# POSSIBILITIES OF USING INFORMATION TECHNOLOGY IN ORGANIZING MODERN MATHEMATICS LESSONS

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#### Abstract

This article covers the issues of the peculiarities of using information technology and the application of the TIMSS and PISA programs in teaching mathematics in elementary grades. Development of mathematical literacy of primary school students and improvement of the content of mathematical education by using innovative pedagogical technologies. The tables of the results of the effectiveness of the stages of detection, research and training of experimental work in schools are given.

#### Introduction

It's known that, one of the important conditions is every member of society organic dependent on creasing with their level knowledge. On the world scale to develop young generation as perfect person is taking into consideration. In developed countries pupils' knowledge, practice and qualifications are based on results which regarding daily activity and they show to correction and modernization education system.[1] Also Government of Uzbekistan starts to prepare to take part in 2022 year for program of International PISA (Programme for International Student Assessment). This demands to prepare programme of (TIMSS-Trends in mathematics and science study) and to confirm pupils of elementary classes' capabilities. TIMSS is the largest and most comprehensive large-scale assessment of mathematics and science for primary and secondary education. It is truly a global enterprise studying the primary and secondary education with more than 70 education systems participating worldwide [2].

Also, our country adopted so important orders to develop system of education [3-5]. They are Republic of founding 2017, 6 April " About General, secondary and secondary special and to confirm education profession-handicraft state Standarts Republic of Uzbekistan Ministries of founding on April 6, 2017" About General secondary and secondary special, to confirm of state education of Standarts education of profession-handicraft decision №187, The President of Republic of Uzbekistan "About to confirm of education of general secondary statute". On March 15, 2017 decision №140, and on January 25, 2018 The President of Republic of Uzbekistan "About General secondary special and to change system of education absolutely" orders were adopted. By the President of Republic of Uzbekistan to create of teaching modern methodology and put into practice, to strengthen pupils' interest to choose profession, important tasks are put to create textbooks. In fact, quick process of global shows", to see program of education again, to create limited documents, and systematic collections. Nowadays, telephone, computer games and different serials are being abstract children's mind.



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In result, demand which to bring up perfect children is not carrying out. The methods of teaching Mathematics is developing with innovation pedagogical technology.

### METHODOLOGY

In a process of primary education modern technology of education didn't make enough. At this moment, in elementary education system technologies of teaching from mathematics to use in process of education didn't apply as separate object investigation. A lot of teachers don't understand maintenance and essence of modern technologies of education.

The organization of modern mathematics lessons in primary grades using information technology linked with the demonstration method. Through this method, elementary school students can hear and see directly. This creates the basis for gaining more knowledge.

"Instructiveness not only develops students' minds, but also awakens their senses. As a proof of this, it can be said that proverbs such as "It is better to see once than to hear a thousand times" or "The dumb also entered the language" that have come down to us from our wise people were not said for nothing.[2]

"Students first analyze mathematical concepts through their concrete imagination, then later they develop abstract imagination. Therefore, the role of visual is gradually decreasing, and symbols (numbers, symbols) begin to take its place. And when solving problems, objects and their images are used as exhibits. [3]

For process of teaching math innovation pedagogical technologies didn't make. Before in "The methods of teaching mathematics" answer "Why to learn mathematics", "What to from mathematics?", "How to learn mathematics?" questions, at present "How to learn profitable and effectual?" answer the question. So that we to light up peculiarities of innovation pedagogical technologies in mathematic lessons. And we show that mathematics lessons technology of "Bumerang" to apply and by this to develop pupils' practice.

**Definition of technology.** This technology to help students to work with different literatures, texts, to save in mind, to have a lot of information's in a short time and mark pupils right by teachers. Using of technology. In practical occupations, seminar laboratory and lecture lessons us individual, little group and community. Using of instruments in a occupation. In a process of reading materials of disperse to study independently, to learn and to acquire.

Order of carrying out occupation. This technology carries out in 3 steps.

-students divided into 5 little groups.

- students are introduced with lesson's aim and order.

-for students to learn individually give matters and illustrations from 1-25 about theme (to 1group 1 from to 5, to the second group 6 from 10, to the third group 11 15)

-to organize new group from every members of group by teacher.

-members of new group change information's and say each other.

-to define degree of acquired information's.

New group members return the first group.

-designate "book-keeper of group" accounts pupils' marks.

-to define pupils how to acquire the theme teacher gives some questions for pupils.





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-to organize questions which made by groups.-to define general marks by members of group.

## RESULTS

It is leaned by practical that teaching elementary schoolchildren using modern educational technology is pressing problem. It will be the main news that organize to use it during elementary mathematics classes. During research it will be clarified that improving elementary schoolchildren's mathematical skills, knowledge and education by using both practical and theoretical ways, produce the effective ways of teaching by using modern pedagogical technology into practice.

In primary education, the situation of teaching in a demonstrative manner using innovative by using modern pedagogical and information technologies was observed. Experimental work was carried out of 4 years (2020-2024). Pedagogical experiment testing and analysis of results in practice, determination of obtained results and their effectiveness was carried out in three stages.

**1.Determining stage.** It consists in 2020-2021 years. In order to determine the knowledge, skills and qualifications of primary school students in mathematics, the content of the subject in accordance with the requirements of the Standard, the state of application of innovative pedagogical technology to the educational process of science programs, textbooks, educational and teaching-methodical manuals was analyzed and problems in their use were identified. The created curriculum and textbooks, scientific-theoretical, pedagogical, methodical, psychological literature were studied. As experimental-testing schools were selected as secondary schools number 3, 10, 17, Navoi city, 82, 85, Koshrabot district, Samarkand region, and 22, 29 secondary schools of Jizzakh city, Jizzakh region

The name of the secondary schools where experimental work was carried out	Number of students in the experimental classes	Number of students in the control classes
The secondary school № 3, Navoi city	74	71
The secondary school № 10, Navoi city	95	96
The secondary school № 17, Navoi city	112	107
The secondary school № 82, Koshrabot district, Samarkand region	90	81
The secondary school № 85, Koshrabot district, Samarkand region	96	84
The secondary school № 22, Jizzakh city, Jizzakh region	105	106
The secondary school № 29, Jizzakh city, Jizzakh region	96	92
Total:	668	637

TA	BLE	1.	Information	about	experimental-	testing schoo	ls
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A total of 668 students in experimental classes and 637 students in control classes took part in the experiment. The results of the first stage pilot test are given in table 2 below:





TABLE 2. The results of the first stage pilot test.								
Number of groups and students	Num studen rese "excellen	ber of ts who ived it" rating	Num studer reso "good"	ber of nts who eived " rating	Num studer rese "satisf	ber of its who ived actory"	Num studer rese "unsatis	ber of its who vived ifactory"
	(in	%)	(in	· %)	rating	(in %)	rating	(in %)
The experimental class (m=270)	67	24,8	78	28,9	112	41,5	13	4,8
The control class (n=251)	55	21,9	66	26,3	118	47	12	4,8

**2. Research stage.** It consists in 2022-2023 years. In the organization of mathematics classes of elementary schools, it was set as a goal to effectively deliver science content to students through a special teaching-methodical system on the basis of demonstration by using information technology.

Number of groups and students	Num studen rese "excellen (in	ber of ts who ived t" rating %)	Num studer reso "good" (in	ber of nts who eived " rating _%)	Number of students who reseived "satisfactory" " rating (in %)		Num studer rese "unsati rating	Number of students who reseived "unsatisfactory" rating (in %)	
The experimental class (m=270)	72	26,6	82	30,2	112	41,4	8	2,9	
The control class (n=251)	58	23,1	67	26,7	120	47,8	6	2,4	

<b>TABLE 3</b>	. The results	of the secon	d stage	pilot test.
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**3. Teaching stage.** It consists in 2023-2024 years. In the organization elementary math classes were organized based on the planned developing math skills by using innovative technology. In experimental group, based innovative pedagogical technology, training was conducted on the basis of the educational-methodical system developed on a scientific basis.

Number of groups and students	Numb student resei "excellent (in <sup>6</sup>	oer of as who ved t" rating %)	Num studen rese "good' (in	ber of ats who ived ' rating %)	Number of students who reseived "satisfactory" rating (in %)		Number of students who reseived "unsatisfactory" rating (in %)	
The experimental class (m=270)	98	24,8	112	28,9	55	41,5	5	4,8
The control class (n=251)	58	23,1	67	26,7	120	47,8	6	2,4

TABLE 4. 7	The results	of the third	stage pilot test.
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#### DISCUSSION

The results of the research we were use the mathematical- statistical methods is done taking into account the differences between the indicators obtained by students of the experimental and control classes at the end of trhe experiment. The effectiveness of the research is evaluated. For this purpose, according to the idea of the student method, the indicators of the students in experimental and control classes at the beginning and the final this stage and the first stage were compared. Our hypothesis about the effectiveness of our work, that is, from hypothesis N<sub>1</sub>, that the two sets of mathematical expectations overlap, was carried out using a test scheme. [10,11]. From this, the N<sub>0</sub> hypothesis is as follows: let mathematical expectations of the estimates of the experimental and control main sets overlap  $m_t=n_n$ , the methodological innovation does not increase the efficiency of the work.

Suppose that the control and experimental groups X and Y give average a result. Let them be different. If a significance level of  $\alpha$ =0.05 is taken, is this different significant or not, that is, does N<sub>0</sub> reject the hypothesis, m<sub>t</sub>=n<sub>n</sub> the question arises. Thus,

$$(\bar{x}-m_T)-(\bar{y}-n_{_H})=t_2\sqrt{\frac{S_T^2}{m_T}}-\frac{S_{_H}}{n_{_H}}<\bar{x}-\bar{y}<-t_2\sqrt{\frac{S_T^2}{m_T}}-\frac{S_{_H}^2}{n_{_H}}$$

We take data from Table 2 in order to analyze the results of students` learning at the beginning of the first stage of the experiment. We are identify the results for experimental groups. Average value:

$$\bar{X} = \frac{67*5+78*4+112*3+13*2}{270} = \frac{335+312+336+26}{270} = \frac{1009}{270} \approx 3,74$$

Average square value:

$$(\bar{X})^2 = \frac{67*25 + 78*16 + 112*9 + 13*4}{270} = \frac{1675 + 1248 + 1008 + 52}{270} = \frac{3983}{270} \approx 14,75$$

Average square value:  $\overline{X}^{-} = (3,74)^{2} \approx 13,99$ 

The dispersion:  $S_{+}^{2} = (\bar{X})^{2} - \bar{X}^{2} = 14,75 - 13,99 \approx 0,76$ 

The quatity: 
$$\frac{S_T^2}{m} = \frac{0.76}{270} \approx 0.0028$$

We are identify the results control groups. Average value:

$$y = \frac{55*5+66*4+118*3+12*2}{251} = \frac{275+264+354+24}{251} = \frac{917}{251} \approx 3,65$$

Average square value:

$$(\bar{y})^{2} = \frac{55 * 25 + 66 * 16 + 118 * 9 + 12 * 4}{251} = \frac{1375 + 1056 + 1062 + 48}{251} = \frac{3541}{251} \approx 14,11$$
  
Average square value:  $\bar{y}^{2} = (3,65)^{2} \approx 13,32$ 

The dispersion: 
$$S_{\mu}^{2} = (y)^{2} - y^{2} = 14,11 - 13,32 \approx 0,79$$

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The quantity: 
$$\frac{S_n^2}{n} = \frac{0.79}{251} \approx 0.0031$$

Student's criterion is found from the table [4]  $t_{\alpha}$  from the quatity  $\alpha = 0,05$ .  $t_{\alpha} = 1,96$ . Then the range is

$$(-1,96\sqrt{0,0028};1,96\sqrt{0,0031}) = (-1,96*0,05;1,96*0,06) = (-0,1;0,12)$$

Thus, 
$$X - Y = 3,74 - 3,65 \approx 0,09$$

According to the results obtained at the beginning of the experiment, it was not enough that the use innovative pedagogical technology in each schools. The results of the final stage of the experiment are compared how to learn mathematical skills of students in the experimental and control groups. At last, we used table 4 to analyze the results of students` learning at the final stage of the experiment. We are identify the results for experimental groups. Average value:

$$\bar{X} = \frac{98*5+112*4+55*3+5*2}{270} = \frac{490+448+165+10}{270} = \frac{1113}{270} \approx 4,12$$

Average square value:

$$(\bar{X})^2 = \frac{98*25+112*16+55*9+5*4}{270} = \frac{2450+1792+495+20}{270} = \frac{4757}{270} \approx 17,62$$

Average square value:  $\overline{X} = (4,12)^2 \approx 16,97$ 

The dispersion: 
$$S_{+}^{2} = (\bar{X})^{2} - \bar{X}^{2} = 17,62 - 16,97 \approx 0,65$$
  
The value:  $\frac{S_{T}^{2}}{m} = \frac{0,65}{270} \approx 0,0024$   
We are identify the results control groups. Average value:  
 $\bar{y} = \frac{58 * 5 + 67 * 4 + 120 * 3 + 6 * 2}{251} = \frac{290 + 268 + 360 + 12}{251} = \frac{930}{251} \approx 3,71$ 

Average square value:

251

$$(\bar{y})^2 = \frac{58 \times 25 + 67 \times 16 + 120 \times 9 + 6 \times 4}{251} = \frac{1450 + 1072 + 1080 + 24}{251} = \frac{3626}{251} \approx 14,45$$

251

251

Average square value:  $y = (3,71)^2 \approx 13,76$ 

The dispersion: 
$$S_{\mu}^{2} = (y)^{2} - y^{2} = 14,45 - 13,76 \approx 0,69$$

value: 
$$\frac{S_n^2}{n} = \frac{0.79}{251} \approx 0.0027$$

Student's criterion is found from the table [10]  $t_{\alpha}$  from the quatity  $\alpha = 0,05$ .  $t_{\alpha} = 1,96$ . Then the range is

$$(-1,96\sqrt{0,0024};1,96\sqrt{0,0027}) = (-1,96*0,05;1,96*0,06) = (-0,1;0,12)$$
  
So,  $\bar{X} - \bar{Y} = 4,12 - 3,71 \approx 0,41$ 

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In this case, the hypothesis  $N_0$  is reject. For alternative hypothesis N1, X > Y is accept. Thus, the effectiveness of teaching mathematics lessons in primary schools` is proven based on innovative pedagogical technologies.

## CONCLUSIONS

Teachers can create a supportive environment by providing positive feedback, listening and responding to students' questions, and being empathetic to students' needs. Indicators of a supportive climate include the frequency with which the teacher helps students learn and the teacher showing interest in student learning, as well as the frequency that the teacher asks students to express their opinions.

So, in the end, we can say that by providing information and innovation technology teacher teach students his own words and explained of verbal speech, and manual instructions serve as illustration. The teacher summarizes the students` observations and draws a general conclusion.

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