The Effect of Inquiry Learning Model on the Attitudes and Character of High School Students

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ABSTRAK

Model pembelajaran inkuiri merupakan salah satu pilihan untuk diterapkan dalam proses belajar mengajar pada mata pelajaran fisika. Permasalahan yang timbul adalah terbatasnya atau kurangnya penerapan model pembelajaran inkuiri dalam kegiatan pembelajaran. Tujuan penelitian ini adalah untuk mengetahui bagaimana sikap dan karakter siswa, serta mengetahui pengaruh penerapan model pembelajaran inkuiri terhadap sikap dan karakter siswa. Jenis penelitian ini adalah penelitian kuantitatif dengan jenis penelitian asosiatif dan komparatif. Sampel penelitian adalah siswa kelas XI IPA jenjang SMA yang terdiri dari dua kelas yang masing-masing kelas terdiri dari 26 siswa. Teknik pengambilan sampel yang digunakan dalam penelitian ini adalah teknik purposive sampling. Instrumen penelitian adalah angket yang berbentuk pernyataan, angket tersebut menggunakan skala likert. Dalam penelitian ini terdapat tiga angket yaitu angket respon siswa terhadap model pembelajaran inkuiri, angket sikap siswa dan angket karakter siswa dalam pembelajaran fisika. Teknik analisis data kuantitatif dalam penelitian ini terdiri dari uji statistik deskriptif dan uji statistik inferensial. Hasil penelitian menunjukkan bahwa model pembelajaran inkuiri dapat mempengaruhi sikap dan karakter siswa menjadi lebih baik.

ABSTRACT

Inquiry learning model is one of the choices, to be applied in the teaching and learning process in physics subjects. The problem that arises is the limited or lack of application of the inquiry learning model in learning activities. The purpose of this research is to find out what students' attitudes and character are, and to find out the effect of implementing the inquiry learning model on students' attitudes and character. This type of research is quantitative research with associative and comparative research types. The research sample was students of class XI Science at high school level which consisted of two classes, each class consisting of 26 students. The sampling technique used in this research is purposive sampling technique. The research instrument is a questionnaire in the form of statements, the questionnaire uses a Likert scale. In this research there are three questionnaires, namely a student response questionnaire to the inquiry learning model, a student attitude questionnaire and a student character questionnaire in physics learning. Quantitative data analysis techniques in this research consist of descriptive statistical tests and inferential statistical tests. The findings show that the inquiry learning model can influence students' attitudes and character for the better.

1. INTRODUCTION

Physics lessons are one of the lessons taken and learned further at the high school level. Physics as a branch of science, studying and analyzing quantitatively symptoms or natural processes through a concrete learning process and mathematical proof (Aji et al., 2017; Aththibby, 2015; I. D. Kurniawati & Nita, 2018). Therefore physics subjects are rarely in demand by students because they are often considered difficult, complicated and not easy to understand it (Hanna et al., 2016; Sarah & Maryono, 2014; Tanti et al., 2017). Learning physics will be more meaningful when students are involved, especially in terms of thinking and reasoning because to understand Natural Sciences (Natural Sciences), especially physics, is not enough to only be obtained from memorizing and listening to explanations (Kusuma et al., 2015; Setyandaru et al., 2017; Supardi et al., 2015). To improve physics learning outcomes, we can improve the quality of learning physics at school by varying the learning model used in the teaching and learning process.

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Inquiry learning model is one of the choices, to be applied in the teaching and learning process in physics subjects. Student -oriented inquiry learning models so that learning will be centered on the student (Budiyono & Hartini, 2016; Nurmayani et al., 2018; Salam, 2017). The use of inquiry models will create learning activities that are more active and fun so that it will affect the understanding of concepts and skills to solve students' problems (Amijaya et al., 2018; Juniati & Widiana, 2017; Salam, 2017). Inquiry learning models can improve student cognitive learning outcomes and also have a good influence on cognitive learning outcomes and understanding of student concepts (Iswatun, I., Mosik, M., & Subali, 2017; Jundu et al., 2020; Siahaan et al., 2021). That way the inquiry learning model is expected to be able to give a good influence on affective aspects such as student attitudes and character.

Attitudes become one of the contexts that need to be considered and improved, because in learning assessment there is also an affective aspect (attitude). An important aspect that needs to be considered in the learning process is the affective aspect (Jufrida et al., 2019; W. Kurniawati & Atmojo, 2017; Nugraha et al., 2020). Because the formation of the attitude of each student is a basic and very important thing to note (Mauliza et al., 2021; Zaki, 2017). In the context that often occurs, students who study hard so that good learning outcomes tend to have a good attitude as well, while students who are not active in learning, learning outcomes are not good and tend to have more unfavorable attitudes (Demirtaş & Aksoy, 2016; D. A. Kurniawan et al., 2019; Tanti et al., 2021). In addition to attitudes, character is no less important in the learning process and in real life in everyday life.

Character is the character and trait possessed by each individual, where with the character they have, others will understand the behavior of each individual. Character is an important indication in creating student affective personality or domain, this can be instilled from an early age (Y. Kurniawan & Sudrajat, 2017; Murniyetti et al., 2016; Rahmadyanti, 2017). In the character aspect there are many values contained therein, character values that are quite important for students, namely the value of disciplinary character and cooperation. Discipline is an important character to be possessed by every student, because with discipline, students will always obey the rules that have been made (Bali & Naim, 2020; Sobri et al., 2019; Wuryandani et al., 2014). Cooperation is also an important character for students, with the character of cooperation, students will understand and understand the importance of good cooperation in order to achieve common goals, because basically everyone is a social creature that requires one another (Agustini, 2020; Lumba & Blegur, 2020; Sari et al., 2018).

The problem that arises is the limited or lack of application of the inquiry learning model in learning activities. Therefore, this research was conducted to see how the application of the inquiry learning model influences students' attitudes and character. Research on the previous inquiry learning model conducted explained that learning using the guided inquiry learning model has a positive influence on students' scientific attitudes (Suryantari et al., 2019). Similar research on the inquiry learning model conducted explained that there was an influence of the guided inquiry learning model on student character (Yuliyanti, 2016). Research conducted by researchers in line with previous research is about the inquiry learning model applied in an effort to improve student attitudes and character, where by looking at the influence of inquiry learning models on attitudes and character simultaneously becomes the renewal of this study.

The urgency or importance of this research was carried out to be used as a study literature and the importance of implementing learning models in class. It is hoped that this research can provide empirical evidence about the effectiveness of the inquiry learning model in forming positive student attitudes and character. The purpose of this research is analyze how the attitudes and characters are owned by students, and to find out the effect of the application of inquiry learning models on student attitudes and character. This study offers a novel contribution by investigating the impact of the inquiry learning model not only on cognitive outcomes but also on the development of attitudes and character, which are often overlooked in traditional educational research.

2. METHOD

This type of research is quantitative research with associative and comparative types of research. Types of Associative Research are used descriptive statistical tests while for comparative research types use assumption tests and hypothesis tests (Sugiyono, 2016). This type of research was chosen because it is in accordance with the research objectives, namely to determine the description of students' attitudes and character as well as the effect of implementing the inquiry learning model on students' attitudes and character. The survey procedure is used to retrieve data by spreading the questionnaire. Class XI students of high school in Batanghari Regency became a population in the research conducted. The sample taken was a class XI IPA student at SMAN 10 Batanghari consisting of two classes, each class consisting of 26 students. Class XI IPA 1 consists of 26 students and class XI IPA 2 consisting of 26 students. The sampling technique

used in this study is purposive sampling technique, which means researchers choose research samples based on predetermined criteria.

The research instrument in the form of a questionnaire in the form of a statement, the questionnaire uses a Likert scale. In this study there are three questionnaires, namely the student response questionnaire to the inquiry learning model, student attitude questionnaire and student character questionnaire in learning physics. The questionnaire used in this research was previously developed by researchers and then validated before use. Once validated and declared valid, the instrument can be used. The instrument grid is listed in Table 1.

Table 1. Instrument Grid of Student Response to Inquiry Learning Models, Student Attitudes, and Student Character

Variable	Indicator	Number of statements
Student response to the inquiry learning model	Enthusiasm in following learning	17
	Media use	
	Interest in studying physics	
	Easy to understand the concepts and importance of physics in life	
Student attitude	Willingness to learn and apply physics subject matter	12
	Seriousness in studying physics	
Student character	Discipline	10
	Cooperation	

By using a Likert scale in the research conducted, the researcher has determined categories for each variable, which are presented in the form of Table 2 and Table 3.

Table 2. Student Attitudes Category Against Physics Learning.

Category	Indicator interval	
	Willingness to learn and apply physics subject matter	Seriousness in studying physics
Very not good	5.0 - 9.0	4.0 - 7.2
Not good	9.1 - 13.0	7.3 - 10.4
Enough	13.1 - 17.0	10.5 - 13.6
Good	17.1 - 21.0	13.7 - 16.8
Very good	21.1 - 25.0	16.9 - 20.0

Table 3. Categories of Student Responses to the Inquiry Learning Model, and Categories of Student Character

Category	Student response to the inquiry learning model	Student character	
		Discipline	Cooperation
Very not good	17.00 - 29.75	7.00 - 12.25	3.00 - 5.25
Not good	29.76 - 42.50	12.26 - 17.50	5.26 - 7.50
Good	42.51 - 55.25	17.51 - 22.75	7.51 - 9.75
Very good	55.26 - 68.00	22.76 - 28.00	9.76 - 12.00

Quantitative data analysis in this study consisted of descriptive statistical tests and inferential statistical tests. Inferential statistics are statistics for drawing conclusions based on data from the sample studied in order to describe the characteristics or characteristics of a population (Astri et al., 2013). Descriptive statistical analysis is used to describe student responses to the application of the inquiry learning model, attitudes and student character. In conducting this quantitative data analysis, the researcher used software assistance in the form of SPSS statistic 25. The inferential statistical test in this study consisted of assumption testing (normality test and linearity test) and hypothesis testing (regression test). Included in the assumption test are normality test and linearity test (Tentama & Yusantri, 2020). The assumption test is used as a prerequisite test to test the hypothesis (Fahruddin et al., 2016). Regression test analysis is used to see whether or not there is an influence of implementing the inquiry learning model on students' attitudes and character.

Before conducting the research, the researcher prepared the instrument to be used. After finishing preparing the research instrument, the next step is to submit a research application to the intended school, after getting permission from the researcher to conduct research by distributing questionnaires. From the questionnaire, the researcher obtained research data that was filled in by students. The data is then processed and analyzed and the final step is to draw conclusions from the results of the data analysis. Data collection in this research can be described in Figure 1.
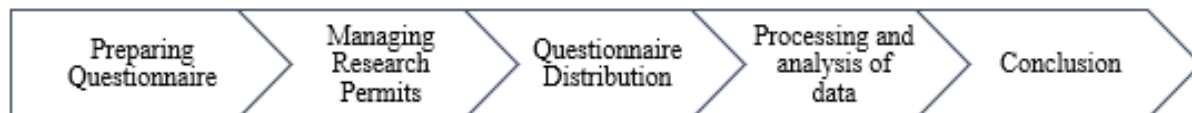

Figure 1. Research Procedure

3. RESULT AND DISCUSSION

Result
Descriptive Statistics

After data collection, the next step is to carry out data analysis. Descriptive statistical analysis was carried **out** to describe the research data, namely student response data to the inquiry learning model, attitudes and student character. The descriptive statistical test results of student responses to the inquiry learning model can be seen in Table 4.

Table 4. Results of Descriptive Statistics on Student Responses to the Inquiry Learning Model

Class	Interval	Category	F	%	Mean	Median	Min	Max
XI IPA 1	17.00-29.75	Very not good	0	0.0				
	29.76-42.50	Not good	9	34.6	45.88	44.50	37.00	58.00
	42.51-55.25	Good	14	53.8				
	55.26-68.00	Very good	3	11.5				
XI IPA 2	17.00-29.75	Very not good	0	0.0				
	29.76-42.50	Not good	7	26.9	47.26	46.50	38.00	60.00
	42.51-55.25	Good	15	57.7				
	55.26-68.00	Very good	4	15.4				

Based on Table 4, the student's response to the inquiry learning model in class XI IPA 1 was dominated by the good category with a percentage of 53.8%, while the student's response to the inquiry learning model in class XI IPA 2 was dominated by the good category with a percentage of 57.7%. The descriptive statistical test results of students' attitudes on the Willingness indicator to learn and apply physics subject matter can be seen in Table 5.

Table 5. Description of the Results of Descriptive Statistics on Student Attitudes on the Indicator of Willingness

Class	Interval	Category	F	%	Mean	Median	Min	Max
XI IPA 1	5.0-9.0	Very not good	0	0.0				
	9.1-13.0	Not good	2	7.7				
	13.1-17.0	Enough	9	34.6	17.88	18.00	11.00	24.00
	17.1-21.0	Good	14	53.8				
	21.1-25.0	Very good	1	3.8				
XI IPA 2	5.0-9.0	Very not good	0	0.0				
	9.1-13.0	Not good	3	11.5				
	13.1-17.0	Enough	13	50.0	16.80	16.50	12.00	25.00
	17.1-21.0	Good	8	30.8				
	21.1-25.0	Very good	2	7.7				

Based on Table 5, students' attitudes on the indicator of Willingness to learn and apply physics subject matter for class XI IPA 1 are dominated by the good category with a percentage of 53.8%, while students' attitudes on the indicator of Willingness to learn and apply physics subject matter for class XI IPA

2 are dominated by a fairly good category. with a percentage of 50.0%. The descriptive statistical test results of students' attitudes towards the seriousness indicator in studying physics can be seen in Table 6.

Table 6. Description of the Results of Descriptive Statistics on Student Attitudes on the Seriousness Indicator

Class	Interval	Category	F	%	Mean	Median	Min	Max
XI IPA 1	4.0-7.2	Very not good	0	0.0				
	7.3-10.4	Not good	4	15.4				
	10.5-13.6	Enough	4	15.4	14.03	14.00	9.00	20.00
	13.7-16.8	Good	15	57.7				
	16.9-20.0	Very good	3	11.5				
XI IPA 2	4.0-7.2	Very not good	0	0.0				
	7.3-10.4	Not good	1	3.8				
	10.5-13.6	Enough	10	38.5	14.03	14.50	9.00	18.00
	13.7-16.8	Good	10	38.5				
	16.9-20.0	Very good	5	19.2				

Based on Table 6, the attitude of students on the indicator of Seriousness in studying physics class XI IPA 1 was dominated by the good category with a percentage of 57.7% while the attitude of students **on** the indicator of Seriousness in studying physics class XI IPA 2 was dominated by the good category with a percentage of 38.5%. The results of descriptive statistical tests on student character on discipline indicators can be seen in Table 7.

Table 7. Description of the Results of Descriptive Statistics of Students' Characters on Discipline Indicators

Class	Interval	Category	F	%	Mean	Median	Min	Max
XI IPA 1	7.00-12.25	Very not good	0	0.0				
	12.26-17.50	Not good	2	7.7	20.84	20.50	16.00	26.00
	17.51-22.75	Good	15	57.7				
	22.76-28.00	Very good	9	34.6				
XI IPA 2	7.00-12.25	Very not good	0	0.0				
	12.26-17.50	Not good	3	11.5	20.61	21.00	14.00	25.00
	17.51-22.75	Good	15	57.7				
	22.76-28.00	Very good	8	30.8				

Based on Table 7, the character of students in the discipline indicators of class XI IPA 1 is dominated by the good category with a percentage of 57.7%, while the character of students in the discipline indicators of class XI IPA 2 is dominated by the good category with a percentage of 57.7%. The results of descriptive statistical tests on student character on cooperation indicators can be seen in Table 8.

Table 8. Description of the Results Statistics Characters on Indicators of Cooperation

Class	Interval	Category	F	%	Mean	Median	Min	Max
XI IPA 1	3.00-5.25	Very not good	0	0.0				
	5.26-7.50	Not good	4	15.4	9.61	10.00	6.00	12.00
	7.51-9.75	Good	4	15.4				
	9.76-12.00	Very good	18	69.2				
XI IPA 2	3.00-5.25	Very not good	0	0.0				
	5.26-7.50	Not good	4	15.4	8.84	9.00	7.00	12.00
	7.51-9.75	Good	16	61.5				
	9.76-12.00	Very good	6	23.1				

Based on Table 8, the character of students in the cooperation indicator in class XI IPA 1 is dominated by the very good category with a percentage of 69.2%, while the character of students in the cooperation indicator in class XI IPA 2 is dominated by the good category with a percentage of 61.5%.

Assumption Test (Normality and Linearity)

Next is the assumption test where the tests used are normality tests and linearity tests. The data can be said to be normal if the significance value is greater than 0.05, while the data can be said to be linear if the significance value is less than 0.05. The results of the normality test of student response data to the inquiry learning model, student attitudes and student character can be seen in Table 9.

Table 9. Description of Normality Test Results.

Variable	Class	Sig.	Distributed
Student response to the inquiry	XI IPA 1	0.200	Normal
learning model	XI IPA 2	0.200	Normal
Student attitude	XI IPA 1	0.200	Normal
	XI IPA 2	0.200	Normal
Student character	XI IPA 1	0.200	Normal
	XI IPA 2	0.200	Normal

Based on Table 9, the normality test of the data, it was obtained that the normality test with the Kolmogorov-Smirnov test had a significance value greater than 0.05, so it can be concluded that the data is normally distributed. The results of the linearity test of student response data to the inquiry learning model, student attitudes and student character can be seen in Table 10.

Table 10. Description of Linearity Test Results.

Variable	Class	Sig.	Distributed
Student response to the inquiry learning model	XI IPA 1	0.023	Linear
Student attitude Student character	XI IPA 2	0.020	Linear

Based on Table 10, the linearity test of the data, the results of the linearity test were obtained with a significance value of less than 0.05, which means that there is a significant linear relationship between student responses to the inquiry learning model, student attitudes, and student character towards physics subjects in both classes.

Hypothesis Test (Regression)

After testing the assumptions or prerequisite tests, the next step is to test the hypothesis. The test in question is the regression test which functions to determine the effect of student responses on the inquiry learning model, student attitudes, and student character in physics subjects. The results of the regression test of the inquiry model response, student attitudes, and student character towards physics subjects are shown in Table 11.

Table 11. Description of the Inquiry Model Response Regression Test, Student Attitudes, and Student Character

Class	Variable independent	Variable dependent	Sig.
XI IPA 1	Student response to the inquiry learning model	Student attitude	0.022
		Student character	0.031
XI IPA 2		Student attitude	0.025
		Student character	0.033

Base on Table 11, the results of the regression test between student responses to the inquiry learning model, student attitudes, and student character towards physics subjects with a sig. <0.05, it can be concluded that there is an influence between the response of the inquiry model to students' attitudes, and the character of students in physics subjects.

Discussion

The results of the descriptive statistical test results of students' responses to the inquiry learning model in class XI IPA 1 were dominated by the good category with a percentage of 53.8%, while student responses to the inquiry learning model in class XI IPA 2 were dominated by the good category with a percentage of 57.7%. From these results students have a good response to the application of the inquiry learning model in physics learning, meaning that students enjoy learning physics using the inquiry learning model (Diani et al., 2019; Ramadoni et al., 2019). By using the inquiry learning model, students can be more

active in following the ongoing learning process. The activeness of these students makes students understand the material being taught faster.

The results of the descriptive statistical test of students' attitudes on the indicator of Willingness to study and apply physics subject matter for class XI IPA 1 were dominated by the good category with a percentage of 53.8%, while student attitudes on the indicator of Willingness to learn and apply physics subject matter for class XI IPA 2 were dominated by the moderate category. Good with a percentage of 50.0%. From these results students have the will to learn and apply physics subject matter well. Students who want to study the material and understand the material being taught are expected to be able to interpret their understanding in everyday life (Berkup, 2014; Rusdiana et al., 2023). The results of the descriptive statistical test of student attitudes on the Seriousness indicator in studying physics class XI IPA 1 were dominated by the good category with a percentage of 57.7%, while the attitude of students on the Seriousness indicator in studying physics class XI IPA 2 was dominated by the good category with a percentage of 38.5%. Students who are the research sample are also serious in studying physics, this is indicated by the results of the data in a good category. Students' scientific attitude is important to be a motivation in carrying out scientific procedures (Ulva et al., 2017; Yuliati et al., 2018).

The results of the descriptive statistical test results of the students' character in the discipline indicators of class XI IPA 1 were dominated by the good category with a percentage of 57.7%, while the character of students in the discipline indicators of class XI IPA 2 was dominated by the good category with a percentage of 57.7%. On average, students have a good disciplinary character, students obey the rules that have been made, namely school rules and class rules during the learning process (Chen et al., 2023; Winarti et al., 2021). The results of the descriptive statistical test of the character of students in the cooperation indicator in class XI IPA 1 were dominated by the very good category with a percentage of 69.2%, while the character of students in the cooperation indicator in class XI IPA 2 was dominated by the good category with a percentage of 61.5%. Student cooperation in participating in the learning process is very good, there is an active interaction between students in groups while studying (Putra, 2021; Ramadhani et al., 2019). Students are enthusiastic to solve the problems given by the teacher.

Next is the assumption test where the tests used are normality tests and linearity tests. The results of the normality test of student response data to the inquiry learning model, student attitudes, and student character obtained normality tests with the Kolmogorov-Smirnov test with a significance value greater than 0.05, so it can be concluded that the data is normally distributed. The results of the linearity test of student response data to the inquiry learning model, student attitudes, and student character obtained linearity test results with a significance value less than 0.05 which means there is a significant linear relationship between student responses to the inquiry learning model, student attitudes, and student character. on physics subjects in both classes (Nurafifah et al., 2021; Retariandalas, 2017).

After testing the assumptions, the next step is to test the hypothesis. The test in question is the regression test which serves to determine the effect between the variables studied. The results of the regression test for the response to the inquiry model, student attitudes, and student character towards physics subjects with a sig. <0.05, it can be concluded that there is an influence between the response of the inquiry model to students' attitudes, and the character of students in physics subjects. The influence that is meant here is a good influence, students are more active when learning, make students more enthusiastic, and enthusiasm for learning increases. When studying students can also improve the disciplined character of the rules given by the teacher such as punctuality to discuss with their group friends (Borgonovi et al., 2023; Burić & Moè, 2020). In addition, students can also hone their collaboration skills with other students. This is in line with the results of research which states that learning using the inquiry model is student-centered, and provides opportunities for students to be active in the learning process (Hermawati, 2012).

Research on the previous inquiry learning model conducted by other study explained that learning using the guided inquiry learning model has a positive influence on students' scientific attitudes (Suryantari et al., 2019). Similar research on the inquiry learning model conducted by explained that there was an influence of the guided inquiry learning model on student character. Research conducted by researchers in line with previous research is about the inquiry learning model applied in an effort to improve student attitudes and character, where by looking at the influence of inquiry learning models on attitudes and character simultaneously becomes the renewal of this study (Zakiyah et al., 2021).

The impact of this research is that with this research, the research results can be used as reading material for sources of knowledge in the short term. Then for the long term the research results can be used as a reference for the application of the inquiry learning model in the learning process, especially in learning physics. Researchers suggest that in the learning process teachers can implement the results of this study. Where in the implementation of the teaching and learning process can use a varied and not monotonous learning model so that students are more enthusiastic and active in learning.

4. CONCLUSION

Based on the research conducted, it can be concluded that students of class XI IPA at SMA Negeri 10 Batanghari have various attitudes and characters, this is in accordance with the nature of each student. Students' attitudes and character can also be influenced by treatment when running or during the teaching and learning process in the form of the learning model used. The learning model in question is the inquiry learning model. The inquiry learning model can influence students' attitudes and character towards a better one. Based on the results of this research, it is recommended that educators at SMA Negeri 10 Batanghari and other schools consider implementing the inquiry learning model to improve students' attitudes and character in a better direction. For future research, it is recommended that further studies be carried out with a wider sample and a variety of other learning methods to obtain a more comprehensive understanding of the influence of various learning models on student attitudes and character.

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