

Improving Learning Outcomes of Science About the Solar System Using the Role-Playing Method

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Abstract. Science learning activities of 6th grade students of SDN Karangreja are still many who obtain learning outcomes below the KKM (KKM 70). Therefore, efforts are needed to improve the learning outcomes of science, one of which is the use of the role-playing method. This study aimed to determine the improvement in the learning outcomes of Grade VI students of SD Negeri Karangreja in the 2019/2020 academic year through role-playing activities in the science subject of Solar System material. The research subjects were grade VI students of SD Negeri Karangreja with a total of 13 children, a class teacher and an observer. Research data collected in the form of student learning outcomes, teacher observation results, and student observation results. This study used Classroom Action Research (PTK), which was carried out in two cycles. Each cycle comprises four stages: planning, action implementation, observation, and reflection. In this study, it is said to be successful if at least 85% of students get a score ≥ 70 : (1) Student learning completeness in cycle I was 69.23% with an average score of 60.00 and in cycle II was 92.31% with an average score of 83.07 (2) Student activity scores in cycle I were 70% and in cycle II were 92%. From the data exposure above, it can be seen that in cycle I, the learning outcomes were not as expected, which means that the research success indicators have not been achieved, whereas in cycle II, the learning outcomes were as expected, which means that the research success indicators were achieved.

Keywords: role play, learning outcomes, solar system

1. Introduction

The quality of education covers several sectors and levels, including basic education. The success of education is greatly influenced by many factors, one of which is teachers. Professional teachers will always strive to improve students' understanding of the materials taught. This is in line with the goals of national education.

To improve the learning process, teachers must develop appropriate strategies. This is because a meaningful teaching and learning process will increase student participation. Learning is said to be meaningful if: (1) there is student involvement in the teaching and learning process, (2) there is intellectual-emotional involvement of students both through analyzing activities, doing and forming attitudes, (3) there is creative student participation in creating a suitable situation for the teaching and learning process to take place.[1]

In connection with the above, the role-playing method is more meaningful in learning because by using the role-playing method, students are directly involved in the learning process.

Science is a subject taught in elementary schools and is the result of human activity in the form of organized information, ideas, and concepts about the natural environment, gained from experience through a series of scientific processes that include research, preparation, and testing of ideas.

The presence of the role-playing method in science learning makes it easier for teachers to convey material to students. Piaget, Vygotsky, and Bruner indicated that children will develop representative abilities when playing. [2] As explained by Hurlock that role play is a form of active play by children through clear behavior and language, related to material or situations as if they have other attributes than they actually do. Role playing can be used as a learning method that teaches children to patiently wait their turn, get their turn, and share. [3] Together with these definitions, children must have good learning motivation so that role playing can run smoothly. Role playing is a challenge for the players, because in this game there are 13 straight rules to open children's imagination, new movements, and details. [4] Not only that, the definition of role playing is also explained in the journal Lindsey, which explains that role playing or pretending is symbolic behavior with full of fun as if it were something else. [5]

Based on the results of observations made after learning science and subsequent evaluations, the results were less than satisfactory, and the author as a class teacher understands that the fault lies with the teacher, not with the students. Students, although in teacher-centered learning, lack of student participation in learning with the opportunity to participate directly in learning, resulting in passive students and an assessment score with an average of 5.38, with the background of these problems, the implementation is considered necessary to conduct Classroom Action Research, because Classroom Action Research is research that aims to improve and improve the quality of learning that is individual and flexible. [6]

The role-playing method is a learning method through developing the imagination and appreciation of students by playing the characters. When playing roles, children play roles because they are influenced by their fantasies by playing an activity as if it were real. [7] According to the Ministry of National Education, that playing a role affects children's speaking abilities, namely being able to train children to speak fluently, then playing roles will be more fun and make children not feel bored, by playing roles children can imagine freely according to with the role played so that a conversation or dialogue will appear between friends. [8]

Therefore, the use of appropriate teaching methods is an alternative to overcoming the problem of students' low absorption of science lessons, in order to improve teaching quality. The application of a teaching method must be reviewed in terms of its effectiveness, efficiency and suitability with the characteristics of the subject matter and the condition of the students which include abilities, learning speed, interests, time owned and socio-economic conditions of students as objects. The Role-Playing learning method is a method that can be used by teachers during the teaching and learning process. This learning method can also be applied to science subjects on the Solar System material. The Role-Playing method itself is a role-playing learning method, in which students play something that can trigger students to be active in learning while playing. This method applies learning while playing, thus learning will be fun, so learning science.

2. Method

The research design used in this study was classroom action research with reference to Kemmis and Taggart. The stages are planning, implementation, observation and reflection, where the implementation and observation stages are carried out simultaneously according to Wiriaatmadja. [9]

The subjects of the classroom action research were 6th grade students of SD Negeri Karangreja, Maos District, Cilacap Regency in the 2019/2020 academic year. The number of students as subjects was 13 students, consisting of 8 boys and 5 girls.

The research procedure used was in the form of a cycle that lasted for two cycles. The purpose of the evaluation and reflection results of Cycle I is to determine the success and obstacles of Cycle I actions, so that researchers can determine the next Cycle II action plan.

The data collection tool in this study was a test given by the teacher with the aim of (1) knowing how well students master the subject concerned within a certain period of time, (2) determining whether the objectives have been achieved, and (3) obtaining grades. [10] The purpose of the test was to determine the completeness of learning, both individually and classically. In addition, we determine where the students' mistakes are, so that the teacher can see where the weaknesses are, especially in which part of the learning objectives have not been achieved. To confirm the data collected, data will also be collected through peer observation to find out and document the activities of teachers and students in teaching and learning.

The calculation method to determine student learning completeness in teaching and learning is as follows: (a) Recapitulate the test results, (b) calculate the percentage of points achieved by each student by using the learning completeness formula in the technical evaluation guidebook. Students are considered individually complete if they reach a minimum of 65, while in classical learning, it is considered complete learning if the number of students who are complete reaches 85%, who have achieved absorption of more than 65%; (c) Analyze the results of observations made by peers on teacher and student activities during teaching and learning activities.

3. Result and Discussion

3.1. Result

Cycle I

Based on the results of the initial study on science learning, the material for Lunar and Solar Eclipses, it was obtained data that 4 students scored ≥ 70 and 9 students scored ≤ 70 . The number of students who completed was 4 students or 30.76% while students who had not completed were 9 students or 69.23%. And the level of student activity is still very low, namely out of 13 students, only 6 students are active or 46.15% and 7 students are not active or 53.85%. Based on these data the researcher plans to improve learning by preparing:

1. Make a lesson plan and action scenarios to be implemented
2. Prepare questions for evaluation
3. Prepare an observation sheet
4. Coordinate with colleagues regarding the implementation of learning improvements

The researcher carried out the implementation of learning improvements in accordance with the prepared lesson plans. In general, the activities in this first cycle consisted of presenting/delivering material, group discussions, class discussions/intergroup discussions

and administering formative tests. After the improvement of the first cycle of learning, the number of students who completed was 10 students or 76.92% and students who had not completed were 3 students or 23.08%.

During the learning process, the observer made observations of the activities of the teacher and student activities with the observation sheets that had been prepared. It was obtained that there were still teacher activities that were not as expected and obtained data that the number of students who were active was 9 and students who were not active were 4.

From the results of the implementation of learning improvements, it turns out that there are still students who have not finished learning. Based on the observed data, not all of the teacher's activities were as expected and in student activities there were also students who had not actively participated in learning activities, so the researchers together with the observers analyzed and reflected to determine corrective steps in the second cycle.

Cycle II

Based on the results of the first cycle of reflection, researchers will make improvements by preparing:

1. Make a lesson plan and action scenarios to be implemented
2. Prepare questions for evaluation
3. Prepare an observation sheet
4. Prepare props
5. Coordinate with colleagues regarding the implementation of learning improvements.

The researcher carried out learning activities in accordance with the prepared lesson plan and the results can be seen that after improving the second cycle of learning, the number of students who completed was 12 students or 92.31% and students who had not completed was 1 student or 7.69%.

During the learning process, the observer observes the teacher's and student's activities using the prepared observation sheet. data obtained that it turns out that all teacher activities are as expected. Meanwhile, from table 4.7, the data shows that the number of students who are active is 12 and students who are not yet active are 1 student.

From the results of the implementation of learning improvements in this second cycle, it turned out that students who had completed $\geq 85\%$ namely 12 students or 92.31% and students who were also active $\geq 90\%$ namely 12 students or 92.31%. This means that the implementation of learning improvements in the second cycle has met the success criteria so that improvements can be stopped in the second cycle.

3.2. Discussion

Cycle I

Based on the results of observations in the field that the process of implementing research using the role-playing method to improve learning achievement in Natural Sciences (IPA) about the Solar System in class VI SDN Karangreja has increased from the initial condition of 60 to 75, this indicates an increase of 13%. From the data on the results of improvements in the first cycle there was an increase in student learning completeness compared to the initial study.

Student activity in learning also increased, reaching 69%, or nine students. The increase in student completeness and activeness was due to the fact that in this lesson, the

researcher used the role-play method so that students were motivated to play an active role and student achievement in learning also increased.

Cycle II

Based on the results of field observations in cycle II, the process of implementing research using the demonstration method to improve learning achievement in Natural Sciences (IPA) about the Solar System in class VI SDN Karangreja experienced a significant increase from the first cycle condition of 77% to 92% in cycle II, which indicates an increase of 15%, whereas from the initial condition, there was an increase of 61% in cycle II.

Data on the results of improvements in the second cycle showed an increase in student learning completeness compared to the initial study and first cycle.

Likewise, student activity in learning increased compared to that in the first cycle. In the second cycle, the student activity in learning was 92.31% (12 students). The increase in student completeness and activeness was due to the fact that in this lesson, the researcher used the role-playing method so that students were motivated to play an active role, and student achievement in learning also increased. This means that the implementation of learning improvements in the second cycle meets the success criteria such that improvements can be stopped in the second cycle.

4. Conclusion

Based on the results of the improvement of learning in Natural Science subjects that have been carried out, the following conclusions can be drawn:

- a. Students understanding and mastery of Grade VI science subjects on Solar System material can be improved by using the role-playing method.
- b. Active student involvement in learning science using the role-playing method can improve students' critical thinking, communication, and knowledge transfer abilities.
- c. Using the role-playing method, students are better able to improve their learning achievement in response to the material and learning problems to obtain more optimal results.

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