

**PROBLEMS DEVELOPMENT OF ELEMENTARY MATHEMATICAL CONCEPTS IN  
PRESCHOOL EDUCATION**

**Kilichova Marhabo Khudoykulovna**

Senior lecturer at Jizzakh State Pedagogical University Department of Theory and  
Methodology of Preschool Education Doctor of Philosophy (PhD) in Pedagogical Sciences

**Medvedeva Olga Anotolievna**

Associate Professor, Candidate of Physico-Mathematical Sciences, Institute of  
Computational Mathematics and Information Technologies, Kazan Federal University

**Abstract:**In this article, the problems of the development of elementary mathematical concepts in preschool education were studied. The formation and development of mathematical concepts in preschool education and educational processes are explained by the opinions of scientists, teachers and psychologists. And recommendations on the pedagogical activity of the educator on the formation and development of mathematical representations in children were given during the organization of training sessions in preschool education.

**Keywords:**preschool education and upbringing, elementary mathematical concepts, child, educator, creative thinking, imagination, problem, independence, critical thinking, activity, action, aspiration, result, personality, scientists, educators and psychologists.

**INTRODUCTION.**

Mathematics is the basis for all scientific disciplines that rely on precision. A person with a strong understanding of this subject is intelligent and tends to be open-minded, having the potential to succeed in any field they choose.[1]

Shavkat Mirziyoyev

Mathematics forms the foundation for the study of various subjects. Mathematical literacy is instilled in children from a young age, upon which all other concepts are built. Teaching mathematics to young learners is considered a key goal in enhancing the educational experience in preschool and elementary school, where it is essential to develop fundamental mathematical concepts while taking into account age-appropriate characteristics.

Educators of preschools and educational institutions need to be familiar with the characteristics and principles studied in the fields of pedagogy, philosophy, logic, and psychology in order to facilitate the development of mathematical concepts in young children. Mathematical understanding enables children to explore the world in a deeper and more comprehensive manner, without becoming detached from reality. It is essential to take into account the ideas that existed prior to the emergence of mathematical concepts among children. These ideas serve as the foundation for the formation of basic mathematical concepts. Prior to each new concept emerging, the child attempts to comprehend its general nature and expresses this comprehension generally in order to verify the results that emerge.

**MATERIALS AND METHODS.**

The level of development of mathematical skills varies among individuals. Their acquisition requires consistent practice. This practice begins with family and early childhood education. Through independently overcoming difficulties encountered during the process of

solving problems, structured tasks, and challenges, persistence is developed, and creativity is enhanced.

From a psychological perspective, the formation of mathematical abilities is a complex and multifaceted process. Each thought is, at its core, a product of creative effort, at a basic or advanced level. Each idea is the result of an individual's independent effort to create, innovate, and disseminate knowledge.

Literature analysis indicates that the development of mathematical concepts is characterized by a high degree of novelty in the final product, the specificity of the process leading up to it, and a significant impact on intellectual growth. Some researchers argue that “diversified thinking encourages children to independently solve novel problems, rapidly acquire deep knowledge, and seamlessly transition to favourable opportunities”.

S.L. Rubinstein's pioneering research on general mental development holds significant importance. He introduced and established the concept of activity as the central focus and goal of psychological inquiry. Based on his Activity Theory, Rubinstein's work on general mental development has had a substantial impact.

Rubinstein defined activity as a process of moving from the subject to the object, and also recognized the second phase of activity as communication that flows from the object back to the subject. His focus on the content of human activity not only highlights individual characteristics but also influences the development of the psyche.[2]

The fundamental psychological concepts of «activity» and «action» were introduced by A. N. Leont'ev in his works. According to Leont'ev, «activity is the interaction between the interconnected elements of a subject», and he believed that reflection of reality in the child's mind is the result of this interaction — that is, processes occurring simultaneously, rather than resulting from «influence».

Thus, psychologists such as Leont'ev have identified the most effective and significant approach for the development and application of forms of activity in the formation of mathematical concepts, and their subsequent use in education, in contrast to the conclusions of Rubinstein regarding educational practice. [3]

All research into the evolution of mathematical concepts is conducted in two primary domains. Firstly, there is the delineation of the distinctive characteristics of mathematical concepts. Secondly, there is an exploration of the intricacies associated with these concepts. These perspectives are manifest in the works of diverse scholars.

a) One possible idea is that certain patterns in children's performance of practical tasks can be used to distinguish between different combinations of skills. This means, for example, that children can independently compose and complete practical tasks, solving issues of a creative nature, and doing so with an understanding of the functional relationships between specific and underlying processes.

b) A second group of studies focuses on interpreting the formation of mathematical concepts in terms of the depth and breadth of knowledge acquired and the degree to which it has been assimilated.

c) A third group links the foundation of mathematical concept formation to the general abilities of teachers, as manifested in their ability to solve various issues such as addition, mediation, identification of logical connections, and knowledge.

Research in the second area focuses on studying and explaining the mechanisms and specificities of the formation of mathematical concepts. Here, an attempt has been made to associate the development of these concepts with personal traits, such as professional interest, the importance of creative thinking for individuals, and age-related characteristics.

L.S. Vygotsky also investigated the issue of developing thinking, initially focusing on the formation of mathematical concepts. He emphasized the importance of finding the most suitable conditions for the formation of these concepts in children. According to his theory, the development of children's imagination does not occur independently of the acquisition of knowledge, and only through the process of obtaining educational information (both knowledge and knowledge) does thinking develop and children's minds progress. In turn, the formation of a mathematical imagination is a prerequisite for attaining a high level of knowledge and mastery of knowledge. [4, 221]

Numerous psychologists and educators who have followed in the footsteps of L.S Vygotsky believe that knowledge and methodology are crucial for teaching children effectively.

### **RESULTS AND DISCUSSIONS**

Hence, in the formation and gradual development of the first elementary mathematical concepts in children, the potential of educational educators and their professional skills and experience are of great importance. Since the educator teaches mathematical knowledge to children, first of all, with his skills, the educator will have to direct the child to acquire new knowledge. In this, it is important to use imagination in the teaching process. That is, pedagogical educators should take into account the level of development of mathematical concepts occupied by children and involve them in the next lighter training.

In this regard, it will be advisable to use the following recommendations of Vygotsky in practice. Educator -

- a) gives children to solve a similar issue to themselves, showing that the issue is solved;
- b) the educator recommends that the child solve and end the issue that he has initiated;
- d) recommends that the child solve more complex problems;
- e) explains the principles of solving the issue, asks auxiliary questions, puts problems, divides the issue into parts, etc.

An individual cannot identify a target without moving. In other words, goals are not given, they cannot be an unreasonable subject. They are given in objective cases, that is, it is necessary to move in order to find the goal. The more diverse our activity and action, the greater our determination of the goal and foresight, and the greater the likelihood.

Depth of thought is based on mathematical accuracy and the essence of the matter, which is expressed in being able to penetrate and distinguish the main from the secondary. Thinking activity is reflected in constant diligence aimed at solving issues. Criticality of reasoning is manifested in assessing whether the path chosen to solve the issue is correct. Productivity of the method of action and correctness of result are expressed in maintaining moderation in activity.

Rational thinking, on the other hand, is defined by the ability to compare modes of activity by placing them in different parameters. This allows us to find ways to spend less time solving issues. The accuracy of reasoning is achieved through a solution to a posed problem or given issue that is different from other methods. This is most often manifested in the sharpness and depth of our thinking.

Intuition plays a significant role in the development of mathematical concepts. Intuition manifests itself in children as an idea or thought that occurs spontaneously. When forming these mathematical concepts, we draw on the categories of learning styles developed by Lerner and Skatkin.

These categories are divided into five learning styles: the pictorial/informational style, the reproductive style (recall, remember), the problematic expression style, the partial research style, and the research style. The descriptive explanatory approach involves utilizing pre-existing knowledge and learning methods. The problematic expression mode, on the other hand, involves

retaining mathematical and precise knowledge. The partial research style incorporates elements of thoughtfulness and reflection. The research style predicts creative activity.

#### **CONCLUSION**

In the process of introducing elementary mathematical concepts to schoolchildren, it is essential to utilize simple problem-solving techniques. This primarily entails the development of creative thinking skills. To foster children's creativity, educators must organize training based on specific methods.

Additionally, play is crucial in furthering children's comprehension of mathematics. Play serves as the fundamental tool that shapes how children's future educational and professional pursuits, attitudes towards others, and interactions with the natural world will develop. Through play, children's cognitive abilities are enhanced, they learn to think innovatively and independently, and skills are formed. When introducing mathematics to children through play, it must be tailored to their developmental stage.

#### **REFERENCES:**

1. Prezident Sh.Mirziyoyev olimlar va yoshlar bilan fikr almashdi. 31.01.2020.  
<https://uza.uz/uz/posts/>
2. Рубинштейн С. Л. Основы общей психологии.: Издательство: Питер, 2002 г. 720 стр.  
<http://yanko.lib.ru>
3. Леонтьев А.Н. Проблемы развития психики.: Издательство: МГУ. 1981, С.56
4. Л.С. Виготский Мышления и речь.: Издательство: Питер, Москва. 2017, С.221
5. Djanpeisova G.E., Jo'raeva N.T. Matematik tasavvurlarni shakllantirish metodikasi. O'quv-uslubiy majmua. Toshkent-2018. 20-22-betlar.
6. Xaliqov F, Qilichova M. Maktabgacha ta'lim tashkilotlari tarbiyalanuvchilarida ijodiy fikrlash qobiliyatini shakllantirish usullari. Maktabgacha ta'lim elektron jurnali. Jizzax. 2021.09.11.