

## Overview the inquiry learning model: Attitudes, student characters, and student responses what's the impact?

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### ABSTRACT

The purpose of this study was to find the differences and relationships between student responses, student character, and student attitudes towards the inquiry learning model for physics subjects. The contribution given in this study is useful if the student's response to learning is not good then there are problems in the learning taught by the teacher so that the teacher can improve better teaching techniques. This study uses mixed research methods designed with an explanatory design which is a combination of two methods, namely quantitative and qualitative research methods. The results of the t-test and correlation test of student variables, student character, and student responses can be said to be good but need to be improved optimally so that these variables are beneficial to students. The conclusion of this study is that there is a comparison and influence between students, student characters, and student responses at State Senior High School (SMA) 10 Jambi City on the inquiry learning model in physics subjects. The implication of this research is very important, namely the short-term impact of this research is useful and can be used as a benchmark to improve the quality of student responses, student character, and student attitudes, especially at the high school level.

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## 1. INTRODUCTION

Education is an effort to help students so that they are able to do tasks independently and responsibly verbally and ethically [1]–[3]. The main priority of education is to produce intellectual generations who are able to integrate knowledge and skills that are used as the basis for social life [4]–[6]. Education is generally divided into several stages namely preschool, high school, high school and then college, university or internship [7]–[9]. School education is achieved with the highest level of education during the first three years of schooling.

High school is a continuation of formal education after junior high school. The first high school is taken within three years from grade 9 to grade 12 [10]–[12]. In the past, this high school was once referred to as a Junior High School (SLTA), until in the 2003-2004 school year, high school was replaced with a senior high school. At the high school level, students will receive education and learning that provides the foundation for quality generations in the future. Education and learning at the junior high school level emphasizes laying the foundation in preparing generations to become human beings who are able to face an increasingly tough era [13]–[15]. In junior high school, it is closely related to the learning model used by teachers to teach students.

The exploratory learning model is learning that develops cognitive, affective, and psychomotor aspects in a balanced way, so learning for learning is considered more meaningful. This learning can provide space for students to learn according to their style. The purpose of exploratory learning is the development of systematic, logical and critical skills or the development of intellectual skills as part of mental processes [1], [16], [17]. The deep strategy model includes a series of learning activities that maximally involve the search abilities of all students and are systematic, critical, logical, analytical so that they can confidently formulate their own understanding. The learning model also teaches students' attitudes and behavior.

Attitude comes from the Latin "*aptus*" which means mental subjective attitude towards the implementation of activities. [18]–[20]. A person's attitude is formed because there is a certain object that stimulates him. Attitudes can be divided into two, namely positive attitudes and negative attitudes [21]–[23]. A positive attitude creates a tendency to hold, approach, accept or even wait for certain objects. Meanwhile, a negative attitude creates a tendency to stay away, hate, avoid, avoid or hate the existence of an object. From this it can be concluded that a working student is a person or group of people who carry out educational activities and try to realize their potential through learning.

Character is self-imposed rules to achieve certain goals related to education, application of learning and intelligence [24], [25]. Building a smart education starts with discipline. Discipline and student hard work are very important for students because students can get very valuable benefits from the applied discipline. Discipline is practiced not only because of the rules and all the rules and practices to be followed, but also to gain the confidence to achieve high levels of success. Example of time discipline; disciplined students value their time and complete assignments within the allotted time. Discipline and character begin with quality education and professional teachers in the classroom [26], [27]. The importance of discipline that must be applied to every educational institution and every individual so that later every student has a great sense of responsibility as a student.

The purpose of this study was to find out the comparison of student responses, student character and student attitudes in physics subjects as well as the relationship between student responses, student character and knowing student attitudes so that they can be used as a good resource. future research. This research is in line with research [28], [29] on the relationship between student attitudes and learning styles. It can be said that the attitude and character of students greatly affect the learning process. If the student's attitude is good, then the learning provided by the teacher is considered successful. According to this study, which tested the response, character and attitude of students. The purpose of this study was to find out how the answers, characters and attitudes of students using the inquiry learning model in high school physics subjects and the relationships of the three variables. The novelty and contribution of this research to education is to find out student reactions to learning, which has a major impact on teacher training in learning areas. Student attitudes and characters can also be known and used as a reference in the learning process. If attitudes and character are not good for learning, this will affect how the teacher's teaching methods need to be developed. Schools can also respond to student development through student feedback, character traits, and attitudes that they can use in class. This is very influential on the development of the student learning process and for the future of students [24], [30].

In this study the response variables, student character and student attitudes were used as variables using an inquiry-based learning model. However, there are weaknesses in this study, namely conducting tests at the non-gender level to more accurately determine student answers, student character and student attitudes based on gender. namely students. The purpose of this study was to answer research questions, namely: i) How are the results of student descriptive statistics on student response variables, student character variables, and student attitudes variables using the inquiry learning model in high school in physics subjects?; ii) How are the results of teacher interviews on student response variables, student character variables, and student attitudes variables using the inquiry learning model in high school in physics subjects?; iii) Are there differences in student response variables, student character variables, and student attitudes variables using the inquiry learning model in high school in physics subjects? iv) Is there a relationship between student response variables, student character variables, and student attitudes variables using the inquiry learning model in high school in physics subjects?

## 2. RESEARCH METHOD

This study uses a mixed explanatory research methodology. Mixed methods research combines two methods (quantitative and qualitative research methods). Explanatory design takes place in several research stages. Data was collected and analyzed by first collecting information, secondly analyzing the material and thirdly formulating quantitative results analysis, and formulating qualitative information and describing it by interpreting the material.

Questionnaire and interview instruments were used in this research instrument. If the questionnaire is in the form of student responses, student character and student attitudes and questionnaires. This instrument has 30 valid ports with a Likert scale. The scale of student responses and student character consists of 4 points and the assessment is very accurate, namely 4 is not good, 3 is quite good, 2 is good, 1 is very good. It is a general indicator of student reactions, student character and student attitudes. The lattice instrument taken from research [31] with the validity level of the instrument must be valid with a significant correlation value of 95% or  $\alpha=0.05$ . And that is with a reliability value of 0.700 which is considered quite satisfactory. If the value of  $\alpha > 0.7$  means that the reliability is reasonable (reasonable reliability), whereas if the  $\alpha > 0.80$ . The description of the response categories to the research learning model in the physics subject of student behavior is presented in Table 1.

Table 1. Student response categories, student characters using the inquiry learning model in physics subjects

Category	Student response	Interval variabel/Indicator	
		Student characters	Student attitudes
Very not good	1.0-4.0	7.0-12.25	7.0-12.25
Not good	5.0-8.0	12.35-17.5	12.35-17.5
Good	9.0-12.0	17.6-22.75	17.6-22.75
Very good	13.0-16.0	22.85-28.0	22.85-28.0

The categories are taken from a study [32]. That is, the student's response in the interval is very less, less, good, and very good. The character of the students is the character of discipline, the character of hard work with very bad, not good, good and very good intervals. The following describes the categories of students' attitudes using inquiry-based learning models in physics; the study population consisted of 50 Jambi City High School students 10 students, 25 XI science (IPA) 1 students and 25 XI IPA 2 students, and the sampling method was random sampling. The reason for the inclusion of research topics for class XI IPA 1 and XI IPA 2 is because the school has learned a lot and uses an inquiry-based eyeglass learning model of student response variables, student personality, student behavior in high school.

The data analysis method used is random sampling. The sample used is students who study physics according to student response variables, student personalities, and student attitudes using the learning question model. Random sampling was used in this study to save time, money and effort. It also makes it easier and more detailed to analyze all the data from smaller survey respondents, resulting in more accurate and comprehensive survey results.

First, a descriptive test, or descriptive statistical test, is performed to obtain scores for three variables (percent, mean, median, minimum, maximum) student responses, student personality, and student attitudes towards physical education. Then backtesting is carried out in the form of assumptions and hypothesis testing. Three acceptance tests were carried out: normality test, homogeneity test, and linearity test. Three acceptance tests were carried out: normality test, homogeneity test, and linearity test. Then do hypothesis testing in the form of t test and correlation test. The t-test is used to determine the comparison of attitude and scientific variables. Correlation test to determine the relationship between student response variables, student personality, and student attitudes [33]. This test has been tested with SPSS 26 for accurate results.

### 3. RESULTS AND DISCUSSION

#### 3.1. Description of student response, student character, student attitudes using an inquiry learning model in physics subjects

The following describes the results of the description according to student responses to physics subjects, student character, and student attitude variables. Student response is behavior that occurs due to the arrival of a stimulus given by the teacher or learning something voluntarily. If from the results of distributing the XI IPA 1 and XI IPA 2 questionnaires, student characters, student attitudes and general indicators in student answers are used. An overview of the response variables, types of students, student attitudes when using the research learning model is presented in Tables 2-4.

Table 2. Description of student response variables using the inquiry learning model in physics subjects

Class	Category	Interval	F	%	Mean	Med	Min	Max
XI IPA 1	Very not good	1.0-4.0	5	20	3.4	3.5	1.0	4.0
	Not good	5.0-8.0	4	16				
	Good	9.0-12.0	8	32				
	Very good	13.0-16.0	8	32				
XI IPA 2	Very not good	1.0-4.0	7	28	3.2	3.3	1.0	4.0
	Not good	5.0-8.0	4	16				
	Good	9.0-12.0	8	32				
	Very good	13.0-16.0	6	24				

Table 3. Description of student character variables using the inquiry learning model in physics subjects

Class	Category	Interval	F	%	Mean	Med	Min	Max
XI IPA 1	Very not good	7.0-12.25	4	20	3.2	3.4	1.0	4.0
	Not good	12.35-17.5	6	24				
	Good	17.6-22.75	9	36				
	Very good	22.85-28.0	6	24				
XI IPA 2	Very not good	7.0-12.25	6	24	3.1	3.2	1.0	4.0
	Not good	12.35-17.5	6	24				
	Good	17.6-22.75	7	28				
	Very good	22.85-28.0	6	24				

Table 4. Description of student attitudes variables using the inquiry learning model in physics subjects

Class	Category	Interval	F	%	Mean	Med	Min	Max
XI IPA 1	Very not good	7.0-12.25	0	0	3.5	3.5	2.0	4.0
	Not good	12.35-17.5	4	16				
	Good	17.6-22.75	10	40				
	Very good	22.85-28.0	11	44				
XI IPA 2	Very not good	7.0-12.25	3	12	3.0	3.2	1.0	4.0
	Not good	12.35-17.5	5	20				
	Good	17.6-22.75	10	40				
	Very good	22.85-28.0	8	32				

The data obtained was processed with three types of tests, namely descriptive statistical tests, hypothesis testing, and hypothesis testing. The descriptive statistical test [34] displays the results of the proportion, median, mean, minimum and maximum by analyzing the resulting data based on the five existing categories. Based on Table 2, the average number of students who chose the "very good" category, with 32% of students in class XI IPA 1 and 24% of students in class XI IPA 2, said it was very good. Thus, XI IPA 1 is superior to XI IPA 2 in the responses of students who use a question-based learning model in physics. Based on Table 3, the average number of students who choose the good category is 36% for class XI IPA 1 and 28% for class XI IPA 2. Thus, XI IPA 1 is superior to XI IPA 2 in terms of changes in student personality according to the research learning model physique. Based on Table 4, the average number of students who choose the "very good" category, with 44% stating very well in class XI IPA 1 and 32% stating very well in class XI IPA 2. Thus, XI IPA 1 outperforms XI IPA 2 in student attitude variables using inquiry-based physics learning models.

### 3.2. Test the normality, homogeneity, and linearity of student responses, student character, and student attitudes using the inquiry learning model in class XI IPA 1 and XI IPA 2

The next test is a hypothesis test consisting of a normality test, homogeneity test, and linearity test. Test the standard analysis first with the normality test. The normality test is used to determine whether the data is normally distributed or not considering that the Kolmogorov-Smirnov result is greater than 0.05 [29]. Based on Table 5, the results of the normality test of student responses, student character and student attitudes using the learning model of questions XI IPA 1, namely 0.200 and XI IPA 2, namely 0.200, can be said to be the results. the value obtained is  $>0.05$ , so it can be said that the data is normally distributed. The homogeneity test results of student responses, student character and student attitudes using the survey learning model namely XI IPA 1 namely 0.536, 0.537, 0.538 and XI IPA 2 namely 0.633, 0.632, 0.6331 can be said to have obtained results.  $>0.05$  to say that the data is homogeneous. With the research learning model, the results of the linearity test of student responses, student character and student attitudes in class XI IPA 1

were 0.034, 0.035, 0.036, and in class XI IPA 2, namely 0.027, 0.028, 0.029, it can be said that the results were obtained  $>0.05$ , so the data can be distributed linearly.

Table 5. Test of normality, homogeneity, and linearity of student responses, student character, and student attitudes using the inquiry learning model in class XI IPA 1 and XI IPA 2

Class	Variable	N	Normality Test	Homogeneity Test	Linearity Test
			Sig. (2-tailed)	Sig. (2-tailed)	Sig. (2-tailed)
XI IPA 1	Student response	25	0.200	0.536	0.034
	Student character	25	0.200	0.537	0.035
	Student attitude	25	0.200	0.538	0.036
XI IPA 2	Student response	25	0.200	0.633	0.027
	Student character	25	0.200	0.632	0.028
	Student attitude	25	0.200	0.631	0.029

### 3.3. Test the t-test and correlation test of student responses, student character, and student attitudes using the inquiry learning model in class XI IPA 1 and XI IPA 2

Then do the hypothesis test that is t test and correlation test. Test the first hypothesis, i.e. H.t-test, carried out with the aim of knowing the comparison between the two classes by comparing three variables. Based on Table 6, the results obtained from the t-test of student responses, student character and student attitudes using the inquiry learning model in class XI IPA 1 were 0.29, 0.028, 0.027, and in class XI IPA 2, 0.16, 0.015, 0.014. So, you could say there is a comparison between XI IPA 1 and XI IPA 2. From the results of sig. (2-fish) less than 0.05. The second hypothesis test, namely the correlation test was carried out with the aim of knowing the relationship between the two schools and the relationship between the three variables. The results of student correlation tests, student character and student attitudes were 0.035, 0.036 in XI IPA 1 and 0.034, 0.033 in XI IPA 2, so it can be said that there is a relationship between XI IPA 1 and XI IPA 2. Results sig. is less than 0.05.

Table 6. T-test of student responses, student character, and student attitudes using the inquiry learning model in class XI IPA 1 and XI IPA 2

School	Variable	N	T-Test	Correlation Test
			Sig. (2-tailed)	Sig. (2-tailed)
XI IPA 1	Student response	25	0.029	0.034
	Student character	25	0.028	0.036
	Student attitude	25	0.027	0.038
XI IPA 2	Student response	25	0.016	0.023
	Student character	25	0.015	0.025
	Student attitude	25	0.014	0.027

### 3.4. Interviews with high school teachers in 10 Jambi cities

From the interview in the Table 7, it can be said that students' reactions to learning were considered quite good, but some students lacked focus in learning, students' attitudes and personalities were also quite good. Teaching is consistent with existing material and uses a consistent learning model. In an interview with State Senior High School (SMA) 10 Jambi City, the teacher asked the physics teacher's opinion about student reactions, student character and student attitudes using the inquiry learning model in physics education in class XI IPA 1 and XI IPA 2. Student reactions were good in physics. Teachers especially about the material. For student character, the teacher said there were students who had very good character in physics class. In addition, regarding attitudes, there were students who were not good at physics, but they said that the students' attitudes were good, but the attitudes of students who gave the lessons given by the physics teacher in class were good.

This research is in accordance with research conducted by Paños *et al.* [35], which discusses students' attitudes towards learning. As an additional aspect in the subject matter of the learning process, knowing student attitudes is very important. However, a study by Paños *et al.* [35] discussed students' attitudes towards learning. Instead of comparing two schools, it is very important to know the attitudes of students. Comparison of schools is very important to find out how the attitudes of students in the first and second schools are compared. That is, the study was conducted to compare two schools using two variables, attitudes and interests, to find a clearer comparison.

This study is also consistent with the student response study [36]. Student feedback is one of the most important factors influencing student success, especially in physics class. Updating answers is also very important because the influence of student answers can affect the progress of learning carried out by teachers

who teach at school. This research is consistent because both examine students' responses to a learning model at school.

This research is also in line with research by Peterson [37] which looked at the characteristics of students, namely discipline and hard work. Where the character is very important in attitudes and behavior resulting from practice or the habit of obeying rules, laws or regulations. The nature of discipline and the essence of hard work is the nature that teachers must teach in the classroom. Peterson [37] with this research because they both test the character of students at school by seeing how many applications there are in physics subjects at school.

The importance of this research is very important. That said, the short-term effects of this study are beneficial and can be used as a benchmark for improving the quality of student responses, student personality, and student attitudes, especially by using a question-based learning model. In middle school. The size of the long-term impact of this research can be used as a benchmark for further research on student responses, student personalities and student attitudes using a question-based learning model. The only limitation of this study is class comparison. However, it has not been tested by comparing schools, so we can find out, among other things, how students react, how many students there are, and how students behave. Based on the comparison of schools, the researchers suggested conducting further research to compare student response variables, student personality traits, and student attitudes with other learning models, and the researchers suggested that it be considered at the senior secondary level.

Table 7. Interviews with high school teachers in 10 Jambi cities

No	Questions	Answer
1.	How do students respond to the inquiry learning model about the material you convey?	Student responses were very diverse, some were paying attention and were very focused, some were paying attention but not being too focused.
2.	How many students are active in the physics learning process?	Some students are already active in learning, but there are also some who are still learning
3.	How do students respond when you relate the learning material to other relevant knowledge?	Student responses are very good because it is very nice to know that the physics material being taught is very relevant to other knowledge so that students get new knowledge
4.	What is the attitude of students towards the difficult physics material that you convey?	The attitudes of students are very diverse, some are challenged to know and listen, some look relaxed

#### 4. CONCLUSION

Based on the formulation of the research problem, it was concluded that XI IPA 1 had better understanding of concepts, green characters, and student responses using inquiry-based learning models than XI IPA 2. I was. Students' responses, student personalities, and students' attitudes were compared between classes XI IPA 1 and XI IPA 2 in physics subjects. There is a relationship between responses, student personalities, and student attitudes using inquiry-based learning models XI IPA 1 and XI IPA 2 in physics subjects. The implication of this research is to examine the extent to which student responses, student personalities, and student attitudes in using learning models in teacher learning. This will allow us to use it as a measure of success in school learning and help us deal with its impact. If students who use the question-based learning model have poor responsiveness, personality, and attitudes, they can improve in the future. Therefore, this research is very important and becomes another source of research on student response variables, student personalities, and student attitudes using question-based learning models in physics learning.

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