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A study analysis of student attitude to science lessons

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ABSTRACT

An attitude is a form of one's perception of an object that is described with expressions of like or not. The purpose of the study was to describe the attitudes of students towards the three indicators of the attitude of the junior high school in Batanghari. The research method uses quantitative survey research. The instrument used was a questionnaire that focused on three indicators consisting of 18 statements and also interviews. The sample in this study was 280 students in Batanghari. The results of research on three attitude indicators which became the dominant focus of research in the good category. The Social Implications of the Science show a good category with a percentage of 57.9%. The pleasure of science learning is well categorized with a percentage of 45.4%. The attitude towards the science investigation is categorized sufficiently with the percentage category of 41.1%. From the research that has been carried out, it can be seen that the attitude of students in junior high school is categorized as good, because the three indicators examined show good categories.

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1. INTRODUCTION

Education is a way to gain knowledge. In junior high schools in Indonesia, one of the scopes of science subjects is the Natural Sciences. According to Chandel, science education is not a separate and detachable unit of education [1]. Natural Sciences is systematic and organized knowledge that is generally accepted universal (universal), and in the form of a collection of data from observations and experiments. Science is an organized knowledge i.e. a systematized body of knowledge, may play to any subject or field of life [1]. According to Carin and Sund, the nature of science includes four main elements, namely attitudes, processes, products and applications. The four elements are characteristic of intact science that cannot be separated from one another and it is hoped that the four elements will emerge in science learning.

Science learning is fun learning because students can learn through nature [2]. However, not a few students also consider that science is one of the difficult subjects. Student responses when studying science are still low [3]. In accordance with the opinion of Topcu and Sahin-Pekmez, science education researchers have presented the argument that students are still having difficulties in learning concepts of science [4]. The concepts in Science will be difficult for students to accept if they rely on verbal communication carried out by the teacher. The Study of Natural Sciences allows for many differences of opinion according to individual observations so it requires direct practice. Science is a great human enterprise, not only endless and faceless but also stable and fluid [1]. It is a self-accumulating, self-growing, self-pervading, self-accelerating, and self-correcting enterprise which is originated in the collective curiosity of man since immemorial time.

Indirectly a concept in Science will be easily accepted by students if in the learning process students can see the process of finding a concept or theory. The extent to which students accept and master a concept in science is reviewed by the ability to understand the concept of science that is able to solve the problems specified in the teaching and learning process that ability is shown by its achievement value [5].

In the learning process the teacher does not only focus on the cognitive aspects of students but also the affective aspects of students namely attitudes. Attitude has often been described as "response tendencies" or as state characterized by "readiness to respond" [6]. This means that attitude is often described as a tendency for response or as a characteristic of the state of readiness to respond. The attitude of students towards science subjects can be seen from how they respond to natural science subjects whether they are interested in science or the difficulty of natural science subjects. One of the goals of science learning is to cultivate students' positive attitudes towards science [7]. This positive attitude can be interpreted as an attitude that supports students to learn, such as enjoying a lesson and a negative attitude is an attitude that prevents students from learning. Perceptions or misperceptions about science mediate the link between knowledge and attitudes (scientific knowledge → perceptions about science → attitudes toward science) [8].

After students complete the teaching and learning process, there is another more important result in the form of evaluating students' abilities as individuals who receive the results of the learning process. According to Thoha, there are several models of evaluation formulation, one of which is a mental process approach in which the objectives of evaluation are more used to measure attitudes [9]. Attitude measurement is very important because the teacher can know each student responds to science learning with an indication that students reject or accept science learning in students. The school word 'attitude' is often used in the academic life of students [10]. Attitude is an ability to evaluate something that is reflected by the attitude of accepting, rejecting, or ignoring [11]. Students' attitudes towards learning science in heterogeneous groups are not influenced by different cultures and backgrounds [12]. Attitudes toward science are important because attitudes can enhance the educational achievements of students and affect their performance [13]. Students' attitudes toward science measured in this study can be seen through three indicators adopted from Fraser [14], namely the social implications of science, attitudes towards investigation in science, and enjoyment in learning science.

The social implications of science are the effects or impacts of learning science on social life. For example it can be in the form of attitudes towards social benefits and the problem of progress and scientific research [15]. The social implications of science alone have benefits for every student, because it will form independence and cooperation in the learning process. The conception that understands someone as a self-sufficient, independent, self-reliant, and self-realizing individual [16]. In school learning activities, the social implications of science often occur, one example is when the division of learning groups. At that time students are required to work together and communicate well between students in the study group. Group work gives students a more accurate picture of how others see themselves and get a better understanding of themselves so that they can help evaluate students' interpersonal behavior [17]. In addition, in group work students are required to know each other personally. students and regulate the equal distribution of the work distribution of each individual, both in terms of ability or expertise, doing it yourself can also be justified. The form of independence of students can also be seen from the work done by the teacher or homework as well as how students add insight through enrichment and others.

Attitudes towards investigations in physics contain students' perceptions of ways or actions in solving problems or problems in physics. In studying physics, students usually conduct investigations, both in class and laboratory learning. Although it encompasses traditional science processes, inquiry also refers to combining these processes with scientific knowledge and reasoning and critical thinking [18-20]. Learners develop a belief during school that to get conclusions they need step by step to be followed in a scientific method, this is how scientists produce new knowledge [21]. The form of physics investigation in the classroom can be seen from the steps of how students answer a problem, namely by observing illustrated images of events, collecting and classifying known data, interpreting and analysing using appropriate formulas for problem solving. When laboratories, physics investigations by students can be seen from how students obtain experimental data, namely by observing and deciding the tools that need to be used, making hypotheses, taking or collecting data based on appropriate procedures to prove hypotheses, measuring objects, analysing experimental data later infer results and compare data with theory.

Enjoyment in learning is the emotion expression of students intrinsically linked to student motivation to learn, with learning and school performance at school [22-24]. The pleasure of learning in science can be defined that every student who has a positive attitude towards science must have comfort and feel pleasure. "Students rate their 'pleasure' from activities (Hate, Dislike, don't care, Like, love), while the teacher assesses the 'usefulness' of each activity" [25]. It can be concluded that students' enjoyment during the process of learning science can be seen from students responding to the learning, in general the indicators of pleasure in learning science are expressed happily or unhappily and like or dislike. The happy or like

attitude of each student will deduce the students' pleasure towards science, while the attitude of dislike or dislike will conclude students have a dislike of science. Student's happy attitude towards science can be shown how students are open and enthusiastic about science in and outside the classroom.

The purpose of this research is to find out how the attitude of junior high school students towards science subjects and the constraints of 3 (three) indicators. In this research, the questions of research are: 1) what is the attitude of students towards the social implications of science?; 2) what is the attitude of students towards attitudes towards research in science?; 3) how do students enjoy the attitude of learning science?; and 4) what are the constraints of social implications in science, attitudes toward inquiry in science, pleasure in learning science?

2. RESEARCH METHOD

This research uses survey research. Survey research examines large (or small) populations (or universes) by selecting and reviewing selected samples from a population [25]. From this sample too, researchers are able to generalize and make decisions about populations [26, 27]. The research subjects were students of junior high school 2 Batanghari Regency, Jambi Province, Indonesia who were taken using a simple random sampling technique. The number of junior high school students studied was 280 students consisting of 7th grade, 8th grade, and 9th grade.

Data collection is done through the provision of instruments, namely questionnaires. This questionnaire has 18 attitude valid statements. Dimensions of students' attitudes toward science subjects studied based on predetermined indicators, namely the social implications of science (social implications of science), attitudes towards investigation in science (an attitude toward science investigation), enjoyment in learning science (enjoyment of science lessons). The attitude of students in science in this study using a Likert scale. Likert scale with type of scale strongly agree (SA), agree (A), doubt (R), disagree (D), and strongly disagree (DS). Each positive item on the instrument has a value: SS = 5, S = 4, R = 3, TS = 2, and STS = 1. The score is reversed for negative items. This questionnaire data was given to students in grades 7, 8, and 9 of Junior High School 2 Batanghari Regency.

The categories of problem solving questions include, very good, good, not good, and very not good, like Table 1.

Table 1. Categories of attitude in science

Category	Interval		
	Social implication of science	Enjoyment of science lessons	Attitude toward science investigation
Very Not Good	5.0 – 9.0	6.0 – 10.8	7.0 – 12.6
Not Good	9.1 – 13.0	10.9 – 15.6	12.7 – 18.2
Enough	13.1 – 17.0	15.7 – 20.4	18.3 – 23.8
Good	17.1 – 21.0	20.5 – 25.2	23.9 – 29.4
Very Good	21.1 – 25.0	25.3 – 30.0	29.5 – 35.0

This research data is in the form of quantitative data and analysed using descriptive statistics. i.e. standard deviations, mean, mode, median, min, max, and category. The results of the questionnaire data were processed with the help of a computer using the SPSS program version 21.0. This process aims to see students' attitudes towards science subjects at junior high school 2 Batanghari District based on predetermined attitude indicators.

3. RESULTS AND DISCUSSION

Attitude scale is used to see students' attitudes towards certain objects, the results of attitudes categories include; reject (negative), support (positive), and neutral [28]. The results of the attitude questionnaire data displayed in the data analysis below comprise 2 assessment sections. The first is an assessment based on intervals that have the following attitude categories: very bad, bad, enough, good, very good. This attitude category assessment is based on the frequency and percentage of all students who choose each attitude category. The second is based on the attitude scale, the attitude scale used is a Likert scale consisting of 5 different assessments. Thus, the renewal of this study is seen from the three attitude indicators used, namely the social implications of the science (social implications of science), the pleasure in learning science (Enjoyment of science lessons). The following are the results of questionnaire data based on indicators:

3.1. Social implication of science

Following are the results of descriptive data analysis using SPSS from the questionnaire data of students' attitudes towards science based on the indicators Social implications of Sciences, can be seen from the questionnaire results Table 2.

Table 2. The results of the indicators social implication of science

Interval	Classification Attitude	Total	%	Standard deviation	Mean	Mode	Median	Min.	Max.
5.0 – 9.0	Very Not Good	2	0.7						
9.1 – 13.0	Not Good	6	2.1						
13.1 – 17.0	Enough	53	18.9	2.467	20.85	20	21	11	25
17.1 – 21.0	Good	162	57.9						
21.1 – 25.0	Very good	57	20.4						

From the Table 2, students' attitudes towards science are based on indicators. Social implications of science in junior high school, the results of the data show that: the category of student attitudes is not very good as much as 0.7% (2 out of 280), students categorized as bad as much as 2.1 % (6 out of 280 students), students in the moderate category were 18.9% (53 out of 280 students), students in the good category were 57.9% (162 out of 280 students), and students with very good attitudes were 20.4 % (57 out of 280 students). While based on the attitude scale shows the data obtained is a mean value of 20.85, mode is 20, other than that from the data analysis obtained standard deviation (2.467) is smaller (<) than the mean (20.85), this means the value The mean is a representation of all research data samples or shows valid research data. These results indicate that students' attitudes toward science on the indicators of adoption of scientific attitudes, students have a positive attitude and in the good category. This is supported from the results of the data above which shows 57.9% of students or 162 students out of 280 total students are in good range and supported by the mode score or dominant attitude scale is 4 "good".

The social implications of science describe how students apply what they learn from science in social life. Table 2 reveals that students 'attitudes based on the social implications of Natural Sciences have good categories with Mean 20.85 and Mode 20. From the results of these means and modes reveal that students' attitudes towards indicators of social implications of Natural Sciences are included in both categories. Furthermore, it is also supported from the results of data analysis in Table 2 showing that 57.9% or 162 of the 280 students were in the good category and 20.4% or 57 of the 280 students were in the excellent category. This is supported by the results of the interview below:

> *"Question: Is science a difficult subject?*
> *Answer: Not really, because in my opinion, science is very fun and I like learning about the nature around where I live.*
> *Question: what do you get from studying Natural Sciences?*
> *Answer: A lot, because what has been learned in Science has a lot of information in daily life, and I think that IPA can make life better, and I can understand more about the nature around me."*

From the interview results the attitude of students about science is dominantly good, meaning that students assume that science has a big influence on their daily lives. It shows that the Attitude towards science teaching is a very significant outcome of the process of science education [29-33]. So it can be concluded that the indicators of the social implications of Natural Sciences in this study indicate that students' attitudes are more dominant in the good category, and students show a positive attitude towards science in the good category. Good attitude categories from the results of data analysis are also supported by the main factors, first students have a happy attitude to learn science and are able to apply what they learn in everyday life. In line with Akpinar states a positive attitude towards science is associated with a positive attitude about the usefulness of science [34-38].

3.2. Enjoyment of science lessons

The results of descriptive data analysis of students' attitudes towards science based on indicators of learning pleasure in science can be seen from the Table 3. From the Table 3, are the results of the assessment of students 'attitudes towards science based on the Enjoyment of science lessons indicator? The results of the data show that: the category of students' attitudes is very good as much as 0.7% (2 out of 280 students), students with a bad category as much as 2.9% (8 out of 280 students), students with enough categories were 15.7% (44 out of 280 students), students with good categories were 45.4% (127 out of 280 students), and students with very good attitude were 35.4% (99 out of 280 students). While based on the attitude scale from

the results of the data above shows the data obtained is a mean value of 19.18, mode is 20. Besides the standard deviation (2.605) is smaller (<) than the mean (19.18), this means the value the mean is a representation of all sample data that is examined or shows valid research data. These results indicate students' attitudes towards science on the indicator of pleasure in learning in science show a positive attitude to science and seen from the results of data analysis that 45.4% of students or 127 of a total of 280 students in both categories. This is also supported by the results of the attitude scale on the questionnaire that most students choose is scale 4 which is "good".

Table 3. The results of the indicators enjoyment in science lessons

Interval	Classification Attitude	Total	%	Standard Deviation	Mean	Mode	Median	Min.	Max.
6.0 – 10.8	Very Not Good	2	0.7						
10.9 – 15.6	Good	8	2.9						
15.7 – 20.4	Enough	44	15.7	2.605	19.18	20	19	11	25
20.5 – 25.2	Good	127	45.4						
25.3 – 30.0	Very Good	99	35.4						

Pleasure is considered an emotional variable and an important concept in learning because it illustrates educational problems to students [39]. The pleasure of learning in science explains about students 'responses to science lessons, which are shown from the students' enjoyment of science lessons and how they desire to learn. From the results of observations show in table 3 indicators of pleasure in learning science in general from the explanation of the results of the dominant questionnaire data towards a positive attitude with a good category, the Mean value of 19.18. Supported also from the results of interviews conducted that the attitude of students towards science is dominant good. This can be seen from the results of the interview below:

"Question: Do you like science lessons at school?
Answer: I like IPA
Question: why do you like science lessons?
Answer: because science is a natural science and I am curious about where I live. But I don't like it when the learning has entered the formula, I don't like calculations."

The results of interviews conducted showed the attitude of students towards natural science subjects in both categories. That is, students think that science is one of the fun lessons. This positive attitude is proven by the average student who agrees that science is fun and is also one of the most interesting subjects. One example of students' enjoyment in science is that students are motivated to seek more knowledge in the field of science. Enjoyment is considered the mechanism that encourages the concentration of learners, helps the learning process, and builds the learning environment or is defined Fun is considered a mechanism that encourages the concentration of students, helps the learning process, and builds a learning environment [40-43].

3.3. Attitude towards science investigations

The results of the questionnaire that have been disseminated and processed about Attitudes in Junior High School students' investigations of science can be seen in the Table 4. From the Table 4, are the results of the assessment of students' attitudes towards science based on indicators Attitudes towards science investigations the results of the data show that: the category of very poor student attitudes of 0.4% (1 of 280 students), students with the unfavourable category of 8.2% (23 out of 280 students), students in the sufficient category were 41.1% (115 out of 280 students), students in the good category were 39.6% (111 out of 280 students), and students with very good attitudes were 10.7% (30 out of 280 students). While based on the attitude scale from the results of the data above shows the data obtained is a mean value of 19.84, mode is 20. Besides the deviation value (2.664) is smaller (<) than the mean (19.84), this means the mean value is a representation of all sample data that is examined or shows valid research data. These results indicate students' attitudes towards science on the indicators of attitudes towards science investigations show a positive attitude to science and seen from the results of data analysis that 41.1% of students or 115 of the total 280 students in the category enough. This is also supported by the results of the attitude scale on the questionnaire that most students choose is scale 3 which is "enough".

Table 4. The results of the indicators attitude towards science investigation

Classification			%	Standard deviation	Mean	Modus	Median	Min.	Max.
Interval	Attitude	Total							
7.0 – 12.6	Very Not Good	1	0.4						
12.7 – 18.2	Not Good	23	8.2						
18.3 – 23.8	Enough	115	41.1	2.664	19.84	20	20	9	25
23.9 – 29.4	Good	111	39.6						
29.5 – 35.0	Very Good	30	10.7						

The results of the questionnaire data analysis in Table 4 with the attitude indicators in the investigation of physics in the Batanghari Regency High School showed that the dominant students were in the good category. Based on the results of the interview, students who are categorized as good have an active attitude in doing, if they find things that are contrary to the experimental results, students respond critically, have high curiosity and never give up.

> *"Question: How do you feel when conducting experiments? Explain the reasons.*
> *Answer: I like it. Conduct experiments / experiments. By doing experiments, physics lessons are not boring. I also became aware of the application of physical laws.*
> *Question: If you have trouble finding answers or certain things during your experiment, would you rather find your own answers or ask a friend?*
> *Answer: If I still can, I prefer to find out for myself and read in the book. But if I really don't know, I just asked my teacher or friend."*

The results of interviews conducted, found that students like to do experiments, which indicates that students like to think critically, discover new interesting things from physics through their investigations. Physics is based on concepts so that learning these abstract things will have obstacles for students and teachers [44-46]. By conducting experiments, abstract physics becomes easier to understand and interest of students. Students who are still strong in finding answers to difficult problems in the investigation show students' confidence in their abilities. The students' confidence in their ability to study natural sciences and mathematics greatly determines their involvement in investigation activities [47-49]. The attitude of students who like to ask questions after trying to find solutions or answers shows that the curiosity of students is very large towards the investigation conducted. Appreciation forms and support for scientific inquiry from students shows that they value the scientific way of collecting evidence, thinking creatively, thinking rationally, responding critically, and communicating, conclusions, because they face life situations related to science [50, 51].

3.4. Obstacles to student attitudes

The measurement results of 280 students taken through a questionnaire. Three attitude indicators measured are outlined with 18 statements, but there are still students with negative attitudes, evidenced by their disagreement with the statement as shown with the Table 5.

Table 5. The results of the indicators, attitude towards science investigation

Indicator	(n = 280)
Social Implication of Science	2.8 %
Enjoyment in Science Lessons	3.6 %
Attitude Towards Science Investigation	8.6 %

Based on the Table 5, there are still obstacles to the three attitudes indicators measured. These results indicate that the Social Implication indicator of Natural Sciences is a constraint of 2.8% (8 out of 280 students). The indicator of pleasure in learning science shows a constant value of 3.6% (10 out of 280 students). Whereas the Attitude towards Natural Sciences Investigation indicator shows the value of obstacles is 8.6% (24 out of 280 students). From these results it can be seen that the biggest obstacle is the attitude indicator towards the Natural Science inquiry.

4. CONCLUSION

The indicators of the Social Implications of Natural Sciences are good, the pleasure of learning Natural Sciences is good, and the attitude towards natural science investigations is quite good. The overall

attitude of students towards science in Batanghari is quite good. Then it can be concluded the attitude of junior high school students towards science in Batanghari Regency has a positive attitude. This illustrates that the acceptance of science subjects in the eyes of students receives positive attention, which can affect science learning outcomes more optimally.

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