



The Application of Problem-Based Learning Strategies in Improving Learning Outcomes Students in Math Subject

Nastiti Dayana Puspa¹, Yantoro², Basyir³, Misnawati⁴

Universitas Jambi^{1,2,3,4}

nastitidayana24@gmail.com¹, yantoro@unja.ac.id², pakbasyir17@gmail.com³,
mizz.nawaties@gmail.com⁴

Receive: 11/02/2024

Accepted: 11/02/2024

Published: 01/03/2024

Abstrak

Penelitian ini bertujuan untuk meningkatkan hasil belajar siswa pada pembelajaran matematika melalui penerapan strategi pembelajaran *problem based learning*. Penelitian ini dilaksanakan dengan melibatkan dan 35 siswa pada kelas IV di SDN 42/IV Kota Jambi. Prosedur penelitian tindakan kelas ini di desain untuk 3 (tiga) siklus, dimana masing-masing siklus dengan tahap pelaksanaan, pengamatan, refleksi dan dilaksanakan dengan kolaborasi antara peneliti dengan guru kelas. Berdasarkan perolehan hasil belajar dan observasi siswa dan guru dengan menggunakan penerapan strategi pembelajaran berbasis *Problem Based Learning* (PBL) terlihat dari hasil pembelajaran yang dicapai siswa meningkat. Hal ini dilihat dari perolehan hasil pada siklus I nilai rata-rata siswa 63,71 pada siklus II nilai rata-rata siswa 68 dan pada siklus III nilai rata-rata siswa mencapai 71,43. Begitu juga persentase siswa yang berhasil dalam pembelajaran setiap siklusnya juga meningkat, dapat kita lihat pada grafis diatas pada siklus I 68,57% siswa, pada siklus II 77,14% siswa, dan siklus III 85,71% siswa dari jumlah keseluruhan siswa yang mengikuti pembelajaran. Sehingga dengan penerapan strategi pembelajaran berbasis *problem based learning* dapat meningkatkan hasil belajar siswa pada mata pelajaran matematika di SDN 42/IV Kota Jambi.

Kata kunci: hasil belajar, pembelajaran matematika, *problem based learning*

Abstract

This study aims to improve student learning outcomes in mathematics learning through the application of *problem-based learning* strategies. This research was conducted involving 35 students in class IV at SDN 42 / IV Jambi City. This classroom action research procedure was designed for 3 (three) cycles, where each cycle with the stages of implementation, observation, reflection and carried out with collaboration between researchers and class teachers. Based on the acquisition of learning outcomes and student and teacher observations using the application of *Problem Based Learning* (PBL) based learning strategies, it can be seen that the learning outcomes achieved by students have increased. This can be seen from the results in cycle I, the average student score was 63.71 in cycle II, the average student score was 68 and in cycle III the average student score reached 71.43. Likewise, the percentage of students who succeed in learning each cycle also increases, we can see in the graph above in cycle I 68.57% of students, in cycle II 77.14% of students, and cycle III 85.71% of students from the total number of students who take part in learning. So that with the application of *problem-based learning* strategies can improve student learning outcomes in mathematics subjects at SDN 42 / IV Jambi City.

Keywords: learning outcomes, math learning, problem-based learning.

INTRODUCTION

Learning is an interaction between teachers and students to achieve the goals set in learning. The goal to be achieved from that interaction is basically the increase in student experience both theory and practice and changes in student behavior. Learning is an effort made by a person to get new things from what he is learning from interactions with his environment (Arifin, 2017). This shows that the experience gained in learning will greatly affect one's learning outcomes. The learning process requires communication activities. This communication arises because of the reciprocal relationship between teachers and students whose purpose of the relationship will affect intellectual, character and social changes and the relationship is based on an educational relationship (Habibullah, 2020).

The learning process always boils down to the learning outcomes that a person achieves. Learning outcomes are the results obtained by individuals in the form of impressions that result in changes in themselves as a result of their learning activities (Lase, 2018). In connection with student success in learning, many things influence student learning success. The success of student learning is fundamentally influenced by two factors, namely internal factors and external factors. Things that include internal factors include intelligence, talent, motive, interest, attention, physical health and learning methods. While those that include external factors include the natural environment, family environment, community, school and lessons (Slameto, 2003: 54).

Learning outcomes are the end result of learning in the form of skills, knowledge, values and attitudes. In the teaching process, results are very important because learning outcomes can be used as a measure of success in the teaching and learning process (Ulfah, U., & Arifudin, O., 2021). As an indicator of students being successful in the teaching and learning process, it can be seen from what grades they get, learning outcomes and student grades can form numbers, alphabets, and so on

(Taqwiyan, 2021). After learning outcomes are achieved or obtained, the teacher can take action against students about what methods and methods remain and how efforts to improve student grades can be through remedial, repetition and reassignment and others so that students can better understand and understand.

Mathematics learning in schools so far is still influenced by the view that mathematics is a ready-made science tool. This view encourages teachers to tend to teach concepts/attitudes, theories and how to use them (Wahyuni, et al., 2014). Teachers tend to transfer the knowledge they have to students' minds and they receive it passively and are not productive in developing it.

Mathematics has begun to be learned from an early age, but it is still found that students' mathematics learning achievements in school are not satisfactory, this is the impact of various problems in the learning process. One of these problems is the lack of students' basic abilities in understanding mathematical concepts and materials (Hikmah & Saputra, 2022). Sometimes students answer questions correctly, but they cannot express the reasons for their answers (Idris, 2018). Students can express formulas but do not know where they come from and why they are used (Yusri, 2018). This situation occurs because in the learning process students are less given the opportunity to express ideas and reasons for their answers so that they are less accustomed to expressing ideas or reasons for their answers.

Teachers have not been able to design learning optimally to develop students' potential in solving problems of mathematics learning materials, or understanding mathematical concepts and materials. There are still teachers who use traditional techniques in classroom learning, including lecturing in front of the class and then giving assignments, after completion, the assignments are discussed together in front of the class guided by the teacher. There is no learning model used in language lessons that makes this lesson feel like watching so that students are less active in participating in this lesson, this is related to the absence of methods that combine student

activeness with the material being taught (Sugiyono, 2008: 18).

Based on the author's survey at SDN 42/IV Jambi City, it was found that students could not do the assignments correctly. Of the 35 students, only 22 could complete the task perfectly. In this case, students' mastery of learning material becomes a measuring tool in achieving learning objectives. Thus, it has an impact on the low learning outcomes of students. This is because the method used by the teacher is not appropriate. Whereas students have the ability to discuss solve problems and connect learning with reality. Teachers generally emphasize the *content of* mathematics lessons rather than providing students with an understanding of how to make mathematics lessons interesting and students interested in learning them. This fact is also due to the mathematics teaching materials in the Student Worksheet (LKS) book, students have been monotonous, saturating, not meeting curriculum standards and not attracting students to learn it.

Learning must be tailored to the needs of students, in order to attract interest in learning, so that the quality of learning can create schools that excel (Sobri, 2013). One of the learning that can be used is problem-based learning. *Problem-based* learning is one of the learning models associated with contextual learning (Cahyanti, 2015). Learning is faced with a problem, which then through solving the problem students can learn more basic skills that will increase student understanding in certain materials.

Initial concept understanding plays an important role in mathematics, everyone with an interest in mathematics will need an understanding of initial concepts in understanding more material, because if we are to fully achieve the objectives of mathematics material, the conditions for achieving the target results in the field of education must have a better understanding of initial concepts. For this reason, one of the efforts to improve the quality of education in schools is by improving the learning process. The application of the *problem-based learning* model is expected to improve the learning process in mathematics subjects. Thus, this study will be entitled Application of *Problem Based Learning (PBL) Based Learning Strategy* to Improve Student

METHOD

The implementation of the research evolved through a *self-reflective spiral*, which is a cycle with a sequence of planning, action, observation and reflection. As shown in the following figure: (Sugiyono, 2001: 5). The following is a class action cycle carried out by the teacher.

This classroom action research procedure is designed for 3 (three) cycles, where each cycle with the stages of implementation, observation, reflection and carried out with collaboration between researchers and Mathematics teachers in with a total of 35 students in class IV SDN 42 / IV Jambi City. In this study, two cycles will be planned, namely cycles I, and II. Cycle one consisted of action and observation, and reflection then carried out the cycle I test. The results of observations and reflections in cycle I were made improvements / observations of the learning process in cycle II. So that the hope of improving students' math learning outcomes increases.

RESULTS

Based on the results of research that begins with looking at the pre-cycle (initial) conditions, the learning outcomes of grade IV students in Mathematics subjects at SDN 42 / IV Jambi City are still low. This can be seen from the results of the test which was attended by 35 students. Of the 35 students as a whole there were 22 people or 62.86% of the total number of students (35 people), while the number of students who had not succeeded was 13 people or 37.14% of the total number. The average score obtained by students is also still low, namely 59.4.

Cycle I learning planning carried out by researchers is to analyze the curriculum to find out the basic competencies that will be delivered to students. In this cycle I, the material to be taught to students about Numbers. Learning carried out in the classroom uses the application of *Problem Based Learning (PBL)* based learning strategies.

In this cycle, the average score of students was still low and did not meet the minimum completeness criteria (KKM). This can be seen from the low average score obtained by students in cycle I, namely 63.71. The number of students who obtained a score \geq

60 was 24 people or 68.57% of the total number of students and students who had not succeeded were 11 people or 31.43 of the total number of students, meaning that the actions provided in cycle I had not been able to improve the learning outcomes of fourth grade students in Mathematics, therefore the action must be continued in cycle II.

Based on the results of the reflection of cycle I, student learning outcomes began to improve and cycle II learning planning was still the same as the previous cycle by correcting the shortcomings that existed in cycle I and then improved in cycle II. In cycle II the material taught was about Number Counting Operations.

In cycle II, there has been an improvement from cycle I. This can be seen from the learning outcomes of cycle II which was attended by 35 people. The average score obtained by students increased from 63.71 in cycle I to 68 in cycle II, and the number of students who have successfully obtained a score ≥ 6 in cycle II is 27 people or 74.14% of the total number of students while students who have not succeeded are 8 people or 22.86% of the total number of students, for that it is necessary to continue the action to the next cycle.

The results of the reflection of cycle II showed that there were still several indicators that needed to be improved, and in cycle III this was an improvement from cycle II. The planning of cycle III only corrects the shortcomings in cycle II and still maintains the goodness. In this cycle the teacher must invite students to be more active in learning and motivate students' courage in answering and asking about material that they do not understand. The material to be taught in cycle III is about Number Counting Operations.

In cycle III, there has been an increase from the previous cycle. This can be seen from cycle I which was attended by 35 students, the average score obtained by students increased from 63, 71 in cycle I to 68 in cycle II and increased to 71.43 in cycle III. In cycle III, there were 30 students who scored ≥ 60 . This means that student success reached 85.71% while unsuccessful students were 5 people or 14.29% of the total number of students in class IV. This figure shows that the actions that have been taken can be said to be successful because they reach the criteria for the success of

classroom action research that has been determined.

In the acquisition of the entire cycle held through formative tests, the learning outcomes obtained by students have improved from the previous cycle and have been in accordance with the expectations. Based on the analysis of test scores and observation data in cycle III, it can be seen that the actions taken in this cycle have succeeded in improving student learning outcomes. This is proven by the learning outcomes obtained by students who have met the predetermined success criteria.

The following are details regarding the improvement of student learning outcomes obtained in learning using the application of *Problem Based Learning* (PBL) based learning strategies:

Table 1. Improvement in learning outcomes

No.	Variables observed	Number or percentage		
		Cycle I	Cycle II	Cycle III
1	Average value	63,71	68	71,43
2	Many students have been successful in learning	24	27	30
3	Many students have not been successful in learning	11	8	5
4	Percentage of students who have succeeded in learning	68,57%	77,14%	85,71%
5	Percentage of students who have not succeeded in learning	31,34%	22,86%	14,29%

Based on the results of the study, there is a change in the average value from cycle I to cycle III actions, this is due to changes in the actions in each cycle are different. Cycle III action is an improvement from the previous cycle, by providing alternatives to the shortcomings and weaknesses in the previous cycles.

From table 1, it can be seen that the learning outcomes of each cycle are increasing. In cycle I the average student score was 63.71 in cycle II the average student score was 68 and in cycle III the average student score reached 71.43. Likewise, the percentage of students who succeed in learning each cycle also increases, we can see in the graph above in cycle I 68.57% of students, in cycle II 77.14% of students, and cycle III 85.71% of students from the total number of students who take part in learning.

DISCUSSION

From the data on the results of observations and learning outcomes using the application of *Problem Based Learning* (PBL) based learning strategies, it can be seen that the learning outcomes achieved by students have increased. This shows that the delivery of teaching using the application of *Problem Based Learning* (PBL) based learning strategies can improve student learning outcomes. In addition, the explanation given by the teacher becomes concrete, easy to understand.

This is in line with the opinion of Cahyanti (2015) which states that learning that can be used is problem-based learning. *Problem-based* learning is one of the learning models associated with contextual learning. As is known, learning is faced with a problem, such as learning mathematics needs to find answers which then through solving these problems students can learn more basic skills that will increase student understanding in certain materials.

Mathematics learning in schools so far is still influenced by the view that mathematics is a ready-made science tool. This view encourages teachers to tend to teach concepts/attitudes, theories and how to use them (Wahyuni, et al., 2014). Teachers tend to transfer the knowledge they have to students' minds and they receive it passively and are not productive in developing it.

It is certainly necessary to prepare learning materials tailored to the needs of students, in order to attract interest in learning, so that the quality of learning can create schools that excel (Sobri, 2013). Through the problems faced by students in learning mathematics, the application of the PBL model is considered to be a solution according to student needs. The *problem-based learning* model is believed to be able to hone students' abilities at the *high order thinking* level which leads students to gain this knowledge directly through their own experiences (Ripai, I., & Sutarna, N., 2019).

Previous research by Anggiana (2019) explained from the results obtained that the improvement in students' mathematical problem solving skills could be better in the Experiment class which used the Problem Based Learning (PBL) learning model compared to the control class which used the conventional learning model. So it can be concluded that the application of *problem-based learning* strategies can improve student learning outcomes in mathematics subjects at SDN 42/IV Jambi City.

CLOSING

Based on the results of observations, evaluations and discussions in cycle I, II, and cycle III, it can be concluded that using the application of *Problem Based Learning* (PBL) based learning strategies can improve student learning outcomes in Mathematics subjects. This can be seen from the increase in learning outcomes obtained each cycle, at the time of the pre-cycle or before the action the average value of students was 59.4 with 22 successful students (62.86%) and after the first cycle of action the average value of students was 63.71 with 24 successful students (368.57%), increased in cycle II with an average value of 68 students and 27 successful students (77.14%), then increased again in cycle III with an average value of 71.43 the number of successful students was 30 people (85.71%) and cycle IV 35 people (100%) students succeeded.

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