is a solution?	. QR code, smartphone. P.S. teacher explains to students how to decode the code correctly

Continuation of table 4 – Lesson progress

Stage of the lesson	Lesson progress	An interactive educational tool
Mental arithmetic	P There were 6 girls sitting on two benches. There were 9 girls on one of them. How many girls were sitting on the second bench?	An interactive educational tool
Learning new material	<ul> <li>Using the chips, perform the operation: 20:5.</li> <li>20:5 = 4.</li> <li>Show the fifth part of the number 20.</li> <li>What is it equal to?</li> <li>How to find the fifth part of any number? (This number must be divided by 5.) Then the students read the rule from the 8<sup>th</sup> textbook.</li> <li>What does it mean to find the fifth part of a number? How to find the results of multiplication?</li> </ul>	Digital camera, interactive board. P.S. The teacher prepares photos for the lesson in advance.
	(Photo-1)	

Physical exercise	. Playing the recording, the student is doing a	Digital camera,
	physical exercise minute	interactive
		whiteboard.
		P.S. The teacher
		invites students
		in advance to
		participate in a
		physical
		education
		minute and
		create their own
		video (no more
		than 2 minutes).

## End of table 4 – Khoduroka

Stage of the lesson	Lesson progress	An interactive
Review of the material covered	(Problem in QR code: Arif caught six fish in the morning and in the evening. He gave a fifth of the catch to the cat, the rest of the fish were fried. How many fish did the cat get and how many fish were fried).	QR code, smartphone.
Summary	W hat did you learn new in the lesson? -Continue the sentences: I learned	
	It was difficult for me I was interested in I liked it the most	

In order to effectively conduct classes using the interactive teaching aids, it is necessary to create a special algorithm, following which the teacher can successfully prepare for the lesson. We are faced with the question of how and where to start? Let's consider the stages of preparation by the teacher for the use of the interactive teaching aids:

1. Organizational moment. Definition of the lesson topic. Setting the goal of the lesson.

2. Definition of the lesson type (introductory, assimilation, formation and consolidation, generalization, control and accounting of knowledge and skills, a combined lesson or another type of lesson) and its place in the system of lessons on this topic. 3. Drawing up a lesson structure, as well as tasks (general tasks, tasks of different stages of the lesson, tasks for searching and structuring the lesson). The main form of organizing the educational process in secondary school is a lesson. During the lesson, new educational material is learned, and students are educated and developed. In the context of a system-activity approach, the main place in the lesson in such a way that the educational process is aimed at social interaction and the interest of students in the process of educational activity led to the emergence of interactive learning technologies, which included, accordingly, interactive methods and means. Modern psychology claims that thinking develops through speech. It follows that interactive technologies are rightfully included in the list of learning technologies that allow students to fruitfully develop independence and communication skills. With regard to a mathematics lesson, we highlight the following methodological recommendations for organizing a lesson based on interactive teaching technologies:

1. Involvement of all students in the work through the organization of group and collective work

To implement this rule in mathematics lessons, interactive methods, forms and means of teaching should be used that allow all students to be included in the discussion process.

2. Joint work on formulating and adopting rules for educational cooperation for students and the teacher

Follows from the previous point, since clear rules are needed for the effective organization of interaction and communication between students and the teacher. Children should be taught to agree in the process of completing an educational task. To do this, it is necessary to jointly determine during the discussion what rules should be followed when communicating. At the beginning of the lesson, you should agree on this and not violate the established rules. For example: showing tolerance for any point of view, respecting everyone's right to freedom of speech.

3. Creating a situation of success.

It is imperative to use "supportive" communication techniques: friendly intonations, the ability to ask constructive questions; address questions to those students who need support

4. Facilitating polyphony.

Means creating conditions for each lesson participant to formulate and express their point of view on any problem under consideration.

5. Developing general group and interpersonal skills of analysis and self-analysis.

Systematically teach schoolchildren to analyze educational and cognitive activity and its results, interaction of participants with the purpose of their timely correction.

6. Prepared premises.

The class should be prepared in such a way that participants will have the opportunity to easily move to each other to work in large and small groups, use appropriate interactive tools.

Organizing a mathematics lesson using interactive technologies is divided into several stages:

1. Lesson design.

When preparing for a lesson, the teacher must determine the topic of the lesson, its goals and planned results, as well as the content of the mathematics lesson. In accordance with this, select interactive methods, means and organizational forms of training that implement them. The teacher must adhere to the didactic principles and conditions for using interactive technologies in mathematics lessons. When developing a mathematics lesson using interactive technologies, it is necessary to follow the following methodological recommendations:

1) Consider the age characteristics of students, their interests.

2) Consider the time frame for using interactive teaching aids during the lesson (comply with the Sanitary and Epidemiological Rules and Regulations - spending no more than 15-20 minutes on the computer).

3) The selected methods, organizational forms and teaching aids should be consistent with the topic, objectives of the lesson, focused on achieving the planned results, promote the interest of students (comply with the requirements for the selection of methods, organizational forms and teaching aids described in paragraph 1.3.).

4) The objectives of the lesson should be clearly defined, the problems that will be solved during the lesson should be highlighted, a lesson plan should be prepared, and technical equipment for the learning space should be provided. It is also necessary to select the main questions for the lesson and determine their sequence. Work out the questions that students may presumably have during the mathematics lesson.

5) It is advisable to use practical examples from life so that students in grades 5-6 can rely on their experience, previously acquired knowledge and they do not have questions about why they study mathematics and where the knowledge they acquired in the lesson can be useful to them.

6) It is necessary to create a comfortable learning environment, that is, to establish positive and trusting relationships.

7) Educational activities in a lesson of this format should be varied, which is ensured by a variety of interactive methods, organizational forms and teaching aids.

8) Develop instructions and all necessary handouts, and other didactic teaching aids (presentations, cards with tasks, etc.)

The result of the implementation of this stage will be the writing of a technological map of the mathematics lesson.

2. Organization of the beginning of the lesson.

At this stage, the first stages of the lesson are organized. The organizational stage of a mathematics lesson in grades 5-6 includes: checking homework, updating knowledge, motivation.

At these stages, in order to check homework, you can use presentations, as well as online services, for example, uchi.ru, in which children can do their homework, and the teacher, having tracked the statistics, has the opportunity to identify difficulties and determine what material needs to be updated. Our work is focused on the development of lessons in which interactive technologies were used. The first paragraph describes the features of organizing lessons and provides examples of the use of interactive methods and teaching aids, which together constitute interactive technologies at various stages of a mathematics lesson. The second paragraph describes methodological recommendations for organizing a lesson using interactive technologies and an example of a discussion lesson and a lesson using the case method, conducted in the 6th grade. The last paragraph describes the conduct of a pedagogical experiment that showed the nature of the impact of the course program on the assimilation of material by students and on understanding the importance of mathematics in life and the need to study it at school. The experimental part of the study showed that the students' level of mathematical training increased, due to the use of a variety of interesting tasks in the lesson, the students worked with interest in the lesson. Based on this, we can conclude that the use of interactive technologies in mathematics lessons has a positive effect on the quality of students' mathematical training on specific topics, activate their creative activity, increase their educational motivation, and allow them to form some universal educational actions. Thus, the use of interactive technologies in the process of teaching mathematics seems very promising.

### CONCLUSION

Analyzing the trends of modern mathematical education, the features of their implementation in the learning process, we came to the conclusion that at the present stage of development, the use of modern teaching technologies is especially important. The use of interactive technologies in teaching mathematics allows us to maintain this trend. The use of interactive technologies allows us to diversify lessons, make them interesting, entertaining, which helps to maintain students' educational and cognitive interest. The greater the interest of students in the subject, the higher the quality of their knowledge. Interactive technologies are also aimed at establishing interpersonal relationships in the classroom through educational interaction, helping to form students' universal learning activities, which is an important component of modern education. Lessons that used interactive technologies were distinguished by the fact that they showed a high level of interest in the learning process among students, which also affected the level of mathematical training. In the process of teaching mathematics using interactive technology methods such as discussion, case method, students acquire educational knowledge in mathematics and develop as individuals. Interactive teaching tools (online services, presentations) contribute to the development of cognitive and creative abilities. Based on the conducted research, it can be argued that the goals and objectives of the final qualifying work were achieved. For a more complete confirmation of the hypothesis, it is necessary to continue further experimental work.

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