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Improving Student Learning Outcomes Mathematics Through Learning Models Problem Based Learning

Maslianti[1], Ulil Azmi[2]
[1]Terbuka University Students, Indonesia
[2]STAI Tgk Chik Pante Kulu Banda Aceh, Indonesia

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ABSTRACT

Objective: *This study aims to examine the effectiveness of the Problem-Based Learning (PBL) model in improving mathematics learning outcomes for third-grade students at SD Negeri 03 Benua Kayong by fostering critical thinking, active engagement, and problem-solving skills.* ***Method:*** *A qualitative descriptive approach was employed, utilizing direct observation techniques and observation sheets as instruments for data collection. The research was conducted in two cycles, with each cycle involving the implementation of PBL in thematic mathematics lessons.* ***Results:*** *The findings demonstrated a substantial improvement in students' mathematics learning outcomes. Student mastery increased from 33.33% during the initial learning phase to 66.67% in Cycle 1 and reached 100% in Cycle 2. Additionally, PBL made learning more engaging and enjoyable, resulting in increased student attentiveness and participation.* ***Novelty:*** *This study highlights the transformative impact of PBL in elementary mathematics education, showcasing its ability to enhance learning outcomes and interest by shifting from traditional methods to an active, student-centered approach. This research contributes to the growing evidence supporting innovative teaching models for foundational mathematics skills.*

INTRODUCTION

Learning activity guidelines play a role in helping students develop their potential into competencies that include improving attitudes, knowledge, and skills for life and devotion to society and the country. Teachers are expected to be able to direct students' potential through learning that encourages critical thinking, creativity, and good communication skills.

Ali (2013) stated that the principles of education include "attention and motivation, activeness, direct involvement, imitation, challenges faced, and individual differences." The application of this principle depends on the teacher's ability to plan, choose strategies, determine models, and implement learning in accordance with the 2013 Curriculum. However, in reality, grade III teachers at SD Negeri 03 Benua Kayong are still not optimal in designing student-centered learning and creating a pleasant learning atmosphere.

Initial reflections showed several problems, including teachers not being optimal in preparing lesson plans (RPP), the strategies chosen were not in accordance with student characteristics and lesson materials, and teacher dominance in implementing learning caused students to lose focus. The delivery of less interesting materials made students lose motivation.

The shortcomings in planning and implementing learning have an impact on low class activity, which affects student learning outcomes. This can be seen from the results of daily tests where 8 students (66.67%) obtained scores below the Minimum Completion Criteria (KKM) of 70, while only 4 students (33.33%) achieved scores above the KKM.

To deliver student-centered and enjoyable learning, teachers can design and implement learning by applying problem-based models. Problem-based learning according to [16] "A challenging learning mode that works in groups to find solutions to real-world problems, where students learn how to learn and connect students' curiosity with the learning they receive". Applying a learning model that allows students to solve "problems gradually through scientific methods, so that students acquire problem-solving skills while gaining knowledge related to the problem in the form of learning outcomes.

According to [29], learning outcomes are "achievements obtained by students after completing a number of materials in a subject, which includes all psychological domains influenced by students' experiences and learning processes". Meanwhile, Sudjana in [13] stated that learning outcomes are "abilities acquired by students after they have learning experiences". In line with that, Rusman in [22] explained that learning outcomes include "a number of knowledge acquired by students, which includes cognitive, affective, and psychomotor domains". Thematic learning is developed based on certain themes. [9] defines thematic learning as "integrated learning that connects several subjects to provide meaningful learning experiences for students".

Meanwhile, Rusman in [22] stated that "thematic learning, as a form of integrated learning, allows students individually or in groups to actively explore and discover scientific concepts and principles that are holistic, meaningful, and authentic". [11] also stated that "thematic learning is an integrated learning approach that uses certain topics to link several subjects so as to provide meaningful experiences to students".

Related to problem-based learning, [22] stated that "Problem-Based Learning is an approach that links learning materials with students' real experiences and environmental conditions, so that students can learn actively and think concretely". Based on this explanation, the purpose of this study was to determine the increase in student learning outcomes after the application of the problem-based learning model in thematic learning in class III SDN 21 Benua Kayong.

Learning Mathematics at SDN 03 Benua The sky face challenge in the form of low results Study student. This matter due to by lack of interest student in follow learning that tends to monoton and lack of implementation method learning that involves student in a way active. The teacher is still dominant use method conventional, so that student not enough stimulated for think critical And creative in finish problem.

The application of the Problem Based Learning (PBL) learning model has the potential to be a solution because it is oriented towards solving real problems that are relevant to students' lives. However, obstacles such as the lack of teacher understanding of PBL, time constraints, and difficulty student in adapt with method This can be an obstacle in its implementation. The main problem is how to integrate the PBL model

effectively to improve students' mathematics learning outcomes at SD Negeri 03 Benua Kayong, while at the same time overcome obstacles that arise during the learning process ongoing.

RESEARCH METHOD

The subjects of this study were all 12 students in grade III of SD Negeri 03 Benua Kayong, consisting of 7 female students and 5 male students. This study was conducted in grade III of SD Negeri 03 Benua Kayong, located on Jalan Anugrah, Dusun Pematang Buluh, Mekar Sari Village, Benua Kayong District, Ketapang Regency. This study was conducted for two months, precisely in the odd semester of the 2024/2025 academic year, namely from October to December 2024. This study was conducted as an effort to improve student learning outcomes through a systematic approach.

The implementation of this classroom action research (CAR) was carried out in two cycles. Each cycle consists of a series of stages that have been planned in advance. In the implementation process, researchers focused on improving the quality of learning through systematically designed cycles. This study seeks to evaluate the effectiveness of the actions taken by involving students as the main subjects and direct observation during learning activities.

The steps in classroom action research include four repetitive stages including planning, implementation, observation, and reflection. The first stage is planning, where researchers prepare a learning plan as a guideline in carrying out actions to achieve optimal results. The second stage is implementation (acting), which is implementing learning actions according to the plan that has been prepared. This stage is a direct implementation in the classroom with the aim of seeing how students respond to the methods applied.

The third stage is observation, which is carried out simultaneously with the implementation of the action. At this stage, researchers make observations to identify student activity and the effectiveness of the learning process. The last stage is reflection, which is evaluating the results of the actions that have been taken. Reflection serves to identify deficiencies, obstacles, and determine improvements needed for the next cycle. Through these steps, researchers can design more effective learning strategies in improving student learning outcomes.

RESULTS AND DISCUSSION

Cycle I observations were conducted by colleagues. At this point, collaborator observations focused on student learning outcomes. Based on the final results shown, student learning outcomes have begun to increase in research cycle 1, with 8 completion criteria. (66.67%) students and 4 (33.33%) other students had incomplete grades with an average overall score of 71.67.

The observation stage of cycle II was carried out by the collaborator. At this stage, the observation carried out by the collaborator focused on student learning outcomes. The final results showed that student learning outcomes increased in cycle II as follows:

up to 12 students met the criteria while there were still other students who had incomplete scores with an overall average of 85.83.

Based on observations of student learning outcomes in subject learning using problem models at the beginning of learning cycles 1 and 2, it showed an increase of 33.33 % in the initial learning, then 66.67 % in cycle 1 and 100 % in cycle 2. 2 increased by 66.67 %.

The application of the Problem Based Learning (PBL) learning model in mathematics education at SD Negeri 03 Benua Kayong has great potential to improve student learning outcomes. PBL is a learning method that focuses on solving real problems, which allows students to be actively involved in the learning process and develop their critical thinking skills and problem-solving abilities [23]. In the context of mathematics education, PBL not only helps students understand mathematical concepts but also relates learning to everyday life situations, making learning feel more relevant and meaningful [24].

One important aspect of PBL is its ability to encourage students to develop their own knowledge through exploration and collaboration. In a study conducted by Akma and Man, it was found that the use of worksheets specifically designed for PBL can improve students' problem-solving abilities [1]. This is in line with the findings of Wibowo et al., which showed that a realistic mathematics learning approach can significantly improve student learning outcomes [38]. Thus, the implementation of PBL at SD Negeri 03 Benua Kayong can be expected to improve student learning outcomes in mathematics through the development of critical thinking and problem-solving skills.

PBL also serves to improve students' mathematical communication. Setiawan et al. emphasized that the PBL model can encourage students to be more active in communicating and sharing ideas, which are important skills in learning mathematics [27]. In addition, research by Ulandari et al. showed that learning materials based on a realistic mathematical approach can improve students' problem-solving abilities and self-efficacy [33]. Thus, the implementation of PBL at SD Negeri 03 Benua Kayong will not only improve students' learning outcomes but also equip them with better communication skills.

In the context of mathematics learning, it is important to integrate approaches that are appropriate to student characteristics. Hidayatulloh et al. showed that the use of manipulative media in mathematics learning can increase students' learning motivation [34]. Therefore, in implementing PBL, it is important to consider the use of media and tools that can support the learning process. This will make students more involved and motivated in solving the problems they face.

Furthermore, research by Mahendra et al. showed that the Problem Posing approach in geometry learning also has a positive impact on student learning achievement [14]. By implementing PBL, students not only learn to solve problems, but are also trained to ask questions and formulate their own problems. These are important skills that can help students understand mathematical concepts more deeply and applicatively.

On the other hand, it is also important to involve parents and the community in the learning process. Rahayu et al. emphasized that collaboration between schools and the community can improve students' mathematics skills [25]. By involving parents in learning activities, students will feel more supported and motivated to learn. Therefore, SD Negeri 03 Benua Kayong can consider holding activities that involve parents in the PBL-based mathematics learning process.

The implementation of PBL must also be accompanied by proper evaluation to measure student progress. Zhang et al. showed that collaborative evaluation can help in understanding students' problem-solving abilities [40]. By conducting regular evaluations, teachers can find out students' progress and provide constructive feedback to improve their learning outcomes.

In implementing PBL, teachers need to have a good understanding of mathematics pedagogy. Bhagwonparsadh emphasized the importance of pedagogical knowledge of mathematics content for educators in implementing PBL effectively [4]. Therefore, training and professional development for teachers at SD Negeri 03 Benua Kayong are very important to ensure the success of implementing this learning model.

In addition, research by Setyono et al. showed that PBL has a significant influence on critical thinking skills and student learning outcomes [28]. Thus, the implementation of PBL in SD Negeri 03 Benua Kayong will not only improve mathematics learning outcomes, but also help students develop critical thinking skills that are very necessary in today's information era.

It is important to create a learning environment that supports the implementation of PBL. Hidayatulloh et al. showed that an interactive and interesting learning environment can increase students' motivation to learn [34]. Therefore, SD Negeri 03 Benua Kayong needs to create a classroom atmosphere that is conducive to active learning, where students feel comfortable collaborating and sharing ideas.

Thus, the implementation of the Problem Based Learning learning model at SD Negeri 03 Benua Kayong has great potential to improve student learning outcomes in mathematics. By linking learning to real problems, encouraging collaboration, and using appropriate media, students will be more engaged and motivated to learn. In addition, support from parents and the community, as well as training for teachers, will be very important to ensure the successful implementation of this learning model.

CONCLUSION

Fundamental Finding : The implementation of the Problem-Based Learning (PBL) model in thematic mathematics instruction for third-grade students at SDN 03 Benua Kayong resulted in significant improvements in student learning outcomes. Mastery levels increased progressively from 33.33% during initial learning to 66.67% in Cycle 1, reaching 100% in Cycle 2, demonstrating the effectiveness of PBL in fostering active engagement, critical thinking, and problem-solving skills. **Implication :** These findings underscore the potential of PBL as a transformative teaching strategy for enhancing learning outcomes in mathematics. By encouraging active participation and critical

inquiry, PBL not only improves academic performance but also cultivates essential competencies for navigating complex social and academic challenges in local and global contexts. **Limitation :** The study was limited to a single grade level and one school, which may constrain the generalizability of the findings. Differences in teacher readiness, student adaptability, and resource availability in other settings could influence the success of PBL. **Future Research :** Further studies should investigate the scalability of PBL across different grade levels, subjects, and educational contexts. Additionally, longitudinal research could explore the long-term impact of PBL on students' critical thinking and problem-solving abilities.

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* **Maslianti (Corresponding Author)**
Terbuka University Students, Indonesia
Email: masliantiktp@gmail.com

Ulil Azmi
STAI Tgk Chik Pante Kulu Banda Aceh, Indonesia
Email: ulilazmi83@gmail.com