SCIENCE : Jurnal Inovasi Pendidikan Matematika dan IPA
Vol. 4 No. 3 Agustus 2024
E-ISSN : 2797-1031
P-ISSN : 2797-0744

MATHEMATICS LEARNING USES THE PMRI APPROACH TO IMPROVE STUDENT LEARNING OUTCOMES

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ABSTRACT

This research aims to improve student learning outcomes in learning mathematics data processing materials using the PMRI approach. The research method used is the Demonstration Method. The subject of the study was a grade VI student of SD Negeri 1 Rambang Muara Enim Regency. The learning improvement procedure is done through Classroom Action Research (PTK), which takes two cycles. Each cycle, the activities carried out include (1) Planning, (2) Implementation, (3) Observation, and (4) Reflection. The data collection technique is carried out through observation sheets for each meeting by researchers to see data about learning activities. The results of the analysis of the research data were obtained: In the first cycle, only 64.3% of students completed and 57.1% were actively involved in learning; in the second cycle, the completed students increased to 92.8%, and students who were active in learning 85.7%
Keywords: PMRI, Study result, Classroom action research

ABSTRAK

Penelitian ini bertujuan untuk meningkatkan hasil belajar siswa dalam pembelajaran matematika materi pengolahan data dengan menggunakan pendekatan PMRI. Metode penelitian yang digunakan adalah Metode Demonstrasi. Subyek penelitian adalah siswa kelas VI SD Negeri 1 Rambang Kabupaten Muara Enim. Prosedur Perbaikan pembelajaran dilakukan melalui Penelitian Tindakan Kelas (PTK) yang berlangsung dalam 2 siklus. Setiap siklus, kegiatan yang dilakukan meliputi: (1) Perencanaan, (2) Pelaksanaan, (3) Observasi/ Pengamatan, dan (4) Refleksi. Teknik pengumpulan data dilakukan melalui lembar pengamatan tiap pertemuan oleh peneliti untuk melihat data tentang aktivitas belajar. Hasil dari analisis data penelitian diperoleh bahwa: Pada siklus I siswa yang tuntas hanya 64.3% dan yang terlibat aktif dalam pembelajaran 57.1% dan Pada siklus II siswa yang tuntas meningkat menjadi 92.8% dan siswa yang aktif dalam pembelajaran 85.7%.
Kata Kunci: PMRI, Hasil Belajar, Penelitian Tindakan Kelas

INTRODUCTION

Mathematics is one of the components of a series of subjects that have an essential role in education. According to Susanto (2013:185), mathematics is one of the disciplines that can improve thinking and argumentation skills, contribute to solving daily problems in the world of work, and support the development of science and technology. According to Unaenah et al. (2022), Mathematics is a universal science that underlies the development of modern science, has a vital role in various disciplines, and advances thinking. In general, mathematics learning at both the elementary and secondary levels is still considered a subject that is difficult for students to understand, so students are first afraid of mathematics subjects. This statement is based on what was revealed in Marhamah's (2009) research, which revealed that many students still struggle to learn mathematics. Hence, they complain and think that mathematics is complicated and scary. Learning difficulties are conditions in which students cannot learn reasonably, marked by obstacles to achieving learning goals or outcomes (Munirah, 2018). Factors that affect the occurrence of student learning difficulties include internal factors and external factors (Latifah & Afriansyah, 2021). According to Jamal (2014), internal factors such

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P-ISSN : 2797-0744

as interest, motivation, intelligence, and so on come from within students.

Meanwhile, external factors come from outside the student, such as the school environment, family environment, and community environment. Another problem is that teachers' strategies must be revised (Pratama, 2022). This causes students to become bored and pay less attention. Therefore, a learning strategy that is suitable for students is needed. The learning strategy in question should be contextual, namely by giving students examples based on the activities carried out by students. One of the approaches that teachers in schools can use is the Indonesian Realistic Mathematics Education (PMRI) approach.

The PMRI approach utilizes daily life and emphasizes the use of an imaginable situation by students (Prihartini, 2020). According to Putri (2014), the PMRI approach can be used in mathematics learning, where mathematics must be close to students and relevant to students' daily life situations. In the PMRI approach, the context serves as a starting point for students to develop the meaning of mathematics and, at the same time, uses the context as a source of mathematics applications (Zulkardi & Putri, 2006). Context is a situation or natural phenomenon/occurrence related to the mathematical concept being studied (Zulkardi & Putri, 2006; Yansen et al., 2019). The context does not have to be a real-world problem but can be in games, props, or other situations as long as it is meaningful and can be imagined in the students' minds (Wijaya, 2012). In PMRI, teaching aids such as data processing materials can be a context in mathematics learning

Based on information from classroom teachers, it shows that most students still do not understand data processing materials starting from collecting data to determining mean, median and mode and can solve problems related to data. Therefore, research was carried out that aimed at improving student learning outcomes in mathematics learning using the PMRI approach.

RESEARCH METHODS

This type of research is called Classroom Action Research (PTK). This research is carried out rationally, systematically, and empirically based on various actions taken, ranging from a plan to an assessment of natural actions in the classroom. The subject of this study is a grade VI student of SD Negeri 1 Rambang Muara Enim Regency. This PTK will be carried out from February 26 to March 9, 2024. The design used in this study uses two cycles consisting of four stages: planning, action, observation and evaluation, and reflection (Arikunto, 2010). The class action research design presented can be seen in the following Figure 1**:**

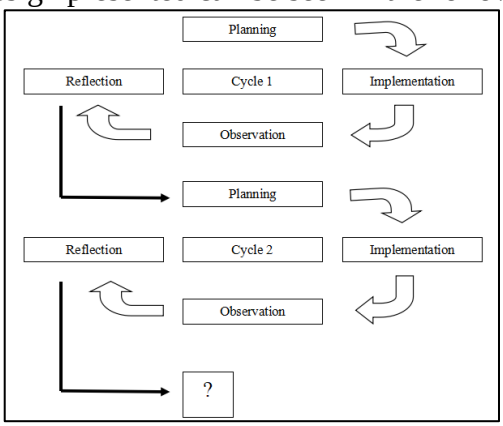

Figure 1. PTK according to Kemmis and Mc. Taggart (Arikunto, 2010)

The first cycle stage consists of four stages, namely: stage (1) Planning, which includes making a learning plan, preparing guidelines for observing student activity, consulting with peers to make instruments, and conditioning students so that they can follow learning well.

Stage (2) Implementation is an action activity in classroom learning. At this stage, the researcher has prepared the instrument to be used. The researcher uses image media that will be displayed classically in front of the class and can be seen by all students. Stage (3): At this stage, the researcher observes when the action is running. So both take place at the same time. At this stage, the researcher observes and records all the necessary things during the action's implementation. This data collection is carried out using a learning plan that has been prepared, including careful observation during the implementation of action scenarios from time to time and their impact on student learning processes and outcomes. In stage (4), the researcher thoroughly reviews the actions taken based on the data collected; then, an evaluation is carried out to perfect the following action. Reflection in PTK includes analysis, sínthesis, and assessment of the results of observations on the actions taken. If there is a problem from the reflection process, a review process is carried out through the following cycle: re-planning, re-action, and re-observation to resolve the problem.

In the second cycle stage, the learning process carried out in this cycle also consists of four stages: (1) The researcher makes a learning plan, prepares guidelines for observing student activity, and consults with peers to make instruments. At the stage of compiling a design, it is made based on the results of improvements from weaknesses in cycle I. Stage (2), the researcher uses diagram board props as a learning context that will be displayed in front of the class, demonstrated by the researcher and student representatives who will conduct demonstrations. Stage (3) makes observations, which include observing students' learning activities during the learning process and evaluating the learning process. Furthermore, stage (4) reflects on the results of student learning activities during the learning process and post-test at the end of the cycle, which will be carried out using student worksheets.

RESULTS AND DISCUSSION

Results

Before the researcher makes learning improvements, the researcher conducts pre-cycle activities. In the pre-cycle activity, the researcher delivered the material without using any media and only using the lecture method. Furthermore, students are given questions about the material as a form of evaluation. The learning outcomes obtained before the improvement are as follows:

Table 1. Learning Outcomes of Pre-Cycle Students

No	Description of Pre-Cycle	Results
1	Minimum Learning Completion Percentage (KKM)	14.3 %
2	Average test score	47.14
3	Number of students who complete their studies	2
4	Number of students who do not complete their studies	12
5	Highest Score	80
6	Lowest Score	20

Judging from the data above, the average learning outcome of students is relatively low. Of the 14 students, only two people whose scores are above the maximum standard of KKM 70 or only 14.3%, so learning improvements must be carried out by conducting cycle I.

In the first cycle, the researcher as a teacher provides opportunities for students to ask and answer questions with teachers and fellow students by discussing. After that, the teacher gives assignments. From the results of the evaluation, it turned out that there was a slight improvement; this increase was reflected in some students attending lessons who were more

motivated and enthusiastic in following the teaching and learning process and followed by the attitude of students who were no longer sleepy.

Table 2. Student Learning Outcomes Cycle I

No	Description	Result
1	Minimum Learning Completion Percentage (KKM)	64.3 %
2	Average test score	62.86
3	Number of students who complete their studies	9
4	Number of students who do not complete their studies	5
5	Highest Score	100
6	Lowest Score	30

Judging from the data in Table 2, as many as nine students whose scores are above the standard. The first cycle was carried out with results that were different from what was expected, even though the success rate of students increased and motivation increased from before the improvement. So, the researcher carried out cycle II as an improvement measure.

Table 3. Student Learning Outcomes Cycle II

No	Description	Result
1	Minimum Learning Completion Percentage (KKM)	92.8 %
2	Average test score	86.43
3	Number of students who complete their studies	13
4	Number of students who do not complete their studies	1
5	Highest Score	100
6	Lowest Score	50

In cycle II, researchers as teachers use diagram board props as a context for learning. With the use of diagram board props, there is an increase in student learning motivation. This is because the diagramboard props are very popular with students, making learning more enjoyable. Students can participate in demonstrating data processing using props in the form of diagramboards; This attracts attention, fosters enthusiasm, and creates a positive impression so that students are motivated to study seriously.

After learning improvements were carried out in the second cycle, there was a relatively high increase, namely from 14 students to as many as 13 students above the KKM, or 92.8%.

In the first cycle, students began to be given action by giving assignment activities. However, when learning activities occurred, only some students seemed active and enthusiastic in doing the assignments. In cycle II, the enthusiasm of students to learn is very high; the learning process feels interactive between students and teachers. The results of student learning activities in each cycle can be seen in Table 4.

Table 4. Student learning activities

No	Involvement of Students learning	Pre-cycle		Cycle I		Cycle II	
		Number of Students %	%	Number of Students %	%	Number of Students %	%

1	Actively Engaged	2	14.3%	8	57.1%	12	85,7%
2	Passive Involvemen	2	14.3%	2	14.3%	2	14.3 %
3	Not Involved	10	71.4%	4	28.6%	0	0%
Total		**14**	**100%**	**14**	**100%**	**14**	**100%**

Based on the table above, the number of students and the percentage of students actively involved in learning before and after learning improvement show an increase. Before the improvement of learning, the number of students who were actively involved was two people (14.3%), then it increased to 8 people (57.1%) in the first cycle and the second cycle to 13 people (92.8%).

The state of students who learn actively, enthusiastically, and interactively can affect student learning outcomes. This can be seen from the researchers' observations regarding student motivation and increasing student learning outcomes.

Discussion

What the researchers found at the beginning of the cycle greatly influenced the next cycle. As stated earlier, the first cycle of students involved is less enthusiastic and passive and tend to pay little attention to lessons as student learning outcomes are low. This makes researchers look for solutions to find the right way to improve learning in the next cycle.

After conducting Classroom Action Research (PTK) in cycle II in grade VI of SD Negeri 1 Rambang, the researcher felt optimistic that high student motivation could improve learning outcomes. This is done by using diagram board props as a context and demonstration method and group discussions that involve students directly so that students can play an active role in learning. There must be cooperation between students, teachers, and the school to improve the quality of school learning.

Based on the results of observation and evaluation of student learning in the mathematics subject of data processing material, before the improvement was made and after the improvement was made, the learning cycle I and cycle II increased. Diagram board props with the demonstration method influence the increase in student learning outcomes. A lesson is declared victorious and has experienced an increase in learning outcomes if at least 75% of the total number of students have obtained a score of 70 (Yunita, 2017).

The learning outcomes of students during the pre-cycle were only two people (14.3%) who were above the KKM; in the first cycle of learning improvement, it increased to 8 people (64.3%), and in the second cycle of learning improvement, it increased to 13 people (92.8%). This shows that using diagram board props and demonstration methods can improve the learning outcomes of grade VI students of SD Negeri 1 Rambang. Several classroom action studies that use context in mathematics learning, namely (1) Yansen (2023) Improving Student Learning Outcomes in Mathematics Learning Fraction Material Using Chocolate Bar Context; (2) Anitasari et al (2023) Improving Learning Outcomes Using the PBL Model Assisted by Concrete Mathematics Media for Class IV SDN 1 Sukorejo; (3) Setyowati (2023) The Influence of Concrete Media in improving Mathematics learning outcomes in class IV MIN Gunungkidul (4) Nuriza (2022) Application of Indonesian Realistic Mathematics Education (PMRI) to Improve Mathematics Learning Outcomes in the Context of Lidi Media for Madrasah Ibtidaiyah Students; (5) Sari (2021) Improving Mathematics Learning Outcomes for Class VI Students through the Application of Animation Video Media.

CONCLUSION

Based on the research and discussion results, it can be concluded that learning mathematics using the PMRI approach can improve the learning outcomes of grade VI students of SD Negeri 1 Rambang. The increase in student learning outcomes can be seen in each cycle's

average post-test results. The average post-test results increased from 62.86 in the first cycle to 86.43 in the second. The percentage of learning completion also increased from 64.3% in the first cycle to 92.8% in the second cycle. In addition, the percentage of actively involved students also increased from 57.1% in the first cycle to 85.7% in the second cycle.

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