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Efforts to Improve Physics Learning Outcomes By Using the Discovery Learning Model in Grade 12 MIPA

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ABSTRACT

The background of this class action research from the Physics learning process at Bina Dharma High School Jakarta in class XII MIA was very monotonous. the average value of a child has not yet reached the KKM. Then class action research is carried out by evaluating teacher assessments, student evaluations, and teaching material assessments. This research is intended to answer the problem: How the discovery learning model can improve the physics learning outcomes of class XII at SMA Bina Dharma Jakarta. These problems are discussed through classroom action research conducted through 2 cycles, with each stage of the cycle being planning, action, observation, and reflection. In the assessment stage regarding teachers in the first and second cycle assessment, a score of 60 and 80 were obtained with an increase of 20%. Assessment of the first and second cycle students was 72 and 85 with a 13% increase. The last assessment of teaching materials in the first and second cycle results obtained 75 and 90 with an increase of 15%. At first, the students held the test only getting an average of 60 after the discovery learning model was applied the students got an average value of 75. Then it can be said the discovery learning model can improve learning outcomes.

Keywords:Physics, Discovery Learning, Learning Outcomes.

INTRODUCTION

School as an educational institution created by the community to help families, and the community in the task of preparing generations of children who are not ready in social life, to help develop in children a physical, intellectual, and moral condition demanded by society as a whole [1]. National education goals contain various human values that must be possessed by Indonesian citizens. Therefore, the aim of national education is the most operational source in developing the nation's cultural and character education[2].

Physics is part of science (IPA), Physics is essentially a collection of knowledge, ways of thinking, and investigations, science as a collection of knowledge can be in the form of facts, concepts, principles, laws, theories, and models. Physics is seen as a process and a product at the same time, so learning must consider strategies and methods of learning that are effective and efficient, one of which is through practical activities[3]. In learning physics, it takes learning that is not only teacher-centered but must be student-centered. In student-centered learning,the interaction will occur between students and teachers and between students [4].

In learning physics, students' understanding of teaching material is very important. A good understanding of the material will make it easier for students to solve every physics problem so that the learning outcomes obtained by students can achieve the Minimum Mastery Criteria (KKM) set by the school. Then an evaluation for the performance of teachers, students, and teaching materials is obtained. In the first cycle, the assessment instruments of these students are obtained based on the ability of students to understand the learning process, answering questions provided by the teacher. Then obtained the results of an assessment of students with an average value of 60. assessment instruments regarding teacher performance

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were obtained during the learning process. The assessment is based on the suitability of the teaching teacher with the syllabus and lesson plans that have been made and how the teacher conveys the contents of learning. Then obtained an assessment of teacher performance by 70. instruments regarding teaching materials for the learning process. Assessment of teaching materials includes the ability of teachers to master teaching materials that will be delivered to students. Then the results of the assessment of teaching material obtained by 75. In this case, if it is associated with data in Bina Dharma Jakarta, the minimum completeness criteria (KKM) of 70.00 from 32 students, then because the results obtained do not meet the target.

Educational assessment is the process of gathering and processing information to measure the achievement of student learning outcomes including : authentic assessment, self-assessment, portfolio-based assessment, tests, daily tests, midterm tests, end-semester tests, competency level tests, competency level quality tests, examinations national, and school/madrasah exams [5].The success of learning objectives is determined by many factors including the factor of the teacher in implementing the teaching and learning process because the teacher can directly influence, foster, and improve the intelligence and skills of students [6].

Discovery learning is a learning process that focuses on the intellectual mentality of students in solving various problems faced, to find a concept or generalization that can be applied in the field ". For students learning will be meaningful and the results will last a long time when students participate directly in getting their knowledge and experience[7].Learning Model Discovery Learning allows students to play an active role in discovering the concept of knowledge by answering and solving existing problems[8]–[11].With the hope that this model can make students more critical in thinking[10], [11].

Some of the strengths of the Discovery learning model have several advantages, namely: 1) increasing students' experience in learning, 2) providing opportunities for students to get closer to sources of knowledge other than books, 3) exploring student creativity, 4) able to increase self-confidence in students, and 5) increasing cooperation between students. This is further supported by the results of several studies conducted by applying the discovery learning model[12].

Active involvement of students in the discovery process is considered to be able to make students responsible in the learning process, through the process of discovery makes students not easily forget about the concepts they find. The activeness of students in the learning process to find takes a long time.

The use of learning models is prioritized to arouse learning passion, motivation to learn, stimulate students to play an active role in the learning process. Discovery learning model is effective for improving student learning outcomes, students tend to be more active in searching and finding information independently. In this model, students are free to identify, analyze, and draw conclusions according to their findings, while the teacher only acts as a guide to student learning processes[4].

The teacher's role in the discovery learning model helps students process information because this discovery learning model requires the involvement of students in the activities of the learning process. In processing information students develop critical thinking skills to understand information and make conclusions. Developing creative thinking skills can make students interested in expressing ideas in processing information, and train students to learn and think systematically. When students process information it takes a long time to conclude.

Based on the results of observations and the

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results of the study, the teacher is encouraged to apply a learning model that encourages students to play an active role, namely the Learning Learning model, in which the students discover the findings of the concept. Learning by giving questions in the Discovery Learning learning model directs students to improve student learning outcomes.

RESEARCH METHODS

To improve and improve the quality of physics learning outcomes learning, classroom action research designs are used. CAR is the application of controlled actions or actions that are recycled (carried out in the form of cycles) to directly address real and specific problems that arise in learning. From this explanation the CAR has the following characteristics; (1) The existence of actions (actions) to improve the quality of learning (in class or outside the classroom) (2) The selected actions are based on the problem that is faced is specific (3) The focus of research on the process and outcome of actions (4) Not to generalization no sampling (5) data collection: interviews, observations, questionnaires/questionnaires, tests (6) conducted in the form of cycles that include activities: planning, implementation, observation, and reflection[13].

The implementation of the action is the steps taken to carry out the plans that have been prepared, namely the application of Discovery Learning with the subject of coloumb law in improving physics learning outcomes in class XII Mipa high school students at Bina Dharma.

Observation is an activity of observing the process and results of the application of Discovery Learning with the subject of static fluid in improving physics learning outcomes in class XII Mipa high school students, Bina Dharma Jakarta. Reflection is an activity of analysis and interpretation of all information obtained from observations during the implementation of Discovery Learning with the subject of coloumb style in improving physics learning outcomes in class XII Mipa High School Bina Dharma Jakarta.

The time observation is carried out at the same time as the action which is aimed at recognizing, recording, and documenting each indicator of the process and the results of the implementation of the action. Reflection is an activity of analysis and interpretation of all information obtained from observations during the implementation of Discovery Learning with the subject of coloumb style in improving physics learning outcomes in class XII Mipa High School Bina Dharma Jakarta.

This research was carried out using more than one cycle. The implementation of this cycle is based on the level of success and improvement of students in the implementation of the application of Discovery Learning with the subject of coloumb style in improving physics learning outcomes in class XII Mipa students at SMA Bina Dharma Jakarta.

RESULTS AND DISCUSSION

In cycle I, 2 meetings were held in which were tested with assessment instruments for students and educators as well as the teaching materials used. So that there is treatment and improvement in the learning process that is in accordance with the maximum level of value of Physics lessons in class XI MIA 1. In accordance with the results of the instrument that has been made, which consists of student assessment instruments, teacher assessments, and assessment of learning materials. The following are the results of the instrument filling during the first cycle

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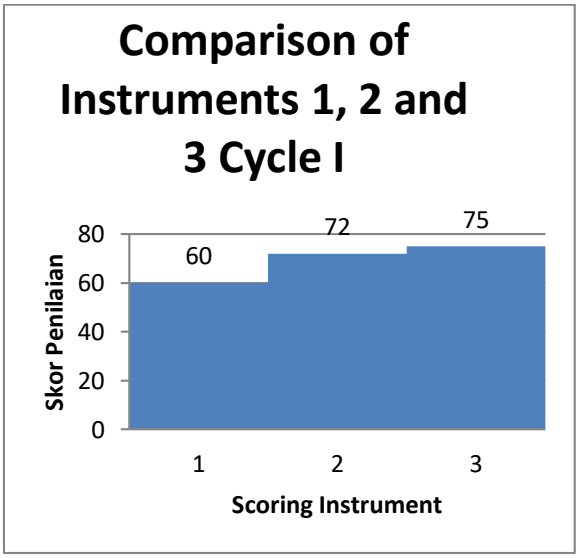

Figure.1 Comparison of Instruments 1, 2 and 3 Cycle I.

Explanation;

- Rating 1 = Student's assessment
- Rating 2 = Teacher performance
- Rating 3 = Teaching material

Instrument 1 is an instrument of student assessment. This assessment is obtained based on the ability of students to understand the learning process, answering questions provided by the teacher. Then obtained the results of an assessment of students by 60%. Instrument 2 is an assessment instrument regarding teacher performance during the learning process. The assessment is based on the suitability of the teaching teacher with the syllabus and lesson plans that have been made and how the teacher conveys the contents of learning. Then obtained the results of an assessment of teacher performance by 72.00%.

Instrument 3 is an instrument regarding teaching material for the learning process. Assessment of teaching materials includes the ability of teachers to master teaching materials that will be delivered to students. Then obtained the results of an assessment of teaching materials by 75%.

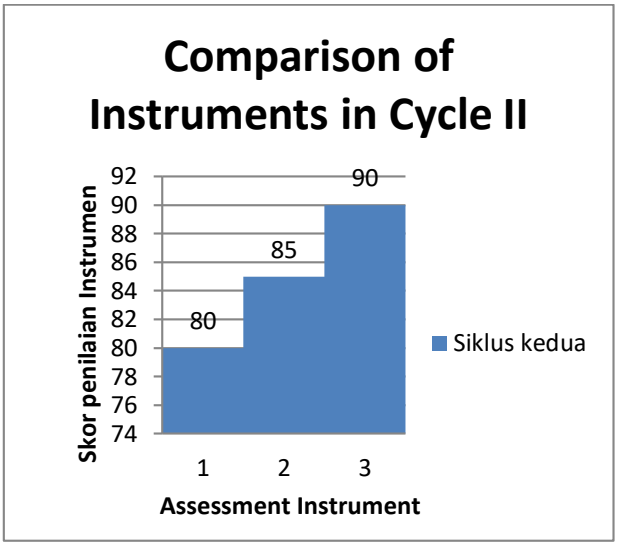

Figure.2 Comparison of Instruments in Cycle II

Explanation;

- Rating 1 = Student's assessment
- Rating 2 = Teacher performance
- Rating 3 = Teaching material

Instrument 1 is an instrument of student assessment. This assessment is obtained based on the ability of students to understand the learning process, answering questions provided by the teacher. In cycle 2 the students experienced an increase in the percentage of assessments in the instrument. This is done so that students can achieve predetermined expectations. Then the assessment results obtained for students by 80%.

Instrument 2 is an assessment instrument regarding teacher performance during the learning process. The assessment is based on the suitability of the teaching teacher with the syllabus and lesson plans that have been made and how the teacher conveys the contents of learning. Then obtained the results of an assessment of teacher performance by 85%.

Instrument 3 is an instrument regarding teaching material for the learning process. Assessment of teaching materials includes the ability of teachers to master teaching materials that will be delivered to students. Then obtained the results of an assessment of teaching materials by 90%.

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Figure.3 classroom teaching

The first assessment of the students over the lack of expectations achieved in the first cycle and the first meeting in the second cycle, collaborators observe how the learning process with the student review, this review covers the process at the first meeting and the second meeting, this assessment consists of the activeness of students, understanding students' cognitive and skills in the learning process. With an expectation value of 83 and a percentage obtained in the second cycle of 60 and the second meeting of 80. after being reviewed together with collaborators is the initial introduction to the discovery learning model requires repeated habituation then after seeing at the second meeting the collaborator managed to see an increase of 20 percent, but my expectations, it is necessary not to hold cycle further, an important note here is the teacher must make a habit of this learning model so that students more easily understand the contents of the lesson.

The next assessment is about the teacher of the teaching process, the second meeting in the first cycle of 72 results will be compared with the first and second meetings in the second cycle. The result obtained is the second cycle of 85. There was an increase from the second meeting of the first cycle to the first meeting of the second cycle of 13 percent. Teacher assessment is carried out by collaborators where the assessment point taken is the suitability of the teaching teacher with the syllabus and lesson plans.

Suitability of learning and learning material is the most important part, learning materials and teaching materials must be mastered by the teacher to create cognitive abilities of students. At the first meeting stage cycle 1, the teacher gets a value of 75 and at the next meeting gets a value of 90 this value also does not meet the expected value of 83. then it can be concluded an increase in the value of 15 percent. the criteria of this assessment are the contents of the learning material and learning objectives that will be given to students.

At the end of the cycle to improve the quality of learning an evaluation will be conducted which includes the teacher, students, and learning outcomes. The evaluation conducted by the teacher is the learning process and the suitability of the lesson plans and syllabus made. Student assessment is done by assessing the response and level of understanding of the material being taught and evaluating the teaching material is done by looking at the suitability of the material with the existing modules.

After a test is conducted on students who initially only get an average of 60 then the learning application is carried out using the discovery learning model and retest is held and an average value of 75 is obtained where these results have exceeded the KKM value. It can be concluded that discovery learning material can improve learning outcomes.

CONCLUSION

Classroom Action Research (CAR) conducted by researchers at SMA Bina Dharma Jakarta was conducted in 2 cycles. The results or impacts obtained from the implementation of CAR by implementing the Discovery Learning model are an increase in student achievement and student participation in physics lessons. second in cycle 1 of 60 results will be compared with the first and second meetings in the second cycle. The results obtained are the second cycle of 80. The first assessment of the students over

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the lack of expectations achieved in the first cycle and the first meeting in the second cycle, collaborators observe how the learning process with student reviews, this review covers the process at the first meeting and the second meeting This assessment consists of the activeness of students, students' cognitive understanding and skills in the learning process.

With an expectation value of 83 and a percentage obtained in the second cycle of 72 and the second meeting of 85. Suitability of learning and learning material is the most important part, learning materials and teaching materials must be mastered by teachers to create cognitive abilities of students. At the first meeting stage of cycle 2, the teacher gets a value of 75 and at the next meeting gets a value of 90 this value also does not meet the expected value of 83.

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