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Application of Problem Based Learning Learning Model in Improving Mathematics Learning Outcomes of Class VIII Students of State Junior High School 1 Ulugawo Academic Year 2021/2022

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Abstract

Based on the results of preliminary observations at the Ulugawo State Junior High School 1, several problems were found, including: 1) Learning is still conventional (teacher centered), and 2) Student learning outcomes in mathematics subjects are still lacking. Research objectives: (1) Describe the quality of mathematics learning through the application of the Problem Based Learning learning model. (2) Describe student learning outcomes in mathematics subjects through the application of the Problem Based Learning learning model. The research location is at Ulugawo State Junior High School 1. The subjects of the study were 26 students of classVIII-A, consisting of 10 men and 16 women. The research method used is Class Action Research (PTK) which consists of four stages, namely: (1) Planning, (2) Action, (3) Observation, and (4) Reflection. Research instruments: (1) Observation sheets, (2) Learning quality questionnaires, (3) Student learning outcomes tests, (4) Interview guide sheets, and (5) Documentation photos. The results of the study: (1) The quality of mathematics learning through the application of the Problem Based Learning learning model in the State Junior High School 1 Ulugawo for the 2021/2022 Academic Year in Cycle I, which is 64.39% classified as sufficient criteria and in Cycle II, 98.53% is classified as very good criteria. (2) The average student learning outcomes in mathematics subjects through the application of the Problem Based Learning learning model at the State Junior High School 1 Ulugawo for the 2021/2022 Academic Year in Cycle I are 69.30 classified as sufficient criteria and in Cycle II, 80.15 are classified as good criteria.

Keywords: Problem Based Learning, Learning Outcomes

INTRODUCTION

Education is a learning process that allows students to develop their own personality potentials such as religious attitudes, self-control, personality, intelligence, self-character and skills. This is in line with the National Education System which states that, Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual power, self-control, personality, intelligence, noble character, as well as the skills needed for themselves, society, nation and state.

The role of education becomes very important in shaping a quality human person. Therefore, the role of education must be in accordance with the objectives of national education as stated in the law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System which aims shaping students into human beings who have faith and piety in God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. Formally, education aims to prepare students to be able to face a life that is always developing through logical, rational, critical, careful, honest, efficient and effective thinking and competent in the world of education and be able to create reliable and professional human resources (HR). Therefore,

education must be carried out as well as possible in order to obtain good results so that human resources increase and develop.

Given the importance of education, there are various efforts that have been made by the government and one of them is the improvement of the curriculum. The current curriculum is the 2013 Curriculum (K-13). The 2013 curriculum is one of the paradigm shifts in learning from conventional learning to one that activates students and trains students' creative thinking skills. The 2013 curriculum integrates several subjects studied at the primary and secondary education levels, one of which is mathematics.

Mathematics is one of the subjects that has a very large role in everyday life and in the development of knowledge, especially in the world of technology. The subject of mathematics does not depend on other sciences, in fact mathematics is a resource used to develop other sciences. This is in line with As'ari, et al (2017: 7) stated that, Mathematics is a universal science that is useful for human life and also underlies the development of modern technology, and has an important role in various disciplines and advances human thinking power. Mathematics subjects are hierarchical or multilevel which means that these subjects must be based from the lowest level to the highest level of each level of education and are mutually sustainable. Based on Permendiknas No. 22 of 2006, it is stated that the purpose of mathematics subjects in schools is for students to be able to:

1. Understanding mathematical concepts explains the relationship between concepts and applies concepts or algorithms, flexibly, accurately, efficiently, and precisely, in problem solving.
2. Using reasoning on patterns and properties, performing mathematical manipulations in making generalizations, compiling proofs, or explaining mathematical ideas and statements.
3. Solving problems that include the ability to understand problems, design mathematical models, solve models and interpret the solutions obtained.
4. Communicate ideas with symbols, tables, diagrams, or other media to clarify circumstances or problems.
5. Have an attitude of appreciating the usefulness of mathematics in life, that is, having curiosity, attention, and interest in studying mathematics, as well as a tenacious and confident attitude in problem solving.

Based on the objectives of learning mathematics above, It is clear that mathematics is very important for students both as a provision in continuing to a higher level of education and more specifically in solving everyday problems. However, this hope was not fully achieved, as seen when Indonesia participated in the PISA (Programme for International Student Assessment) study. The results of the PISA study published by the OECD in 2015 show that the mathematical literacy of Indonesian students at the international level has not been encouraging. From 2000 to 2015, Indonesia's ranking was still at the bottom with the average still far from the international score. The results of PISA 2015 show that mathematics achievement in Indonesia is ranked 63rd out of 72 countries with a score obtained is 386.

Jurmaniati, et al (2015:68) argue that one of the factors causing the low PISA in Indonesia is "Indonesian students are generally poorly trained in solve questions with characteristics such as questions in TIMSS and PISA". Furthermore, according to Harahap and Surya (2017: 45), namely: Weak problem-solving ability of nonroutin or high-level problems. The questions tested in PISA consist of 6 levels (the lowest level 1 and the highest level 6) and the questions tested are contextual questions, the problems are taken from the real world. Meanwhile, students in Indonesia are only familiar with routine questions at level 1 and level

2.Therefore, it can be concluded that the mathematics problem-solving ability of Indonesian students is low.

Basically, problem solving ability is the ability of students to solve mathematical problems by paying attention to the process of finding answers based on problem-solving steps. this is in accordance with the opinion of Arifuddin, et al (2018: 263) saying that "problem-solving ability is one of the efforts to find a way out of a difficulty in order to achieve a goal that is not so easy to achieve immediately". Mathematics subjects are not just taught to students to be seen and heard, but can be done by continuously practicing and doing problems in order to better understand concepts and symbols in mathematics. One of the abilities that students must have to achieve these goals is the understanding of concepts. Understanding concepts is very important because mastery of concepts will make it easier for students to learn mathematics. In mathematics learning, more emphasis is placed on mastering concepts so that students have the provision to achieve other basic abilities such as reasoning aspects, the communication aspect, and the problem-solving aspect. This is in accordance with Fitrah (2017: 52) who said that, In every learning, especially in mathematics in the classroom, of course, what is a reference for teachers is the emphasis on mastering concepts so that students have complete basic provisions to achieve other basic abilities such as the mathematical conjecturing process, mathematical communication and problem solving.

However, these expectations are not fully achieved, because the reality is that at this time the implementation of learning activities is still not optimal. Based on the results of observations at the Ulugawo State Junior High School 1, several problems were found, including: learning is still conventional (teacher centered), the learning media used is less varied so that students quickly feel bored, lack of creativity and curiosity of students in doing assignments and teachers less associate the subject matter with real-life context. This problem causes student learning outcomes in mathematics subjects to be lacking. The following are the average scores of class VIII students in mathematics subjects.

Table 1. Average Mathematics Scores of Class VIII Students in Odd Semester of State Junior High School 1 Ulugawo Academic Year 2021/2022

School Year	Semester	Class	Average Value	Criterion	KKM
2021/2022	odd	VIII - A	57,64	Less	70
		VIII - B	58,32	Less	

Source: Mathematics Teacher Class VIII State Junior High School 1 Ulugawo

Based on some of the problems above, solutions are needed in overcoming these problems in order to improve the quality and results of learning. One of the necessary ways is that a teacher must be able to apply an effective learning model in teaching. The use of learning models can try to help students become active to develop students' reasoning power so that they are able to develop and evaluate arguments. One of the learning models that is very effectively used in the implementation of learning process activities is the use of the Problem Based Learning (PBL) learning model. Problem Based Learning is one of the student-centered learning models and emphasizes student cooperation in solving problems. The Problem Based Learning learning model can place students as a learning center that demands full student activity in order to solve every problem faced by students independently by constructing the knowledge and understanding possessed. Sofyan, et al (2017: 48) stated that, Problem-Based Learning derived from English Problem Based Learning is a learning approach that begins with solving a problem, but to solve that problem students need new knowledge to be able to solve it. In Duch's opinion in Shoimin (2018: 130) stated, Problem Based Learning (PBL) is a teaching model characterized by real problems as a context for students to learn critical thinking and problem-solving skills and gain knowledge.

RESEARCH METHODS

In the implementation of this study, researchers used the Class Action Research (PTK) method, so that the object of action is: application of Problem Based Learning learning models and mathematics learning outcomes. The research location is Ulugawo State Junior High School 1, Jalan Ulugawo Onodalinga Village, Ulugawo District, Nias Regency, North Sumatra Province. The subjects of the study were class VIII-A students with a total of 26 people. This research was carried out in the even semester of the 2021/2022 Academic Year and was adjusted to the schedule of mathematics subjects. The duration of the research is approximately 1 month, in cycle I 3 meetings are held and in cycle II 2 meetings are held and added once for the end of the cycle.

To collect data in this study used several research instruments. The research instruments used are as follows:

1. Observation Sheet. Observation sheets are used to observe the learning process in the classroom. This observation sheet is filled in by the teacher of mathematics subjects as an observer. The observation sheets used by researchers include: Learning Process Observation Sheets (Teacher Respondents). These observation sheets are used to collect data on activities during the learning process; Observation sheets of actively engaged students. These observation sheets are used to collect data on student activities in the learning process relating to interests, attention, participation, and percentages; and Actively Uninvolved Student Observation Sheets. These observation sheets are used to collect data on students who are not actively involved in the learning process. The activities of students who are not actively involved in learning activities are: noisy, doing other tasks, sleepy, going in and out of class, disturbing other students, daydreaming, nosy, doodling on paper, playing HP/Game, and moving around.
2. Student Learning Outcomes Test. Learning outcomes tests are used to determine the improvement of student learning outcomes. Before the learning outcomes test is used as a research instrument, validation is first carried out and instrument trials are carried out.
3. Learning Quality Questionnaire Sheet. The learning quality questionnaire is an instrument to measure the quality of learning which is compiled in the form of an objective questionnaire, where to the respondent who in this case is a student who will be given several questions. Learning quality questionnaires are circulated to students (respondents) at the end of each cycle.
4. Interview Guide Sheet. Interview guide sheets for teachers and students are used to find out how to respond or Their opinion about the learning that has been implemented by the researcher. Interviews are conducted at the end of each cycle.

RESULTS OF RESEARCH AND DISCUSSION

Description of Research Findings

1. Research Settings

This research was carried out at Ulugawo State Junior High School 1 located in Onodalinga Village, Ulugawo District, Nias Regency. The subjects of the study were class VIII-A students totaling 26 people, consisting of 10 men and 16 women. Before the research was conducted, the researcher first collaborated with the principal of the Ulugawo State Junior High School 1 and with his approval the research could be carried out and the researcher also collaborated with the teacher of mathematics subjects. The implementation of this research includes four stages, namely: planning, action, observation, and reflection. The implementation of research is carried out using the services of observers or observers, namely teachers of mathematics subjects who assist in the implementation of observations

during the research, so that this research activity can be carried out properly. Research activities are carried out to coincide with the hours of mathematics subjects and do not interfere with the process of implementing other learning and also researchers as well as practitioners do not need to leave the classroom where he teaches. This research starts from May 18 to June 10, 2022. Classroom action research on mathematics learning using the Problem Based Learning learning model to improve the quality and learning outcomes of students in learning mathematics and is carried out in 2 cycles. The schedule of mathematics class VIII-A class class hours at Ulugawo State Junior High School 1 during the research is as follows:

Table 2. Research Implementation Time

Cycle	Day/Date	Information
1	Wednesday, May 18, 2022	Studying material on analyzing the distribution of data.
	Friday, May 20, 2022	Studying the material on determining the average (mean) value of a data.
	Wednesday, May 25, 2022	Studying material on determining the median and mode of a data.
	Friday, May 27, 2022	End of Cycle I Test
2	Friday, June 3, 2022	Studied material on determining the size of the spread of range and quartile data.
	Wednesday, June 8, 2022	Studied material on determining the size of the spread of interquartile range data and quartile deviation.
	Friday, June 10, 2022	End of Cycle II Test

2. Logical Validation Results

To find out the student learning outcomes in this study, a test was used, where the test used was a written test in the form of a description test and consisted of a cycle I learning outcomes test and a cycle II learning outcomes test. Before the first cycle learning outcomes test and the cycle II learning outcomes test are determined as research instruments first logically validated to mathematics teachers / lecturers. From the validation results by 3 validators, the cycle I learning outcomes test and the cycle II learning outcomes test are declared valid or suitable for use as research instruments.

3. Instrument Trial Results

After the test is declared valid by the three validators, then the test is tested at the State Junior High School 2 UlugawoYear 2021/2022 with a learning outcomes test consisting of 5 items of description test forms. With the results of the trial, the research instrument is used to test the validity of the test, the reliability of the test, the test difficulty index test, and the differentiating powertes.

4. Validity Test

Validity test is a test used to determine the validity or not of an instrument, so that through validity tests it can be known whether an instrument can be used or not. The test validity test is carried out based on the acquisition of scores on the implementation of instrument trials. Based on the results of calculating the validity test from question item number 1 to question item number 5 declared valid so that it is suitable for use as a research instrument, the results of calculating the validity test can be seen in the following table:

Table 3. Validity Test Calculation Results

No.	Skor r_{hitung}	Skor r_{tabel}	Conclusion
1.	0,855	0,413	Valid

2.	0,932	0,413	Valid
3.	0,855	0,413	Valid
4.	0,957	0,413	Valid
5.	0,953	0,413	Valid

5. Reliability Test

Reliability tests are carried out to find out whether the results of research instruments are reliable and can be used anytime and anywhere. Based on the results of calculating the reliability test, a calculated value = 0.924 was obtained.Then consulted on the price of the value of the table with the degree of freedom (et al) = N–1= 24–1 = 23 with a significant degree of 5% obtained the value of the rtabel = 0.413. Because the rhitung value is greater than the rtabel, namely 0.924 > 0.413 so that it can be concluded that the learning outcomes test instrument is declared reliable.

6. Test the Level of Difficulty

The difficulty level test is carried out to ensure the suitability between the difficulty level of the questions that have been set on the learning outcomes test grid with the actual situation, it is necessary to conduct a difficulty level test. Based on the calculation results of the difficulty level test starting from question item number 1 to question item number 5, it turns out that the difficulty level of each test item corresponds to the difficulty level on the learning outcomes test grid, So that the learning outcomes test is feasible to be used as a research instrument, the results of calculating the difficulty level test are in the following table:

Table 4. Difficulty Level Test Calculation Results

No.	Mean	Maximum Score of Each Question	Difficulty Level	Question Difficulty Level Criteria
1.	6,25	8	0,78	Easy
2.	8,33	12	0,69	Keep
3.	6,33	8	0,79	Easy
4.	8,17	12	0,68	Keep
5.	5,21	20	0,26	Difficult

7. Differentiating Power Test

A differentiating power test is performed to determine whether each test item can distinguish capable students from underprivileged students. Based on the results of calculating the differentiating power test starting from question item number 1 to question item number 5, it turns out that the results have good distinguishing power so that they can be accepted and suitable for use as research instruments, the results of calculating the differentiating power test can be seen in the following table:

Table 5. Differentiating Power Test Calculation Results

No.	$\bar{X}_A$	$\bar{X}_B$	$\bar{X}_A - \bar{X}_B$	Ideal Maximum Score	Differentiating Power Index	Distinguishing Power Criteria
1.	8,00	4,50	3,50	8	0,44	Good
2.	11,50	5,17	6,33	12	0,53	Good
3.	8,00	4,67	3,33	8	0,42	Good
4.	11,17	5,17	6,00	12	0,50	Good
5.	9,33	1,08	8,25	20	0,41	Good

8. Data Exposure Every Cycle

a. Data Cycle I (First Meeting, Cycle I): The percentage of observation of the learning process (teacher respondents) is 60.42% with sufficient criteria; The percentage of observation of students who are actively involved in the learning process is 62.98% with sufficient criteria; The percentage of observations of students who are not actively involved in the learning process is 11.54%.

b. Data Cycle I (Second Meeting, Cycle I): The percentage of observation of the learning process (teacher respondents) is 64.58% with sufficient criteria; The percentage of observations of students who are actively involved in the learning process is 66.11% with sufficient criteria; The percentage of observations of students who are not actively involved in the learning process is 7.69%.

c. Data Cycle I (Third Meeting, Cycle I): The percentage of observation of the learning process (teacher respondents) is 72.92% with sufficient criteria; The percentage of observation of students who are actively involved in the learning process is 68.99% with sufficient criteria; The percentage of observations of students who are not actively involved in the learning process is 7.69%.

d. Cycle I Data (End of Cycle I): The percentage of learning quality questionnaires, namely 64.39%, is classified as sufficient criteria; The percentage of completion of student learning outcomes is 61.54% while the percentage of incomplete is 38.46%; The average student learning outcomes, which is 69.30, are classified as sufficient criteria.

e. Data Cycle II (First Meeting, Cycle II): The percentage of observation of the learning process (teacher respondents) is 93.75% with Good criteria; The percentage of observations of students who are actively involved in the learning process is 93.27% with good criteria; The percentage of observations of students who are not actively involved in the learning process is 7.69%.

f. Data Cycle II (Second Meeting, Cycle II): Percentage of observation of the learning process (teacher respondents) is 95.83% with Good criteria; The percentage of observation of students who are actively involved in the learning process is 96.15% with good criteria; The percentage of observations of students who are not actively involved in the learning process is 3.85%.

g. Cycle II Data (End of Cycle II): The percentage of learning quality questionnaires, namely 98.53%, is classified as Very Good; The percentage of completion of student learning outcomes is 84.62% while the percentage of students is not completed, namely 15.38%; The average student learning outcomes, which is 80.15, are classified as Good criteria.

Discussion

a. Reflection of cycle I

a. First Meeting, Cycle I

The implementation of learning is still not carried out optimally, in accordance with the results of the observation of the learning process (teacher respondents) obtained an average observation result of 2.42 (sufficient) and the percentage of observation results is 60.42%. The weaknesses of the learning process at this meeting are: the ability to master the class is still lacking, and the lack of ability to solve problems.

Based on these weaknesses, There are several corrective actions taken by researchers, namely: researchers learn and prepare themselves better in mastering the subject matter to be taught to students, researchers make more careful preparations in solving the problems being discussed, and researchers prepare themselves to better conclude the subject matter at the end of learning activities.

The results of the observation of students who are actively involved in the learning process obtained an average interest of 2.50 (enough) with a percentage of 62.50%, an average of attention which is 2.54 (enough) with a percentage of 63.46%, an average participation of 2.46 (enough) with a percentage of 61.54%, and an average presentation of 2.58 (enough) with a percentage of 64.42%. So that the percentage of observations of students who are actively involved in the learning process is 62.98%. This result shows that students are not fully involved in the learning process activities. The shortcomings are: Students do not yet realize the importance of learning for their future, so they are less motivated to compete for achievements; Students open books but not books that are being studied; Students still lack the courage to express questions and opinions; and There are still students who tell stories with their friends.

Solutions carried out by researchers in overcoming some of the shortcomings above include: Increasing student awareness that learning is very important; Encourage students to be actively involved in every learning activity; Increase students' courage in asking questions and expressing opinions; and Invite students to focus on participating in learning activities so that students do not tell stories with their friends. In the observation section of students who were not actively involved in the learning process, the percentage of observation results was obtained, namely 11.54%. At this meeting, there are students who are not actively involved in learning, namely there are students who are noisy and nosy. The solution in overcoming this problem is that researchers will pay attention to and advise students to be inactive during the learning process.

b. Second Meeting, Cycle I

At this meeting, the implementation of learning experienced a slight change compared to the previous meeting although it was still far from expectations. In accordance with the results of the observation of the learning process (teacher respondents) obtained an average observation result of 2.58 (sufficient) and the percentage of observation results was 64.58%. There are several weaknesses at this meeting, namely: mastery in explaining learning materials is still quite sufficient, the ability to define and organize learning tasks in learning is still not optimal, the ability to direct students in the application of the Problem Based Learning learning model is still quite sufficient, and the ability to provide feedback is still not optimal.

The solutions carried out by researchers in overcoming some of the shortcomings above include: researchers make better preparations in mastery and in explaining learning materials when teaching, researchers take better corrective actions in defining and organizing learning tasks in learning, researchers make even better improvements in directing students to learn and must still control students in the process Learning, and researchers take even better remedial actions in providing feedback and in carrying out evaluations.

Then in the observation results of students who are actively involved in the learning process, an average interest of 2.62 (enough) with a percentage of 65.38%, an average of attention is 2.65 (enough) with a percentage of 66.35%, the average participation is 2.62 (enough) with a percentage of 65.38%, and the average presentation is 2.69 (enough) with a percentage of 67.31%. So that the percentage of observations of students who are actively involved in the learning process is 66.11%. Based on these results, it can be concluded that student involvement in the learning process still remains less than optimal.

The causes of the lack of student involvement in the learning process are: Students often tell stories with their friends so that they become noisy; Lack of student enthusiasm in following the learning process; Students' attention is less focused on the lesson; Students look lazy and some are sleepy. Remedial actions taken by researchers in overcoming some of the above shortcomings include: Encouraging students to focus on explaining the subject matter; Encourage students to focus on paying attention to the explanation of the subject matter; Encourage students to be enthusiastic in learning; and Motivate students to be more actively involved in learning. The observation results of students who were not actively involved in the learning process obtained a percentage of observation results, namely 7.69%. At this meeting, there were several students who were not actively involved in learning, including noisy students and some students who were nosy to their friends while studying. So, researchers will pay attention to and reprimand students who are not active in the learning process activities.

c. Third Meeting, Cycle I

At This meeting saw that the implementation of learning experienced changes compared to the previous meeting although it was still far from expectations. In accordance with the results of the observation of the learning process (teacher respondents) obtained an average observation result of 2.92 (sufficient) and the percentage of observation results was 72.92%. Then in the observation results of students who are actively involved in the learning process, an average interest of 2.81 (enough) with a percentage of 70.19%, an average of attention is 2.73 (enough) with a percentage of 68.27%, the average participation is 2.77 (enough) with a percentage of 69.23%, and the average presentation is 2.73 (enough) with a percentage of 68.27%. So that the percentage of observations of students who are actively involved is 68.99%. These results show that there has been an increase in students who are actively involved in learning. Then the observation results of students who were not actively involved in the learning process obtained the percentage of observation results, namely 7.69%. At this meeting, there are students who are not actively involved in learning, namely there are students who are sleepy and disturb other students. The solution in overcoming these weaknesses is that researchers who act as teachers always pay attention to students who are not focused on learning and researchers always try to increase student interest in learning.

d. End of Cycle I

At the end of Cycle I, the percentage of learning quality questionnaires was obtained, namely 64.39% classified as sufficient criteria. Then the percentage of completion of student learning outcomes, namely 61.54% and the average student learning outcomes, namely 69.30, are classified as sufficient criteria. In accordance with the results of the recapitulation, the average result of the final reflection of Cycle I was 64.48%. This result shows that the implementation of Cycle I still does not meet expectations, which means that the problems at the Cycle I stage have not been resolved, so they will be continued in Cycle II. Some of the weaknesses contained in the implementation of Cycle I are caused by several things, including: Researchers still do not master all stages of implementing the Problem Based Learning learning model; Researchers suboptimally explain learning objectives to learners at each meeting; Researchers still do not fully master the learning material they want to teach students; The ability to define and organize learning tasks in the application of the Problem Based

Learning learning model is still not implemented in every learning process activity; The ability to solve problems in the application of the Problem Based Learning learning model is still not good.

Based on some of the weaknesses above, the researcher took corrective actions which included, among others: Prepare yourself to be even better in mastering the stages of implementing the Problem Based Learning learning model; Researchers must be even better at explaining learning objectives to learners at each meeting; Researchers prepare themselves to better master and explain learning materials to students; Researchers will be even more critical in solving a problem or topic of discussion in the application of the Problem Based Learning learning model; and Researchers always provide encouragement and motivation to students to be more actively involved in participating in learning process activities.

2. Reflection of Cycle II

a. First Meeting, Cycle II

At this meeting, the implementation of learning has improved well compared to the previous meeting. In accordance with the results of the observation of the learning process (teacher respondents) obtained an average observation result of 3.75 (good) and the percentage of observation results was 93.75%. These results show that there has been a good change in the learning process through the application of the Problem Based Learning learning model. However, researchers continue to take corrective actions in order to obtain even better results by: Better prepare themselves in studying and mastering the stages of applying the Problem Based Learning learning model; Researchers prepare well in mastering and explaining learning materials to learners; Always provide motivation and attention to students so that students are more actively involved and enthusiastic in learning.

The observation results of students who are actively involved in the learning process obtained an average interest of 3.73 (good) with a percentage of 93.27%, the average attention is 3.69 (good) with a percentage of 92.31%, the average participation is 3.73 (good) with a percentage of 93.27%, and the average presentation is 3.77 (good) with a percentage of 94.23%. So that the percentage of observation of students who are actively involved in the excitement of the learning process is 93.27%. Based on these results, it can be concluded that students are able to be actively involved in learning activities, but researchers will still evaluate so that at the next meeting student involvement in learning activities will increase. The observation results of students who were not actively involved in the learning process obtained a percentage of observation results, namely 7.69%. In this part of the meeting, there are still students who are not actively involved in learning, namely there are still noisy students. So the solution in overcoming this weakness is that the researcher will reprimand and Continue to motivate students to be actively involved.

b. Second Meeting, Cycle II

At this meeting, the implementation of learning has increased compared to the previous meeting. In accordance with the results of the observation of the learning process (teacher respondents) obtained an average of observation results, namely 3.83 (good) and the percentage of observation results was 95.83%. The observation results of students who are actively involved in the learning process obtained an average interest of 3.81 (good) with a percentage of 95.19%, an average of attention which is 3.85 (good) with a percentage of 96.15%, an average participation of 3.88 (good) with a

percentage of 97.12%, and an average presentation of 3.85 (good) with a percentage of 96.15%. So that the percentage of observations of students who are actively involved in the learning process is 96.15%. Based on these results, it can be concluded that students have almost fully been actively involved in the learning process through the application of the Problem Based Learning learning model. The observation results of students who were not actively involved in the learning process obtained a percentage of observation results, namely 3.85%. These results show good results because the level of inactivity of students in learning is low. At this meeting, there are still students who are working on other assignments. The solution is that researchers will still minimize students who are not actively involved in learning by taking it seriously and focusing on following the implementation of learning process activities.

c. End of Cycle II

At the end of Cycle II, the percentage of learning quality questionnaires was obtained, namely 98.53% classified as very good criteria. The percentage of completion of student learning outcomes is 84.62% and the average student learning outcomes, which is 80.15, are classified as good criteria. In accordance with the results of the recapitulation, the average reflection result at the end of Cycle II was obtained, which was 93.16%. These results show that the implementation of research in Cycle II has been achieved and has met expectations, and the interview results state that students are happy and interested in participating in learning activities through the application of the Problem Based Learning learning model because through the application of the Problem Based Learning learning model students can be actively involved in learning activities so that student learning outcomes are good and the quality of learning is good. So, it can be concluded that the implementation of Cycle II has met expectations so that this research has been achieved optimally.

CONCLUSION

By processing and analyzing data from research results that have been carried out, the researchers conclude as follows: The quality of mathematics learning through the application of the Problem Based Learning learning model at the State Junior High School 1 Ulugawo Academic Year 2021/2022 in Cycle I, which is 64.39% classified as sufficient criteria and in Cycle II, 98.53% is classified as very good criteria; The average student learning outcomes in mathematics subjects through the application of the Problem Based Learning learning model at the State Junior High School 1 Ulugawo Academic Year 2021/2022 in Cycle I are 69.30 classified as sufficient criteria and in Cycle II, 80.15 is classified as good criteria.

Based on the results of the study, the author's suggestion is: Teachers should use the Problem Based Learning learning model because they are able to develop students' attitudes and skills in thinking critically, systematically and respecting each other; A teacher who wants to apply the Problem Based Learning learning model should fully master the stages of its implementation for the optimal implementation of the learning process; Students should prepare to study at home so that students are able to express ideas or ideas about a problem that arises.

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