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The REACT-Based Contextual Learning Model And Mastering The Concept Of Physics In High School Students

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ABSTRACT

This study aims to determine the effect of the REACT-based contextual learning model on the mastery of physics concepts in high school students. This study used a Quasi Experimental research model with a pretest-posttest control group design. The study population was all students of class XI MIA SMA Negeri Samadua, South Aceh Regency which consisted of two classes. Both classes were used as research samples by forming an experimental group and a control group. The experimental group is a class that uses a REACT-based contextual learning model in physics learning, while the control group is a class that uses a conventional learning model through the lecture method. The instruments used were RPP, LKPD and test questions. The pretest and posttest in this study were used to measure the students' initial and final abilities in physics. The data analysis technique used is the t-test with a significance level of 5%. The results of hypothesis testing obtained t_{count} (2.13) > t_{table} (1.68), meaning that Ho is rejected and Ha is accepted. These results interpreted that there was a significant influence on the REACT-based contextual learning model on the mastery of physics concepts for students of class XI MIA SMA Samadua, South Aceh Regency.

Keywords: Contextual learning, REACT-based, mastery of concepts

INTRODUCTION

The implementation of learning in the classroom is one of the main tasks of the teacher. In the learning process there is still a tendency to minimize student involvement. The dominance of the teacher in the learning process causes the tendency of students to be more passive so that they are still waiting for the teacher's presentation rather than looking for and finding the knowledge they need themselves (Bustami, B., et.al., 2020). Even though the 2013 curriculum views that knowledge cannot just be transferred from teachers to students. Students are subjects who have the ability to actively seek, process, construct, and use knowledge (Merisa, N. S., et.al., 2020). The interaction in the learning process between students and educators and learning resources in a learning environment is regulated and supervised so that learning activities are directed in accordance with educational goals that serve to assist students in developing all their potential, skills, and personal characteristics in a positive direction. Efforts to make this happen, every teacher is expected to be able to plan, implement and

evaluate the learning process and student learning outcomes using good methods (Ibrahim & Yusuf, 2019).

Based on the results of preliminary observations by researchers at SMA Negeri Samadua, South Aceh Regency, information related to the learning process and learning resources used by the teacher were textbooks (student books) from publishers and material summaries made in the form of power points, which according to some students the physics material presented was still difficult to understand. Experimental or experimental activities are also rarely carried out. According to (Ahman & Mursalin, 2018), the physics learning process in schools still uses a lot of lecture methods and physics subject matter seems only to be memorized. Students tend to be passive in the learning process and are unable to construct the knowledge they acquire. A wise teacher will choose, sort and determine a method or model that is suitable for learning materials to create conducive classroom situations and conditions (Al-Tabany, 2014).

Physics learning is not only limited to learning facts and theories, but requires investigative activities to find new facts, either through observation or experiment, which involves process skills based on scientific attitudes (Selamet et al., 2013). Physics learning also has objectives including developing students' knowledge, understanding, and analytical skills towards the environment and surroundings (Cahyono et al., 2017). Learning physics in students is expected not only to master the concepts but also to apply the concepts they have understood in solving physics problems in everyday life (Azizah et al., 2015). The difficulty of students understanding or mastering the physics material presented by the teacher at SMA Samadua, South Aceh Regency can be seen from the minimum completeness criteria determined by the school, which is 70.This is in accordance with the results of research (Lefrida, 2016) which concluded that students have difficulty understanding the concept in particular physics subjects, causing many students to have low learning outcomes and do not reach the minimum completeness criteria.

Problem of Research

Based on this problem, the researcher suspects that the learning process used, the method or learning model chosen has not been effective for students' mastery of physics concepts and relates them to everyday life, so that an effort is needed to apply a learning model for students that is thought to improve learning outcomes. and mastery of concepts. According to (Ismaya et al., 2015), the learning model chosen must be able to help teachers instill concepts in students by inviting them to discover the concepts they are learning, work together, apply these concepts in everyday life and transfer in new conditions.

It is thought that the contextual learning model can help to overcome the problem of mastery of concepts in students because this learning model involves students in important activities that help them relate subject matter to the real life context they face (Selamet et al., 2013). Furthermore, according to (Nisa et al., 2018), contextual learning offers learning that further emphasizes students' abilities and relates material to everyday life. Contextual learning

models can be developed based on REACT with the aim of improving understanding of concepts and learning outcomes (Aqib, 2015).

The use of the REACT-based learning model in learning must go through five stages, namely relating, experiencing, applying, cooperating, and transferring (Choiriyah, 2017; Nisa et al., 2018). The REACT learning model has high effectiveness in developing students' conceptual understanding. Through this learning model students are also given the opportunity to develop and practice science process skills optimally (Fakhruriza & Kartika, 2015).

The REACT-based contextual learning model not only teaches concepts and facts but directs students to find meaning in learning through activities relating to the concept of subject matter with everyday life (Musdalifah, 2013). This statement is supported by the results of research conducted (Putra et al., 2014) showing that there are significant differences in mathematics learning outcomes between students who are taught with the REACT strategy and students who are taught using conventional learning models.

Research Focus

Based on the description of the research problems that have been discussed, this study only focuses on learning physics on the subject of global warming in class XI MIA. This study aims to determine the effect of the REACT-based contextual learning model on the mastery of physics concepts in high school students.

METHODOLOGY OF RESEARCH

General Background of Research

This study used a Quasi Experimental Design research model. Quasi-experimental research functions to determine the effect of the experiment / treatment on the characteristics of the subject desired by the researcher (Mulyatiningsih & Nuryanto, 2014).

The research was conducted at SMA Negeri 1 Samadua, South Aceh Regency. The research was conducted in the second semester of the 2018/2019 academic year, starting on April 5-23 2019. The study population was all students of class XI MIA SMA Negeri Samadua which consisted of two classes, 20 students of class XI MIA-1 and class XI MIA- 2 as many as 20 students. Because the total population consists of only two classes, these two classes are at the same time a research sample, in which class XI MIA-1 students are designated as the experimental class and class XI MIA-2 as the control class.

Subject of Research

The experimental class is a class that uses a REACT-based contextual learning model in physics learning and the control class is a class that uses a conventional learning model through the lecture method with a total of 20 students. The pretest and posttest in this study were used to measure the students' initial physics and final physics abilities.

Instrument and Procedures

The instruments used in this study were treatment instruments and measurement instruments. The treatment instruments in this study include the implementation of learning design (RPP) and student discussion sheets (LDPD). Posttest questions are an instrument used to measure students' mastery of physics concepts in the form of 10 multiple choice questions and 5 essay questions. This test is carried out after students take part in the learning process for the subject of global warming.

Data Analysis

Before testing the hypothesis, a prerequisite test is carried out including the normality test and the homogeneity test. Furthermore, the t-test (t-test) was used with a significance level of 5%. This test aims to determine the significance of the students' mastery of physics concepts in the experimental class compared to the control class as measured by the posttest value data. The test criteria used in this study are reject H_0 if tcount> ttable and accept Ha. In this case, it means that the average value of the experimental class students is better than the control class students' concept mastery average (Sugiyono, 2019).

RESULTS AND DISCUSSION

From the results of processing normality test data for the experimental and control groups at the pretest (6.52 and 5.15) and posttest (7.52 and 1.44), the distribution of sample data for each group is normally distributed so that data analysis can be continued. Likewise, the homogeneity test of the value of mastery of physics concepts in the experimental class and control class $F_{count} < F_{table}$ or 1.06 <2.15 is homogeneous so that the analysis can be continued. The implementation of learning in the experimental class and the control class is in accordance with the predetermined learning stages, while seen from the student activities during the learning process, it shows that the learning process in the experimental class is better than the learning process in the control class.

Mastery of physics concepts in this study can be seen from the pretest and posttest scores of the experimental class and the control class. Table 1 shows the pretest and posttest mean scores of the experimental class and the control class. From these results, it shows that the average value of the experimental class increased by 53.35 while the control class only increased by 45. Although the average scores of the two classes showed the same score reached KKM, the experimental class experienced a higher increase than the class. control. This shows that the treatment of the learning model affects student learning outcomes.

Table 1. Mean Value of Pretest and Posttest

Class	Pretest	Posttest
Experiment	33,00	86,35
Control	37,25	82,25

Hypothesis test results obtained tcount of 2.13 while t table of 1.68. Thus, t count> t table or 2.13> 1.68, it means that Ho is rejected. These results can be interpreted that Ha's research hypothesis is accepted, that is, there is a significant effect of the REACT-based contextual learning model on the mastery of physics concepts in class XI MIA SMA Samadua, South Aceh Regency.

The results of this study are supported by research results (Fatmala et al., 2016) which state that the implementation of the REACT contextual learning model can improve students' problem-solving abilities and research results (Safitri & Mahmudi, 2017) which states that contextual learning with the REACT strategy is effective in reviewing from student achievement.

Based on the results of the study (Jannah & Supardi, 2020) it is stated that the guided inquiry model with the REACT strategy can improve learning outcomes because with the REACT strategy students try to find the concepts being taught, try to understand the concepts, work together, and apply the knowledge that is being taught. obtained in real life (Putri & Saputro, 2019) and in REACT, students try to find a meaningful relationship between abstract ideas and practical applications in the real world (Fauziah, 2020).

CONCLUSIONS

Based on the results of data analysis and discussion, it can be concluded that there is a significant effect of the REACT-based contextual learning model on the mastery of physics concepts in class XI MIA SMA Samadua, South Aceh Regency. Through the findings of this study, the application of the REACT-based contextual learning model can be used in other physics subject matter in the hope that it can improve students' mastery of physics concepts.

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