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Analysis of Students' Attitudes Toward Physics Achievement

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Abstract – *Attitudes plays an important role in influencing student achievement in physics education. However, there is limited study investigating the effect of students' attitudes on physics achievement in Indonesia. Therefore, this research aimed to investigate the correlation between students' attitudes towards physics learning achievement. The research used a quantitative descriptive approach through survey methods. The research sample was obtained by simple random sampling of as many as 35 students of class XI IPA 2, consisting of 17 men and 18 women. Data collection used a student attitude questionnaire instrument. The study showed that student's attitudes have an average of 61 with the highest student's attitude being 90 and the lowest student's attitude being 30. The results of student achievement in the form of physics test scores have an average of 67 with the highest score being 100 and the lowest score being 36. The results of the correlation test analysis obtained a score significance (p< 0.05) with a correlation coefficient of 0.576. So, it can be concluded that there is a positive correlation and a fairly strong category between students' physics attitudes and students' physics achievements. This shows that the higher the student's attitude towards physics, the higher the student's achievement will be.*

Keywords: *attitudes; correlation; physics achievement; survey*

I. INTRODUCTION

Physics has an important role in everyday life (Nurmisanti et al., 2017). In studying physics, the aim is to develop students' knowledge, understanding, and analytical skills regarding the environment and surroundings (Harjati, 2023). This aim can be achieved if the important factors influencing physics achievement can be analyzed and identified such as students' attitude, students' gender, and time spent doing the homework (Khusaini & Darmawan, 2021). In the context of Physics education, for example, the learning outcomes referred to are not only in the aspect of understanding ability Physics as a natural or cognitive science but also an attitude aspect towards Physics (Supardi et al., 2015; Woldemariam et al., 2023). Apart from that, students who have sufficient interest in learning good when following the Physics learning process in class, so that it becomes motivation to learn Physics that comes from within the student (Mahir, 2019). The interest in learning that students then have reflected in students' attitudes and actions when participating in the physics learning process in

class (Darwis, 2018).

However, students found it difficult to study physics. This is proven by research Ady & Warliani, (2022) which stated that 74.19% of students have difficulty understanding physics material. This difficulty results in a lack of student attitudes towards physics lessons which has an impact on student participation in the physics learning process in class. According to Arista et al., (2013), internal factors that significantly influence students' physics learning difficulties include motivation, especially in the level of students' attention to physics lessons with an impact of 56.74%, especially in the ability to solve physics questions with an impact of 58.55%. On the other hand, external factors that influence students' learning difficulties include teachers' teaching methods, especially in students' use of physics learning media related to teachers' teaching methods, especially in the use of learning media with an impact of 54.11%. The results of observations at schools show that in the learning process, teachers' teaching styles still mostly use the teacher center model, which results in students not being able to be actively involved in the learning process, giving rise to a lack of self-confidence in students in solving contextual physics problems (Mulyani et al., 2020).

This fact is supported by research by Oktaviana et al., (2016) who found low student attitudes towards physics lessons and a lack of student involvement in the learning process. This is due to a lack of motivation, a lack of liking for physics subjects, and students not having an internal desire to study physics, for example students will study physics depending on who the teacher will teach (Yolviansyah et al., 2021). The impact of low student attitudes towards learning physics is that students' enthusiasm for learning decreases, and okstudents depend on friends who are smarter in each physics subject (Banda & Nzabahimana, 2023; Kinasih & Mariana, 2021). Another impact is the lack of positive attitudes that students have towards learning physics, which results in students' lack of confidence in searching for information to solve various problems in physics (Astalini et al., 2018; Papalazarou et al., 2023).

Research that discusses students' attitudes towards achievement only focuses on the learning process and the learning methods used (Jung, 2024; Muhsin, 2019). This is proven by Candrasa & Cen, (2023) to determine student learning achievement using students' perceptions of teachers' teaching methods. In other research, it is also stated that to determine student learning achievement using the influence of the Project Based Learning model (Desnylasari et al., 2016). Previous research only discussed the influence of teacher perceptions and methods which had a positive influence and there was no significant influence of the Project Based Learning learning model on students' learning achievement scores in the knowledge aspect (Saad et al., 2019). Judging from previous research, there was little use of questionnaires

related to student attitudes. In reality, the questionnaire aims to find out students' attitudes directly. Attitude is one of the factors that has an influence on the learning process within students (Rosidi et al., 2021). In addition, students who have a positive attitude towards physics lessons will be actively involved in class, while students who have a negative attitude are less active in class involvement (Peciuliauskiene, 2023). Furthermore, several studies only focus on the correlation between student diversity on student achievement rather than their attitudes (Fatmawati et al., 2022).

Therefore, this study aimed to examine whether student attitudes have a correlation with learning achievement. This research also investigated the correlation between student attitudes and student achievement in physics subjects based on the results of questionnaires distributed to students at SMAN 1 Bululawang.

II. METHODS

The research used quantitative descriptive research with a survey approach (Sugiyono, 2022). This research design used a cross-sectional survey, where the survey was carried out once on November 1 2023. Survey research was conducted on class XI Science students at SMA Negeri Malang Regency with a total of 35 students as respondents consisting of 17 male students and 18 female students. The participants were invited using random sampling, where students were randomly selected from seven different classes (Sugiyono, 2022).

The instrument used for this research used a questionnaire adapted from Khusaini (2021). The questionnaire used contains 11 questions which contain indicators of student attitudes towards student achievement. However, this research focuses on questions number 7 and 8. Question 7 relates to students' self-confidence which consists of 8 statements and question 8 relates to students' hobbies which consists of 9 statements.

The research phase was carried out in several stages, namely:

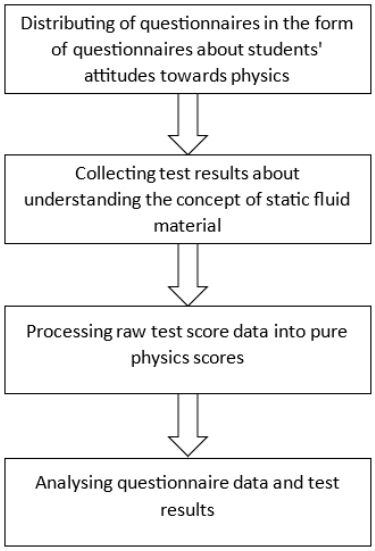

Figure 1. Research Flowchart

The research data used is student attitude data towards physics subjects. Student attitude data was obtained from the results of questionnaires distributed to students. From the questionnaire data used, it was adapted using a Likert scale with four scales. Where the data is converted into numbers by changing positive attitudes to numbers by changing them to number 4 for strongly agree, number 3

for agree, number 2 for disagree, and number 1 for strongly disagree. Meanwhile, for negative attitudes the opposite value applies (Mawardi, 2019). Then the results of the Likert scale data were translated using 0-100 interval analysis. So that it can be calculated in quantitative form, the answers from respondents are given a weight or score (DeCastellarnau, 2018).

Data analysis of student attitudes towards student achievement used descriptive analysis with the help of *IBM SPSS Statistics 23*. The results of the analysis of student attitudes and achievements are categorized into five categories. These categories can be seen in Table 1.

Table 1. Ideal assessment criteria

Intervals	Category
X ≤ (M-1,5 SB)	Very Low
(M-1,5 SB)<X ≤(M-0,5 SB)	Low
(M-0,5 SB)<X ≤(M+0,5 SB)	Enough
(M+0,5 SB)<X ≤(M-1,5 SB)	High
X>(M+1,5 SB)	Very High

(Sugiyono, 2022)

After that, the students' attitude data was tested using a normality test to determine whether the data taken from the sample was included in a normal distribution or not. Data is classified as normal distribution if the significance value is > 0.05 (Sheldrake et al., 2019). Next, a correlation test was carried out between student attitude data and student achievement to understand the relationship between these two variables. According to Arikunto (2011), correlation analysis is a research technique used to assess the level of relationship between two or more variables without making changes, additions, or manipulation of previously existing data (Arikunto, 2011). Two variables have a relationship if the significance value is <0.05. To find out the category of relationship between two variables, it can be seen through the correlation coefficient according to Table 2 as follows.

Table 2. Interpretation of variable relationship levels based on coefficient

Coefficient Interval	Relationship Level
0,00-0,199	Very Low
0,20-0,399	Low
0,40-0,599	Enough
0,60-0,799	High
0,80-1,00	Very High

(Sugiyono, 2022)

III. RESULTS AND DISCUSSION

The results of the correlation test analysis obtained a significance value of 0.000 < 0.05 with a correlation coefficient of 0.576. So it can be obtained that there is a positive relationship with a fairly strong category between student attitudes towards student achievement. This is in line with research by Wulandari & Febriana (2020) which was conducted at SMA Negeri 1 Sungai Banyak with a research sample of 60 students which stated that in the correlation test the value of the Pearson correlation was 0.041 < 0.05, so that Ho was rejected and declared there is a relationship or correlation between attitudes and student learning outcomes. 90% of students are said to have a good attitude with high learning outcomes and 8.3% of students are said to have a very good attitude with very

high learning outcomes. Data analysis was carried out in several stages, namely: 1. Carrying out descriptive statistics on student attitudes and achievements. 2. Then the results of the questionnaire and achievements were searched for frequencies and percentages to determine the assessment categories. 3. Continue by testing the normality of the data whether it is normally distributed or not. 4. Next, a correlation test analysis was carried out to determine the relationship between attitudes and student achievement. This research was conducted to measure students' attitudes and achievements towards physics subjects at SMAN 1 Bululawang. The respondents used in class XI IPA 2 were 35 students consisting of 17 men and 18 women.

Descriptive Statistics

Tabel 3. Descriptive statistics

Group	N	Min	Max	Mean	S.D
Student attitudes	35	30	90	61	19
Achievement	35	36	100	67	24

In Table 3, students' attitude scores have an average of 61 with the highest student attitude being 90 and the lowest student's attitude being 30. Student achievement results in the form of physics test scores have an average of 67 and the highest score is 100 while the lowest score is 36. Standard The achievement deviation value of 24 is greater than the students' attitudes which have a standard deviation of 19. This shows that the distribution of student achievement scores is wider than the distribution of students' attitude scores.

Table 4. Student questionnaire result

Intervals	Freq	Percentage	Category
X<32	1	3%	Very Low
32<X≤51	11	31%	Low
51< X ≤71	11	31%	Medium
71 <X ≤ 91	12	34%	High
X> 91	0	0%	Very High

Table 5. Student achievement results

Intervals	Freq	Percentage	Category
X<31	0	0%	Very Low
31<x≤55	13	37%	Low
55< x ≤80	9	26%	Medium
80 <x ≤ 104	13	37%	High
x> 104	0	0%	Very High

According to Table 1, the assessment criteria obtained are the frequency of data distribution based on predetermined intervals. Based on the average, students' attitudes are in the medium category. It can be seen from Table 4 that the number of students in the very high and very low attitude categories is less than the attitudes of students in the low, medium and high groups. Of the 35 students, there were no students who had very high student attitudes and only 1 person was in the very low category. This is also not much different from the achievement results in Table 5, where none of the 35 students are in the very high or very low categories. The average student achievement results are in the medium category. This can also be seen from the frequency of attitudes of students with very low and very high scores being the same as the

frequency of student achievement with very low and very high scores.

Normality test

Table 6. Normality test results

Group	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	**df**	**Sig**	**Statistic**	**df**	**Sig**
Student attitude	.211	35	.000	.860	35	.000
Performance	.179	35	.006	.901	35	.004

Based on Table 6, data analysis was carried out by carrying out a normality test. The data sample used was 35 students, so the Shapiro-Wilk normality test was used because the data sample was less than 100 samples. In Table 6 it can be seen that the student attitude data obtained a significance of 0.000 < 0.05 so the data is said to be not normally distributed. Likewise, the results of student achievement obtained a significance value of 0.04 < 0.05, so the data was not normally distributed. From this, the next test was tested non-parametrically because the data obtained was not normally distributed. In the correlation test, because the data is not normally distributed, using the Spearman's rho correlation test, the following results are obtained.

Correlation Test

Table 7. Spearman's rho correlation test results

			Performance	Student attidude
Spearman's rho	Value	Correlation Coefficient	1.000	.576**
		Sig. (2-tailed)		.000
	Student attitude	Correlation Coefficient	.576**	1.000
		Sig. (2-tailed)	.000	

Based on Table 7, the relationship between student attitudes and student achievement can be seen that the significance shows a value of 0.000 < 0.05, which means there is a relationship between student attitudes and student achievement. Judging from Table 2, the correlation coefficient of 0.576 shows that the student attitude variable and student achievement have a positive relationship in the quite strong category. These positive results indicate that if students' attitudes improve, student achievement will also increase. These results are also in line with research (Fatuliyah, 2023) at Jayanegara Lawang Vocational School which found that there was a positive link between students' attitudes and learning outcomes. Not only that, research by Maltar et al., (2022) states that the level of relationship between students' attitudes and learning outcomes has a type of unidirectional correlation which can be defined as the higher the students' attitudes, the better their learning outcomes will be. Apart from that, Astalini et al., (2019) research states that the attitude of students in the moderate category towards learning physics is proven by the fact that enjoyment of studying physics,

interest in increasing study time, interest in a career in physics have a linear relationship.

In this research, the relationship between student attitudes and student achievement is quite strongly correlated, which means that the higher the student's attitude towards physics, the higher the correlation with learning achievement.

IV. CONCLUSION AND SUGGESTION

Student attitudes are a factor that greatly influences student achievement. Based on the results of research that has been carried out, the relationship between student attitudes and student achievement is seen using a correlation test. The results of the correlation test analysis showed a significance value of 0.000 <0.05 and a correlation coefficient of 0.576. So it can be concluded that there is a positive relationship and a fairly strong category between students' physics attitudes and students' physics achievements. This shows that the higher the student's attitude towards physics, the higher the student achievement will be.

It is hoped that future research will not only focus on student learning outcomes but it is hoped that educators will also look at students' attitudes towards learning. because attitude is a reflection of students' thoughts. If students think a subject is difficult, it has an impact on students' attitudes and affects their learning achievement results. This can be done by using learning strategies that are interesting and involve interaction between students and are adapted to advances in technology.

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