

IMPROVING MATHEMATICS LEARNING OUTCOMES THROUGH PROBLEM BASED LEARNING (PBL) LEARNING MODEL FOR 4TH GRADE STUDENTS

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Abstract

Problem-Based Learning (PBL) is an active learning approach that engages students in solving real-world problems to enhance their mathematics learning outcomes. This study aims to investigate the effectiveness of the PBL model in improving students' understanding and achievement in mathematics. The research employed an experimental design with a pretest-posttest control group. The participants were divided into an experimental group receiving PBL-based teaching and a control group receiving conventional teaching. The results demonstrated that students in the PBL group exhibited significantly better mathematics learning outcomes compared to the control group. These findings suggest that PBL holds promise as an effective learning approach, promoting critical thinking, problem-solving skills, collaboration, and motivation in mathematics. This study's implications may contribute to the development of learning strategies that emphasize the practical application of mathematical concepts, fostering students' deeper understanding and ability to apply these concepts effectively.

Keywords: Mathematics, Problem-Based Learning, Teachers

1. INTRODUCTION

Education is very influential in the development process of a nation and state in order to develop well, if education is not supported, it is impossible for a nation and state to develop well. Education is all learning experiences that take place in all environments and throughout life (D.D Kristianingsih, 2010). Education is part of life to influence and develop each individual. Education can be obtained from formal education and non-formal education. Formal education can be obtained through schools, while non-formal education can be obtained from courses or training institutions. Primary school is one part of formal education and compulsory education program. Learning in elementary schools focuses not only on student learning completeness but also on strengthening student character. In the learning process, learning activities will take place optimally if the potential and involvement of students can be optimized during the learning process (Arista, 2018).

The definition of education formulated in Law Number 20 of 2003 concerning the National Education System article 1, namely: Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to develop religious spirituality, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state (Devita, 2015) it can be concluded that education is the process of developing all human abilities and behavior through teaching with the aim of developing abilities and shaping the character

and civilization of a dignified nation in order to educate the nation's life and realize quality human resources, and develop the potential of students to become human beings who believe and fear God Almighty (Eismawati, 2019). Education is an ideal concept, while teaching is an operational concept and the two are closely related and inseparable.

Mathematics is one of the sciences that plays an important role in various aspects of life. The development of science and technology can improve applied science and basic science. The purpose of teaching Mathematics is to prepare students to be able to use mathematics and mathematical thinking in everyday life. One way to improve basic science skills is to improve skills in mathematics.

Mathematics is very rapidly developing in aspects of life. Starting from the development of the economy, technology to industries that are still related to mathematics, the role of mathematics is studied starting from elementary school, secondary school to college. In teaching mathematics, it is not only the ability to count but how the cultivation of concepts can be understood so that it can be understood, the meaning of mathematics and can reason to solve a problem in various ways (Fauni, 2019). Starting from well-organized numbers to gradual towards complicated directions.

The PBL (Problem Based Learning) model for grade 4 mathematics is a learning approach that involves students in actively solving mathematical problems using real-world contexts. In this model, students are given tasks or questions that encourage them to think critically, apply mathematical concepts, and work collaboratively in finding solutions (Janah, 2019).

The development of mathematics education is one of the important aspects in creating a generation that excels in the field of mathematics. Good math learning outcomes not only affect students' academic achievement, but also have far-reaching implications in everyday life. Therefore, it is necessary to make efforts to improve mathematics learning outcomes for students. One of the learning models that has been proven effective in improving mathematics learning outcomes is Problem Based Learning (PBL). This learning model focuses on the application of mathematical concepts in real-world situations. Students are given problems or tasks that require them to apply mathematical knowledge and skills in solving complex problems. PBL encourages students to actively think, work together, and develop a deep understanding of mathematical concepts.

Some previous studies have revealed that PBL is effective in improving students' mathematics learning outcomes. according to Fauni (2019) regarding improving mathematics learning outcomes through the PBL model assisted by card sort in fifth grade students showed positive results. The study shows that the use of PBL can effectively improve students' understanding of mathematical concepts. according to Setyaningtyas (2019) also conducted research on improving math learning outcomes through PBL models assisted by video media in grade IV elementary school students. The results of their research show that the PBL learning model with the use of video media can increase students' interest in learning and understanding of mathematical concepts.

Based on these studies, it can be concluded that the PBL model is an effective learning approach in improving students' mathematics learning outcomes. By utilizing real-world situations and applying mathematical concepts in relevant contexts, students

can gain a better understanding and be able to connect mathematical concepts with everyday life.

In this article, we will further discuss the use of PBL model in improving mathematics learning outcomes. Previous studies that have been conducted will be a reference to support the argument about the effectiveness of PBL. It is hoped that this article can provide insight and a deeper understanding of the benefits and potential of the PBL model in improving mathematics learning outcomes for students.

2. RESEARCH METHOD

The type of research to be conducted is classroom action research (PTK). Three meetings were held as part of the cycle of the review process, which has three stages and is based on one cycle. These stages are: (1) Planning stage (2), Observation (3) and Reflection. This is the implementation stage. The research was conducted at SD Negeri Cengkareng Barat 16 Pagi. The type of research used is class action research (PTK). According to the cycle, one cycle is completed for three meetings using the review process cycle, which has three stages: planning, action and observation.

At SD Negeri Cengkareng Barat 16 Pagi, 25 students of class IV, 15 boys and 10 girls were included as research participants, along with the teacher. Planning, implementing and commenting on each cycle are many parts of the research procedure. Researchers attempt to make learning strategies that will be implemented in teaching and learning activities in the form of lesson plans at the planning stage. In this case, the researcher works with the classroom teacher to create teaching aids, selects instructional strategies that are appropriate for the subject and learning process to ensure that it runs smoothly, and compiles observation notes of teacher activities and student responses that are useful for observing.

The steps taken at the implementation and observation stage, or the instructor practicing the prepared learning resources, are based on the plan made earlier. The researcher monitors, records, and documents the teaching and learning activities carried out by students and teachers during the observation stage to ascertain whether the actions taken are in accordance with the predetermined plan.

The final phase of each cycle is reflection, where many shortcomings in the actions taken are discovered. At this stage the researcher makes corrections and recommendations for deficiencies in the learning activities that have been used. Researchers and educators talk about how to implement the learning action plan. Teachers and researchers will re-plan if learning activities record results that show weaknesses in order to develop a new plan that will be implemented in the next cycle.

The data needed for this research include: (1) data in the form of observation of the implementation of problem-based learning in mathematics learning (2) Information on mathematics test scores by utilizing problem-based models and learning. (1) Observation sheets are used to carry out learning activities in mathematics classes using models and problem-based learning (2) Subject-specific test sheets with multiple choice questions.

3. RESULT AND DISCUSSION

The presented data on the results of classroom action research that has been made with a problem-based learning model, for student learning outcomes in order to facilitate discussion and determine the development of learning outcomes, the data is presented globally in the teacher's ability, the graph describing the student survey results is shown in the following figure:

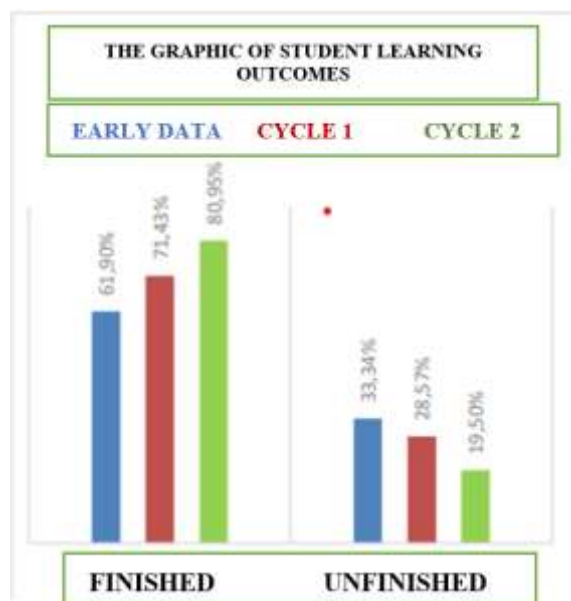


Figure 1. Survey Results

Through the graph above, it is clear that student learning outcomes in learning mathematics using the Problem Based Learning (PBL) learning model can increase and improve learning outcomes.

Based on the research results, it can be seen that the quality of teacher teaching is increasing, as evidenced by the increase in the average student test and teacher commitment. Thus, the research results above support the hypothesis that using the Problem Based Learning (PBL) learning model can improve students' mathematics learning achievement. In addition, the Problem Based Learning (PBL) approach can encourage new students to learn and can help motivate existing students to continue learning so there is no need to continue to the next section (Nasution, 2019) (Rahmadani, 2017).

4. CONCLUSION

Based on the results of classroom action research by applying the Problem Based Learning (PBL) approach in mathematics subjects to improve the ability of class IV learning outcomes, it can be concluded that: The application of the Problem Based Learning approach can improve the ability of learning outcomes, namely TUNTAS with

initial data 61.90% cycle1 71.43% cycle2 80.95% while learning outcomes are NOT TUNTAS, namely initial data 33.34% cycle1 28.57% and cycle2 19.50%.

Therefore, in an effort to improve students' mathematics learning outcomes, schools are expected to use the Problem Based Learning (PBL) model in the learning process, especially for mathematics subjects on the subject matter. It is also expected for teachers to guide students to be active in learning activities and foster a spirit of cooperation in groups. while for students, it is expected to be able to apply the knowledge gained from the teacher and always improve understanding for each lesson so that learning outcomes increase. Expected for other researchers who want to conduct relevant research to allocate more time so that the results obtained are better.

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