

# Perception And Attitudes Toward Science: Condition Of Students In Learning Natural Sciences In Indonesia

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**Abstract:** The purpose of this study is to determine the relationship between student perceptions and student attitudes towards natural science. The perceptions of the students studied were reviewed through three indicators, namely observation, understanding, and assessment of science teachers, materials and media. The attitude of the students studied was reviewed through three indicators, namely the social implications of science, the adoption of scientific attitudes, and the interest in increasing science learning time. The research uses associative quantitative research. The instruments in this study were in the form of student perceptions of questionnaires on science subjects and student attitude questionnaires on science subjects. The data analysis technique uses descriptive statistics and inferential statistics. The results of the study stated that students' perceptions of natural science belong to the good category. The attitude of students towards natural science is included in the good category. The relationship between students' perceptions and students' attitudes towards natural science showed a significant positive correlation.

**Index Terms:** Perceptions; Attitudes toward Science; Students.

## 1. INTRODUCTION

Education is an activity that has the purpose of preparing students to be people who have a positive contribution to the community [1]; [2]. Indonesia has several levels of education, namely elementary school, junior high school, high school, and college. Every level of education has different levels of difficulty. At the junior high school level, students are expected to be able to use thinking skills to solve problems in everyday life, one of them is in Science / Science. Junior High School Curriculum focuses on students in studying events in everyday life so as to provide students with direct experience [3]. Through science has actually provided provisions for solving the problems of everyday life, given that science is a science that seeks answers to questions of what, why, and how symptoms of nature relating to the composition of structure and nature, changes and dynamics of nature. Essentially science lessons are products, processes, attitudes and technology. Attitude is a reaction to a situation or object that is positive or negative. Whereas according to [4]; [5]; [6] attitudes are defined as individual beliefs and feelings towards an object. The above opinion states that attitude is an important component that must be possessed by students in natural science subjects. According to [7]; [8] Attitudes toward science are considered important because they can affect the performance of students and can improve student learning achievement. The importance of attitudes in natural science learning can be seen in the actions of students who show positive attitudes and negative attitudes. [9]; [10] there are two perceptions or attitudes of students to natural science is a positive attitude and negative nature in which both attitudes greatly affect the success of a student in learning science. A positive attitude is indicated by students tend to be more diligent in learning so that they get satisfying results, whereas a negative attitude is characterized by students being less diligent in learning so that they get unsatisfactory results [11]; [12]. It causes students to have a negative attitude towards science so do not like science lessons [13][14], "If students have negative attitudes towards science, they also do not like science courses and science teachers. The attitudes of students towards Natural Sciences measured in this study are represented by three indicators adopted from TOSRA [15][16] social implications of science, 2) adoption of scientific

attitudes, and 3) interest in increasing science learning time. Attitude is a fixed organization of processes of motivation, perception or observation of an aspect of individual life. Attitude is the tendency to act, perceive, think and feel in the face of objects, ideas, situations, or values. Based on the two opinions above, it can be concluded that attitude is a reaction of one's perception of objects, situations, and other aspects of life. Students have different personalities and attitudes between each other so students can have different perceptions of learning methods so that emerging behaviors will be different [17]. Based on the opinions above, it can be concluded that students' perceptions and attitudes of students have a close relationship. Perception is the process of entering experience of objects and events in the form of messages or information into the human brain which then forms the thought process. In addition, the nature of like it or not, like being unhappy about an object will cause an image in the formation of perception. Science learning raises diverse perceptions of students. If students' perceptions of a lesson are good, then in learning students will be more enthusiastic about taking lessons, but if students' perceptions of a lesson are not good then students will feel reluctant and even lazy to take lessons. Students who have a positive perception of science will emerge enthusiasm in learning science so that it will affect student learning outcomes [18]; [19]. Conversely students who have negative perceptions of science will not cause in him enthusiasm in learning science so that it will also reduce student learning outcomes. Students' perceptions of science subjects measured in this study were reviewed through three indicators, namely 1) observation of science teachers, material and media, 2) understanding of science teachers, materials and media, and 3) assessment of science teachers, materials and media. The purpose of this study is to determine the relationship between student perceptions and attitudes of students towards science subjects, especially in junior high schools throughout the District Sekernan, Muaro Jambi, Indonesia. The questions in this study are aimed at:

1. How are students' perception toward natural science?
2. How are students' attitudes towards natural science?
3. Is there a significant relationship between student perceptions and student attitudes toward natural science?

The findings in this study are expected to contribute to improving students' perceptions of science subjects and student attitudes towards natural science.

## 2 METHODOLOGY

### 2.1 Research Design

This study uses a type of associative quantitative research. The research design is using correlational design. In correlational research designs, investigators use the correlation statistical test to describe and measure the degree of association (or relationship) between two or more variables or sets of scores [20]. The purpose of the research is to find out the relationship between students' perceptions and students' attitudes towards science subjects.

### 2.2 Research Sample

The population of this study were all students at Muaro Jambi 5 Public High School, Muaro Jambi 6 Public Middle School, and Muaro Jambi 26 Public High School totaling 1292 students. The number of research samples was determined using the techniques of Isaac and Michael, while the sampling of the study was determined using a simple random sampling technique. According to [21] "In simple random sampling, each member of the population under study has an equal chance of being selected and the method involves selecting at random from a list of the population (a sampling frame) the required number of subjects for the sample". The sample used in this study was 784 students consisting of 261 students of Muaro Jambi Middle School 5, 261 students of Muaro Jambi 6th Middle School, and 262 students of Muaro Jambi Public Middle School 26.

### 2.3 Research Sample

The instrument of this research was a questionnaire. This questionnaire is in the form of student perception questionnaires for natural science and student attitude questionnaires for natural science. Questionnaire of student perceptions of natural science has 3 indicators which contain 22 items of statements. Questionnaire of perception using Likert scale measurement. Assessment of the Likert scale is Always (A), Often (O), Sometimes (S), Rarely (R), and Never (N). For statements that are positive (+) the measurement starts from the values 1, 2, 3, 4, and 5 on the Always scale (SL). Whereas for statements that are negative (-) the measurement starts from the value of 5,4,3,2,1 on the scale Never (TP).

**Table 1.** Questionnaire Indicator for Student Perception

No	Variable	Indicator	Sub Indicator
1		Observation	Observation of discipline of science teachers Observation of science materials Observation of the media
2	Students' perceptions of science subjects	Understanding	Understanding of the way teachers teach Understanding of material Understanding of the media
3		Assessment	Assessment of how to teach the teacher concerned Assessment of material

provided  
Evaluation of the media  
Assessment of facilities

Questionnaire for student attitudes towards natural science has 3 indicators which contain 18 statements. Questionnaire of attitude using Likert scale measurement. Assessment of the Likert scale is Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). For statements that are positive (+) the measurement starts from the values 1, 2, 3, 4, and 5 on the Always scale (SL). Whereas for statements that are negative (-) the measurement starts from the value of 5,4,3,2,1 on the scale Never (TP).

**Table 2.** Questionnaire Indicator for Attitudes toward Natural Science

No	Variable	Indicator
1	Attitudes towards natural science	Social implications of science Adoption of scientific attitudes Interest increases the learning time of science

### 2.4 Data Analysis

To determine the perceptions of students in the good category or not, a grouping of categories is used using a range of scores. The score range is influenced by the scale used and the number of statements. The following is a category of student perceptions of natural science:

**Table 3.** Categories of Student Perception of Natural Sciences

Indicator 1	Range		Indicator 3	Category
	Indicator 2			
9 sd 16,2	6 sd 10,8		7 sd 12,6	Very bad
16,3 sd 23,4	10,9 sd 15,6		12,7 sd 18,2	Bad
23,5 sd 30,6	15,7 sd 20,4		18,3 sd 23,8	Pretty good
30,7 sd 37,8	20,5 sd 25,2		23,9 sd 29,4	Good
37,9 sd 45	25,3 sd 30		29,5 sd 35	Very good

To determine the attitude of students in the good category or not, then grouping categories is done using a range of scores. The score range is influenced by the scale used and the number of statements. The following is the category of student attitudes towards natural science:

**Table 4.** Student Attitude Categories of Natural Sciences

Indicator 1	Range		Indicator 3	Category
	Indicator 2			
5 sd 9	6 sd 10,8		7 sd 12,6	Very bad
10 sd 13	10,9 sd 15,6		12,7 sd 18,2	Bad
14 sd 17	15,7 sd 20,4		18,3 sd 23,8	Pretty good
18 sd 21	20,5 sd 25,2		23,9 sd 29,4	Good
22 sd 25	25,3 sd 30		29,5 sd 35	Very good

Data analysis in this research using inferential statistics consisting of mean, median and product moment correlation test.

## 3 RESULTS AND DISCUSSION

This study examines the relationship of student perceptions with student attitudes towards natural science. In addition to researching relationships, researchers also describe students' perceptions of natural science and describe students' attitudes

towards natural science.

a. Student Perception of Natural Science

Students' perceptions of natural science consist of three perceptual indicators, namely observation, understanding, and assessment.

1. Observation of the Discipline of Science Teachers, Science and Media Materials

Observation indicators have sub-indicators of observation on the discipline of science teachers, observations of science materials, and observations of the media. The results of descriptive statistical analysis of observational indicators can be seen in table 5.

**Table 5.** Observational Descriptive Statistics on the Discipline of Science Teachers, Science and Media Materials

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	9,0-16,2	Very bad	0	0%				
2	16,3-23,4	Bad	6	0,8%				
3	23,5-30,6	Pretty good	105	13,4%	35,8	36	20	45
4	30,7-37,8	Good	358	45,7%				
5	37,9-45	Very good	315	40,2%				

Based on the above table as many as 0 students categorized as very bad with a percentage of 0%, 6 students categorized as not good with a percentage of 0.8%, 105 students categorized quite well with a percentage of 13.4%, 358 students categorized well with a percentage of 45.7%, and 315 students were categorized very well with a percentage of 40.2%. So it can be concluded that students tend to have good perceptions of the observation indicators with sub-indicators of observation on the discipline of science teachers, science and media material.

2. Understanding of the way teachers teach, material and media

Understanding indicators have sub indicators of understanding of the way teachers teach, understanding of the material, and understanding of the media. The results of descriptive statistical analysis of understanding indicators can be seen in table 6.

**Table 6.** Descriptive Statistics Understanding of How Teachers Teach, Materials and Media

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	6-10,8	Very bad	0	0%				
2	10,9-15,6	Bad	8	1%				
3	15,7-20,4	Pretty good	157	20%	23,49	24	13	30
4	20,5-25,2	Good	379	48,3%				
5	25,3-30	Very good	240	30,6%				

Based on the above table as many as 0 students categorized as very bad with a percentage of 0%, 8 students categorized as not good with a percentage of 1%, 157 students categorized quite well with a percentage of 20%, 379 students categorized well with a percentage of 48.3%, and 240 students categorized very good with a percentage of 30.6%. So it can be concluded that students tend to have good perceptions of indicators of understanding.

3. Assessment of How to Teach Science Teachers, Materials, Media and Facilities

Assessment indicators have sub indicators of assessment of how to teach science teachers, assessment of material provided, assessment of media, and assessment of facilities. The results of the descriptive statistical analysis of the assessment indicators can be seen in table 7.

**Table 7.** Descriptive Statistics Assessment of How to Teach Science Teachers, Material, Media and Facilities

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	7-12,6	Very bad	1	0,1%				
2	12,7-18,2	Bad	11	1,4%				
3	18,3-23,8	Pretty good	156	19,9%	26,88	27	10	35
4	23,9-29,4	Good	416	53,1%				
5	29,5-35	Very good	200	25,5%				

Based on the above table as many as 1 student categorized as very bad with a percentage of 0.1%, 11 students categorized as not good with a percentage of 1.4%, 156 students categorized quite well with a percentage of 19.9%, 416 students categorized well with a percentage of 53.1 %, and 200 students categorized very well with a percentage of 25.5%. So it can be concluded that students tend to have good perceptions of the assessment indicators.

b. Students' Attitudes towards Natural Science

The attitude of students towards natural science consists of three indicators namely the social implications of natural

science, adoption of scientific attitudes, and interest increases science learning time.

Social Implications of Science

The social implication indicators of science are related to social attitudes in students such as: learning, teaching students to be independent, collaborating in terms of conducting experiments in the learning process of science subjects. The results of descriptive statistical analysis of indicators of social implications of IPA can be seen in table 8.

**Table 8.** Descriptive Statistics of Social Implications of Science

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	5,0-9,0	Very bad	4	0,5%				
2	9,1-13,0	Bad	54	6,9%				
3	13,1-17	Pretty good	293	37,4%	17,76	18	5	25
4	17,1-21	Good	371	47,3%				
5	21,1-25	Very good	62	7,9%				

Based on the above table as many as 4 students categorized as very bad with a percentage of 0.5%, 54 students categorized as not good with a percentage of 6.9%, 293 students categorized quite well with a percentage of 37.4%, 371 students categorized well with a percentage of 47.3 %, and 62 students categorized very well with a percentage of 7.9%. So it can be concluded that students tend to have a good attitude on indicators of social implications of science.

### 1. Adoption of Scientific Attitudes

Indicators of adoption of scientific attitudes are students willing to accept new thoughts or not in accordance with their previous thoughts. This indicator can also be interpreted as students like to use new methods of conducting investigations in the field of science. The results of descriptive statistical analysis of indicators of adoption of scientific attitudes can be seen in table 9.

**Table 9.** Adoption Descriptive Statistics of Scientific Attitudes

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	6,0-10,8	Very bad	0	0%				
2	10,9-15,6	Bad	21	2,7%				
3	15,7-20,4	Pretty good	254	32,4%	21,69	22	11	30
4	20,5-25,2	Good	445	56,8%				
5	25,3-30	Very good	64	8,2%				

Based on the table above as many as 0 students categorized as very bad with a percentage of 0%, 21 students categorized as not good with a percentage of 2.7%, 254 students categorized quite well with a percentage of 32.4%, 445 students categorized well with a percentage of 56.8% and 64 students were categorized very well with a percentage of 8.2%. So it can be concluded that students tend to have a good attitude on the indicator of adoption of scientific attitudes.

Interest Increases Science Learning Time Indicators of interest in increasing learning time Science can be measured by looking at students' interest in the world of science with attitudes that like reading about science, experimenting to spending time in the laboratory. The results of the descriptive statistical analysis of indicators of interest in increasing science learning time can be seen in table 10.

**Table 10.** Descriptive Statistics of Interest Increases Science Learning Time

No	Flow	Classification of Attitudes	Total	Percent	Mean	Median	Min	Max
1	7,0-12,6	Very bad	1	0,1%				
2	12,7-18,2	Bad	40	5,1%				
3	18,3-23,8	Pretty good	210	26,8%	25,27	25	9	35
4	23,9-29,4	Good	420	53,6%				
5	29,5-35	Very good	113	14,4%				

Based on the above table as many as 1 student categorized as very bad with a percentage of 0.1%, 40 students categorized as not good with a percentage of 5.1%, 210 students categorized quite well with a percentage of 26.8%, 420 students categorized well with a percentage of 53.6 %, and 113 students are categorized very well with a percentage of 14.4%. So it can be concluded that students tend to have a good attitude on the indicators of interest in increasing the time to study science.

### 3. Assumption Test

Assumption test is used to see whether the data is normally distributed or not, and to test data linearity. There are 2 test assumptions carried out in this study, namely:

#### 1. Normality Test

Data normality test uses the Kolmogorov-Smirnov test to find out whether the data analyzed is normally distributed or not. The following are the results of the normality test for the perception variables:

**Table 11.** Results of Analysis of Perception Variable Normality Test

Class	Test of Normality	
	Sig.	Data Description
7	0,192	Normal
8	0,399	Normal
9	0,334	Normal

Based on the results of the normality test the data proved that the perception data were normally distributed. The following are the results of the normality test for the attitude variable:

**Table 12.** Results of Analysis of Perception Variable Normality Test

Class	Test of Normality	
	Sig.	Data Description
7	0,340	Normal
8	0,785	Normal
9	0,119	Normal

Based on the results of the normality test the data proved that the attitudes data were normally distributed.

## 2. Linearity Test

Data linearity test using linear regression test to find out the analyzed data is linear or not. The following are the results of the data linearity test:

**Table 13.** Results of Analysis Linearity Test

Class	Test of Linearity	
	Sig.	Data Description
7	0,000	Linear
8	0,000	Linear
9	0,000	Linear

## 4. Correlation Test

The purpose of this study is to find out the relationship between student perceptions and student attitudes towards natural science. Relationship analysis uses product moment correlation. The following are the results of the correlation test of students' perceptions and attitudes variables.

**Table 14.** Results of Correlation Analysis of Perception and Variable Attitudes to Use Pearson Product Moment Test

Class	Pearson Correlation	Sig.	Level of Relationship
7	0,780	0,000	Strong
8	0,781	0,000	Strong
9	0,844	0,000	Very strong

The results showed that students' attitudes towards science subjects with the perception of students in grade 7 had a significance value of 0,000 (Sig. <0.05) with a correlation coefficient of 0.780. In grade 8 had a significance value of 0,000 (Sig. <0.05) with a correlation coefficient of 0.781. In grade 9 had a significance value of 0,000 (Sig. <0.05) with a correlation coefficient of 0.844. Based on the hypothesis test of students' perceptions of students' attitudes toward science subjects that the two variables have a significant positive relationship and are classified into strong relationships, meaning  $H_a$  is accepted and  $H_0$  is patterned, meaning that the better the students' perceptions of science subjects the better the students' attitudes toward science subjects. Attitudes are judgments or reactions to objects, people or other aspects which include likes and dislikes and are pleasant or unpleasant. Attitude is defined as an enduring positive or negative feeling about some person, object, or issue (affective domain) [22]. In the learning process, that attitude functions as "dynamic forces", namely the power to move people to learn. Attitude can be defined as the tendency to give learned, consistent, positive or negative reaction to an object [23]; [24]; [25]. Objects can be people, goods, objects and so forth. Students' attitudes towards science include love or dislike of science and use science as something boring or not boring. Perceptions formed by students can be either positive or negative perceptions. Students who have positive perceptions tend to accept the object they are capturing according to their personality, while students who tend to reject the object they are capturing for their personality are students who have negative perceptions. So it can be concluded that students who have a positive perception of science subjects are those students who receive or like science subjects. While students who have negative perceptions of science are students who reject or do not like science subjects. Based on the research findings, it can be concluded that students' perceptions of natural science for indicators of observations on the way

teachers teach, the material provided, media and facilities are in the good category. For indicators of understanding the way teachers teach, the material provided, media and facilities are in the good category. As well as indicators of the way teachers teach, the material provided, media and facilities are in the good category. So it can be concluded that students' perceptions of natural science are good. Students' attitudes towards natural science are tested based on three indicators. Based on the results of the research findings, it can be concluded that students' attitudes towards natural science for indicators of social implications of natural science are in the good category. For indicators of adoption of scientific attitudes in the good category. And for indicators of interest in increasing the time to study natural science are in the good category. So it can be concluded that students' attitudes towards natural science are good. That perceptions affect student characteristics. Human perception relates to the environment. The relationship is through the senses that are owned, namely the senses of sight, hearing, touch, feeling, and kissing. The subject of natural science aims to make students able to understand the concepts of science, have the skills to use scientific methods, encourage students to be more critical and creative in using simple technology in solving problems they face. In this study, it can be concluded that students are happy with science lessons. Students assume that science lessons are interesting and fun lessons. The condition of students in general in junior high school is in line with expectations, this is caused by: (1) relevant learning methods; (2) the media used is more varied; (3) teachers in teaching science use the environment. One effort to make students happy and enthusiastic in learning science is that the teacher embodies active, creative, effective and enjoyable learning. One effort that can be done by the teacher is to use the right and appropriate learning model to achieve the learning objectives. Teachers need to adopt existing learning models, or create their own. In addition to using the right learning model, teachers also need to use varied learning media.

## 4 CONCLUSION

Based on the results of research conducted on student perceptions of science subjects reviewed through three indicators, it can be concluded that students' perceptions of science subjects are good. Details of statistical data show that the observation indicators have good results, understanding indicators have good results, and assessment indicators have good results. Based on the results of research conducted on the attitudes of students towards science subjects in junior high schools throughout Muaro Jambi Regency, which are represented by three indicators, it can be concluded that students' attitudes towards science subjects are classified as good. Details of statistical data show that the indicators of social implications of IPA have good results, indicators of adoption of scientific attitudes have good results, and indicators of interest in increasing science learning time have good results. The results showed that there was a significant positive relationship between students' perceptions of students' attitudes towards science subjects in 7th, 8th, and 9th grades.

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