ISSN: 3026-0442

Proceedings of the 2nd International Conference on Education, Science Technology and Health (2nd ICONESTH 2024 Universitas Bina Bangsa Getsempena, Sept 10-12, 2024, Banda Aceh, Indonesia

THE APPLICATION OF A REALISTIC MATHEMATICS LEARNING MODEL IN IMPROVING PRIMARY SCHOOL STUDENT LEARNING OUTCOMES IN BANDA ACEH CITY

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ABSTRACT

This research aims to improve and improve learning outcomes in the learning process which leads to improving mathematics learning outcomes by implementing the Realistic Mathematics Learning Approach implemented by researchers at SD Negeri 15 Banda Aceh City. The subjects in this research were 35 grade IV students and the object of this research was realistic mathematics learning for the 2024/2025 academic year. From the results of data analysis, it shows that during the pre-test before the action was taken, out of 35 students, there were 2 students who completed the study with an average class score of 35.85 and a classical completion level of 5.71%. Furthermore, in cycle I, after implementing realistic mathematics learning, the average class score increased to 68.28 with a classical completion level of 65.71% and the number of students who completed it was 23 students. And after the actions were taken and the second cycle post test was given, learning results were obtained with the class average value increasing to 77.57 and 31 people completed it with a classical completion level of 88.57%. From the results of observations that have been made, it shows that in the first cycle of analysis the achievement obtained by teachers was 2.76 and students obtained 2.44, which means it was still in the poor category. In cycle II, the data from student and teacher observations improved to good. Where the good activity category increased from 2.76 to 3.70 for students and from 2.44 to 3.44 for teachers. Based on the results of this research, it can be concluded that the application of a realistic mathematics learning model can improve student learning outcomes in the operational material for calculating the addition of fractions in class IV of SD Negeri 15 Banda Aceh City.

Keywords: *Realistic mathematics, learning models, Improving earning outcomes*

A. INTRODUCTION

Education is a conscious effort that is deliberately carried out to make the nation's life more intelligent, education is also a strategic route to improve the quality of human resources. In this way, the problems faced will be resolved quickly. Education can also build character for every human being. Therefore, the government must be able to build a targeted, planned education sector for the advancement of public education. Many efforts have been made by the government, but in reality the problem of education in Indonesia is very complex, many groups believe that the quality of education in Indonesia is still low. This can be seen from the educational ranking in Indonesia which is still low compared to other developing countries. The problem that is often found in education is the quality of teaching which influences low student learning outcomes and children are not encouraged to develop thinking skills. The learning process in the classroom is

directed at the child's ability to memorize information, the child's brain is forced to memorize and accumulate various information without being required to understand the information he remembers to relate it to everyday life. As a result, our students graduate from school, they are theoretically smart, but they are poor in application.

The teacher is a very determining component in the implementation of a learning strategy. Without a teacher, no matter how good a strategy is, it is impossible to apply that strategy. The success of implementing a learning strategy will depend on the teacher's expertise in using strategic approaches, techniques and learning strategies. Teachers who think teaching is limited to conveying lesson material will be different from teachers who think teaching is a process of providing assistance to students, especially for students at primary education age. Teachers are the end of the wall in improving the quality of education.

An approach or method is a component that also has a very determining function. The success of achieving goals is largely determined by this component. No matter how complete and clear the other components are, unless they can be implemented through the right strategy or approach, these components will have no meaning in the process of achieving goals. Therefore, every teacher needs to understand well the role and function of methods and strategies in implementing the learning process.

Mathematics is one of the fields of study taught in elementary school. but in the field of mathematics there are still many students who get very low learning outcomes. Even though mathematics is very important in human life. Mathematics is the science that underlies technological development and plays an important role in improving human thinking power. Mathematics does not only use calculation problems, but uses patterns, logic and ideas. As Soejadi said, "Mathematics as one of the basic sciences, both applied and reasoning, has an important role in efforts to master science and technology."

One of the causes of low student mathematics learning outcomes is because the methods or strategies used by teachers in the learning process are less varied. Sometimes teachers start teaching by just dictating the lesson and if there is time they only give a simple explanation.

Realistic Mathematics Learning is an approach to mathematics learning that uses students' experiences and environment as primary teaching tools. This approach adheres to Freundenthal's opinion about a combination of perspectives on what is mathematics?, how to learn mathematics?, and how should mathematics be studied? Freundenthal also has the view that mathematics is a human activity. In this approach, the teacher only acts as a facilitator and guide, so it is hoped that students will carry out more activities alone or in groups to solve problems under the teacher's guidance.

This research focuses on teaching Mathematics in schools in elementary schools. The results of this research show that students will learn more actively and interestedly by using Realistic Mathematics Learning in the teaching and learning process and ultimately can improve student learning achievement.

B. REVIEW OF LITERATURE

In the learning process, whether or not achieving goals is successful is largely influenced by how the learning process is experienced by students. There are several definitions of learning in terms of several sources, including, Meanwhile, C. T. Morgan (in M. Sobry Sutikno, 2023: 3) defines "learning as a relatively permanent change in behavior as a consequence or outcome of past experience".

Learning is an absolute requirement to become clever in all things, both in science and in terms of skills or abilities. Lester D. Crow stated that learning is an individual's change in habits, knowledge and attitudes (Sagala 2019: 13). James Owhittaker further said that "Learning is a process where behavior (in the broadest sense) is generated or changed through practice or training. “(Modonto 2019 : 34).

Learning is a mental/psychic activity that takes place in environmental interactions which results in changes in knowledge, skills and attitudes (Winkel, 2019:53). Learning is a change in behavior that can be observed through the link between stimulus and response according to mechanistic principles (Dahar, 2018: 24).

George J. Mouly in his book (Tritanto, 2019:9) Psychology For Effective Teaching, that learning is basically the process of changing a person's behavior due to experience. A similar opinion was expressed by Kimble and Garmei who stated that learning is a relatively permanent change in behavior, occurring as a result of experience. Meanwhile, Garry and Kingsely stated that learning is an original process of changing behavior through experience and practice.

Arthur T. Jersild (in Sagala 2019: 12) states that learning is "modification of behavior through experience and training", namely changes or bringing about changes in behavior in education due to experience and training or because of training. Hendry E. Garret (2022) believes that learning is a process that takes place over a long period of time through practice and experience which leads to personal change and changes in the way of reacting to certain stimuli.

C. RESEARCH METHODS

The type of research carried out is classroom action research which aims to improve student mathematics learning outcomes. Where this research seeks to explain the influence of realistic mathematics learning on student learning outcomes in mathematics subjects, especially fractional addition calculation operations in class IV of State Elementary School 15, Banda Aceh City. .

In accordance with the type of classroom action research, this research has several stages which constitute a cycle. Each cycle is carried out based on the changes to be achieved. This research will be carried out in two cycles, namely cycle I and cycle II. This research procedure uses several stages, starting from planning, implementing actions, observing and finally reflecting. The data collection tools used in this research were observation and tests.

Cycle I

a. Planning

The action planning stage is carried out after the initial test is given. The initial test is given to determine students' ability to solve problems comparing simple fractions. The results of this test are then used for initial identification of the actions to be taken. At this stage, the activity carried out is action planning, namely in the form of preparing learning scenarios which are arranged according to the level of student learning outcomes in solving problems comparing simple fractions using Realistic Mathematics Learning.

At this stage the action planning for each cycle is as follows:

Action planning in cycle I:

1. Researchers prepare a learning plan for each meeting which includes learning scenarios with realistic mathematics learning.
2. Researchers created a test to measure students' ability to complete simple fraction comparisons.
3. Researchers prepare research instruments in the form of observation sheets.
4. Researchers prepare simple fraction comparison material.

b. Implementation of Actions

The teaching and learning activities carried out are the development and implementation of learning scenarios that have been prepared. At the end of the action, they are given an exercise to see the results that have been achieved, after being given the action of learning simple fraction comparisons in solving problems.

The learning activities carried out by researchers are:

1. The researcher explains material about the operation of adding fractions using a realistic mathematics learning model that links the material to real things.

2. Ask students about material they don't understand, then explain again.
3. The researcher explains how to add fractions by presenting them in the form of real examples in the form of objects close to the students and providing examples of questions.
4. Give practice test results to students and then direct several people to display their work results in front of the class.
5. The researcher asked other students' opinions regarding the results of their friends' work in front of the class, then looked for the stage at which students had difficulty in solving the problem and then explained it back to the students.
6. Researchers motivate students to compete to solve questions in front of the class and provide feedback on the results of students' work.
7. Provide guidance to students so they can improve their grades on assignments given at the next meeting.

c. Observation/reinforcement

The observations carried out included the implementation of monitoring the mathematics learning process in the classroom directly. The activities observed included teacher and student activities in the learning process. This observation aims to determine the suitability of the action with the plan that has been prepared and to find out the extent to which the implementation of the action can produce changes in accordance with the desired results.

d. Reflection

Reflection activities are carried out to consider the teaching guidelines carried out and see the conformity achieved with what is desired in mathematics learning. For this reason, reflect on the weaknesses/deficiency of the actions that have been taken which are useful for improving implementation in the next cycle (cycle II).

Cycle II

In cycle II there will also be 4 (four) stages which will be explained as follows:

a. Action Planning II (Alternative Solutions)

At this stage the researcher creates alternative problem solving (action planning) to improve students' ability to solve simple fraction comparison problems. This procedure is the same as cycle I and learning is carried out to correct deficiencies found in cycle I. Where at this stage the implementation begins with a teaching and learning process with the activities carried out in planning still being the same, namely:

1) Researchers prepare a learning plan for each meeting which includes learning scenarios with realistic mathematics learning.
2) Researchers created a test to measure students' ability to complete simple fraction comparisons.
3) Researchers prepare research instruments in the form of observation sheets.
4) Researchers prepared simple fraction comparison material and prepared questions with a higher level of difficulty.

b. Implementation of Action II

The implementation stages of cycle II are:

1) Discuss the completion of the learning outcomes test I which is considered difficult by students who do not understand the material.
2) Provide opportunities to ask questions for students who do not understand the material.
3) Conduct evaluations by providing exercises related to the material so that students understand better.
4) Ask students to complete the questions on the blackboard.
5) Assessing completed student assignments.
6) Reflecting where students can find out their correct answers and correct their wrong answers.

c. Observation

This observation activity was carried out to observe the learning process in the classroom directly. The implementation of observations was assisted by the class IV teacher.

d. Reflection

This activity tries to see the results of implementation developments and contains conclusions regarding deficiencies or advantages during the process of providing realistic mathematics learning in the teaching and learning process. Reflection is carried out to determine whether there is an increase in learning outcomes from the actions that have been taken.

D. RESULTS AND DISCUSSION

1. RESEARCH RESULTS

Based on data analysis, it is known that classical student learning outcomes have increased. The increase in students can be seen in the table below:

Table 1. Comparison of Values and Completeness of Student Learning Results in Preliminary Tests, Cycle I and Cycle II Comparison of Pretest Learning Results, Post Test Cycle I and Post Test Cycle II

No.	Student Initial	Pretest		Post Test of Cyclus I		Post Test of Cyclus II	
		Score	Explanation	Score	Explanation	Score	Explanation
1	S01	10	incomplated	70	complated	95	complated
2	S02	15	incomplated	75	complated	80	complated
3	S03	40	incomplated	70	complated	90	complated
4	S04	20	incomplated	80	complated	100	complated
5	S05	35	incomplated	60	incomplated	65	incomplated
6	S06	10	incomplated	50	incomplated	70	complated
7	S07	20	incomplated	75	complated	75	complated
8	S08	20	incomplated	45	incomplated	75	complated
9	S09	50	incomplated	70	complated	80	complated
10	S10	70	incomplated	80	complated	65	complated
11	S11	30	incomplated	70	complated	75	complated
12	S12	15	incomplated	90	incomplated	100	complated
13	S13	55	incomplated	55	inclompate	75	complated
14	S14	30	incomplated	90	complated	100	complated
15	S15	25	incomplated	70	complated	90	complated
16	S16	20	incomplated	50	incomplated	70	complated
17	S17	40	incomplated	80	complated	70	complated
18	S18	50	incomplated	60	incomplated	80	complated
19	S19	55	incomplated	75	complated	85	complated
20	S20	45	incomplated	50	incomplated	70	complated
21	S21	30	incomplated	90	complated	100	complated
22	S22	50	incomplated	70	complated	75	complated
23	S23	55	incomplated	45	incomplated	50	incomplated
24	S24	30	incomplated	55	incomplated	75	complated
25	S25	40	incomplated	50	incomplated	50	complated
26	S26	20	incomplated	75	complated	75	complated
27	S27	15	incomplated	60	incomplated	85	complated
28	S28	60	incomplated	70	complated	75	complated
29	S29	70	incomplated	70	complated	80	complated
30	S30	35	incomplated	75	complated	85	complated
31	S31	30	incomplated	70	complated	75	complated
32	S32	40	incomplated	65	complated	75	complated
33	S33	40	incomplated	85	complated	85	complated

No.	Student Initial	Pretest		Post Test of Cyclus I		Post Test of Cyclus II	
		Score	Explanation	Score	Explanation	Score	Explanation
34	S34	30	incomplated	75	complated	75	complated
35	S35	55	incomplated	70	complated	85	complated
Total		1255	1255	2390	2390	2715	2755
Avarage Score		35.85		68.28		77.57	
Completeness		5.71%	complated	65.71%	complated	88.57%	complated
		94.28%	incomplated	34.28%	incomplated	11.42%	incomplated

Table 2. Completeness of Learning Results for Preliminary Test, Post Test Cycle I and Post Test Cycle II

No.	Achievement of learning outcomes	Pretest	Post Test Cyclus I	Post Test Cyclus II
1	Avarage Score	35.85	65.71	78.71
2	Number of Students	2	23	31
3	Completion Percentage	5,71%	68.86%	88,57%

Based on the table above, it can be clearly seen that there has been an increase in student learning completion results. For more clarity, in order to differentiate the level of completion in the initial test, post test cycle I and post test cycle II regarding improving learning outcomes can be seen in the following graphic image:

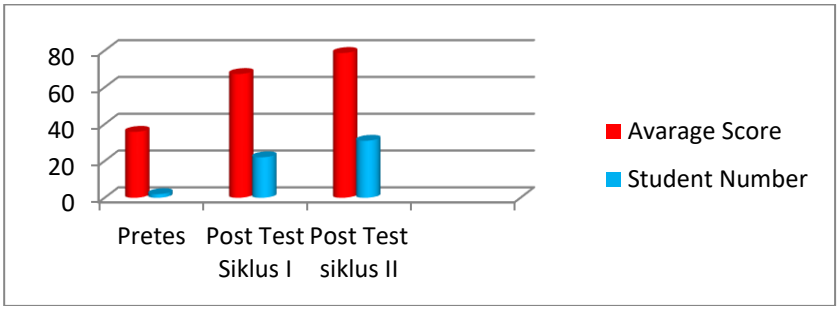

Figure 1. Graph of Improvement in Learning Results

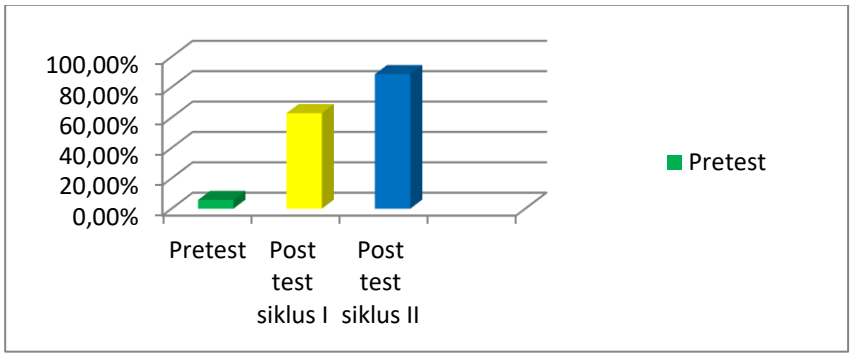

Figure 2. Graph of Increasing Completeness of Learning Outcomes

E. COCLUSIONS AND SUGGESTIONS

a. Conclusions

Based on the result of the research, thus there are some conclusions that can be drawn as follows:

1. Applying realistic mathematics learning can improve student learning outcomes in the teaching and learning process

2. The results of mathematics learning material on arithmetic operations on adding fractions for class IV students at SD Negeri 15 Banda City in the initial test were very low with an average score of 35.85 and classical completion reaching 5.71%, which means low.
3. The results of mathematics learning material on arithmetic operations for adding fractions for class IV students at SD Negeri 15 Banda City, there was an increase in the first cycle, which was low with an average score of 68.28 and classical completeness of 65.71% or increasing. Furthermore, in cycle II, an average score of 77.57 was obtained and classical completeness reached 88.57%, which means that students' presentations experienced changes of more than > 85%. This shows that from cycle I to cycle II there was an increase
4. With the application of realistic mathematics learning, there is a real change in student learning outcomes as seen from the differences in students who experienced changes starting from 2 people who completed the initial test, 22 people in cycle I and 31 people in cycle II.
5. By using realistic mathematics learning, mathematics learning is more enjoyable and can improve student learning outcomes in the field of mathematics study, the main topic of fractional addition arithmetic operations.

b. Suggestions

Based on the research results and conclusions in this classroom action research, that realistic mathematics learning can improve student learning outcomes in mathematics lessons, therefore the researcher proposes several suggestions for improving and improving the quality of mathematics learning as follows:

1. For elementary school teachers, applying the Realistic Mathematics Approach in learning can be used as an alternative to improve students' mathematics learning activities and outcomes.
2. In the teaching and learning process, teachers are expected to use realistic mathematics learning as an alternative learning model on the subject of fractional addition calculation operations.
3. In the learning process, teachers should apply realistic mathematics learning to increase student stimulus by relating the material to reality.
4. For heads of students who are involved in learning to instill a positive attitude in learning mathematics.
5. For school principals, to continue to provide opportunities for teachers to take part in several activities aimed at improving the quality of education
6. For researchers, to carry out research thoroughly in order to improve the quality of education, namely by applying several learning methods and approaches, especially in mathematics lessons, one of which is by applying the Realistic Mathematics Approach.

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