

## Application of Case Study Method to Improve Student Learning Outcomes on Dynamic Electricity Material

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### Abstract

Students' interest in science subjects, especially Dynamic Electricity material is still lacking because students feel that the material studied is not useful in life. That makes the learning outcomes obtained by students less than optimal in Dynamic Electricity material. This study aims to improve student learning outcomes by using the Case Study learning method on Dynamic Electricity material. The type of research conducted was Classroom Action Research. The research subjects were ninth-grade students of SMP Muhammadiyah 9 Bojonegoro academic year 2023/2024 totaling 30 people. The research instrument used was a learning outcome test in the form of multiple-choice questions totaling 25 questions. Data analysis of the research results used the percentage of classical completeness. The results showed that the classical percentage in pre-cycle, cycle 1, and cycle 2 were 16.7%; 76.7%; and 96.7% respectively. In addition, student activities in learning activities using the Case Study learning method showed that students were more enthusiastic about learning Dynamic Electricity material. Based on the analysis of the research results, it can be concluded that the application of the Case Study learning method can improve the learning outcomes of the research subjects. Therefore, further research related to the application of the Case Study learning method can be carried out on other science subjects, so that the effectiveness of the Case Study learning method can be more accurate.

*Keywords:* Learning Outcomes, Case Study, Dynamic Electricity;

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### 1. Introduction

The text Education is closely related to the learning process carried out at a certain level. Education is a conscious and planned effort to create a learning atmosphere and learning process where students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. [1]. The process. in education emphasizes training, understanding, and maturation. The existence of education is one of the efforts to approach perfection in the understanding of science.

One of the sciences that exist at the education level is Natural Science (IPA). In essence, science is a product, process and application. As a product, IPA is a set of knowledge and concepts, as a process, IPA is a process that uses to study an object of study, discover and develop IPA products, while as an application, IPA will create technology that can

facilitate life. [2]. Science learning in schools is expected to be a vehicle for students to learn independently about nature and be able to develop and apply to everyday life based on the scientific method. Science learning at the Junior High School (SMP) level is still integrated, meaning that it has not been separated between the concepts of Chemistry, Biology and Physics.

One of the achievements to see student success in science learning is learning outcomes. The definition of learning outcomes relates to the abilities obtained by students from learning activities which are indicated by changes in behavior. [3]. One of the components included in learning outcomes is intellectual skills, meaning that students have the ability and respond to environmental concepts that exist in life [3]. [3]. Learning results will be obtained by taking it seriously. The success of learning outcomes is influenced by two factors, namely internal and external. Internal factors come from the students themselves, while external factors can come from the family, school and community environment.

Student learning outcomes obtained at the education level will make students able to compete in various activities in the community. Based on the results of observations and interviews in science subjects, especially class IX SMP Muhammadiyah 9 Bojonegoro, it is known that students are not motivated and interested in science subjects, especially Dynamic Electricity material. Students feel that the material studied is not related to problems that exist in everyday life. This makes the learning outcomes obtained by students less than optimal in Dynamic Electricity material. A total of 25 students or 83.3% got learning results below the Minimum Completeness Criteria (KKM) set by SMP Muhammadiyah 9 Bojonegoro in science subjects, meaning that only 5 students or 16.7% could reach the KKM. The KKM set by SMP Muhammadiyah 9 Bojonegoro in science subjects is 78.

Based on these problems, a solution is needed to overcome them. One solution that can be given is the application of learning methods that are in accordance with Dynamic Electricity material. Knowledge related to Dynamic Electricity material is very related to real life because in everyday life students are inseparable from the knowledge learned in Dynamic Electricity material. Therefore, the learning method chosen as a solution is *Case Study*.

Choosing the right learning method can create an effective and efficient learning process. In addition, the right learning method can make the material delivered by the teacher interesting for students. Learning methods are part and instructional strategies that have a function as a way of presenting, describing, giving examples and giving exercises to students so that they can achieve learning objectives. [4]. The purpose of the learning method is to assist students in developing their ability to solve problems. Learning methods consist of several kinds, one of which is *Case Study*.

*Case Study* is an active learning method that focuses students on real situations in the form of cases. A *case study* can be descriptive information about an experiment, event or project. *Case Study* can be interpreted as the result of an intensive and systematic investigation conducted by individuals or groups. In *Case Study* students and teachers can take a broad and complex phenomenon. According to [5], *Case Study* learning will present case studies and observation activities. Therefore, case studies given to students in Dynamic Electricity learning will help students understand the concept of Dynamic Electricity because students will feel that the concepts they learn are related and useful in everyday life.

The implementation of learning with the *Case Study* method requires considerable effort related to time, insight, energy and thought. Case Study has several benefits including emphasis and understanding of context, learning is done independently,

discipline and responsibility and if done in groups there will be a collaboration. *Case Study* can make it easier for students to understand learning and increase student response.[6]. *The Case Study* learning method has several systematic steps that must be carried out by students. According to [7] The steps are the division of the class into groups if *Case Study* is done in groups, distributing problems, students carry out discussions according to the problem and submit the results, then the teacher provides guidance by providing conclusions, reflection and evaluation. Based on the review of the *Case Study* learning method and the problems that occur in Dynamic Electricity material experienced by 9th grade students at SMP Muhammadiyah 9 Bojonegoro, this study aims to improve learning outcomes by applying the *Case Study* method.

## 2. Research Methods

The research conducted was Classroom Action Research (PTK). This research illustrates that research activities are carried out empirically and systematically on actions taken by teachers and students. Classroom Action Research involves observers who are involved to observe the implementation of learning, namely teacher and student activities. The purpose of this observation is to find out the weaknesses in the implementation of learning so that improvements can be made.

The subjects of this study were ninth grade students of SMP Muhammadiyah 9 Bojonegoro, totaling 30 people. The research was conducted in the odd semester of the 2023-2024 academic year, namely the fourth week of October to the third week of November in 2023. This research was conducted on science subjects, especially Physics material, namely Dynamic Electricity.

This Classroom Action Research aims to improve the quality of learning, one of the indicators of which is the improvement of student learning outcomes. This Classroom Action Research has four stages in each cycle, namely (1) planning, (2) implementation, (3) observation, and (4) reflection. Activities carried out at the planning stage are the preparation of a Learning Implementation Plan (RPP) with the *Case Study* learning method, preparation of teacher and student activity observation sheets, preparation of learning outcomes test questions consisting of 25 multiple choice questions.

The implementation and observation stages are carried out simultaneously, teachers and students conduct learning using the *Case Study* learning method in accordance with the lesson plan, while observers observe teacher and student activities. At the end of the cycle, the teacher gave a learning outcome test. Furthermore, the reflection stage is carried out where analysis is carried out regarding weaknesses and strengths, as well as improvements that must be made if the research objectives have not been achieved and the research must be continued in the next cycle. The reflection stage is based on the results of observations and learning outcomes obtained by students. Figure 1 below shows the Classroom Action Research cycle.

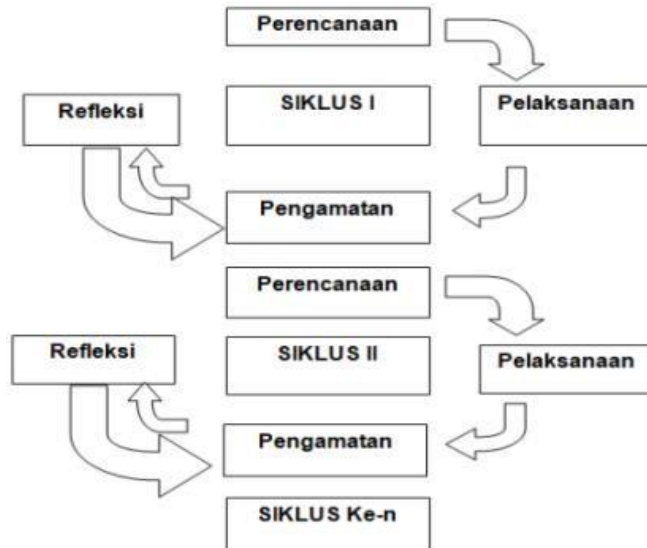


Figure 1. PTK cycle (Arikunto in [8])

The types of data in this study are quantitative and qualitative data. Quantitative data is obtained from student learning outcomes tests at the end of each cycle. Qualitative data is obtained from observations in the form of information provided by observers according to observations made during the learning process. In accordance with the type of data obtained in the study, the research instruments used were test sheets and observation sheets.

### 3. Results and Discussion

Based on the learning process and results that have been carried out by the 9th grade science teacher at SMP Muhammadiyah 9 Bojonegoro, it is known that student learning outcomes on Dynamic Electricity material have not been maximized. This is indicated by the results of the Daily Test where there are 5 students or 16.7% who can reach the KKM, meaning that most students, namely 25 students or 83.3% cannot reach the KKM set by the school. Therefore, research was conducted, namely learning Dynamic Electricity by using the *Case Study learning* method to improve student learning outcomes.

In the planning stage of cycle 1, researchers prepared all the needs for learning, starting from lesson plans, observation sheets, learning outcomes tests, to learning media. In the implementation stage, learning activities were carried out on October 23, 2020 in class IX SMP Muhammadiyah 9 Bojonegoro. The learning process was carried out in accordance with the lesson plan, namely using the *Case Study learning* method. The case study given was "Why in a series circuit, one of the lights is dim and the other lights are bright, even though in a parallel circuit all the lights are equally bright?". At the end of cycle 1, a student learning outcomes test was conducted. Based on the test, it can be known about the students' ability to answer questions related to Dynamic Electricity material after

learning using the *Case Study learning* method. Student learning outcomes in cycle 1 are shown in Figure 2.



Figure 2. Percentage of Students' Learning Outcomes that were Not Completed and Completed in Cycle 1

Based on Figure 1, it can be seen that the percentage of students who are not complete or cannot reach the predetermined KKM is 23.3% so that the percentage of students who have reached KKM in cycle 1 or complete is 76.7%. The number of students who became research subjects was 30 people, so that the number of students who were not complete was 7 students and the number of students who were complete was 23 students. The average student learning outcomes obtained in cycle 1 were 85.9. The learning results in cycle 1 have shown an increase when compared to the pre-cycle but these results have not been maximized because the target of the percentage of complete students set by the researcher is 85%. Therefore, the research will be continued in cycle 2. Based on the observation results, it is known that, in cycle 1, students had difficulty in analyzing the relationship between quantities in Dynamic Electricity material, especially in Ohm's law. Therefore, improvements were made in cycle 2 by providing the right stimulus and contextual examples that are more familiar, so that the concept of Dynamic Electricity is easily understood.

Cycle 2 learning activities were carried out on November 6, 2023 using the lesson plan that had been designed, namely using *Case Study*. Improvements that have been planned in cycle 1 will be applied in cycle 2 so that student learning outcomes can be maximized. The case study given in cycle 2 is "What type of electrical circuit is used in your home?". Learning in cycle 2 is still observed by observers to find out the weaknesses and improvements that will be made so that maximum results are achieved. After learning is carried out, students are given a learning outcome test to determine student understanding of Dynamic Electricity material. Figure 3 shows the learning results in cycle 2.

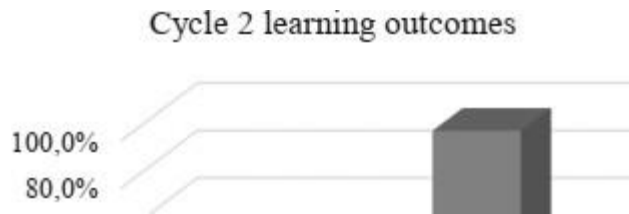


Figure 2. Percentage of Students' Learning Outcomes that were Not Completed and Completed in Cycle 2

Cycle 2 showed that student learning outcomes had improved from cycle 1. The percentage of students who were not complete was 3.3% or 1 student scored below the KKM. This shows that the percentage of students who were complete was 96.6% or 29 students scored above the KKM. However, according to the observation results, it can be seen that there are still weaknesses in the implementation of cycle 2 learning, namely students tend to be passive when they do not know the type of circuit and guidance is still needed to connect electrical circuits in everyday life with electricity concepts. The percentage of students who can achieve KKM in cycle 2 has exceeded the target, so the research was not continued in cycle 3.

Based on the results of pre-cycle, cycle 1, and cycle 2 research, it can be seen that student learning outcomes on Static Electricity material have increased when learning is carried out using the *Case Study* learning method. Table 1 shows the comparison of learning outcomes of students in class IX SMP Muhammadiyah 9 Bojonegoro starting from precycle, cycle 1 and cycle 2.

Table 1. Comparison of student learning outcomes in pre-cycle, cycle 1 and cycle 2

	Average Value	Lowest Score	Highest Score	Number of Incomplete Students	Percentage of Incomplete Students	Number of Students Completed	Percentage of Students Completed
Pre cycle	58,3	40	80	25	83,3%	5	16,7%
Cycle 1	85,9	72	100	7	23,3%	23	76,7%
Cycle 2	90,3	76	100	1	3,3%	29	96,7%

Based on Table 1, it can be seen that student learning outcomes on Dynamic Electricity material have increased from pre-cycle, cycle 1 and cycle 2 after learning using the *Case Study* learning method. The increase occurred in the average score, lowest score, highest score, number and percentage of students who could reach the KKM set by SMP Muhammadiyah 9 Bojonegoro in science subjects. The average score increased from pre-cycle, cycle 1 and cycle 2, namely 58.3; 85.9; and 90.3. The lowest score of students in the pre-cycle, cycle 1 and cycle 2 also increased, namely 40; 72; and 76. The highest score

that students can achieve in the pre-cycle is 80 while in cycle 1 and cycle 2 there are students who are able to answer all questions correctly or achieve a score of 100. The number and percentage of students who are complete or can achieve KKM also increased from the pre-cycle, cycle 1 and cycle 2, namely 5 students or 16.7%; 23 students or 76.7%; and 29 students or 96.7%. Student activities in learning activities using the *Case Study* learning method show that students are more enthusiastic in learning Dynamic Electricity material.

The results of this study are in accordance with several previous studies related to the *Case Study* learning method. Research that has been conducted by [9] shows that the case study method is able to make students' attention focused on learning activities, thus making learning activities more effective and learning objectives can be achieved. Other research has been conducted by [10] which shows that the *learning by case method* has a positive effect on the effectiveness of accounting student learning.

#### 4. Conclusions

Based on the data from the research results and discussions that have been carried out by researchers, it can be concluded that the application of the *Case Study learning* method in science subjects on Dynamic Electricity material can improve the learning outcomes of research subjects, namely 9th grade students of SMP Muhammadiyah 9 Bojonegoro in the 2023/2024 academic year. This can be seen from the increase in the percentage of students who can achieve KKM from pre-cycle, cycle 1 and cycle 2, namely 16.7%; 76.7%; and 96.7%. In addition, it can also be seen from the average scores in the pre-cycle, cycle 1 and cycle 2 which have increased, namely 58.3; 85.9; and 90.3. The increase in the percentage of students who are complete and the increase in the average score from pre-cycle, cycle 1 and cycle 2 is supported by student activities that show enthusiasm during learning activities obtained from the observation results. Researchers suggest that research related to the *Case Study* method can be carried out on other science subjects, so that the effectiveness of the *Case Study* learning method can be more accurate.

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