

DELVING INTO THE WORLD OF NUMBERS: INNOVATIVE APPROACHES IN ELEMENTARY MATHEMATICS EDUCATION

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Abstract

Mathematics is a subject that has a very important role in a child's future life, but in reality children are less serious, tend to find it difficult and do not like math lessons. This research aims to find out what innovative approaches are in basic mathematics education. Library data collection method, or research in which the research object is explored through various library information. The nature of this research is descriptive analysis, namely the regular analysis of the data that has been obtained, then providing understanding and explanation so that it can be understood well by the reader. The conclusion of this research is that one of the innovations in basic mathematics education is the use of interactive media, such as application-based mathematics games, animated learning videos, and interesting teaching aids. Apart from the use of technology and collaboration, other innovations include extracurricular activities and mathematics competitions to motivate children.

Keywords: Innovative approach, education, basic mathematics

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INTRODUCTION

The application of mathematics is closely related to everyday life. Mathematics has many functions, including comparing pocket money, calculating the weight of objects and various other disputes, playing a role in resolving conflicts between people. At this time, mathematical ability and the ability to use mathematics are important requirements for humanity. Without the contribution of mathematical concepts and basic mathematical processes, humanity would face many difficulties. Therefore, humans need mathematics as a tool to fulfill their daily needs. Therefore, mathematics is the key to learning. The 2013 curriculum's integrated thematic approach to teaching materials, which includes teaching elementary school students the fundamentals of music education, is beset by basic issues due to the effects of the Fourth Industrial Revolution and 21st-century abilities. (Desyandri et al., 2021).

Education will not mean anything if it is not accompanied by continuous improvement, enhancement, development and innovation in learning (Desyandri & Maulani, 2019).

The development of education continues to change every year along with the challenges in preparing quality and competitive human resources in the global era. This condition also has an impact on learning in elementary schools, such as mathematics subjects.

Mathematics is the basic capital in technological progress and builds various scientific foundations. Mathematics is taught from elementary school to college, mathematics improves the ability to think logically, analytically, systematically, critically, creatively, and the ability to work together. Mathematics skills are the basis for facing a more competitive and rapidly changing life (Permendiknas Number 22 of 2006 concerning Content Standards for Primary and Secondary Education Units (Husna, Saragih, & Siman, 2013)).

Mathematics is a subject that has a very important role in a child's future life, but in reality children are less serious, tend to find it difficult and do not like math lessons. Mathematics is a subject that has different properties and characteristics from other subjects so that it requires special basic abilities. To understand mathematics, you need to understand basic skills in calculating, such as addition, subtraction, division and multiplication, the concept of relationships, measurement, geometry and group or set. Without mastering this skill, it is difficult to learn mathematics well. In honing and improving students' numeracy skills, teachers need to innovate in learning. Innovation that can foster students' interest in learning.

The level of student focus during the mathematics learning process makes mathematics unpopular with children and causes students to have difficulty learning, easily feeling bored. A teacher and students are given the freedom to determine the appropriate learning process, so that a teacher is required to innovate learning,

especially mathematics learning. Mathematics is a basic subject that will be used up to university level (Swaratifani & Budiharti, 2021).

RESEARCH METHOD

This kind of research is known as library research; it is a collection of studies on data gathering techniques used in libraries or studies in which the research object is investigated using a variety of library resources. Research that analyzes or critically evaluates information, theories, or discoveries found in a corpus of academically focused literature is known as library research or literature reviews. It also formulates theoretical and methodological contributions to a certain subject. (Hadi Sutrisno, 2015). Finding different theories, laws, postulates, principles, or ideas that are used to examine and resolve defined research issues is the main goal of library research. This research is characterized by descriptive analysis, which entails a systematic examination of the collected data followed by comprehension and justification to ensure the reader understands the findings

RESULT AND DISCUSSION

Basic concepts of elementary mathematics education

A lot of basic knowledge is understanding the basic concepts of mathematical material itself. Needless to say, each of us must understand the context better than the mathematics itself. In learning, students' activities are mostly listening to the teacher's explanations and taking notes, learning mathematics directly from the symbols. The teaching process still tends to be teacher-centered, and there are not many student-centered applications. Meanwhile, most teachers in teaching still pay little attention to students' thinking abilities and the teaching methods used are less varied (Sadiq, F. 2014).

Basic aspects of mathematics are a requirement to be able to complete mathematics work, without understanding the components of mathematics you will experience difficulties in learning mathematics. A mathematics teacher must try to "reduce" the abstractness of mathematical objects so that it makes it easier for students to grasp mathematics lessons at school. Thus, a mathematics teacher in explaining facts, concepts, skills and principles must adapt to the development of students' reasoning so that it looks concrete (Rahmita Yulia Gazali, 2016).

At primary school level the level of concreteness must be greater than at higher school levels. The higher the school level, the higher the level of abstractness. Perhaps by relating the material to be presented to the reality around students or adapting it to its use. So, the presentation is often not directly in the form of mathematical material. For example, to explain the concept of "5" not directly with the five symbol, but instead introduce it with a concrete object, for example with five marbles. After understanding the meaning of the word five, the symbol is introduced. Likewise, explaining the

concept of geometry can be started by bringing in shapes made from cardboard, paper, and so on. This is followed by geometric shapes formed with several sticks and then increasing to images accompanied by symbols or words.

The basic concepts of basic mathematics education are:

1. Understand the concept of whole numbers and fractions, arithmetic operations and their properties, and use them in solving daily life problems.
2. Understand flat shapes and simple spatial shapes, their elements and properties, and apply them in solving problems in everyday life.
3. Understand the concepts of size and measurement of weight, length, area, volume, angle, time, speed, discharge and apply them in solving daily life problems.
4. Understand the concept of coordinates to determine the location of objects and use them in solving daily life problems.
5. Understand the concept of data collection, presenting data with tables, pictures and graphs (diagrams), sorting data, data ranges, arithmetic averages, modes and applying them in solving daily life problems.
6. Have an attitude of respect for mathematics and its uses in life
7. Have the ability to think logically, critically and creatively.

Innovations in elementary mathematics education

The mathematics learning process must provide opportunities for students to see and experience for themselves the use of mathematics in real life, as well as provide opportunities for students to be able to construct their own knowledge through various activities. The hope is that students can master basic mathematical concepts correctly so they can apply them in everyday life. Mathematics is a tool for developing ways of thinking. Mathematics is very necessary both for everyday life and in facing advances in science and technology. So that mathematics lessons need to be given to every student from elementary school, even from kindergarten, thus the hope to be achieved in learning mathematics at the junior high school level is to have adequate mathematical thinking skills, because students must be prepared attitudinally and mentally to facing the situation and conditions of development of world globalization, technology and information in the future.

One of the innovations in basic mathematics education is the use of interactive media, such as application-based mathematics games, animated learning videos, and interesting teaching aids (Farisdianto, 2020). This aims to make mathematics learning more interesting and help students visualize difficult concepts. Apart from that, collaborative learning is also emphasized, where students are invited to work together to solve mathematical problems and share understanding with each other.

Apart from the use of technology and collaboration, other innovations include extracurricular activities and mathematics competitions to motivate students. In this way, students can see the use of mathematics in everyday life and experience the fun

of solving mathematical problems. By implementing this innovation it will create a more enjoyable learning environment, encourage critical thinking, and increase their understanding of mathematics (Anggreini & Priyojadmiko, 2022).

This innovation is also expected to overcome the challenges students face in learning mathematics, such as difficulty understanding abstract concepts and lack of interest. Apart from that, mathematics learning innovation also seeks to develop 21st century skills in students. Apart from understanding mathematical concepts, students are also invited to develop logical thinking, problem solving, communication and collaboration skills. This is in line with future needs where these skills will become important in facing global challenges.

The important role of basic mathematics education in children's intellectual development

Jean Piaget (1886-1980), a Swiss psychologist, spent 50 years studying how children think and the processes related to intellectual development. In explaining how young children's intellect develops, Piaget believed that children carry from birth a curious nature and constantly try to understand the world around them. Children's curiosity encourages them to actively construct representations of the environment they experience in their minds. The result of this activity is that in the child's mind a network of concepts called schema is formed. At all levels of development, the child's need to understand his environment encourages him to investigate and construct theories that explain what he experiences. Piaget stated that humans grow and adapt to their environment. Piaget's constructivist cognitive view also states that children at any age are actively involved in the process of obtaining information and building their own knowledge (Jarmita, 2015).

Mathematics education for children is a means that can be used to develop thinking skills, encourage children to develop the various intellectual potentials they have and data is used as a means to foster various positive attitudes and behavior in order to lay the foundations of personality as early as possible, such as being critical, tenacious, independent, scientific, and rational (Mirawati, 2014).

Challenges faced in teaching basic mathematics

The low or nonexistent attention of kids in math classes is one of the issues with math education. Mathematical learning activities completed at home, at school, and in the community demonstrate a person's complete self-involvement and interest in the subject. Youngsters who are motivated to learn mathematics are those who put in the effort and are willing to study the subject. Why don't children have a high interest in mathematics? According to several factors, namely: 1) cultural factors in our society, there is a culture that people are not happy with the culture of hard work. The more technology can replace the role of human work, the more people don't want to work

hard and tend to hand over many things to machines or other tools. Many children want the process of achieving goals instantly and ignore the process of hard work, thus making children memorize and not pay attention to the process. 2) educational system factors Everything in our educational system is usually decided from "above". In this instance, the instructor serves as the primary information source, with the student acting as a blank slate to be filled with a variety of knowledge. Children's development is neither centered nor given attention in the learning process, which is still teacher-centric. Instead of serving as the primary information source and the pinnacle of scientific authority, teachers must adopt a new role as facilitators, assisting pupils in developing their own knowledge. It is intended that by using this paradigm, kids will study more actively, engage in lively conversations, have the bravery to express their opinions and accept those of others, and have a high level of self-confidence. Mathematics is a human activity (Hans Freudental, 1973). According to him, students cannot be viewed as passive recipients of ready-made mathematics, but students must be given the opportunity to rediscover mathematics under adult guidance. In this way, learning mathematics becomes more meaningful for students and can provide adequate competency provisions both for further study and for entering the world of work. 3) assessment system factors assessment systems in schools tend to only assess the final results of children's work and not the process of children's work. Another problem is that there are still many parents who do not understand mathematics material and how to teach it, so they will be confused when their children ask their parents about mathematics problems. 4) factors of the nature of the field of study. Typical characteristics of mathematics include objects that are abstract, use symbols that are not widely used in everyday life, thought processes that are limited by strict rules, and material in mathematics that sometimes does not show its usefulness. in everyday life. Of course, children must have perseverance and be willing to work hard to discover the beauty of mathematics, so that they will be interested in mathematics. 5) the teacher factor which is the main component in the educational process because the teacher is the implementer of the process. The methods used by teachers in teaching mathematics are sometimes not in accordance with children's way of thinking, and are not in accordance with children's development.

One thing that must be understood and realized is that not all students have a high intellectual level. Each student's ability to capture the lesson material presented is different. "Every child has different reasoning powers. Some of their responses to the material presented by the teacher were fast and some were slow. Forcing and scolding students will not produce results as expected. Especially for mathematics subjects, do not ask children to memorize formulas, because mathematics is an exact science that requires understanding and persistent practice. Memorizing formulas and how to do problems is not the right way to make children proficient in mathematics (Julie Stern, 2108).

CONCLUSION

There are several important points related to innovative approaches in mathematics education, namely:

1. Basic concepts of basic mathematics education
2. Innovation in basic mathematics education
3. The important role of basic mathematics education in children's intellectual development
4. Challenges faced in teaching basic mathematics

One of the innovations in basic mathematics education is the use of interactive media, such as application-based mathematics games, animated learning videos, and interesting teaching aids. Apart from the use of technology and collaboration, other innovations include extracurricular activities and mathematics competitions to motivate students.

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