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A Study of Student Responses in the Implementation of Simulation Learning Models in Physics Subjects

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ABSTRAK

Research Objectives: This study aims to see students' responses using a simulation model while studying physics at SMAN 1 Muaro Jambi.

Methodology: This type of research is Mixed Methods in quantitative methods using student response questionnaires, and qualitative methods using interview instruments. The research subjects were 29 students from one class X MIA 5. Quantitative data analysis techniques used descriptive statistics.

Main Findings: The results of the analysis obtained from student responses using simulation models in physics subjects, namely, have a good response in using simulation models.

Novelty/Original Research: Choosing a good learning model will affect students' attitudes during class hours, if the learning model makes students enthusiastically active, the learning process will be productive. In the physics subject, students' responses using the direct instruction model can be said that students do not understand the concepts and formulas described by the teacher.

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1. INTRODUCTION

Education is an activity that has an important meaning for all humans, education allows humans to change behavior and knowledge to be much better [1]. A good education will bring someone to be a competent and innovative person and vice versa. The world of education in Indonesia continues to develop to improve the quality and quantity of a person [2]. Education is a learning process that helps students / learners to develop their intellectual potential, so that the main objective of learning is the effort made by the intellect of each student to develop [3]. The process of learning, the quality of the learning process can be observed from how student activities, teacher-student interactions, and student learning motivation. While the quality of learning outcomes can be observed from student achievement and learning completeness [4]. In this learning process to improve the quality of this mindset, it needs to be supported by a proper teaching process so that students' abilities can develop properly [5]. The learning process is an activity designed to help someone learn a new ability and / or value [1]. Student achievement is also related to the subjects they like, for example in science lessons. Science is one of the subjects that must be studied in junior high schools. Natural Sciences (IPA) is part of science [6]. One of the subjects included in the science category, namely physics, physics is a branch of science that has its own uniqueness and characteristics [7]. Problems that often arise in the learning process in class include the inability of students to relate one concept to another, many misconceptions, and the low ability of students to solve problems and understand the concepts of physics. Physics is a branch of science that has its uniqueness and

characteristics. The uniqueness of physics lies in the existence of concepts that are abstract and require idealization through mathematical modeling [8].

Learning physics is learning that is very racing on the concepts and requires a high level of understanding [9]. In the learning process, especially in physics lessons, the attitudes of students are very important. To make students more understand and interested in learning physics, the role of a teacher must prepare methods that can help students and also the role of a teacher is facilitator learning that brings students to excel in learning objectives. Therefore it is very important for teachers to know motivational techniques that will generate interest in physics lessons for students [10]. Physics learning is very important to use learning methods that foster motivation in physics lessons, the learning method used must be in accordance with these students, to select and apply learning methods, a teacher needs to consider several factors, such as student characteristics, compatibility of methods and learning materials, and learning objectives [11]. In physics lessons using a learning model that makes students active will be better. The learning model is a plan that is used as a guide in planning classroom learning [12] , using a simulation learning model will make students more active in learning physics . The simulation model is a model that involves anyone in the strategy by considering themselves as other people. Its purpose is to study how other people act as well as feel [13]. This simulation model has stages in learning.

Table 1. Simulation Model Syntax

First Stage: Orientation	Second Stage: Participation Exercise
Presents broad topics about simulation and concepts that will be used in simulation activities. Describes simulations and games.	Creating scenarios (rules, roles, procedures, scores, types of decisions to be chosen, and objectives)
Presents an overview of the simulation	Assigning roles
	Carry out the practice in a short period of time
The third stage: Implementation of the simulation	Stage Four: Interviewing participants (one or all of the following activities)
Take charge of game activity and game administration	Summarize events and perceptions
	Summarize difficulties and insights
Get feedback and evaluation (regarding appearance and influence decisions)	Analyze the process
	Comparing simulation activities with learning material
Explain misconceptions	
Continue the simulation	Assess and re-design simulations

From the learning model that has been applied to students, it will be seen that the student's attitude in learning physics. The positive attitude of students towards physics subjects will be seen when students are enthusiastic during the learning process, are students active to ask and answer questions given by the teacher, especially during class group discussions, the positive attitude of students is the interaction between students and teachers in the process learning and vice versa [13]. Because if students have a negative attitude to cultural values, they will also have a negative attitude to their teacher.

Attitude is a form of expression or student response to learning objects, also in the form of expressions of liking or disliking or accepting or rejecting an object. Attitudes that occur during the learning process are very important in directing students [14]. Attitude measurement is done to see the individual's ability to an object. Student attitudes will affect student learning outcomes. Attitudes in learning are very important [15]. most students are more concerned with learning outcomes without paying attention to the attitudes and skills students should acquire during the learning process [16]. The problems above can be overcome in many ways that can be applied by teachers in teaching in order to increase student activity, interest and understanding in learning [17]. By using this simulation learning model can help students understand physics lessons. Physics is one of the subjects that deals with various scientific concepts which some of its applications can be found in everyday life [18].

This research was conducted at SMA N Muaro Jambi in class X MIA 5 using a simulation learning model . Student responses when learning physics using a simulation model of student interest in physics have increased, because in this learning material and physics concepts are simulated by students and there are games too. So students understand the concepts of physics more quickly by applying the simulation model.

The purpose of this research is expected to make it easier for teachers to use learning models when learning physics. In this research, the questions addressed are: Student responses when learning physics use a simulation learning model; What do students think about attitudes towards physical subjects a. The findings of this study can contribute to improving students' attitudes towards learning physics

2. RESEARCH METHOD

The research design used is quantitative and qualitative research methods. Quantitative is research that aims to test whether the prevailing theory is true or not. "Quantitative research is an approach for testing objective theories by examining the relationship among variables [19]". with quantitative using a response questionnaire, the data were analyzed with a Likert scale which was converted into a quantitative scale. The statement is strongly disagree, disagree, agree, neutral, strongly agree. Statement items consist of positive statements and negative questions [20]. While using qualitative interviews. This population took only 1 class, namely X MIA 5 with a total of 34 students at SMAN 1 Muaro Jambi. The sampling technique used in this study was purposive sampling. Purposive sampling is a sample that is carried out by taking the subject not based on strata, random or area but based on the existence of certain objectives [21]. In this study, namely knowing student responses to physics subjects using a direct instruction model. The data analysis used is descriptive analysis. A description or presentation of large amounts of data that includes mean, mode, median, maximum, minimum, and standard deviation is a descriptive statistic [22]. The data were analyzed using the SPSS 22 program to obtain the percentage, frequency, average data.

3. RESULTS AND DISCUSSION

Student responses were obtained from a response questionnaire consisting of 20 statements, given to students after being given treatment using a model. The results of this research in class X MIA 5 at SMAN 1 Muaro Jambi are:

Table 1. Descriptive statistics of students' responses to the simulation model

Variable	Interval	Frequency	Presentation%	K belonging to the selected		
Simulation learning model	20.00-36	0	0 %	Not very good	Mean	2,9697
	37-53	3	9.1 %	Not good	Median	3.0000
	54-70	28	84.8 %	Enough	mode	3.00
	71-87	2	6.1 %	Well	Minimum	2.00
	88-104	0	0 %	Very good	maximum	4.00

Based on table 1. The descriptive statistics of students' responses to the simulation model showed that the students who were categorized as very good were 0, the Good category was 2 students out of 33 students (6.1%), while the Enough category had a very large response, namely 28 students (84.8) of 33 students, then the bad category was 3 students (9.1%) out of 33 students and the last category was very bad 0%. With a mean of 2.96697, median of 3.0000, mode of 3.00, minimum of 2.00, and maximum of 4.00. It can be seen that the student's response to this simulation model is sufficient. Students really like learning physics using this simulation model, students tend not to be sleepy and not bored while studying, because, in this learning model, students are required to actively simulate physics material and concepts in front of the class in groups. The positive attitude of students in learning depends on the student's interest. There are those who like physics lessons, so every time they learn physics they will be more enthusiastic. Students have positive or negative responses or students think that science subjects, especially physics, are fun or even scary [3].

Choosing a good learning model will affect students' attitudes during class hours, if the learning model makes students enthusiastically active, the learning process will be productive. In the physics subject, students' responses using the direct instruction model can be said that students do not understand the concepts and formulas described by the teacher. Physics has many applications, but students still have difficulty understanding physics, and it causes student interest and motivation to learn less [23]-[27]. Students feelings towards physics subjects will be reflected through the attitudes they show during the eye process at the time of learning. The higher the concentration of teachers and students, the more effective the learning activity is, on the other hand, if the concentration of students is low, the results will not be optimal [28]-[30].

The concentration of students in learning can certainly affect the attitudes of these students, but this simulation learning model, it can increase student concentration so that students can understand the concepts and knowledge of physics lessons [31]-[36]. Therefore, it is expected that the knowledge in the form of principles and concepts that students get will be more meaningful and will be stored longer in students' memories.

Research data collection was carried out using test and interview techniques. In interview observations that have been carried out on class X MIA 3 students, namely:

1. Do you like physics? the student answered, "really like it because physics subjects have a lot of formulas".
2. what do you like about physics? Newton's Law is "nothing to my liking".
3. Do you like doing experiments? the student answered, "yes, I like it".

4. What benefits have you felt studying physics? Students answered, "can understand the concepts of physics with everyday life".
5. Do you know physics scientists? Students answer "Einstein ".
6. Do you want to increase your physics learning time? Students answered "Yes".
7. Do you want a career in physics? Students answered "no"

The conclusion obtained in the interview above is that students really like physics lessons, students also understand and apply physics concepts in everyday life. In contrast to learning the students prefer experiments/experiments in the laboratory. Students also know physics scientists, it can be said that this student is really interested in physics, and even wants to increase his time studying physics.

4. CONCLUSION

In this study, it can be concluded that the students' responses to the simulation model in this physics subject are quite good. Using this learning model can improve students' understanding of physics. of course, the learning model greatly influences student learning responses. The results showed 0% of students responded very poorly, 3% of students responded not well, 28% of students responded well enough, 2% of students responded well, and 0% of students responded very well.

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