

Research Article

Application of Problem-based Learning Learning Model with Game Approach to Improve Learning Outcomes in Class X-4 SMAN 8 Malang

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Abstract.

The background of this study is that the learning motivation of students in participating in mathematics learning is very low, this can be seen in the basic ability test conducted before starting early semester learning, the average class score was 23.6 with only 16 students who had scores above the grade average of around 44.4%. In addition, from the results of interviews with grade X-4 children, information was obtained that learning in previous junior high schools was only teacher-centered and learning was carried out online, thus leading to lack of understanding of mathematics ion students. The lack of teaching aids is also one of the obstacles by teachers in the learning process. Students are also still shy in expressing opinions, so they still need to be guided in order to express their opinions. The purpose of this study is to apply the problem-based learning (PBL) learning model with a game approach to improve the learning outcomes of class X-4. This research was conducted at SMAN 8 Malang for two cycles and consisted of three stages, namely planning, implementation of actions and action results (do), and reflection (see). The results of this study showed that the results of changes in the final test results of cycle I and cycle II using the game approach showed a better development in the percentage in each cycle, which was 42.4%, with an average value of 21.36 in cycle I and to 94.4%, with an average value of 89.1 in cycle II. In this case, it can be concluded that the application of the PBL model with a game approach can improve the learning outcomes of grade X-4 students of SMAN 8 Malang.

Keywords: problem-based learning, Game, learning outcomes

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1. INTRODUCTION

The role of education in life is very important. Education is a support in improving human resources (HR) in Indonesia for nation building. Basically, education is a countermeasure in creating maximum human natural resources. This is because education is a basic aspect in achieving the development sector both in the economic, political, socio-cultural, legal, and other sectors.

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Mathematics is a universal science of great importance in the world of education. Therefore, mathematics subjects need to be given to all students from elementary school to advanced school to equip students with logical, analytical, systematic, critical, and creative thinking skills and be able to solve problems encountered in everyday life. (Sufri Mashuri, 2019) .

The Problem Based Learning (PBL) Learning Model uses constructivist principles to encourage the application of prior knowledge. In Problem Based Learning (PBL), teachers take on the role of facilitators rather than as lecturers. Facilitators help groups build understanding and connect concepts by providing information, directing exploration, strengthening understanding of difficult concepts, and introducing resources. In addition, the facilitator asks for reflection of group processes and group results. Facilitators can also be considered as coaches or guides who provide feedback and encouragement (Salari, Roozbehi, Zarifi & Tarmizi, 2018).

Through observations in the first semester conducted in class X-4 of SMAN 8 Malang, information was obtained that the learning motivation of students in participating in mathematics learning was very low, this can be seen in the basic ability test conducted before starting the initial semester learning, the average class score was 23.6 with only 16 students who had a score above the class average of around 44.4%.

In essence, the game method is a way of presenting the subject matter through various forms of game activities to create a fun, serious but relaxed atmosphere so that students will learn happily. The game method can support the learning process of students, because during the learning process students can play and hone the skills and abilities they have. In the game method the child can also hone new knowledge and old knowledge that he has before. With this game method, it is hoped that students can be more motivated to follow the learning process, especially in learning mathematics. (Anggi Handini, 2014).

Based on research by Tian, Endah, Kiswoyo (2019) who applies active learning with game methods to improve student mathematics learning outcomes obtained from the results of the percentage of student learning outcomes is 51.13%, while student posttest results after being treated with bingo games the percentage of student learning outcomes becomes 72.66%, and the use of bingo game methods can create a pleasant learning environment, where students will become active in the learning process, better able to work with other friends, the classroom atmosphere is more lively and able to achieve the desired learning goals. Therefore, learning mathematics using the game method can improve student learning outcomes. .

Based on the research of Khoirul and Jurotun (2019) who applied the PBL learning model to improve the activities and learning outcomes of high school students on dimension three with the help of teaching aids, it was obtained that the PBL learning model assisted by simple teaching aids made from straw waste can improve student

learning outcomes by an average of 75.44 with the number of completed students reaching 86.84%, can increase student activity to 3.68 (very active). The response of students to the learning model that has been applied is very positive (80.99%). Therefore, the PBL learning model assisted by simple teaching aids made from straw waste can be applied to mathematics learning, especially the three dimensions.

Based on this background, researchers will apply the Problem Based Learning (PBL) model with a game approach to improve the learning outcomes of class X-4 SMAN 8 Malang.

2. METHOD

The method used in this research is PTK (Class Action Research). Classroom Action Research is research conducted in the classroom using an action to improve the quality of the teaching and learning process in order to obtain better results than before. The creation of PTK takes a long time because it must implement actions and variables that have been designed to achieve the desired results. The main objective of Classroom Action Research that is the focus of researchers is to improve learning outcomes using the application of the PBL (Problem Based Learning) learning model with the Class X-4 game approach of SMAN 8 Malang. In this study, researchers carried out the stages of plan (planning), do (application of learning and observation), and also see (reflection).

The subjects of the study were students of class X-4 at SMAN 8 Malang totaling 36 students. The determination of discussion groups is based on heterogeneous abilities by considering the results of basic ability tests (TKD) and learning styles to obtain a description of student activities during the learning process. The research was carried out at SMAN 8 Malang which is located at Jl. Veteran no. 37, Sumber Sari, Lowokwaru District, Malang City, East Java with the research time being carried out on August 1-30, 2022. Data collection is carried out in the first semester (one) of the 2022/2023 Academic Year.

This class action research consists of three stages, namely the preparation stage (plan), implementation (do), reflection (see) where data analysis, and preparation of reports.

1. Preparatory stage (plan)

The preparation stage includes the preparation of learning tools such as ATP (Learning Objectives Flow) and teaching modules containing learning steps, teaching materials, assessment sheets in the form of cycle tests to find out learning outcomes after following the learning process.

2. Implementation stage (do)

The implementation stage of Class Action Research is carried out as many as 2 cycles in August 2022 in the same class with the help of PPG Prajabatan students, civil service teachers, and civil service lecturers as research observers. At this stage of implementation, data analysis of student learning outcomes is also carried out.

The formula used to calculate the average cycle test value is:

$$N_a = \frac{\sum N_s}{\sum \text{peserta didik}}$$

Information:

N_a = Average Test Cycle Scores

N_s = Test Cycle Scores

3. Reflection stage (see)

The reflection stage is carried out with PPG Prajabatan students, guru pamong, and pamong lecturers as research observers and is used to determine the sustainability of the cycle at PTK based on the strengths and weaknesses of the previous cycle. So that the results of reflection are used as consideration for improving learning tools, modifying learning methods, and teacher strategies in implementing learning.

After the three stages of class action research are met, the researcher can prepare a report. Here is the cycle used in classroom action research.

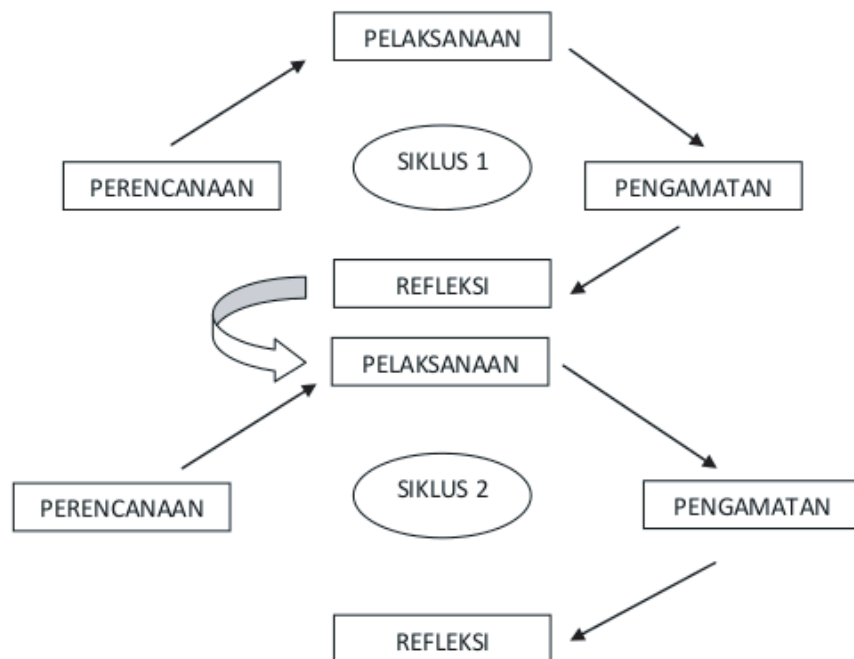


Figure 1: Class Action Research Cycle.

3. RESULTS AND DISCUSSION

3.1. Results of the action of cycle I

From the results of the observation activities, 5 people were carried out, namely civil service teachers, civil service lecturers, and 3 PPL PPG Prajabatan colleagues. The thing that is observed is about the sequence of the learning process using the observation sheet.

Based on the results of observations of teacher activities in the first cycle by pamong lecturers, it is 97, where if on average it reaches 3.88, while by pamong teachers it is 79, where if on average it reaches 3.16 out of a perfect score of 5 and is categorized as SUFFICIENT. Meanwhile, on the observation sheet of students who entered the skill score, it is known that the activeness of students during learning is well marked by many students who are enthusiastic about discussing and asking questions.

Based on the data from the study of Exponent Definition Material, Exponent Properties, and Root Shape, it can be seen as follows:

Based on the data in table 4.1, it can be seen that the average grade point average in the first cycle was 21.3 or 41.6% of all students had more grades than the grade average. Please note that in the test there were 3 children who did not take the cycle test because they did not enter. So that from cycle I it is possible that it will increase in the next cycle.

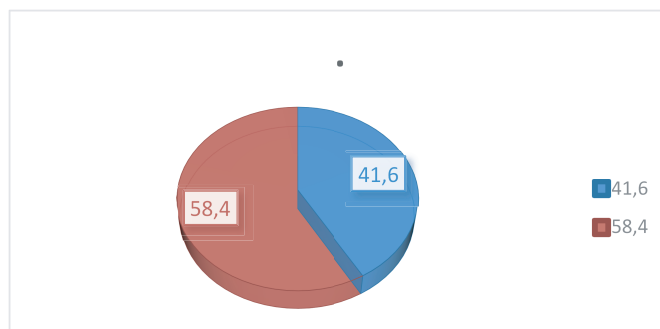


Figure 2: Percentage of Student Completeness of Exponent Number Material, Exponent Properties, and Root Form of Cycle I.

Based on observations by observers, it is shown that practical teachers emphasize intonation during learning. When in groups, teachers are more inclined to the right so there are several other groups that are not visited by the teacher. Teachers also need to manage time (time keeper) so that learning can run on time. There needs to be ice breaking to manage student focus before learning begins. Teachers also need to hold a strengthening of concepts so that students are not misguided.

TABLE 1: Learning Outcomes Data on Exponent Number Material, Exponent Properties, and Root Form of Cycle I.

| No | Student Name | Cycle 1 Test Scores |
|----|--------------|---------------------|
| 1 | S1 | 19 |
| 2 | S2 | 12 |
| 3 | S3 | 8 |
| 4 | S4 | 13 |
| 5 | S5 | 15 |
| 6 | S6 | 69 |
| 7 | S7 | 9 |
| 8 | S8 | 44 |
| 9 | S9 | 23 |
| 10 | S10 | 44 |
| 11 | S11 | 5 |
| 12 | S12 | 44 |
| 13 | S13 | 30 |
| 14 | S14 | - |
| 15 | S15 | 9 |
| 16 | S16 | 24 |
| 17 | S17 | 5 |
| 18 | S18 | 48 |
| 19 | S19 | 17 |
| 20 | S20 | 33 |
| 21 | S21 | - |
| 22 | S22 | 13 |
| 23 | S23 | 29 |
| 24 | S24 | 45 |
| 25 | S25 | - |
| 26 | S26 | 8 |
| 27 | S27 | 10 |
| 28 | S28 | 21 |
| 29 | S29 | 13 |
| 30 | S30 | 9 |
| 31 | S31 | 43 |
| 32 | S32 | 49 |
| 33 | S33 | 14 |
| 34 | S34 | 9 |
| 35 | S35 | 26 |
| 36 | S36 | 9 |
| | Average | 21,3 |

However, there are still shortcomings in the implementation of this first cycle, including the need to make game rules such as tournaments so that students can be more

motivated in learning, the need for instruction per section, the emphasis on using cellphones in class, namely to open a calculator only not to find answers in mathematics applications.

The improvement plan that can be done by practical teachers as researchers is to maintain the use of games in learning but with different variations.

3.2. Results of Cycle II Action

From the results of the observation activities, 5 people were carried out, namely civil service teachers, and 4 PPL PPG Prajabatan colleagues. The thing that is observed is about the sequence of the learning process using the observation sheet.

Based on the results of observations of teacher activities in the first cycle by civil service teachers, it was 107, where on average it reached 4.28 out of a perfect score of 5 and was categorized as GOOD. Meanwhile, on the observation sheet of students who entered the skill score, it is known that the activeness of students during learning is well marked by many students who are enthusiastic about discussing and asking questions. This shows that teachers have been able to apply *the Problem Based Learning* model learning well. Based on the data on the learning outcomes of Exponent Function Material (Growth and Decay) can be seen as follows:

Based on the data in table 2, it can be seen that the average grade point average in cycle II is 89.1 or 94.4% of all students have more than the grade average. Please note that in the test there is 1 child unable to take the cycle test due to dispen. So that from cycle II it has increased in terms of learning outcomes from 21.3 to 89.1 or in the form of percent from 41.6% to 94.4%. The following is the percentage of student completeness of the exponent function material in cycle II:

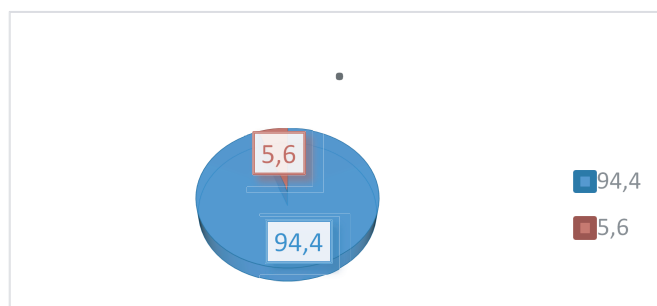


Figure 3: Percentage of Student Completeness Material Exponent Function Cycle II.

The stage carried out after observation is reflection. This reflection is carried out by practical teachers as researchers together with observers (among teachers, among lecturers, and PPL PPG students). Reflection aims to determine the degree of success as well as deficiency after the implementation of the action cycle II.

TABLE 2: Learning Outcomes Data Material Exponent Function Cycle II.

| No | Student Name | Cycle II Test Scores |
|----|--------------|----------------------|
| 1 | S1 | 81 |
| 2 | S2 | 100 |
| 3 | S3 | 84 |
| 4 | S4 | 91 |
| 5 | S5 | 88 |
| 6 | S6 | 100 |
| 7 | S7 | 89 |
| 8 | S8 | 91 |
| 9 | S9 | 100 |
| 10 | S10 | 90 |
| 11 | S11 | 94 |
| 12 | S12 | 84 |
| 13 | S13 | 100 |
| 14 | S14 | 0 |
| 15 | S15 | 86 |
| 16 | S16 | 100 |
| 17 | S17 | 74 |
| 18 | S18 | 89 |
| 19 | S19 | 100 |
| 20 | S20 | 89 |
| 21 | S21 | 84 |
| 22 | S22 | 91 |
| 23 | S23 | 100 |
| 24 | S24 | 81 |
| 25 | S25 | 100 |
| 26 | S26 | 100 |
| 27 | S27 | 100 |
| 28 | S28 | 91 |
| 29 | S29 | 100 |
| 30 | S30 | 84 |
| 31 | S31 | 97 |
| 32 | S32 | 91 |
| 33 | S33 | 84 |
| 34 | S34 | 92 |
| 35 | S35 | 100 |
| 36 | S36 | 84 |
| | Average | 89,1 |

The successes that have been achieved in cycle II include that students are more enthusiastic about learning than in cycle I. Based on observations by observers, it shows that practical teachers are good at compressing time according to the hours. By

using video, PPT, speakers, and picker wheel games in learning makes students more enthusiastic and focused on paying attention to the teacher in carrying out learning. Teachers have also provided *ice breaking* at the beginning of learning so that students' focus can be more focused.

The following is a table of recapitulation of PTK results cycle I and cycle II:

TABLE 3: Recapitulation of PTK Cycle I and Cycle II Results.

| No | Activities | Cycle I | Cycle II |
|----|--------------------------------|---------|----------|
| 1 | Teacher activity | 3,52 | 4,28 |
| 3 | Student learning outcomes test | 41,6% | 94,4% |

Based on the findings found in the first cycle, there was 1 group of 4 students, but 3 of them only depended on 1 friend in doing work and must be considered because according to the researcher the student did not have the motivation to learn mathematics. In addition, researchers found students who could do it in other ways, so according to the researcher, the student was creative in finding other ways to do the problem.

Based on the findings found in cycle II, there was 1 student showing a significant increase in learning outcomes from 0 to 74, although not above the average grade completion, but these students have shown an increase in learning outcomes. In addition, researchers have also found some students who can do things in other ways, so it can be said that from 1 student to several students who have improved to think creatively.

Based on table 3, the activities measured as a whole have shown progress in each cycle. It can be seen that at the end of cycle II all target criteria can be met, therefore the results of student learning tests are better through learning using the Problem Based Learning model and using a game approach.

4. CONCLUSION

Based on the results of research and discussion, it can be concluded that in general the application of the PBL (Problem Based Learning) model with a game approach can improve the learning outcomes of class X-4 SMAN 8 Malang. This can be concluded as follows:

1. There was a change in the final test results of cycle I and cycle II on the Exponents and Exponent Functions material using the game approach showing a better progression in the percentage in each cycle, which was 42.4%, with an average value of 21.36 in cycle I and to 94.4%, with an average value of 89.1 in cycle II.

2. There was a change in the results of teacher activity observations in the first cycle of 3.88 from civil service lecturers and 3.16 from civil service teachers if averaged to 3.52. In cycle II it becomes 4.28.

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