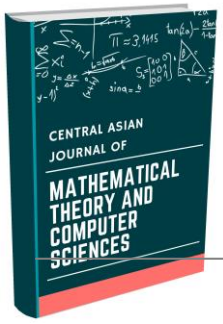

CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES

https://cajmtcs.centralasianstudies.org

Volume: 04 Issue: 11 | Nov 2023 ISSN: 2660-5309

METHODS OF DEVELOPING INITIAL MATHEMATICAL CONCEPTS IN EARLY GRADES

Toshboyeva Saidakhon Rakhmonberdiyevna, Rasulova Surayyo Komiljon qizi

Teacher of Fergana state university

Abstract

The article discusses the methods and importance of developing initial mathematical concepts in early grades, as well as the contemporary role and significance of technological advancements in shaping mathematical concepts.

ARTICLEINFO

Article history:
Received 3 Sep 2023
Revised form 20 Oct 2023
Accepted 27 Nov 2023

Keywords: *imagination, mathematical ideas, concept, method, initial, analyzing, education, numbers , technology.*

---***---

Learning to shape initial mathematical concepts in early grades is crucial for students because it serves as a fundamental guide and essential step in implementing the initial stage of teaching mathematics. This stage focuses on developing students' mathematical ideas, forming their concepts, analyzing, and solving problems.

In early grades, the following methods can be used to shape initial mathematical concepts:

Educational Debates: The issue of developing the mathematical concepts of primary school students is becoming increasingly important in Uzbekistan, given the country's goal to enter the top 30 countries in the world according to the ranking of the international assessment program PISA (The Programme for International Student Assessment) by the year 2030. The continuous improvement of the content of the education system is demanded from the perspective of quality in order to achieve this goal.

In the region of Transoxiana, the 9th to 12th centuries marked the Renaissance era, during which a distinctive feature of the period was the emergence of great scholars not only contributing to the advancement of science but also playing a crucial role in the development of mathematical concepts.

Practical exercises and games: Various games and practical exercises can assist children in learning numbers and basic mathematical operations, contributing to the development of mathematical concepts. For instance, games involving cards related to numbers or activities like finding mathematical truths or solving interesting problems can be utilized. In these games, elementary school students engage with numbers, reinforcing mathematical concepts through problem-solving.

Mathematics educational games play a crucial role in providing students with the necessary concepts through interactive learning. These games enhance curiosity and familiarity among students.

Geometry-related exercises: Drawing triangles, rectangles, circles, squares, and other shapes, along with learning their properties, help in conceptualizing initial mathematical ideas. In the early grades, this process is carried out not in a complex system but, on the contrary, in a simplified system to facilitate understanding.

Visual tools: In the early grades, the use of visual tools and representations is crucial in the process of conceptualizing and explaining mathematics. They assist students in learning and understanding abstract mathematical concepts. The following forms and tools can be used in shaping initial mathematical concepts and learning mathematics in the early grades:

- Charts and diagrams: Charts and diagrams can assist students in visualizing mathematical concepts in a graphical format. For example, using charts to illustrate arithmetic operations, fractions, or geometric shapes.
- Number cards: Number cards are convenient tools for students to learn numbers, arithmetic, and operations. Using number cards, students can learn and practice numbers, operations, and mathematical activities.
- Games and activities: Learning mathematics can also be achieved through educational games and interactive activities. These tools are designed to capture students' interest and facilitate learning through play. Utilizing the "Learn While Playing together" method helps organize lessons, making it easier for students to shape their mathematical concepts and creates the possibility for long-term retention in their memories.
- Utilizing visual tools such as numbers, shapes, and diagrams: Using visual tools like numbers, shapes, and diagrams can be highly effective in shaping children's concepts. Drawing and diagrams are particularly powerful in forming visual representations, aiding in the development of children's imaginations.

Group activities: Organizing children into groups and encouraging them to collectively solve mathematical problems can be highly beneficial. This approach not only develops their teamwork skills but also facilitates mutual learning. Conducting group activities and collaborative exercises in mathematics further simplifies the teaching process. Students assist each other, making it easier to shape mathematical concepts. Working in groups fosters camaraderie among students, promoting respect, cooperation, and assistance to each other and to others. It contributes to meaningful and beneficial discussions, exchange of ideas, and broadening of perspectives.

Examples and solutions: Students are taught examples and methods of solving them. Examples assist in applying mathematical concepts practically. By solving these examples themselves, students comprehend mathematical principles.

Illustrating with Real-life Examples: Teaching mathematics through examples related to real-life situations, such as calculating expenses while shopping or measuring ingredients while cooking, can be effective. Emphasizing that life without mathematics is impractical and that mathematical concepts are needed everywhere helps in shaping mathematical understanding:

- Grocery store: Students learn mathematics by calculating prices and expenses together with their parents at the grocery store. This process helps them slowly and steadily shape their mathematical concepts while forming their understanding through practical experiences.
- Journeys and distances: Students can learn and enhance their mathematical concepts during travels by calculating distances traveled on buses, trains, or airplanes, determining the duration of the journey, and understanding the cost of the trip. These experiences contribute to the development and reinforcement of basic mathematical concepts.
- Cooking: Students, by preparing meals together with their family at home, learn about quantities and multiplication. This helps them quickly and easily grasp new topics in class, contributing to their effective and quality learning outcomes.

Working with imaginary information and models: Students learn mathematics by visualizing concepts and working with models. This approach aids in understanding and solving problems effectively.

Interactive teaching methods: Utilizing interactive teaching methods to instruct mathematics in elementary school is highly beneficial for eliciting students' ideas, promoting active participation in practical activities, and enhancing their interest in learning mathematical concepts. The following interactive teaching methods help further simplify the challenges in teaching activities:

- Virtual textbooks and online tools: In teaching mathematics, you can use online textbooks, interactive math games, and online presentations. This helps to increase students' interest in new materials and provides the opportunity to introduce mathematical concepts through graphics and animations.
- Math games and interactive assignments: Using games and interactive assignments for learning mathematics is beneficial. It engages students in interesting and practical mathematical activities, fostering their enthusiasm for the subject.
- Utilizing interactive whiteboards, computer programs, and educational games: Incorporating modern technologies such as interactive whiteboards, computer programs, and educational games is advantageous. It captures children's attention more effectively and enhances their curiosity.

Regular review and practical exercises: In elementary grades, conducting regular reviews and practical exercises is essential to reinforce mathematical concepts. These methods are crucial for understanding and learning mathematics in the early stages. By applying mathematics through practice and utilization, students can gain more confidence in their abilities and comprehend how to apply mathematical concepts in their lives. When minimal effort is invested in reviewing any knowledge, it can be retained for an extended period and utilized effectively.

Repetition exercises are crucial in developing initial mathematical concepts, fostering a deep understanding, and enhancing overall conceptualization. The following exercises are helpful in creating convenience for elementary school students in shaping their mathematical understanding:

- Numbers and operations: Imagining a certain number and separating it from other numbers. Understanding addition, subtraction, multiplication, and division operations. Performing these operations with examples.
- Logical problems: Encouraging students to independently solve logical tasks through logical assignments. Logical problems involve statements like "If... then, what happens?" These types of exercises help develop imagination and enhance problem-solving abilities.
- Time, seconds, and hours: Learning to tell time using mathematical concepts such as hours, minutes, and seconds. Understanding and practicing time calculations.

Utilizing modern technologies: Incorporating modern technologies in teaching mathematics in elementary school is crucial for providing students with engaging and effective solutions for practical application, visualization, and learning. The following modern technologies assist students in learning mathematics in the early grades:

- Electronic books and videos: Electronic books and video lessons can provide diverse approaches to learning mathematics. Students can explore materials that interest them and study at their own pace.
- Learning programs and illustrations: Learning programs and interactive illustrations assist students in conceptualizing mathematics. Through animations and interactive elements, students find it more engaging to grasp and learn concepts, making the learning process more interesting.
- Online learning platforms: Online learning platforms can be helpful in teaching mathematics in elementary classes. These platforms provide students with the opportunity to engage in practical application of mathematics through tests, exercises, and lessons.
- Mathematics exercises: Utilizing mathematics exercises is crucial in teaching mathematics in elementary classes. These exercises assist students in solving examples or analyzing mathematical problems.

- Graphic programs: Graphic programs assist students in visualizing mathematical concepts. Diagrams, graphs, and charts provided by these programs help students understand and conceptualize various mathematical ideas.

Each method should align with the various abilities of children and take into account their unique learning styles. Additionally, teachers' creativity in developing new methods based on students' interests is crucial. When each student is exposed to personalized concepts, using visual tools and representations can facilitate and simplify the learning process. Implementing these exercises in early grades enhances students' abilities to conceptualize, think, discuss, brainstorm, and ask questions.

Initially, through elementary mathematical sciences, students acquire foundational knowledge about numbers and counting, geometric shapes, and concepts related to time and space. By delving into these sciences, students can analyze and synthesize the characteristics of objects, as well as grasp the straightforward connections of comparison, contrast, and generalization. The simple relationships between these early mathematical concepts help shape the understanding of children:

- Concepts about the shapes of geometric figures and objects are formed;
- Understanding phase relationships and acquiring the skill of phase localization are developed;
- Concepts about time are shaped;
- Concepts about quantity (magnitude) are developed;
- Knowledge about numbers and counting is provided, and concepts about quantitative relationships within the decimal system are formed.

REFERENCES

1. Toshboyeva, S. R., & Turg'unova, N. M. (2021). THE ROLE OF MATHEMATICAL OLYMPIADS IN THE DEVELOPMENT OF INDIVIDUAL CONSCIOUSNESS. Theoretical & Applied Science, (4), 247-251.
2. Toshboyeva, S. R., & Shavkatjonqizi, S. M. (2021). Specific ways to improve mathematical literacy in the process of sending students to hinger education. Academicia: An international multidisciplinary research journal, 11(10), 234-240.
3. Toshboyeva, S. R. (2020). Competent approach in teaching probability theory and mathematical statistics. EPRA International Journal of Research and Development (IJRD).
4. Rahmonberdiyevna, T. S., & Soxibovna, A. M. (2021). Techniques for Teaching Elementary Students Rational Numbers and Convenient ways to Perform Operations on Them. International journal of culture and modernity, 11, 283-287.
5. Raxmonberdiyevna, T. S., & Shavkatjonqizi, S. M. (2021). Methods for the development of stochastic competence in mathematics lessons at school. ACADEMICIA: An International Multidisciplinary Research Journal, 11(5), 863-866.
6. Rakhmonberdiyevna, T. S. (2022). CREATIVITY AS A PEDAGOGICAL PROBLEM. Conferencea, 138-141.
7. Rakhmonberdiyevna, T. S. (2022). RESEARCH OF CREATIVE ACTIVITY OF THE FUTURE PRIMARY CLASS TEACHER. Conferencea, 155-157.
8. Rahmonberdiyevna, T. S. (2022). MULOHAZALAR VA PREDIKATLAR USTIDA AMALLAR MAVZUSI BO‘YICHA BA’ZI MASALALARNI YECHISHNING SODDA YO‘LLARI. RESEARCH AND EDUCATION, 1(2), 234-237.

9. Тошбоева, С. Р. (2022). БЎЛАЖАК БОШЛАНҒИЧ СИНФ ЎҚИТУВЧИЛАРИНИНГ ИЖОДИЙ ҚОБИЛИЯТЛАРИНИ РИВОЖЛАНТИРИШНИНГ НАЗАРИЙ АСОСЛАРИ. Journal of new century innovations, 4(1), 294-297.
10. Тошбоева, С. Р. (2022). БЎЛАЖАК БОШЛАНҒИЧ СИНФ ЎҚИТУВЧИЛАРНИНГ ИЖОДИЙ ҚОБИЛИЯТЛАРИНИ МАЛАКАВИЙ АМАЛИЁТ ЖАРАЁНИДА РИВОЖЛАНТИРИШНИНГ ПЕДАГОГИК ХУСУСИЯТЛАРИ. Journal of new century innovations, 4(1), 289-293.
11. Toshboeva, S. R., Mallaboeva, B. M., & Yusupova, L. A. K. (2022). LAWS AND THEIR APPLICATION BASED ON SOME INTERESTING COMBINATORIAL PROBLEMS. Oriental renaissance: Innovative, educational, natural and social sciences, 2(10), 1341-1349.
12. Rahmonberdievna, T. S., & Mukhtorovna, M. B. (2022). LAWS AND THEIR APPLICATION BASED ON SOME INTERESTING COMBINATORIAL PROBLEMS.
13. Toshboyeva, S., & Hojimamatova, H. (2023). THE SIMPLEST AND MOST CONVENIENT METHODS OF DEFINING FUNCTIONS IN MATHEMATICS AND EXAMPLES OF GP IN THE FIELD OF VALUES. Modern Science and Research, 2(5), 730-737.
14. Rahmonberdiyevna, T. S., & Davlatboyevna, E. D. (2023). Analysis of Examples and Problems Related to Types of Fractions, Mixed Numbers, Addition and Subtraction of the Same Fraction. European Journal of Pedagogical Initiatives and Educational Practices, 1(2), 24-29.
15. Rahmonberdiyevna, T. S. (2023). PEDAGOGICAL AND PSYCHOLOGICAL BASIS OF DEVELOPMENT OF LOGICAL THINKING OF STUDENTS. *IJTIMOIY FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI*, *3*(5), 136-140.
16. Rakhmonberdievna, T. S. (2023). Methods for solving simple text problems in elementary grades.(in 4th grade). *Journal of Science-Innovative Research in Uzbekistan*, *1*(2), 240-244.
17. Tashboyeva, S., & Khojimamatova, K. (2023). PROCEDURE FOR WORKING SIMPLE TEXT PROBLEMS IN ELEMENTARY GRADES.(IN 3RD GRADE). *Центральноазиатский журнал образования и инноваций*, *1*(6 Part 6), 82-85.
18. Rahmonberdiyevna, T. S. (2023). PROCEDURE FOR WORKING SIMPLE TEXT PROBLEMS IN ELEMENTARY GRADES.(IN 1ST GRADES). *MODERN PROBLEMS IN EDUCATION AND THEIR SCIENTIFIC SOLUTIONS*, *2*(2), 183-187.
19. Rahmonberdiyevna, T. S. (2023). Analysis of the order of multiplication and division operations on fractions and related examples: Crossref. *IQRO*, *4*(1), 218-221.
20. Toshboyeva, S., & Xojimamatova, X. (2023). PROCEDURE FOR WORKING SIMPLE TEXT PROBLEMS IN ELEMENTARY GRADES.(IN 2ND GRADES). *Modern Science and Research*, *2*(7), 221-225.
21. Rahmonberdiyevna, T. S. (2023). BOSHLANG'ICH SINFLARDA SODDA MATNLI MASALALARNING ISHLASH TARTIBI.(2-SINFLARDA).