The Impact of The Discovery Learning Model Study on The Learning Outcomes of Students in Class X on The Primary Material of Quantities and Measurements

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Abstract. The purpose of this study is to ascertain how the Discovery Learning Learning Model affects student learning outcomes on the primary subject matter of quantities and measurements in Class X Semester I SMA Markus Medan T.P. 2021/2022. All class X SMA Markus Medan Semester I T.P. 2021/2022 students made up the study's population. The research sample was drawn at random from two classes (Cluster Random Sampling), class X-MIA 3, which served as the experimental class and had 30 students, and class X-MIA 4, which served as the control class and had 30 students and was taught using the traditional model. The multiple-choice test utilized in this study comprised a total of 21 questions and had undergone validity, reliability, level of difficulty, and discriminating power testing. The data showed that employing the discovery learning model, which was superior to using traditional learning, increased learning outcomes.

Keywords: Model Discovery Learning, Student Learning Outcomes

1. Introduction

Education is an effort to develop human beings towards maturity, intellectual, social, and moral maturity. Therefore, in the process, education is not only developing intellectuals but covers all the potential that students have. So that interaction in learning must be built in full. In the entire educational process, learning activities are the most dominant and main activities. The teaching and learning process can occur due to the interaction between a person and the learning environment. Whether or not educational goals are successful depends on the learning process that a person is experiencing [1].

Designing and implementing more effective learning activities, such as managing study spaces, students, and learning can help identify a good learning process. In addition to a strong learning process, teachers' skill is required order to design learning activities that are as effective as possible[2].

The primary component of education is learning, which takes place in classrooms. Based on the high and low student learning outcomes attained, one can observe the measuring point of success in the accomplishment of educational goals. Low student learning results are a result of students' inadequate conceptual understanding, which is brought on by Indonesian curricula, instruction, and assessments that still place a strong emphasis on content and neglect the context

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and science process dimensions[3]. The extent to which a learner comprehends a topic and can use it in daily life determines, in large part, the learning outcomes for that student.

The researcher noticed students' learning deficits when they were being observed in class as they attempted to comprehend a high school-level level physics learning challenge. Physics is considered to be quite challenging by the pupils. Learning becomes more teacher-centered as a result, and while teachers are more involved in teaching and learning activities, student cooperation is still a problem. Teachers only employ one sort of learning model as a result of their lack of familiarity with other types.

Furthermore, the learning model employed is likewise less diverse, using primarily lecture and discussion methods. This may result in poor learning results for students in terms of their understanding of physics since it makes pupils uncomfortable, bored, and reluctant to study over time.

Additionally, there is less variety in the learning style used, which mainly employs lecture and discussion techniques. This may result in poor learning results for students in terms of their understanding of physics since it makes pupils uncomfortable, bored, and reluctant to study over time.

There needs to be encouragement or motivation for pupils to learn more actively and to comprehend what is being studied to order to increase their aptitude and enthusiasm to learn. To order to become an actor who can demonstrate his supremacy as a tough, self-assured, creative, autonomous, and professional figure in their respective disciplines, students play a vital part in his preparation [4].

Because of this, it's essential to combine teachers' instructional models with students' readiness for learning. For orders for students to learn more effectively, teachers must be able to apply learning models effectively. It is assumed that the teaching and learning processes used in schools will help pupils develop the capabilities the curriculum focuses on. So that pupils can attain the KKM desired by the school, innovations are required that are tailored to the features of the students.

It is necessary to work on raising education standards to order to address these issues. Correcting the ineffective learning processes in the teaching and learning process in the classroom might serve as the first step in these efforts. Students' potential should be developed through the direction of the learning environment, which calls for a student-centered educational process (student-active learning). Students learning outcomes can be improved by actively immersing them in the learning process, allowing them to absorb concepts directly and better understand them.

The discovery learning model is one of the suitable models of learning. Students will be more engaged in learning and discovering concepts linked to the content of magnitude and measurement with the implementation of the discovery learning paradigm. Students can then analyze and explain what they have learned by presenting their discoveries independently.

The discovery learning model is a theory of learning that examines student-centered learning procedures and active learning experiences that will aid students in discovering and expressing their thoughts regarding the subject being studied [5].

Students with a keen interest in learning can benefit from the discovery learning approach. The implementation of discovery learning to enhance student learning outcomes is going well. Students are more eager and interested in participating in sessions, and they can exhibit increased student activity through group work, prop use, presentations, and questioning. [6].

Because the delivery of the material necessitates a grasp of fundamental concepts that are undoubtedly connected to events or facts discovered by students, it is anticipated that using the

discovery learning model in conjunction with the material of magnitude and measurement will be able to synergy physics learning and produce active creative learning.

2 Methods

This research was conducted in class X SMA Markus Medan, North Sumatra. This research was conducted in the first semester of the 2021/2022 Academic Year.

This research is a quasi-experimental type of research, namely grouping the research sample into two groups, each of which is the experimental class, the discovery learning model is set and the control class is the conventional learning model.

This study aims to find information about the effect of student learning outcomes who are taught using the discovery learning model on the subject matter of Quantity and Measurement.

The instrument used in this study was a learning outcome test consisting of 21 questions. The question of student learning outcomes was validated using a validity test by 2 experts, namely one lecturer and one physics teacher. The arrangement of this research instrument follows the cognitive realm of Bloom's taxonomy revision by Anderson.

In this research, there is an experimental class and a control class. In the control class, the conventional learning model will only be carried out, while the experimental class is set with the discovery learning model. Before being given a lesson, students are asked to do a pre-test after that at the end of the lesson students are given a post-test question. The difference in learning outcomes between the experimental and control classes is used as an indicator of student learning success using the discovery learning model in learning at school.

3 Result And Discussion

In this study, two classes—the experimental class, which is taught using the discovery learning model, and the control class, which is taught using the traditional learning model—are each given a different type of instruction.

X-Mia 3 served as the experimental class, and X-Mia 4 served as the control group. Both courses took a pretest to gauge the students' initial levels of learning before the treatment was put into practice. There are 30 pupils in each class.

In comparison to the control class, the experimental class's average pretest score was 43.65 as opposed to 40.57. Table 1 below shows the disparity in the pretest scores for the two classes.

Table 1. Average results of pre-test and post-test experimental class and control class

Class	***Pre-test***	***Post-test***
Experiment	43.65	77.30
Control	40.57	72.70

The average pre-test score of students in the experimental class before receiving therapy was 43.65, according to research data in Table 1. Additionally, the control class's pre-test score on average was 40.57. Having a standard deviation between 7.51 and 9.03. Students in the experimental class and the control class had similar mean pre-test scores. This is because neither the experimental nor control classes have received any medical attention.

The experimental class then employed the discovery learning model after receiving therapy, whereas the control class used the traditional learning model. After being taught using the

discovery learning paradigm, students in the experimental class had an average post-test score of 77.30, compared to 72.70 in the control class. has a 6.49 and 8.81 standard deviation. The average post-test score for the experimental class is greater than the average pre-test score for the control class, as seen by this. Student learning outcomes are rising in both classrooms, but in the experimental class, the average value has met the minimal completeness standard. Although the control class's average value of student learning outcomes has grown, it still falls short of meeting the minimum requirements for all students..

According to the preceding description, the findings of this study show that the discovery learning model and conventional learning have an impact on students' learning outcomes in class X's even semester in the years.2021/2022. Because the experimental class uses the discovery learning paradigm, the learning outcomes between that class and the control class are significantly different. models of discovery learning that use syntaxes or learning stages not seen in traditional learning. The discovery learning model emphasizes the process of complete student engagement to be able to locate the content being studied and relate it to real-life circumstances to encourage students to be able to apply it in everyday life. In the discovery learning process, students do not just act as recipients of lessons through instructor explanations in a direct manner. Verbal, yet students are involved in discovering the essence of the subject for themselves. Students that use the discovery learning model are more engaged in their learning throughout the stages of stimulation, problem identification, data collection, data processing, verification, and generalization. These instructional techniques motivate students to participate more actively in class.

This is supported by the results of research conducted by Kadri & Rahmawati[7], Ratna, et al. [8] which state that discovery learning can improve student physics learning outcomes at SMP Negeri 2 Pamona Timur. Research by Widiadnyana, et al [9] stated that there were significant differences between students who used direct learning using the discovery learning model, Mariza & Derlina [10] stated that there was a significant effect of discovery learning on student learning outcomes, and Salwan & Rahmatan [11] stated that the effect of Discovery Learning-based worksheets on improving student learning outcomes.

4 Conclusion

Based on data analysis and hypothesis proofing, it can be concluded that there is a significant effect of learning using the discovery learning model on student learning outcomes. The results of the pretest study obtained that the average value of the experimental class was 43.65 and the average value of the control class was 40.57, based on the normality test $L_{table} > L_{account}$ and the homogeneity test $F_{count} < F_{table}$, this shows that both classes are normally distributed and homogeneous. Based on the initial ability test count table, states that the two classes have the same ability. Then different treatments were carried out on the results of the post-test, the average value of the experimental class was 77.30 and the average value of the control class was 72.70, based on the t-test (one party) obtained t_{count} 2,30 > t_{table} 1.671, there was a significant effect of discovery learning model on student learning outcomes in the subject matter of quantities and measurements in class X SMA Markus Medan year of 2021/2022.

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