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IMPLEMENTATION OF CONSTRUCTIVISM LEARNING IN IMPROVING UNDERSTANDING OF THE CONCEPT OF BUILDING FLAT FOR GRADE 1 STUDENTS OF SDN AJUNG 01 KALISAT

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Abstract

Mathematics learning at the elementary school level plays a crucial role in shaping students' logical and analytical thinking skills. However, the low understanding of 1st grade students of SDN Ajung 01 Kalisat towards the concept of building flat triangles and squares is caused by a learning approach that is still memorized and only relies on image media in textbooks or digital media. This study aims to describe and examine the implementation of constructivist learning in improving the understanding of the concept of building flat for 1st grade students of SDN Ajung 01 Kalisat through the use of concrete media and direct learning experiences. The theory of constructivism was chosen because it facilitates students' active construction of knowledge. This research method uses a descriptive qualitative approach with observation, interviews, and documentation data collection methods to provide an in-depth picture of the learning process in the classroom. The results of the study show that the application of constructivism theory can improve students' understanding of the concept of triangular and rectangular flat building materials. This can be seen from the ability of students to construct their own knowledge through concrete objects, increased exploratory activities in the classroom, and evaluation results that show a deeper understanding than before. The results of the study show that the use of the constructivist approach can create a more meaningful and relevant learning experience for 1st grade elementary school students.

Keywords: Constructivism Learning, Flat Building, Elementary Mathematics

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A. Introduction

Mathematics learning plays an important role in the development of logical, analytical, and systematic thinking skills in students (Arikunto, 2021). Mathematics not only involves learning about numbers, but also teaches how to think critically to solve problems in daily life. Therefore, in primary education, it is important to provide a truly meaningful and relevant mathematics learning experience for students so that they can apply it in their daily lives.

The learning experience of mathematics so far, which is only required to memorize and the use of inappropriate learning approaches, has resulted in a lack of understanding of grade 1 students on the concept of triangular and rectangular flat buildings. This is because they only learn through pictures in books and the digital media. Therefore, it is necessary to use a learning approach whose implementation requires concrete media and direct experiences. One of the learning approaches that suits these needs is constructivist learning theory. So that the formulation of the problem arises: "How can the implementation of constructivism learning improve the understanding of the concept of building flat in 1st grade students of SDN Ajung 01 Kalisat?"

This study aimed to describe and examine the implementation of constructivist learning in improving the understanding of the concept of flat building in grade 1 elementary school students.

Constructivism learning theory

Constructivist learning theory emphasizes that knowledge is actively constructed by individuals through interaction with the environment rather than passively received from teachers (Slavin, 2020). Constructivism, one of the most popular learning theories, posits that individuals actively build their knowledge and understanding through interaction with their experiences. This theory emphasizes the primary role of students in the learning process, marking a shift in focus from a more passive to a more participatory approach. Within the framework of constructivism, learning is considered a dynamic process in which students not only receive information but are also actively involved in designing the meaning of those experiences.

Jean Piaget stated that 7-year-olds (Grade 1 of elementary school) build knowledge through assimilation and accommodation of objects around them. Thus, the teacher only acts as a facilitator who provides concrete media, while students actively discover the characteristics of a flat building themselves.

Math learning

Mathematics is a tool to develop a way of thinking; therefore, mathematics is indispensable for solving problems in daily life and supporting the advancement of science and technology (Offirston, 2014:1). Hudoyono (Yayuk, 2019, p. 1) states that mathematics is a field of science that trains reasoning to think logically and systematically

in solving problems and making decisions. Learning mathematics requires a distinctive approach because mathematics is abstract, consistent, hierarchical, and deductive. According to Fauzi and Mulyani (2013), mathematics learning in elementary school should use a concrete and contextual approach so that students can understand concepts in depth and meaningfully. Moreover, students at the age of 6-7 years based on the theory of cognitive development put forward by Piaget (quoted by Rahmawati, 2015), are at a concrete operational stage where they are not able to think abstractly but need concrete media and direct experience. An appropriate learning approach is required to overcome this problem.

Constructivist learning theory in mathematics learning

Constructivist learning theory emphasizes that knowledge is actively constructed by individuals through interaction with the environment, rather than passively received from teachers (Slavin, 2020). The theory of constructivism in mathematics learning views that mathematical knowledge cannot be transferred entirely from the teacher's mind to the student's mind, but must be actively built by the student himself through dynamic cognitive processes.

According to this view, students are not "empty vessels" that simply receive information but active subjects who construct new understandings based on the structure of prior knowledge.

In the context of abstract mathematics, constructivism emphasizes the importance of individual mental activity (assimilation and accommodation according to Piaget) and social interaction (collaboration and scaffolding according to Vygotsky) to achieve deep conceptual understanding. Thus, constructivism-based mathematics learning shifts from simply memorizing formulas to a process of reinvention, where teachers act as facilitators who provide contextual problems for students to explore, discuss, and reflect on their mathematical ideas independently.

B. Methods

This research uses a qualitative method, in which the process of data collection is carried out with interview and observation techniques, as well as the documentation needed to describe the real conditions of the research results.

- The first stage is planning, in which the researcher conducts interviews and pretests of grade 1 students regarding their understanding of the concept of triangular and rectangular flat buildings. The researcher then compiled RPM, learning media, and assessment instruments that integrate constructivism learning to improve the understanding of the concept of flat building for grade 1 students.

- The second stage is acting or implementation, where constructivist learning is applied to understand the concept of triangular and rectangular flat buildings in grade 1 students. In this process, students are provided with media in the form of concrete objects in their surrounding environment, such as books, ice cream sticks, origami paper, straws, and others. Students are invited to play by arranging ice cream sticks and straws according to the shape of the objects they find around them to understand that objects with three sides are called triangles, while objects with four sides are called four facets. In this way, students can discover for themselves how to understand the shape of triangular and rectangular flat buildings through direct experience and interaction with the surrounding environment.
- The third stage is observation, at which stage the researcher observes and records student behavior during learning so that changes in the learning atmosphere and the process of students' understanding of the learning material with their group mates can be known.
- The fourth stage is reflection, in which the researcher provides formative test instruments to students to measure the achievement of learning outcomes after participating in the learning stages with a constructivist approach.

C. Finding and Discussion

The implementation of constructivist learning succeeded in improving the understanding of the concept of flat buildings through three main findings. Based on the data from the initial test instruments and formative tests, there was a real increase in students' understanding of the concepts of triangles and quadrants. This shows that the switch from textbook memorization methods to an independent knowledge construction approach can provide better and measurable academic results.

Based on the interview results, students consistently stated that using concrete media, such as ice cream sticks, is much easier to understand than just looking at two-dimensional images in package books. Physical media provide a sensory experience that helps students identify the characteristics of a flat building in a concrete manner.

Based on the results of the observations, the implementation of constructivism succeeded in changing students' perception of learning. Students feel that they are not learning under pressure but rather playing. However, from the activity of arranging ice cream sticks and straws, students were proven to be able to independently deduce new knowledge about the difference in the number of sides in triangles and squares.

At SDN Ajung 01 Kalisat, the constructivist learning process begins by providing problems that are relevant to daily life. The teacher does not directly explain about " triangles " and " quadrangles ", but asks students to group objects in class.

Based on the results of observations at SDN Ajung 01, the constructivist approach has completely changed the way classes are conducted. Previously, students listened more and accepted what the teacher said about getting up flat. However, in constructivism, grade 1 students are invited to create their own knowledge by using objects around the classroom, such as whiteboards, notebooks, and others.

The teacher provides other concrete objects in the form of ice cream sticks and straws for students to build their knowledge of building flat triangles and quadrants. This is in accordance with Jean Piaget's theory that children aged 7-8 years learn more effectively by manipulating physical objects. Students not only memorize the name of a flat building, but they also understand its characteristics because they invented it themselves.

The research data show that the students' concept comprehension scores have increased significantly. This increase occurred due to assimilation and accommodation processes. Assimilation occurs when students associate new knowledge of the concept of triangles with objects with which they are already familiar, such as slices of pizza or the roof of a house. Accommodation occurs when students adjust their understanding that not all four-sided objects are called "squares" but rather "squares" squares. Through small group discussions, Grade 1 students at SDN Ajung 01 can exchange opinions and correct misunderstandings without feeling judged by the teacher.

The use of media, such as ice cream sticks and colorful straws, is very helpful in learning. For 1st graders, the concepts of "sides" and "corners" can be very abstract. However, when they used a real object to form a square, they intuitively understood that there were four connecting lines for a square and that the task of connecting lines for a triangle.

The results of the reflection show that learning has become more meaningful. Students not only know "what" a flat build is, but also "why" a shape is called a triangle or a square. They understand the logic behind these concepts.

Although the results were positive, there were challenges in time management. The knowledge construction process takes longer than the lecture method. However, researchers have found that although the process was slow at the beginning, student retention was much stronger. Students do not forget easily because they understand the logic and do not just memorize the visuals.

D. Conclusion

Based on the results of the research and discussion on the implementation of constructivism learning in 1st grade students of SDN Ajung 01 Kalisat, there are several important conclusions. The application of constructivism learning theory, which is carried out through four stages, namely planning, implementation, observation, and reflection,

has proven to be effective in improving the understanding of the concept of triangular and quadrilateral flat buildings. Grade 1 students, who were initially passive listeners, have now turned into inventors who actively build their own knowledge.

The use of manipulative media relevant to the surrounding environment, such as ice cream sticks, straws, books, and origami paper, plays a crucial role in bridging students' thinking from the concrete operational stage to an understanding of abstract geometric concepts. Through the physical activity of arranging these objects, students can intuitively and deeply understand the logic of sides and angular points.

There was a sharp increase in concept comprehension scores through assimilation and accommodation processes. Students no longer just memorize shapes visually but can classify objects based on their functional characteristics, for example, understanding that a square is not just a square but a building with four sides. Small group discussions have also proven effective in validating students' understanding and building their confidence in learning.

Although the constructivist method requires more time management than the conventional lecture method, the reflection results show that students' retention of the material is much stronger. Learning based on direct experience makes the material not easy to forget because students understand the essence of why a building is categorized as triangular or square.

Overall, constructivist learning at SDN Ajung 01 Kalisat has succeeded in creating a lively, meaningful, and relevant learning atmosphere for students' daily lives. Therefore, this approach is highly recommended for application to other mathematics materials that are abstract at the elementary school level.

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