Efforts To Improve Alignment Ability Through Problem Solving Method

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ABSTRACT

The aim of this research is motivated by low Mathematics scores, especially in the aspect of Calculating Mixed Whole Number Operations. Based on the analysis of the formative tests of Class V students at Public Elementary School 04 Babat Banyuasin, out of 13 students, only 3 students, or 23% achieved completeness, the rest were still below the school's KKM, namely ≥ 75. The method in this research used the Classroom Action Research (CAR) method. The aim of the Classroom Action Research that the researchers conducted was to find out how much the use of teaching aids and problem solving methods can increase student motivation as a result of the learning improvements that have been implemented. This research was carried out in two cycles, namely cycle I and cycle II. In cycle I the average score was 77.85 with learning completeness of 62% or out of 13 students only 8 children achieved completeness and 5 children did not. This shows an increase from pre-cycle to Cycle I and according to the researchers, this is not satisfactory. After progressing to the second cycle stage, the average score was 83.23 with 85% completeness, or of the 13 children who achieved completeness, 11 children and 2 children did not complete it. Thus it can be concluded that the use of teaching aids and problem solving methods can increase students' learning motivation.

Keywords: Problem Solving Method; Arithmetic Operations; Elementary School

INTRODUCTION

Education is a basic need for all individuals. To obtain education, a learning process is needed that cannot be obtained in a short time, but rather through certain stages that will produce impacts or results that are adjusted to the process. Educated human resources have the ability to follow the development of science and technology (IPTEK) (Rahman et al., 2022). One of the government's efforts to increase the quality of education in Indonesia is when was it establishment the Education Unit Level Curriculum (KTSP), which refers to the Regulation of the Minister of Education No. 22, 23, and 24 which regulates the content standards and competencies of graduates at the elementary and secondary education levels (Safitri et al., 2022).

The School Level Curriculum is designed to overcome the challenges faced by the world of education in Indonesia, namely the ineffectiveness of the learning process with it still being too focused on the role of the teacher (teacher centered) (Masdiono, 2019). This also applies to learning mathematics. Currently, the mathematics learning process is not yet capable enough to develop students' abilities to think logically, rationally, critically, carefully, honestly, and effectively.

Likewise, the assessment system is developed to be adjusted to relevant indicators for each subject. Improvement in student achievement can be achieved if the learning process takes place in a meaningful way, namely learning by actively presenting students, both physically, mentally, intellectually, or emotionally. This success is highly dependent on the teacher's ability to teach. A teacher will have competence in teaching if he or she at least understands and can apply various learning methods practically, and relates them to the learning process, in addition to having other supporting abilities.

Mathematics is an important basis for mastering science and technology, both in terms of its application and in terms of reasoning. One of the main characteristics of mathematics is the use of symbols, (Laela & Hasanudin, 2024). Symbols in mathematics are used to express various things, such as facts, concepts, operations, or principles/rules. Through these symbols, mathematics can function as a foundation in the development of science, (Unaenah et al., 2020). Mastery of mathematics should be focused on understanding mathematical concepts that can be applied in everyday life, (Mirkovic et al., 2015). Two factors support the direction of mathematics mastery for students today, namely: (1) Mathematics functions as a tool to understand natural and social phenomena, and (2) Mathematics has been involved in various human activities, both for daily needs and for professional interests.

In order to achieve the objectives of mathematics learning and competencies that must be mastered by students, a learning model is needed that can make students learn actively, creatively, and enjoyably, adjusting to their developmental stage. By using a learning model like this, it is hoped that the results obtained can provide meaning to students. Learning is considered meaningful if students can understand and apply the concepts learned in various situations.

As a result, in learning, especially Mathematics learning which requires full active participation from students, students' abilities are often inadequate. Students tend to feel lazy and bored with passive learning methods. This method does not encourage students to explore their ideas and creativity according to their age, which ultimately results in a decrease in Mathematics learning achievement. In Public Elementary School 04 Babat Banyuasin, for grade V students, mathematics is a less popular subject, especially for students with below average abilities.

(Desviona et al., 2024) Stated in general, students often have difficulty in applying mathematics in real-life contexts. Another factor that makes mathematics difficult for students is because that mathematics learning does not provide meaning or relevance (Raharjo et al., 2021). In the learning process in class, teachers do not connect the material with the schemes that students already have and do not provide students with opportunities to discover and construct their own mathematical ideas. As a result, students easily forget and have difficulty applying mathematics.

The cause of low student learning outcomes does not only lie in the low ability of students. However, the lack of activity and creativity on the part of teachers in planning the delivery of material can also occur. Teachers need to understand that the speed of students in thinking and receiving material varies greatly. Sometimes teachers in learning, almost all concepts are delivered based on the teacher's ability. The use of learning media is sometimes not thought of. However, in reality, the student's mindset is not the same as his.

All parties want in every learning to achieve results that are in accordance with what is desired. In order to achieve this goal, we are challenged to determine the right learning method to help students overcome the difficulties they face.

METHOD

The method in this research uses the Classroom Action Research (CAR) method. According to (Arikunto, 2006), Classroom Action Research (CAR) is an observation of learning activities such as actions, intentionally emerging and naturally occurring in a class together. This action is also given by the teacher or with direction from the teacher and carried out by students. Some CAR procedures are as follows:

1. Procedure design

a. Planning

In this planning stage, the researcher plans the activities to be carried out by preparing:

- Preparing the Learning Implementation Plan,
- Preparing the facilities and supporting facilities needed,
- Providing the research instruments and data analysis methods needed.

The number of cycles in classroom action research is planned based on the time allocation available to adjust to the Mathematics learning syllabus of Class V of Public Elementary School 04 Babat Banyuasin. This research is planned to be carried out in 2 cycles, namely each cycle includes 2 meetings. In addition, the researcher will also choose colleagues who are willing to help in the observation process during the classroom action research.

b. Implementation

Implementation of Action Research, at this stage, the action is carried out according to the plan that has been prepared in the previous stage, with the steps taken by the teacher referring to the applicable curriculum. Implementation will be carried out based on two cycles, namely Cycle I and Cycle II.

2. Data Analysis Techniques

Before being analyzed, data was first collected from learning outcomes Pre-Cycle, Cycle I, and Cycle II. As a reference in the learning improvement process, the researchers used:

a. Quantitative Data

Quantitative data refers to data in the form of numbers or figures, which can be obtained through measurement or by changing qualitative data into quantitative data.

b. Qualitative data

Qualitative data is data in the form of sentences or data that is categorized according to the quality of the object being analyzed, such as good, bad, smart, and others, test results are used to collect data quantitatively. Meanwhile, to obtain qualitative data, an observation sheet that has been prepared previously is used. The test result assessment sheet contains information related to students' abilities quantitatively in understanding the concept of integer operations. The test at the end of the learning is carried out during the pre-cycle, cycle I, and cycle II of the Mathematics subject, the material on Mixed Integer Arithmetic Operations is analyzed using the percentage technique. The formula used to determine the level of learning completion is:

With the completeness of the formula above, the level of learning completeness can be explained in Table 1 below:

Table 1. Mathematics Score Completeness Scale Pre-Cycle, Cycle I, Cycle II

Scale	Value	Ranking
90 – 100	91 – 95	Very good
80 – 90	81 – 89	Good
70 – 80	71 – 78	Good Enough
60 – 70	61 – 65	Enough
50 – 60	51 – 55	Less
40 – 50	41 – 45	Very Less

The data categorization process is carried out by filtering and grouping the collected data according to previously determined categories, (Ştefan, 2012). The category is intended to include students' initial understanding, students' test scores, exploration activities, investigation activities to adjust students' activities, and students' final understanding. Validation is the second step in the data analysis process. After the research data has gone through the validation stage, the data is then interpreted by referring to theories, related research results, or considerations from researchers and colleagues (observers). This interpretation aims to develop a plan that can increase students' ability levels when asking questions and finding solutions to difficulties faced by teachers and students. Obtaining this interpretation will be a guide in designing and implementing the next steps to make them clearer and more focused.

RESULT AND DISCUSSION

Description of Pre-Cycle Research Results

1. Results

a. Pre-Cycle

The initial understanding of grade V students of Public Elementary School 04 Babat Banyuasin regarding the concept of integer operations before the classroom action research was carried out was also classified as very low. This can be seen from the results of the final test analysis of grade V Mathematics of Public Elementary School 04 Babat Banyuasin which was carried out previously, namely the following:

Table 2. Pre-Cycle Mathematics Subject Test Results

Scale	Completion Criteria	
	Completed	Not Completed
90 – 100 80 – 90 70 – 80 60 – 70 50 – 60 40 – 50	3	4 6
Average	3	10
Percentage	23%	77%

From Table 3 and the graph above in the Pre-Cycle of 13 students only 3 or 23% have completed, the rest, or 77% have not completed Mathematics learning, especially Mixed Integer Arithmetic Operations. The low results are caused by the use of conventional teaching methods, namely lectures, questions and answers, and assignments. In addition, the media used is also limited to basic tools such as whiteboards and markers. Adjusting this achievement until the follow-up of Cycle I is held, with the desire that the level of completion of class V students of Public Elementary School 04 Babat Supat will increase.

b. Cycle I
1. Implementation
A. Initial activities that will be carried out are:
- Read prayers and take attendance of the number of student's present
- Greet and ask about the children's conditions,
- Convey the objectives and learning activities.

B. Core activities will be carried out in several ways, namely:
- The teacher asks students to discuss with their deskmates regarding the concept of addition and division of mixed integers.
- The teacher holds a question and answer session about the properties of arithmetic operations "Children, how many properties of arithmetic operations do you know, try to mention them?"
- The teacher provides several cases regarding mixed arithmetic operations, addition, and division, namely using the properties of arithmetic operations.
- Students and teachers draw conclusions regarding the material that has been discussed.
C. In the final activity, the teacher gives a written test to students.

2. Cycle I Observation
Observation activities were carried out during the improvement of Mathematics learning the material was Mixed Integer Arithmetic Operations for Grade V of Public Elementary School 04 Babat Banyuasin. At this stage, the researcher was assisted by colleagues to carry out observation improvements to students' activeness in asking and answering questions.

3. Cycle I Reflection
The problem faced in cycle I is the behavior of students who are less active in the learning process by using inappropriate media during the learning process so that students are less motivated.

Table 3. Mathematics Subject Test Results for Cycle I

Scale	Completion Criteria	
	Completed	Not Completed
90 – 100 80 – 90 70 – 80 60 – 70 50 – 60 40 – 50	5 3	5 6
Average	8	5
Percentage	62%	38%

From the learning results of fifth grade students of Public Elementary School 04 Babat Banyuasin in calculating mixed integer arithmetic operations, it is not as desired. The average class obtained is 77.85 out of 13 students, 8 children or 62% have completed the remaining 5 children or 38% have not completed it. Therefore, improvements must be made to the learning in cycle II.

c. Cycle II
1. Implementation
A. Initial activities to be carried out are:
- Reading prayers and taking attendance of the number of student's present
- Greeting and asking about the children's condition,
- Conveying the objectives and learning activities.

B. The core activities will be carried out in several ways, namely:
- Using metal coins and beads, the teacher explains the concept of addition and division of mixed integers
- The teacher writes several mixed integer calculation problems on the board
- The teacher asks students one by one to come to the front of the class and work on the problems
- using the metal coins and beads that have been provided.
- Students and teachers make conclusions related to the material that has been discussed
C. In the final activity, the teacher gave a written test to the students.

2. Cycle II Observation
Observation activities were carried out during the improvement of Mathematics learning on the material of Mixed Integer Arithmetic Operations for Grade V of Public Elementary School 04 Babat Banyuasin. Observations were focused on improving observations of the learning process in the form of effective tests and special actions for students who needed guidance.

3. Cycle II Reflection
In the cycle II reflection stage, the researcher also carried out a reflection on the learning improvement efforts that had been made.

Table 4. Mathematics Subject Test Results for Cycle II

Scale	Completion Criteria	
	Completed	Not Completed
90 – 100	3	
80 – 90	4	
70 – 80	4	
60 – 70		2
50 – 60		
40 – 50		
Average	11	2
Percentage	85%	15%

From the learning results in cycle II, the expected results have been given, namely that almost 85% of students produced scores above the KKM and the class average reached 83.23 or as many as 11 students completed the Mathematics test in the form of Mixed Integer Arithmetic Operations.

Therefore, the teacher did not carry out the Learning Improvement Plan in cycle III, this success was due to:
- The teacher has provided a lot of motivation by giving awards to students who successfully responded to questions correctly
- The teacher has used the problem solving method so that students can be active in the learning process
- The teacher uses teaching aids in the form of metal coins and beads.

2. Discussion
Through the learning improvement process in 3 meetings, namely Pre-Cycle, Cycle I, and Cycle II in Mathematics, especially Mixed Number Arithmetic Operations, we can obtain the development of grade V students' scores at Public Elementary School 04 Babat Banyuasin in Semester 1 2014/2015 as in the table below:

Table 5. Results of Mathematics Subject Tests Pre-Cycle, Cycle I, Cycle II

Number of Students	Level of Completion	Pre Cycle	Cycle 1	Cycle 2
13 Students	Completed	3	8	11
	Percentage	23%	62%	85%
	Not yet finished	10	5	2
	Percentage	77%	38%	15%
Total Value		720	1.012	1.082
Average		55,38	77,85	83,23

From the results of the Pre-Cycle test, data was obtained regarding student completion in Mathematics learning in the Mixed Integer Arithmetic Operations material. 13 students took the test, namely the number of classical scores reached 720 and the average class score was 55.38. Of the total students, only 3 managed to achieve a score above the Minimum Completion Criteria (KKM), while 10 students were still below the KKM. The percentage of KKM achievement at this stage only reached 23%. Based on the initial results, actions were taken in Cycle I with the hope that the level of completion of grade V students of Public Elementary School 04 Babat Banyuasin in Integer Arithmetic Operations would increase. After improvements in Cycle I, the results obtained were as follows: the number of students was 13, and the number of classical scores was 1,012, with a class average of 77.85. A total of 8 students managed to get scores above the KKM, while 5 students were still below the KKM. The percentage of KKM achievement in this cycle reached 62%. In Cycle I, there were 8 students, or 62% who successfully completed Mathematics learning, while 5 students, or 38% had not achieved completion. These results indicate an increase in the percentage of student completion in grade V in Mathematics, namely 2 students with increased completion, with the percentage of completion increasing from 23% to 62%. Meanwhile, the percentage of students who had not completed decreased from 78% to 38%. However, these results still need to be improved, because Cycle I has not achieved the target of the Minimum Completion Criteria (KKM) that was expected. Therefore, Cycle II was carried out to evaluate the previous results. In Cycle II, the data obtained were as follows: the number of students was 13, the number of classical scores was 1,082, and the class average was 83.23. A total of 11 students successfully obtained scores above the KKM, while 2 students were still below the KKM, with a KKM achievement percentage of 85%.

In cycle II, students who completed Mathematics learning were around 11 students or 85%. While students who had not completed Mathematics learning were around 2 students or 15%. Adjusting the achievements that had been achieved in cycle II, there was an increase in the percentage of completion of class V students, namely from students who had completed in cycle I, which increased from 62% to 85%. While students who had not completed it decreased from 38% to 15%. This also means that the emergence of classroom actions in cycle I can also have an impact on student completion for Mathematics subjects (Mixed Arithmetic Operations and Integers). Although not 100% complete, efforts to improve learning showed satisfactory results. The success of learning is influenced by the atmosphere in which teaching and learning activities take place. A calm and comfortable atmosphere allows students and teachers to concentrate and be productive in learning optimally. Another factor that plays a role in the success of learning is the use of learning media, which includes everything that can stimulate students' thoughts, feelings, attention, and motivation to encourage the learning process. Meanwhile, teaching aids function as aids to create effective learning situations, especially in strengthening students' memory by helping them think concretely and reducing the use of excessive words. In addition to learning media, choosing the right method is also very important to support learning success.

In this research, the researchers also use the problem solving method. By using problem solving, it is hoped that students can solve problems related to the Mixed Integer Arithmetic Operations so that students' understanding can increase.

CONCLUSIONS

A. Conclusion

After going through the improvement from Pre-Cycle, Cycle I to Cycle II, analyzing the questions, and summarizing the value of each cycle during the implementation of the improvement of learning, the following conclusions can be drawn:

- In the improvement of learning for the subject of mathematics in grade V of Public Elementary School 04 Babat Banyuasin with the material of Mixed Integer Arithmetic Operations, learning media in the form of metal coins and beads are used. The method used is Problem Solving. This learning media and method makes it easier for students to understand the material being taught and also increases the level of learning achievement, proven by the natural increase in the level of value from Pre-Cycle, Cycle I, and Cycle II.
- Success in the learning process is influenced by the selection of media appropriately according to the material being taught and the application of effective methods in its delivery.
- The learning process through the problem solving method and the use of interesting learning media can help improve students' understanding of the learning material.

B. Suggestions

Several steps should be taken by teachers to increase students' level of understanding of the subject matter, including when applying the appropriate learning methods or models and media to support students' comprehension, absorption, and understanding of the material being taught. From the results of the classroom research that has been conducted, the researcher provides the following suggestions:

1. For Teachers

- Teachers should prepare themselves thoroughly before teaching, both in preparing lesson plans, using methods and teaching aids, analyzing students' work results, and creating a calm and comfortable atmosphere.
- Teachers should always conduct Classroom Action Research (CAR) with the aim of evaluating their performance until students' learning outcomes increase.

Giving awards to students who can answer correctly is very important to motivate them. In addition, it is also important to provide guidance to students whose answers are still not quite right, namely using various teaching methods, so that students can understand and draw their own conclusions from the learning material. This is intended to create an active, innovative, creative, and enjoyable learning atmosphere (PAIKEM), (Supriono, 2011).

2. For students

Students should prepare themselves well and also play an active role in their learning process. They are also required to demonstrate their sense of responsibility in completing the tasks given by the teacher so that their learning achievements can develop as expected.

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