

THE EFFECT OF ACTIVE LEARNING MODEL TYPE QUIZ TEAM ON STUDENTS' UNDERSTANDING OF PHYSICS CONCEPTS OF GRADE X SMA NEGERI 4 PANDEGLANG

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ABSTRACT

This study aims to determine the effect of using the *active learning model of the quiz team* type on the understanding of physics concepts. This study was conducted at SMA Negeri 4 Pandeglang in semester 2 of the 2017/2018 academic year. The sample of this study was students of class X MIPA 8 with a sample size of 33 students. Sampling using simple random sampling. The type of research used was *pre-experiment with a one group pre-test post-test* research design . After the data was normally distributed and homogeneous based on the normality test and homogeneity test, it was continued with hypothesis testing. Based on the calculation results, the calculated t value > t table (0.05) ($3.23 > 1.70$) was obtained, which means H_0 is rejected and H_1 is accepted. Therefore, the results of this study concluded that there is an effect of the active learning model of the quiz team type on the understanding of physics concepts.

Keywords: *Active learning model, quiz team type* , conceptual understanding, Physics learning

INTRODUCTION

Education is a container in which there are efforts by teachers to develop students' potential, both potential that is inside and potential that is outside the student [1] . Potential development can make students independent in learning which is useful not only for themselves but also for many people. Education is the main factor in forming a quality nation. If education in a country is of quality, it is certain that the country is a developed country. Therefore, the government in Indonesia is expected to be able to guarantee the quality of education, because if education in Indonesia is considered, education in Indonesia will be the same as education in developed countries [2] .

The success of education implementation can be influenced by several factors, one of which is the readiness of teachers in teaching students [3] . Teaching can be interpreted as the process of conveying ideas, concepts, or

information from a teacher to students. The process of conveying ideas, concepts, or information requires good communication between teachers and students so that learning can run smoothly and the learning outcomes obtained are maximized.

The change in curriculum from KTSP (Education Unit Level Curriculum) to kurtilas (Curriculum 2013) has an impact on students to learn independently, while teachers are only supervisors and facilitators. This curriculum change requires teachers' ability in teaching so that students learn independently and become whole human beings.

A teacher must master various skills as a professional teacher. One of the skills in question is in choosing a learning model. A teacher in carrying out learning activities must apply a learning model [4] . The learning model is a framework used to describe the learning process in the classroom in order to achieve learning objectives during the learning process.

The learning process using the *active learning model of the quiz team* type is carried out in a fun way and can develop creativity in students [5] , so that students are trained to be independent in the learning that is carried out. The use of the *active learning model of the quiz team* type [6] can also improve students' understanding of concepts, because during the learning process students discuss, ask questions, answer questions, give directions, express opinions, and convey information and also students' understanding of a material is tested/trained [7] . In addition, the use of the *active learning model of the quiz* type can make students work together with their group members and create competition between groups [8] . Therefore, the selection of the *active learning model of the quiz team* type is considered very suitable for teachers to use to teach physics material to students.

Physics is one of the subjects in school that discusses the problems of natural phenomena of the universe. Natural phenomena that occur are explained using formulas that require logical thinking to learn the material. Physics is a subject that students' interest in learning is lower compared to other subjects, because it emphasizes logic based on real phenomena. In addition, in studying physics there are many concepts and principles that are generally abstract. The difficulty that many students face is the difficulty in interpreting various concepts and principles of Physics.

Therefore, physics is described mathematically to make it easier for students to interpret various concepts and principles of physics. Based on the results of a survey conducted by researchers at SMA Negeri 4 Pandeglang, the results of learning physics in class X MIPA 8 were less than satisfactory and still did not meet the KKM (Minimum Completion Criteria) or were still below 7.5 with an average score of 30.52. The average

score of 30.52 indicates that students' conceptual understanding is still low. This is because the initial concept brought by students does not match the scientific concept. The wrong initial concept has an impact on students' understanding in learning physics, because wrong concepts are difficult to fix and this wrong concept often occurs in the field of physics. Based on the description above, the researcher was motivated to conduct a study entitled: "The Effect of the Quiz Team Type Active Learning Model on Students' Understanding of Physics Concepts in Class X of Sma Negeri 4 Pandeglang".

RESEARCH METHODS

The research using the *active learning model of quiz team* type was conducted in February to May of the 2017/2018 academic year with a sample of 33 students in class X MIPA 8. The design used in this study was one group pre-test post-test. The technique in collecting data in this study was in the form of a free essay test given before and after treatment (*active learning model of quiz team* type) [9] . The data collected were the results of students' answers from tests that had been completed by students before and after treatment (*active learning model of quiz team* type) and from the results of practice questions that had been completed by students on the discussion of momentum and impulse, then the data from the students were analyzed based on the qualification of understanding the concept.

RESULTS AND DISCUSSION

The students' physics concept understanding ability in discussing momentum and impulse is described from the analysis of the students' answer results during *the pre-test, post-test* [10] , and from the results of the practice questions after the treatment was given to the students in the form of free essay questions that have been adjusted to the concept understanding

indicators. Based on the research that has been conducted, data on the frequency distribution of students' physics concept understanding during the pre-test was obtained. The researcher analyzed the data, until finally the researcher was able to present the data in the form of a table as below.

TABLE 1. Frequency Distribution of Students' Understanding of Physics Concepts in the Pre-test Example of writing equations:

Mark	Frequency	Percentage(%)	Information
81-100	0	0	Very high
61-80.99	0	0	Tall
41-60.69	3	10	Enough
21-40.99	23	76.67	Low
0-20.99	4	13.33	Very Low
Amount	30	100	

Meanwhile, the data produced during the post-test obtained data from the frequency distribution of understanding of physics concepts which can be seen in the table below.

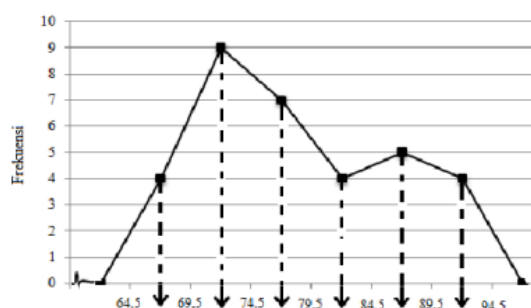
TABLE 2. Frequency Distribution of Students' Understanding of Physics Concepts in the Post-test

Mark	Frequency	Percentage(%)	Information
81-100	9	30	Very high
61-80.99	17	56.67	Tall
41-60.69	4	13.33	Enough
21-40.99	0	0	Low
0-20.99	0	0	Very Low
Amount	30	100	

From Tables 1 and 2, it can be seen that there is a change in the frequency distribution value of students' understanding of physics concepts. At the time of the pre-test, the range of values

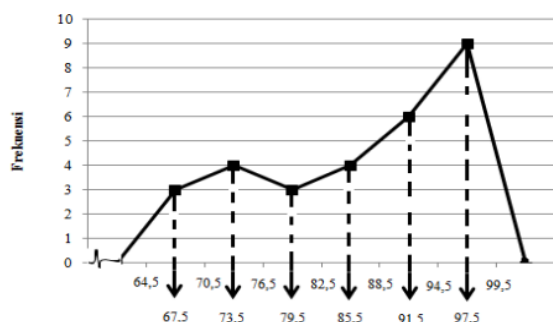
between 81 - 100 was 0 people to 9 people at the time of the post-test, where in this range of values it is in a very high qualification. In the range of values between 61 - 80.99 at the time of the pre-test, there were 0 people to 17 people at the time of the post-test, where in this range of values it is in a high qualification. In the range of values between 41 - 60.99 at the time of the pre-test, there were 3 people to 4 people at the time of the post-test, where in this range of values it is in a sufficient qualification. In the range of values between 21 - 40.99 at the time of the pre-test, there were 23 people to 0 people at the time of the post-test, where this range of values is in a low qualification. While in the range of values between 0 - 20.99 at the time of the pre-test, there were 4 people to 0 people at the time of the post-test, where in this range of values it is in a very low qualification.

In addition, based on the results of the practice questions that students have worked on after the treatment was given, this can be seen in the graph below.



Graph 1. Results of the 1st Practice Questions for Grade X MIPA 8 Students

The graph above is the result of the 1st practice question which shows an increase in the range of values 69.5 - 74.5 which has a frequency of 9. After experiencing an increase, the graph then experiences a decrease, where the lowest decrease in the graph is at a value between 79.5 - 84.5 and 89.5 - 94.5 which have the same frequency of 4. Meanwhile, the 2nd practice question can be seen in Graph 4.2.



Graph 2. Results of the 2nd Practice Questions for Grade X MIPA 8 Students

Graph 4.2 is the result of the 2nd student practice question which shows a continuous increase even though there is a slight decrease. Where the highest peak on the graph is at a value between 94.5 - 99.5 with a frequency of 9 and the lowest peak is at a value between 64.5 - 70.5 and 76.5 - 82.5 which have the same frequency of 3.

The results of the study conducted at SMA Negeri 4 Pandeglang using the *active learning model of the quiz team* type to determine the ability of students' understanding of physics concepts seen from the qualification of understanding concepts in the pre-test obtained an average value of students' understanding of physics concepts in the low qualification with a percentage value of 28.87%. While the *post-test* value obtained an average value of students' understanding of physics concepts in the high qualification with a percentage value of 73.57%. In addition, the results of the practice questions that have been worked on by students obtained an average value of understanding concepts in the results of the 1st practice questions had a percentage of 76.21% which was in the high qualification and the average value of understanding concepts in the results of the 2nd practice questions students had a percentage of 75.18% which was in the high qualification. The average value of understanding concepts from the results of the practice questions that have been worked on by students experienced an increase in value which

was getting better from the 1st practice questions, although the average number of understanding concepts decreased which was caused by the provision of the 2nd practice questions as many as 4 students were absent.

Based on the results of the *pre-test*, *post-test* and the results of the practice questions worked on by students, it can be seen that there is a change in value that is getting better. This is because students are accustomed to implementing learning by applying the *active learning model of the quiz team* type in physics learning. The use of the *active learning model of the quiz team* type makes students learn independently so that they are active in learning activities in groups and are directly involved in the material they are studying, so that students can explore the potential that exists within themselves. The success of implementing the *active learning model of the quiz team* type can also maximize cognitive abilities because during the learning activities there are discussion activities, asking, answering, and solving questions in groups that make students think critically so that it can affect students' understanding of concepts and the understanding of concepts received by students in learning activities will be stored for a long time because students can solve questions critically and repeat the material they have learned with questions presented in the form of quizzes.

Based on the *pre-test*, *post-test*, and student practice question results, there is an influence of the *active learning model of the quiz team* type on students' understanding of physics concepts. This can be seen from the results of the hypothesis test calculations that have been carried out previously, namely the t count value = 3.23 > t table (0.05) = 1.70, which means **H1 is accepted**. Thus, the *active learning model of the quiz team* type has been successfully applied to students in learning at

school.

CONCLUSION

Based on the results of research that has been conducted using the quiz team type active learning model on understanding concepts, the following conclusions were obtained:

1. Students gave positive, active and very enthusiastic responses in participating in learning activities by implementing the active learning model of the quiz team type in groups because learning was carried out in a fun way. So that the application of the active learning model of the quiz team type makes the understanding of the concept of the material received stored for a long time.
2. Overall, the average value of students' understanding of physics concepts after implementing the active learning model of the quiz team type is at a high qualification with a percentage value of 73.57% for the post-test and the average value of students' understanding of physics concepts from the results of the practice questions is at a high qualification with a percentage value that has been carried out, the tcount value is obtained = $3.23 > t_{table}(0.05) = 1.70$. So H_1 is accepted.
3. Based on the hypothesis test that has been obtained, physics learning with the active learning model of the quiz team type has an effect on students' ability to understand physics concepts.

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