



CREATIVE, INNOVATIVE APPROACHES TO THE WORK OF SHAPING THE MATHEMATICAL IMAGINATION OF CHILDREN IN THE TRAINING OF PRESCHOOL EDUCATIONAL ORGANIZATIONS

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<https://doi.org/10.5281/zenodo.7956126>

Annotation: The article is devoted to the study of the concept of creativity in preschool educational institutions from a scientific and pedagogical point of view, the analysis of aspects of its manifestation in the activity of forming mathematical concepts, the development of methodological foundations for the development of mathematical imagination in preschool children and the compilation of methodological recommendations.

Key words: preschool educational organizations, creative, innovative approach, mental processes, creative development, formation of mathematical concepts, child's intellectual potential, age, pedagogical conditions.

Introduction: For every 100 children aged 3-7 years, there were 28.1 places in preschool organizations nationwide. Observations show that, among some shortcomings, the work on the formation of mathematical representations of children of preschool educational preparatory groups on the basis of state requirements is also not at the level of demand. The reason for this is, in one way, the lack of educational tools, conditions in the provision of education in preschool educational organizations, and in the other, the lack of methodically mature educated, experienced specialists. The problems of preschool education are that the development of mathematical visions in children is not methodically, scientifically-based. According to the "concept of development of the preschool education system of the Republic of Uzbekistan until 2030" [1] the tasks of eliminating problems in the field and providing full coverage with the preparation for compulsory one-year free general primary education for 6-year-olds and their qualitative preparation for school education are envisaged. This brought the concept of "creativity" into the discipline of pedagogy, which in itself studies the laws of educational and educational work. The development of scientific knowledge in particular today, the influence of creativism on the formation of mathematical visions, requires an in-depth study of this issue from a scientific pedagogical point of view. The presence of various opinions in the scientific understanding of the issue of creativity, the failure to reach a holistic conclusion is another manifestation of the relevance of the topic of our master's thesis work.

LITERATURE ANALYSIS AND METHODOLOGY:

Many scientists have conducted research on improving the preschool education system. These scientists have worked on the psychic processes that children undergo in order for mathematical concepts to be conscious and understandable. The problem of developing mathematical concepts includes the following issues from a psychological point of view.

- 1) the emergence of the structure and form of the concept.

2) development of mental actions and ways and methods of mental activity for the formation of concepts.

N to this problem. He. Bikbaeva and others [3-5] have also studied these problems. Currently, Research is being carried out in several directions on the development of mathematical concepts. The basis of the formation of mathematical concepts is connected by Methodists with their general abilities, manifested in the sum of various concepts: addition, reasoning, determination of logical connection, solution of cognitive problems. Mathematical concepts will also be developed if the child, on the basis of the formed mathematical concepts, has the ability to abandon innovation, interesting solutions to the problem, standard methods that have always been used, to come up with new solutions to the problem, to predict ways to solve a practical problem.

Modern educators believe that teaching, the source of development, depends on the knowledge and competence of educators. In this case, it is recommended to use two indicators:

- 1) the child's acquisition of new knowledge with the help of adults.
- 2) develop the ability to independently apply, implement the acquired knowledge in the child.

DISCUSSION AND RESULTS: A modern understanding of the problems of teaching children mathematics provides for their involvement in communication with mathematics on the basis of activities and creative games. Mathematics has always (along with actions, speech and Toys) been a necessary condition for the general development of children. One of the most important tools for the development of mathematical representations is the personal mathematical curiosity of children. Mathematics in preschool preparatory groups is interesting to teach to perform actions and at the same time is one of the most relevant forms of the development of mathematics in the preschool education system. Elementary mathematics occupies a large potential of emotional, psychological, social influence. It has a huge impact on the development of personal qualities that can be formed precisely in joint mathematical and creative activity. Collective intellectual training gives all children positive results, without exception, no matter how quickly the child shifts in his mathematical development. First of all, they bring victory in an emotional way. The emotional sphere of the child is enriched in constant communication with mathematics. Children are very fond of solving puzzles that are displayed in audios in training, remembering mathematical concepts and terms. They sincerely rejoice at every result that they have successfully completed. They are delighted by holidays, performances, parents' gatherings, open classes with guests, concursions, festivals and concerts, "transparent" performances before the children and employees of the preschool educational institution, parents. The educational function of training is also undoubtedly one of the forms of collective communication. In children, responsibility for the correct execution of their duties, shaylik, concentration of attention appear in one place.

Collective training brings children together, raises will, determination in achieving the task set, helps in overcoming impotence, reluctance, disbelief in one's own power.

In mathematics, the work of solving and building examples is also practiced the fine motor skills of the fingers of the hands. Develops a sense of rhythm, fantasy and creative imagination. As soon as mathematics learns to perform examples, children discover for themselves the world of mathematical numbers and their relationships. They improve the

quality of measurement, aiming and mathematical calculation. For most children, the skills to perform mathematical actions quickly improve. It is a tool in the development of not only individual development, but also thinking, creative initiatives, conscious relationships between children. Promotes the development of mathematical and analytical abilities. Thanks to this, the child's perception and feeling are perfected.

The leading pedagogical idea of the experiment consists in creating conditions that promote the development of children's mathematical abilities in preschool age through intefaoic and non-traditional methods.

As these conditions, the following can be recognized:

1. The level of development, indicators, criteria, components of mathematical abilities in children were determined.
2. To determine the initial level of mathematical abilities of preschool age, the results obtained during the diagnosis were analyzed.

The following technologies were used in experimental work. In general, the purpose of the topic is the development of mathematical imagination in the children of the preparatory group through various methods. The child develops computational skills, mathematical memory, mathematical imagination, the skill of solving mathematical examples and problems is formed and acquires various methods in it.

In training, children's mathematical creative abilities are developed in solving examples, in creative movement under mathematics, in improvisation in game activities (mathematical activation during games).

The most important condition for the mathematical ability to be performed in training are the following:

- master the skills and methods of solving mathematical problems in various situations;
- knowledge of the possibilities of mathematical actions, their content and properties;
- feeling a certain reserve of impressions regarding mathematical competence;
- the presence of a set of mathematical and general abilities (imagination, fantasy, figurative thinking).

Organized creative assignments in the form of individual and group training were used to carry out training. According to the criteria and assessments, three levels of mathematical abilities were distinguished: high, medium and low.

Carrying out the identification of mathematical and creative abilities of preschoolers is able to help determine the hidden special mathematical abilities of children. Diagnosis in the context of the criteria given consisted in the professional pedagogical assessment of the level of creative components of the personal abilities of preschoolers by pedagogical experts. To obtain a clearly acceptable result, a methodology for determining mathematical abilities was developed, taking into account the criterion of the level of mathematical abilities of preschool age. The methodology not only made it possible to give an exhaustive assessment of the current moment, but also to monitor the dynamics of the formation of the mathematical imagination of preschool-aged preparatory group children, to make a general diagnosis by a number of parameters. The task is based not on the assessment of knowledge, but, in general, on the research of cognitive activity and, in part, on activities related to mathematical thinking. It allows you to obtain information and draw conclusions in order to compare the results that can be used during the study.

The diagnosis is based on empirical material collected as a result of the use of an exercise system. The exercise system consists of playful tasks that reveal the following structural components of the mathematical imagination:

- high-speed logical thinking display ability;
- emotional sensitivity;
- knowledge of the mathematical interests of educators;
- the tendency of educators to invent mathematical problems and examples.

The participation of preschool children in the diagnosis is considered a playful situation, a trusting relationship with the educator and a psychologically favorable environment in its conduct.

Practical diagnostic assignments included the following. Initially, several directions were outlined in the issue of diagnosis, and they were studied on the following topics.

I. Carrying out the study of the section of number and quantity. This diagnosis was studied on the basis of the game "let's say familiar numbers".

Work was carried out on determining the level of development on the section of number and quantity (the task made it possible to determine reactive-metric abilities. All assignments were formed in a 4/4 scale in the middle tempo (4 takt)).

The game involves a preschool child in a situation of solving simple tasks in mathematical capabilities (measurement, calculation, comparison, aiming). If the child did not know or refused to handle mathematical situations, he was offered to knock on the table or clap in the palm of his hand.

The results were as follows.

Table 1.

The level of formation of mathematical representations of preschool children at the beginning and end of the experiment

Groups	Number of educators	Javoblar					
		At the beginning of the school year			At the end of the academic year		
		HL	ML	LL	HL	ML	LL
Experience	95	27/27,5	36/36,7	31/35,8	45/46	47/48	3/3
Control	92	28/29,8	31/33	33/37,2	36/38,3	41/43,6	15/18,1

Note: HL-high level; ML-middle level; LL-lower level; percentage in denominator.

In the experimental groups, it was found as a result of the assumption that the number of high-level responses to assignments in the school year training increased by 7.1% compared to control groups, the number of mid-level responses increased by 4.2%, and the number of lower-level responses decreased by 10.2%.

In our research, we used the criterion χ^2 (xi-square), one of the criteria for mathematical statistical methods of pedagogical research, to determine the effectiveness of didactic materials and recommendations proposed, the reliability of the results obtained from the pedagogical experiment carried out.

Since the work studied by US is measured on a scale of grades above two categories, that is, the assimilated concepts of educators are measured in HL, ML, LL, the calculations were carried out according to the following formula:



$$T_{\text{кыз}} = \frac{1}{n_1 \cdot n_2} \sum_{i=1}^C \frac{(n_1 Q_{2i} - n_2 Q_{1i})^2}{Q_{1i} + Q_{2i}};$$

In this:

$T_{\text{кыз}}$ – statistical criterion observation value

C – number of categories

$v = 1, 2, 3$ – category number

$\alpha = 0,05$ – pre-given degree of importance

n_1, n_2 – onumber of objects being investigated (number of students in control and experiment classes)

Q_{1i} – the number of first-choice objects per category I (grade) in terms of the nature of the study (we have the number of students of the experimental class who received a certain grade)

Q_{2i} – the number of second-choice objects per category I (grade) in terms of the nature of the study (we have the number of control class students who have received a certain grade)

Before making calculations, we put forward the following assumptions. If $\alpha = 0.05$, the values obtained by the calculations, i.e. the observation value ($T_{\text{кыз}}$) of the statistical criterion is greater than the critical value ($T_{\text{крит}}$) of the statistical criterion ($T_{\text{кыз}} > T_{\text{крит}}$), then the assumption H_0 is negated and the assumption H_1 is assumed. If ($T_{\text{кыз}} < T_{\text{крит}}$), the assumption H_0 is acceptable.

Considering that the degrees of freedom in US are $v = 2, 3, 4$ and the degree of importance is $\alpha = 0.05$, we define $T_{\text{крит}}$. Its value was found to be 5,991, respectively, in accordance with the degrees of freedom given.

Based on the results of the experimental work carried out, computer calculations were carried out using a program developed for the χ^2 criterion and compared with $T_{\text{крит}}$ value.

1- for the table $T_{\text{кыз}} = 6,514 > T_{\text{крит}} = 5,991$

According to the results $T_{\text{кыз}} > T_{\text{крит}}$, which means that the H_0 conjecture is negated and the H_1 conjecture is acceptable.

Taking into account the statistical significance of the values obtained as a result of Formula-based calculations, the effectiveness of our research work and the proposed materials and recommendations was confirmed from a pedagogical point of view.

CONCLUSIONS AND SUGGESTIONS: As a result of the research work on the topic "creative, innovative approaches to the formation of mathematical imaginations in children in the training of preschool educational organizations", the following conclusions were drawn:

1. It was justified that the formation of mathematical representations in children of preschool educational organizations on the basis of state requirements is a methodological problem;

2. In preparatory groups of preschool educational organizations, an analysis of the current state of development of mathematical representations of children was carried out;

3. Developed creative methods and tools for the development of mathematical imagination in children of preparatory groups of preschool educational organizations;

4. Preschool educational organizations identified the possibility of using interactive methods in the development of their mathematical imagination in preparatory group children:



5. The preparation was tested in an experimental test of the effectiveness of the development of mathematical imaginations in Group children, and it was determined that in the experimental groups the number of high-level responses to assignments in the school year training increased by 7.1% compared to control groups, the number of middle-level responses increased by 4.2%, and the number of lower-level responses decreased by 10.2;

6. The methodological foundations for the development of mathematical imaginations of preschool educational organizations in preparatory group children are theoretically and methodically based.

7. Methodological recommendations have been developed for the development of mathematical imaginations of preschool educational organizations in preparatory group children.

As a result of the research work, the following recommendations can be made:

1. Regular use of mathematical concepts in training develops interest in this type of activity in children. The mathematical activity of educators is cultivated in different conditions: in theatrical activities, in building-making games, in activity centers. Knowledge of the manifested strengths of children is important not only for analysis, but also allows you to determine in them the prospects for future career choice, stimulation of mathematical abilities.

2. Taking into account the manifested abilities of the child is necessary not only to develop them, but also to direct his talent to the appropriate stream.

3. Games and interactive methods promote the development of children's mathematical abilities, create conditions for a wide range of mathematics and the accumulation of a reserve of mathematical impressions, help to successfully solve the tasks of " state requirements for the development of children of Primary and preschool age.

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