Improving Student Learning Outcomes Through the Application of Demonstration Methods in Science Learning At SMP Negeri 17 Palu

Murdiyah
SMP Negeri 17 Palu

Abstract. The demonstration method is a way of presenting lessons by demonstrating or demonstrating to students a particular process, situation, or object being studied, either actually or imitation, which is often accompanied by an oral explanation. With the demonstration method, the process of students' acceptance of the lesson will be more deeply impressive, thus forming a good and perfect understanding. Therefore, the aim of this research is to find out how the demonstration method is implemented so that it can improve the activities and learning outcomes of class IX A science lessons at SMP Negeri 17 Palu for the 2022/2023 academic year. The research method used is classroom action research. The research subjects consisted of 30 class IX A students, 17 boys and 13 girls at SMP Negeri 17 Palu. The research procedures carried out are based on each cycle, namely planning, implementation, observation, and reflection. Types of data and data collection techniques use qualitative and quantitative data, where qualitative data is collected through observation and documentation. Meanwhile, quantitative data is collected through tests at the end of each cycle. Meanwhile, data analysis techniques use data reduction techniques, data presentation, and drawing conclusions. Data analysis techniques, namely qualitative and quantitative data analysis. The results of the research show that the application of the demonstration method can improve student learning outcomes in science learning class IX A of SMP Negeri 17 Palu in the 2022/2023 academic year. In the first cycle as many as 24 people (80%) increased to 28 people (93%) in cycle II. The highest score in cycle I was 100 for 3 people. In cycle II the highest score increased to 100 for 7 people. The lowest score in cycle I was 50 for 2 people and in cycle II the lowest score was 60 for 2 people.

Keywords: learning outcomes, demonstration methods, science learning

1. Introduction

Natural Sciences is a science that deals with systematic natural phenomena and objects that are arranged in an orderly, generally accepted manner in the form of a collection of results from observations and experiments, (Afifah, 2015; Astalini, Kurniawan, Darmaji, Putri, & Nawangsih, 2019; Fukuta & Masumori, 2013). Natural sciences have a very important role in providing an understanding of the properties and phenomena of nature, as well as of living creatures and life processes, (Fakhry, 2010; Harefa & Sarumaha, 2020; Hisbullah & Selvi, 2018; Wisudawati & Sulistyowati, 2022). In fact, teachers realize that in class IX A, learning science still requires a certain amount of knowledge that must be memorized, not through direct learning activities and a process of discovery. The teaching and learning activities developed by the teacher are very monotonous and still use conventional methods, which are limited to applying the lecture method (Aras & Arhas, 2022; Arhas, Syazwani, & Nasrullah, 2022; Ikhsan, Niswat, Saleh, & Arhas, 2019a, 2019b; Jamaluddin, Nurhaliza, Nasrullah, & Supriadi, 2022), listening to the teacher's explanation in an orderly (verbalistic) manner, and then working on practice questions. In learning, teachers rarely use learning media that are interesting and help students understand the material. The learning process does not provide opportunities for students to actively interact with the teacher and lesson material so students tend to be passive while the teacher is active (teacher-centered).

The learning method used by the teacher mentioned above causes several problems, including science subjects becoming less interesting for students, students becoming bored during science lessons, verbalism occurring in students, the knowledge
gained by students does not last long, and students’ understanding of the material is low. The various problems above lead to low student learning outcomes in science lessons in class IX A of SMP Negeri 17 Palu. From the results of problem identification as mentioned above, as subject teachers we try to overcome the problems that arise so that the learning process can run well so that student learning outcomes can be achieved by implementing learning improvements. The priority problem that is the aim of improving the learning process is to improve the learning implementation process which will be carried out by applying the demonstration method to increase student activity and learning outcomes in science learning with magnetic force material.

The demonstration method is a method where the teacher shows the process of something happening through visual aids so that children can understand the concept of the material being taught, (Anggraini & Suyadi, 2019; Bhidju & Press, 2020; Sagemba & Muksin, 2021; Suharti, 2021). Apart from that, children will also be more motivated to learn because they will be curious about what the teacher is teaching. With this demonstration method, it is hoped that various student learning activities can grow in connection with student learning activities. In other words, educational interactions are created. In this interaction, the teacher acts as a mover or guide, while students act as recipients or guides.

2. Method

The design of this research is classroom action research, (Bandrang, 2022; Etta, 2022; Kartini, 2022; Madya, 2007; Saputra, 2021). The research design follows the Kemmis & Mc Taggart model through Cycle I and Cycle II, (Badroeni, 2018). The research subjects consisted of 30 class IX A students, 17 boys and 13 girls at SMP Negeri 17 Palu. The research procedures carried out are based on each cycle, namely planning, implementation, observation, and reflection. Types of data and data collection techniques use qualitative and quantitative data, where qualitative data is collected through observation and documentation. Meanwhile, quantitative data is collected through tests at the end of each cycle. Meanwhile, data analysis techniques use data reduction techniques, data presentation, and drawing conclusions, (Miles & Huberman, 1994). Next, the data obtained was analyzed using the percentage technique of individual absorption capacity and classical completeness obtained by students. The equation used is:

\[
\text{Percentage of individual absorption capacity} = \frac{\text{total score obtained}}{\text{the total score of all students}} \times 100\% \\
\text{Percentage of classical completion} = \frac{\text{number of students who completed}}{\text{the total number of students}} \times 100\% 
\]

The indicator of the success of this class action research is if the learning outcomes of the basic competency science subject "Applying the concept of magnetism, electromagnetic induction, and the use of magnetic fields in everyday life" of students in class IX A of SMP Negeri 17 Palu for the 2022/2023 school year achieve individual absorption minimum 70% and classic absorption capacity 85%. The success referred to in this PTK is the success of assessment in the realm of knowledge. The observation sheet is used to determine the teacher’s assessment of the implementation of teaching and learning activities by applying the demonstration method. The indicator of successful observation is if the average teacher's teaching and learning activities are "Good".
3. **Results and Discussion**

As stated in the previous section, each cycle in this research consists of several stages, namely: Initial Reflection, Planning, Implementation, Observation, and Reflection. The results obtained at each stage in each cycle are explained as follows:

3.1 **Cycle I**

The activity carried out at this stage is to determine learning materials that are considered urgent for the teacher to handle. The teaching material in question is Natural Science (IPA) material on the basic competency "Applying the concept of magnetism, electromagnetic induction, and the use of magnetic fields in everyday life", with indicators, namely 1) Explaining the properties of magnets; 2) Distinguish between ferromagnetic, paramagnetic and diamagnetic; 3) Observe various shapes of magnets; and 4) Find various products that utilize electromagnets or electromagnetic induction; 5) Observe various products that utilize electromagnets or electromagnetic induction.

At this stage the researcher also formed groups of students consisting of 5 people per group.

3.1.1 **Planning**

A number of activities carried out at this stage include making: Learning plans, learning scenarios, preparing literature books from the library, ATK for students (namely: lined HVS paper for notes), preparing learning outcome assessment formats according to predetermined indicators, and preparing formats. observations for teachers and students.

3.1.2 **Implementation**

Implementation of actions in cycle 1 is carried out once face-to-face in learning activities outside of end-of-cycle test activities. The time allocation for SMP is 5 X 40 minutes. The first face-to-face meeting in cycle I was held on Tuesday, January 10, 2023. Hours 3 -7 and the material taught was: a) Magnetic properties; b) Difference between ferromagnetic, paramagnetic, and diamagnetic; c) Magnetic shapes; d) Find various products that utilize electromagnets or electromagnetic induction; f) Observation of various products that utilize electromagnets or electromagnetic induction. This material is contained in the textbook that has been distributed to students. The teacher conveys the competency material to be achieved, and then presents the material as usual. Furthermore, the teacher continues to carry out learning activities according to the stages of the demonstration learning method as contained in the learning scenario.

The following week, namely the second face-to-face session of a cycle I, the final test of the cycle I was held on Tuesday 17 January 2023. The questions given were multiple choice questions with a duration of 40 minutes. The results obtained can be seen in Table below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Acquisition Aspect</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The number of students</td>
<td>30 person</td>
</tr>
<tr>
<td>2</td>
<td>Number of students who completed</td>
<td>24 person</td>
</tr>
<tr>
<td>3</td>
<td>Classical completeness</td>
<td>80%</td>
</tr>
<tr>
<td>4</td>
<td>The highest score</td>
<td>100 (3 persons)</td>
</tr>
<tr>
<td>5</td>
<td>Lowest value</td>
<td>50 (2 persons)</td>
</tr>
</tbody>
</table>

*Source: research results*
After the end of cycle test assessment was held, out of 30 students, 24 (80%) completed it. The highest score was 100 by 3 people, the lowest score was 50 achieved by 2 students.

3.1.3 Observation
Observation activities were carried out by observers during the learning implementation, namely on January 10 2023. The focus of the observation was observing the activities of teachers and students during the learning implementation.
Observation of teacher activities aims to see the suitability of learning implementation with the learning plan. In this first cycle, the teacher/researcher presents learning material according to the plan, namely the application of the articulation method. All aspects of the assessment are generally rated good, there are only those that are quite good, namely in terms of time management and student enthusiasm. More complete observation results can be seen in the attachment.

In this first cycle, the teacher/researcher presents learning material according to the plan, namely the application of the demonstration method. Based on the observations, at first the students were a little confused. This is because new students experience demonstration learning methods. However, after it was explained again, the students were very enthusiastic and enthusiastic, worked together with each other, and began to show the expected learning results.

3.1.4 Reflection
Based on the results of Cycle I, the final test results for Cycle I were only 80% classical completion. For this reason, researchers continued to Cycle II.

3.2 Cycle II
Activities in cycle II are still on the same basic competency as cycle I, namely: "Applying the concept of magnetism, electromagnetic induction, and the use of magnetic fields in everyday life", but with different indicators, namely: a) Explaining 3 ways to make magnets; b) Explain how to increase the strength of an artificial magnet; c) Experiment on how to make a magnet. At this stage, the researcher also formed groups of students consisting of 4 people per group.

3.2.1 Planning
A number of activities carried out at this stage include making: Learning plans, learning scenarios, preparing literature books from the library, ATK for students (namely: lined HVS paper for notes), preparing learning outcome assessment formats according to predetermined indicators, and preparing formats. observations for teachers and students.

3.2.2 Implementation
Implementation of actions in cycle 1 is carried out once face-to-face in learning activities outside of end-of-cycle test activities. The first face-to-face meeting in cycle I was held on Tuesday, January 24, 2023. Hours 3 - 7 and the material taught were: a) 3 (three) ways to make magnets; b) How to increase the strength of artificial magnets; c) Experiment with how to make a magnet.

This material is contained in the textbook that has been distributed to students. The teacher conveys the competency material to be achieved, and then presents the material as usual. Furthermore, the teacher continues to carry out learning activities according to the stages of the demonstration learning method as contained in the learning scenario.

The following week, namely the second face-to-face session of cycle II, the final test of cycle II was held on Tuesday 31 January 2023. The questions given were multiple
choice questions with a duration of 40 minutes. The results obtained can be seen in Table 2:

<table>
<thead>
<tr>
<th>No.</th>
<th>Acquisition Aspect</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The number of students</td>
<td>30 person</td>
</tr>
<tr>
<td>2</td>
<td>Number of students who completed</td>
<td>28 person</td>
</tr>
<tr>
<td>3</td>
<td>Classical completeness</td>
<td>93%</td>
</tr>
<tr>
<td>4</td>
<td>The highest score</td>
<td>100 (7 persons)</td>
</tr>
<tr>
<td>5</td>
<td>Lowest value</td>
<td>60 (2 person)</td>
</tr>
</tbody>
</table>

Source: research results

After the end of cycle test assessment was held, out of 30 students, 28 (93%) completed it. The highest score was 100 by 7 people, the lowest score was 60 achieved by 2 students.

3.2.3 Observation

Observation activities were carried out by observers during the learning implementation, namely on January 24, 2023. The focus of the observation was observing the activities of teachers and students during the learning implementation. Observation of teacher activities aims to see the suitability of learning implementation with the learning plan. In cycle II, the teacher/researcher presents learning material according to the plan, namely the application of the demonstration method. All aspects of the assessment are rated Good. More complete observation results can be seen in the attachment. In cycle II, the teacher/researcher presents learning material according to the plan, namely using the demonstration method. Based on the results of the researcher's observations, students were very active and enthusiastic in carrying out the assignments given.

3.2.4 Reflection

Based on the results of the final test of Cycle II, the classical completeness was 93%. This figure shows that the individual absorption capacity indicator of at least 70% and the classical absorption capacity of 85% have been achieved. Likewise, the results of observations of teaching and learning activities have also achieved success indicators, namely that the average teacher is "Good." For this reason, this research only reached cycle II.

Based on the results of observations in cycle I, learning management generally went well, but there are still things that need to be improved, namely in time management and the need to increase students’ enthusiasm in participating in learning. However, in cycle II learning management experienced an improvement where all aspects were of good value and this had a positive impact on students’ learning completion. More details can be seen in the attachment.

After observing the test scores/results for cycle I and cycle II, it turned out that there were quite significant differences. The difference in scores in question is that from a total of 30 students, 24 students who completed cycle I (80%) increased to 28 students (93%) in cycle II. The highest score in cycle I was 100 for 3 people. In cycle II the highest score increased to 100 for 7 people. The lowest score in cycle I was 50 for 2 people and in cycle II the lowest score was 60 for 2 people. For more details, see the table 3:
Table 3.
Comparison of Final Test Assessment Scores for Cycle I and Cycle II

<table>
<thead>
<tr>
<th>No.</th>
<th>Acquisition Aspect</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The number of students</td>
<td>30 person</td>
</tr>
<tr>
<td>2</td>
<td>Number of students who completed</td>
<td>24 person</td>
</tr>
<tr>
<td>3</td>
<td>Classical completeness</td>
<td>80%</td>
</tr>
<tr>
<td>4</td>
<td>The highest score</td>
<td>100 (3 persons)</td>
</tr>
<tr>
<td>5</td>
<td>Lowest value</td>
<td>50 (2 persons)</td>
</tr>
<tr>
<td></td>
<td>Cycle I</td>
<td>Cycle I</td>
</tr>
</tbody>
</table>

Source: research results

This research only reached cycle II because the indicators of learning success/completion, namely individual absorption capacity of at least 70% and classical absorption capacity of 85%, were achieved, namely 93%. The intended learning outcomes are results/values in the cognitive/knowledge domain. Likewise, the results of observations of teachers who teach, in this case the researcher, in the process of teaching and learning activities are on average good.

4. Conclusion

Based on the results of the classroom action research above, it can be concluded that the application of the demonstration method can improve student learning outcomes in science learning for class IX A of SMP Negeri 17 Palu in the 2022/2023 academic year.

References


