DEVELOPMENT OF STATION LEARNING DEVICES USING METAPHORICAL THINKING APPROACH TO IMPROVE LEARNING INDEPENDENCE AND MATHEMATICS LEARNING OUTCOMES IN CLASS V SD STUDENTS

Toni Ernawan[1], Wardono[2], Suparti[3]
e-mail : toniernawan50@admin.sd.belajar.id,
wardono@mail.unnes.ac.id,
suparti@ecampus.ut.ac.id,
Program Studi Magister Pendidikan Dasar
Universitas Terbuka Semarang

Abstract

Toni Ernawan. 2023. Development of *Station Learning* Learning Devices with a *Metaphorical Thinking* Approach to Increase Learning Independence and Mathematics Learning Outcomes in Grade V Students.

Education is one of the most important aspects of human life. Through education humans are able to compete and survive in the era of globalization. Learning can be said to be effective if learning can achieve the target or at least achieve the basic competencies that have been set. One of the learning that is felt to be not effective in learning mathematics. The characteristics of mathematics are objects that are abstract, deductively axiomatic, so that many students find it difficult to learn mathematics. In learning mathematics, especially fraction material for fifth grade students at SDN Punggursugih, Ngawen District, Blora Regency, learning independence and learning outcomes are still low. Therefore, this study aims to improve learning independence and student learning outcomes through the development of *Station Learning learning* tools with a *Metaphorical Thinking* approach.

The population in this study were all fifth grade students at SDN Punggursugih. Research and development of *Station Learning* learning tools with a *Metaphorical Thinking* approach to learning in class V SDN Punggursugih, Ngawen District, Blora Regency.

Based on the results of research and discussion, the development of *Station Learning* learning tools with a *Metaphorical Thinking* approach is capable of increasing learning independence and student learning outcomes.

Keywords: Station Learning, Metaphorical Thinking Approach

1. Introductions

All corners of the world, including Indonesia, want advanced human resources who are intelligent, moral and educated. Every human being has the right to get a proper education. Education is an important aspect of human life. With education, humans are able to compete and survive in the era of globalization. One of the substances emphasized in improving the quality of education is creating effective learning. Learning is said to be effective if learning can reach the target or at least achieve the basic competencies that have been set. The government continues to strive to improve the quality and quality of education. Improving the quality of education is directed at improving the quality of Indonesia's Human Resources (HR) as a whole through the heart, mind, feelings and sports so that they have competitiveness in facing global challenges. As for one of the goals of education contained in the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System which emphasizes that the purpose of National Education is to grow and develop individuals who (1) believe in and fear God Almighty, (2) have noble character, (3) have knowledge and skills, (4) have physical and spiritual health, (5) have a strong and independent personality, and (6) have a sense of social and national responsibility.

Mathematics has an important role in the development of science and technology, so it is important to teach students at school. This is confirmed in RI Law no. 20 of 2003 concerning the National Education System which states that mathematics is a compulsory subject for students at the primary and secondary education levels. Mathematics is a subject that is still considered difficult by students. Various studies have been conducted to increase students' interest in mathematics, updating all aspects of the learning process both methods, learning strategies or developing media to assist the learning process. The situation at school shows that the implementation of existing learning methods is still lacking, thus making students less active and even tending to be passive.

Changes in the learning process must persist, because a teacher should not provide learning in the same (static) way. The teacher must provide changes for the progress of student learning. Selection of appropriate learning methods, will be able to provide significant changes in students. According to Cittor & Kamalanabhan (2014) that Metaphorical Thinking assists learners in connecting and building parallel patterns and relationships into language as well as relevant symbols to provide information. Cittor & Kamalanabhan (2014) continued to explain that Metaphorical Thinking has a strong influence on the ability to process information. Through learning with the Metaphorical Thinking approach, efforts are made to make abstract mathematics into concrete mathematics for fifth grade students at SDN Punggursugih, Ngawen District, Blora Regency, for the 2022/2023 academic year, as explained by Hendriana (2012), metaphorical thinking in mathematics is used to clarify one's way of thinking that is connected with math activities. The development of Station Learning learning tools with Metaphorical Thinking becomes fun learning without forgetting the substance of the learning process.

2. Research Methods

The model that will be developed in this study uses the development model presented by Borg and Gall in (Setyosari, 2010). The strategy for developing an educational product by Borg and Gall is referred to as research and development, which is a process used to develop and validate educational products. The product produced in this study is the development of a Station Learning learning tool with a Metaphorical Thinking approach for fifth grade students at SDN Punggursugih, Ngawen District, Blora Regency.

In this research and development, researchers will develop a Station Learning learning tool with a Metaphorical Thinking approach for learning in class V. The research and development steps according to Borg and Gall (in Sugiyono, 2016) consist of 10 steps, namely: (1) Potential and problems , (2) Data collection, (3) Product design, (4) Design validation, (5) Design revision, (6) Product trial, (7) Product revision, (8) Usage trial, (9) Product revision and (10) Mass production.

This research will be carried out at SDN Punggursugih, Ngawen District, Blora Regency. The research will be carried out in class V for the 2022/2023 school year. The factor for choosing the location for this study was SDN Punggursugih as the experimental class because it was in accordance with the current assignment. The selection factor for the fifth grade students at Punggursugih Elementary School is because these schools have the same intellectual abilities.

Another reason for choosing this school was because SDN Punggursugih was the most effective place.

The population in this study were all fifth grade students at SDN Punggursugih, totaling 20 students, 10 students were selected as the experimental class and 10 other students as the control class. Class selection is based on the considerations of the researcher and the class teacher itself.

Selection of respondents using porposve sampling technique. Possible sampling technique is a technique for taking samples of data sources with certain considerations (Sugiyono, 2013). The consideration in question is that the selected respondents (data sources) can represent several people who are in the high, medium, and low groups. The number of respondents selected was 6 people.

The analysis was carried out to determine the validity, practicality and effectiveness of the instruments used as measuring instruments in research. The research instruments in this study included test and non-test instruments.

3. Result and Analysis

In this section, data analysis will be described regarding the development of Station Learning learning tools with the Metaphorical Thinking approach to increase learning independence and mathematics learning outcomes in fifth grade students. The following is the result of an analysis of student learning outcomes and describes the findings during the treatment of respondents who have been selected based on results of critical thinking (high, medium, low).

Learning is said to be effective if after being tested in the experimental class the results are: (a) students' problem-solving abilities in mathematics reach mastery of classical learning; (b) there is an increase in students' problem-solving abilities on math problems with Station Learning learning tools with a metaphorical thinking approach; and (c) the problem-solving ability of class students using Station Learning learning tools with the Metaphorical Thinking approach is higher than that of conventional learning classes.

The instrument used in testing the effectiveness of learning devices is a test of mathematical problem solving ability. Based on these data, it is then analyzed to determine the effectiveness of the use of learning devices with Station Learning learning tools with a metaphorical thinking approach. Based on the results of the effectiveness test of learning tools, it was found that (1) the proportion of students in Station Learning learning tools with the Metaphorical Thinking approach that met the minimum completeness criteria of 70 reached more than 75%, (2) there were differences in student learning outcomes before and after being given Station learning tools

Learning with a metaphorical thinking approach, (3) there is a difference in the average final ability of the experimental class and the control class, (4) based on the average student learning outcomes in the pretest and post test scores, it shows an increase in learning outcomes in both the control class receiving conventional learning methods as well as in the experimental class that received the learning method of the Station Learning learning tool with the metaphorical thinking approach. (5) in the final learning outcomes it was found that the Station Learning learning tool with the metaphorical thinking approach proved effective in improving student learning outcomes compared to conventional learning methods with an average increase of 9.45 from the initial test results.

The independence of learning mathematics is one of the basic abilities that students must have, including being able to complete assignments and responsibilities, being able to solve problems and believe in one's own abilities. The independent character of the learner according to Sumahamijaya et al (2003) will emerge because of the following indicators: (1) Initiative; (2) Creativity (inventiveness); (3) Innovation (new invention); (4) Improvisation (development); (5) Pro-active (never give up in seeking and finding solutions to various problems encountered).

Students' skills in solving problems can be seen from students' responses during learning. When learning takes place, is there a positive reciprocal relationship or not in the classroom between the teacher and students, such as question and answer when the lesson is finished or when there is material that is not understood by students. In addition, the level of student focus when learning takes place and interest in learning also affect student skills. The more focused the students when the material is delivered, the more skilled the students will be in solving a problem. The increase in students' skills before being given the method and after being given the Station Learning learning tool with the Metaphorical Thinking approach can be seen in the initiative indicator which was originally 69% to 71% as shown in Figure 4.10. The ability of students to complete tasks and responsibilities can be seen from the seriousness of students in doing homework given by the teacher. Through these indicators, it can increase student independence in learning.

4. Closing

The development of Station Learning learning tools with the Metaphorical Thinking approach produces learning tools that are valid, practical, and effective in increasing learning independence and student learning outcomes as evidenced by students being more independent, active, and students completing KKM. Learning tools developed include syllabus, lesson plans, worksheets, and student books.

The use of Station Learning learning tools with the Metaphorical Thinking approach can increase student learning independence. Student learning independence as measured through the indicators Initiative, Creativity, Innovation, Improvisation, and Pro-active experienced an average increase of 3.4% for each indicator between before and after the Station Learning method with the metaphorical thinking approach was applied.

The use of Station Learning learning tools with the Metaphorical Thinking approach was able to increase the average learning outcomes of the experimental class from 67.08 to 76.53. From this average value, it can be concluded that there is a difference in the average results of learning mathematics from before and after being given a Station Learning learning tool with a metaphorical thinking approach.

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