

Identification of students attitudes towards natural sciences at Adhyaksa 1 Junior High School, Jambi City

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ABSTRACT

The study examined the attitudes of students at Adhyaksa 1 Junior High School in Jambi, Indonesia towards science subjects. This type of research is a mixed method. This study involved 136 students of Adhyaksa 1 Junior High School in Jambi City. The instruments used consisted of questionnaires and interviews. The questionnaire used was adapted from the study Astalini and Kurniawan with a Cronbach alpha value of 0.842 with a valid number of claims of 56. Data were analyzed using descriptive statistics processed using the SPSS program. The results of the seven indicators are the social implications of science, normality of scientists, attitudes towards science inquiry, adoption of scientific attitudes, pleasure in learning science, interest in learning more science, career interest in science, this dominant in the moderate category, which means students are sufficient in learning science. With this research, it is expected to be able to measure students' attitudes towards how students' attitudes towards the natural science course in Adhyaksa 1 Junior High School, Jambi City.

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1. INTRODUCTION

Education becomes one of the means to create quality human beings who in the process are always continuous from one generation to the next and cannot be separated from life. Education is a processor effort carried out by someone to gain knowledge, skills, and habits in life [1]. Education can improve human resources for the better and of course to improve the quality of education in Indonesia [2]. Education is a real learning process to develop cognitive as well as the formation of students' attitudes [3]. The purpose of education is to develop the potential of students so they can think creatively and critically [4]. The purpose of education itself can be achieved during the learning process in the form of providing experience to students [5]. Education in Indonesia on the school track consists of three levels, namely basic education, secondary education, and formal higher education.

Natural Sciences is one of the subjects at the secondary school level at the junior high level. According to Lestari, *et al.* [6], one of the compulsory subjects that must be followed by students from elementary to junior high is Natural Science (IPA). At the primary school level, science subjects are often under-emphasized. According to Lamanauskas [7], very Often the teachers of natural subjects at basic school emphasize a lack of knowledge of natural science education at primary school. Whereas in the learning

process, science subjects must have scientific skills, knowledge, and attitudes. This has been explained by Wilujeng, *et al.* [8], in the science learning process students are required to obtain knowledge, mastery of skills and development and scientific attitudes. "Essentially science lessons are products, processes, attitudes and technology" [9]. Basically, science subjects are products, processes, attitudes, and technology.

Attitude is how a person reacts to an object so that the attitude can be a positive attitude and also a negative attitude. Attitudes, are acquired through learning and can be changed through persuasion using a variety of techniques [10]. Attitude is one of the factors that influence the learning process [11]. According to Shah, *et al.* [12], attitudes originate from within students which are shown in their liking or dislike towards a lesson. Science process skills are also used to develop a scientific attitude to provide motivation in learning [13].

The social implications in science are very important for a student to have when learning science. Social implications will shape the cooperation and independence of students in the learning process [14]. Science (Natural Sciences) requires proof and truth of natural law that can be proven by scientific methods [15]. Science process skills can be developed by conducting practical activities [16]. The attitude of the investigation of science is also important for students to have in learning science, this means students have a high curiosity. According to researchers [9-17], investigation in science can help impose the attitudes and skills of students.

High student curiosity will make students take their free time to increase science learning time which means students have a positive attitude. This positive attitude is characterized by the enthusiasm of students when learning takes place where students actively ask and answer questions given by the teacher [18]. This can increase the mastery of the material which results in increasing student grades. Interest in taking time to study science is one of the keys to a positive attitude of students in science learning [19]. Students who increase their learning time in science will be able to think logically and scientifically, this means students have fun in learning science [20].

Students who have a positive attitude in learning will feel happy when the learning process takes place. The pleasure of learning science is where each student has a positive attitude towards science which is shown by being open and enthusiastic during science learning takes place [21]. The effectiveness of learning can be measured by the level of student achievement. Success in the lesson is measured by the level of student entry [22]. Students who are negative about science will tend to be less enthusiastic when learning takes place and also be indifferent when the teacher explains [23]. Science basically consists of concepts and theories, according to [24], this is based on physics, which is one branch of natural science that requires an investigation or scientific work to get a concept, principle, theory, and law.

In the aspect of normality scientists describe how students perceive scientists in the field of science. Attitudes of scientists in solving problems and finding new discoveries that can be used as role models for students [25]. Since student scientists are identical to people who work in the laboratory and have new findings. The attitude of a scientist who can solve problems and find new discoveries can be a role model for students in learning science because in essence the subject of science is always associated with experiments to discover new things.

In science learning some experiments go through clear experimental steps so students must look for scientific information. For this reason, knowledge will be proven true from the hypotheses studied by students. The adoption of scientific attitude is needed to conduct experiments. The adoption of scientific attitude is the application of scientific behavior in learning science [26]. In science learning some concepts that require high understanding [27]. The results of students' attitudes toward learning science will affect students' interest in a career in the field of science for their future. If a student is negative toward natural science, then the student has no interest in a career in natural science [28]. Conversely, if students have a positive attitude towards science lessons, students will be interested in a career in the field of science.

This study aims to determine the attitude of students towards science subjects in junior high school precisely in SMP Adhyaksa 1 Jambi City, Indonesia. Attitude indicators include the social implications of science, the normality of scientists, attitudes towards science inquiry, adoption of scientific attitudes, pleasure in learning science, interest in increasing the time of learning science, and interest in a career in the field of science. In this study the research questions:

- a. What is the attitude of students towards the social implications of science?
- b. What is the attitude of students towards the normality of scientists?
- c. What is the attitude of the students towards the investigation in science?
- d. What is the attitude of students towards the adoption of scientific attitudes?
- e. What is the attitude of students towards the pleasure in learning science?
- f. How do students' attitudes towards Interest increase science learning time?
- g. What is the attitude of students towards career interests in the field of science?

This research can contribute to improve students' attitudes towards learning science that can be a benchmark for teachers to find out how students' attitudes when learning science takes place.

2. RESEARCH METHOD

This research used quantitative methods that were strengthened by qualitative data. Quantitative data obtained from questionnaire data from qualitative data from the interviews of researchers and students in Adhyaksa 1 Junior High School, Jambi City, Indonesia. The sample of this study was 136 students in Adhyaksa 1 Junior High School, Jambi City, Indonesia. The instrument used was adopted from research [29] entitled the development of junior high school students' attitudes towards natural science subjects with a total of 56 valid statements and a Cronbach alpha value of 0.842 for the indicators used in this study, can be seen in Table 1.

In this study, researchers used 7 indicators namely the social implications of science, the normality of scientists, attitudes toward science investigations, adoption of scientific attitudes, pleasure in learning science, interest in increasing science learning time, and career interests in the field of science using the Likert scale 5 for statement very good, 4 for good statements, 3 for fair/neutral statements, 2 for bad/negative statements and 1 for very bad statements.

Analysis of the data used is using the SPSS program to look for descriptive values. Descriptive statistics are the description or presentation of data, in the form of summary frequencies, namely mode, average, median, minimum, maximum and standard deviation [30].

Data at the qualitative research stage was collected through semi-structured interviews aimed at deepening quantitative research results and analyzing deeper attitudes of students towards science subjects.

Table 1. Indicator attitude of natural sciences

No	Indicator	Number of statements
1	Social implications of science	9 statements
2	Normality of scientists	7 statements
3	Attitudes towards science investigations	7 statements
4	Adoption of scientific attitude	7 statements
5	Pleasure in learning science	9 statements
6	Interest increases the amount of time studied in science	8 statements
7	Career interests in the natural sciences	9 statements

3. RESULTS AND DISCUSSION

The renewal of this study is that all indicators of learners' attitudes towards science subjects are examined, which in total are seven attitudes indicators including the social implications of science, normality of scientists, attitudes towards science investigations, adoption of scientific attitudes, pleasure in learning science, interests increase science learning time, and career interests in the field of science conducted at Adhyaksa 1 Junior High School in Jambi City, Indonesia. In a previous study [31] entitled "Identification of the Attitudes of Social Implications from Natural Sciences, Interest in Increasing Science Learning Time, and Interest in Career in the field of Science in junior high school students in Muaro Jambi District" which only took a few indicators. The results of this study are presented in the Table 2.

3.1. Social implications of natural sciences

The social implications of the science of junior high school students, we can see the results of the questionnaire that has been distributed, with results like Table 2. It can be seen in Table 2 that as many as 11.8% of students (16 out of 136) are in the good category, which shows that students have understood the implications of science for students' social lives. In the sufficient category, there are 69.9% (95 of 136) students, which means students still understand the social implications of natural science subjects in their lives. In the worst category, there were 18.4% (25 out of 136) students who showed that the students did not understand the social implications of the science subjects themselves.

Table 2. Social implications of natural sciences

Variable	Interval	Frequency	Percentage (%)	Category	Mean	Standard Deviation
Social implications of Natural Science	9:00 - 16.2	0	0	Very bad	26.91	
	16.3 - 23.4	25	18.4	Not good	27.00	
	23.5 - 30.6	95	69.9	Enough	27.00	
	30.7 - 37.8	16	11.8	Well	Minimum	8:00
	37.9 - 45	0	0	Very good	Maximum	36:00

From the results of interviews conducted with students, the following results were obtained:

Question: Does knowing the application of science in daily life help to better understand natural science subjects?

Answer: Yes you can. Because by linking science in everyday life science subjects will be more easily understood. For example when we see a coconut fruit falling from a tree.

The concept of learning science is basically applied only in everyday life. According to [32], by studying science will provide provisions to solve the problems of daily life.

3.2. Scientist normality

The results of the spread of the normality science questionnaire can be seen in Table 3. It can be seen that, the data are in the excellent category of 2.2% (3 of 136) students. In the good category that is 37.5% (51 out of 136) students, the enough category is 50.7% (69 out of 136) students, the bad category is 9.6% (13 out of 136) students. This means students still do not understand and see themselves as a scientist.

Question: Do you know science scientists?

Answer: I don't know much about science scientists, what I know is Newton.

Table 3. Scientist normality

Variable	Interval	Frequency	Percentage (%)	Category		
Normality of Scientists	7.00 - 12.6	0	0	Very bad	Mean	22.74
	12.7 - 18.2	13	9.6	Not good	Median	23.00
	18.3 - 23.8	69	50.7	Enough	Mode	10.00
	23.9 - 29.4	51	37.5	Well	Minimum	3.00
	29.5 - 35	3	2.2	Very good	Maximum	31.00

Students lack knowledge about science scientists. If students have attitudes like scientists then students will solve problems with scientific methods. The attitude of a science scientist is always interested in how natural events occur and their causal relationships from those natural events [33]. These attitudes, which are important for increasing student achievement [34].

3.3. Attitudes towards science investigations

The results of the questionnaire that have been disseminated about the attitude towards the scientific investigation are presented in Table 4. It can be seen that the very good category contained 1% (1 of 136) students, the good category 36.8 (50 of 136) students, the sufficient category was 55.1% (75 of 136) students, the bad category was 7.4% (10 of 136) students. This means that the attitude towards the scientific investigation is still classified as standard.

Question: What do you think is the way to help understand difficult science material?

Answer: Read more books to increase understanding of difficult material

Table 4. Attitudes towards Science investigations

Variable	Interval	Frequency	Percentage (%)	Category		
Attitudes towards science investigations	7.00 - 12.6	0	0	Very bad	The mean	22.56
	12.7 - 18.2	10	7.4	Not good	Median	23.00
	18.3 - 23.8	75	55.1	Enough	Mode	23.00
	23.9 - 29.4	50	36.8	Well	Minimum	2.00
	29.5 - 35	1	1	Very good	Maximum	31.00

When students cannot understand science lessons in theory it can be done experimentally well. In experiments, students will take data, some students may experience failure. Students who try to repeat it means the student is like to be an investigation into the IPA. Experiments on science must be based on honesty and must not manipulate data [35].

3.4. Adoption of scientific attitude

The results of the questionnaire that have been disseminated about the adoption of scientific attitudes can be seen in Table 5. From Table 5 adoptions of scientific attitudes, in the good category, there are 20.6% (28 of 136) students, the moderate category is 58.8% (80 of 136) students, and the bad category is 20.6% (28 of 136) students. This means that the scientific attitude of students is more dominant in the sufficient category, meaning that students still do not have a scientific attitude when learning science.

Question: Do you like to do experiments/experiments?

Answer: Like but on certain subjects that are easy. Like for example when throwing a ball into the basketball ring to calculate the motion of a satellite dish.

Table 5. Adoption of scientific attitude

Variable	Interval	Frequency	Percentage (%)	Category		
Adoption of scientific attitude	7.00 - 12.6	0	0	Very bad	Mean	20.93
	12.7 - 18.2	28	20.6	Not good	Median	21.00
	18.3 - 23.8	80	58.8	Enough	Mode	8.00
	23.9 - 29.4	28	20.6	Well	Minimum	2:00
	29.5 - 35	0	0	Very good	Maximum	29.00

Science learning in junior high school students is required to be scientific. This is because scientific attitudes can shape students' thinking creatively and critically [36]. Students are emphasized in providing direct experience and also based on science, environment, technology, and society [37].

3.5. Pleasure in learning science

We can see the results in the science learning process for junior high school students from the questionnaire that has been distributed, with results as in Table 6. The results of the distribution of the pleasure questionnaire in learning science show that in the good category that is 11.8% (16 of 136) students, the sufficient category is 69.9% (95 out of 136) students, the category is not good namely 18.4% (25 of 136) students. This means that there are still very few students who are happy about science.

Question: Do you think that science subjects are classified as difficult subjects?

Answer: Yes it's difficult. Because I don't like natural subjects and also many natural science formulas.

Table 6. Pleasure in learning science

Variable	Interval	Frequency	Percentage (%)	Category		
Pleasure in learning science	9:00 - 16.2	0	0	Very bad	Mean	26.91
	16.3 - 23.4	25	18.4	Not good	Median	27.00
	23.5 - 30.6	95	69.9	Enough	Mode	27.00
	30.7 - 37.8	16	11.8	Well	Minimum	8.00
	37.9 - 45	0	0	Very good	Maximum	36:00

Based on the above interview students do not like science lessons because subjects are considered difficult. Science learning is taught mathematically consisting of formulas in which students do not know where and for what the formula is [38]. Students who do not like learning science can be seen when learning takes place. According to Sağır [39], students tend not to focus when teachers explain the science of material, students are lazy to learn is marked by sleepy and grabbed while studying science.

3.6. Interest in increasing the amount of time studied in science

The results of the questionnaire of interest in extending the science learning time can be seen in Table 7. The results in Table 7 students with a very good category that is 0.7% (1 of 136) students, good category 11.0% (15 of 136) students, enough categories are 69.9% (95 of 136) students, the category of not good is 17.6% (24 from 136) students. This means students are still not interested in increasing the amount of time they learn in science. They feel they have enough with the actual study hours without any additional study time.

Question: Do you want to increase the time of learning science?

Answer: I do not want to increase my study time in Natural Sciences because for me the actual study time is enough.

Table 7. Interest in increasing the amount of time studied in science

Variable	Interval	Frequency	Percentage (%)	Category		
Interest increases the amount of time studied in science	8.00 - 14.4	0	0	Very bad	Mean	23.44
	14.5 - 20.8	24	17.6	Not good	Median	23:00
	20.9 - 27.2	95	69.9	Enough	Mode	23:00
	27.3 - 33.6	15	11.0	Well	Minimum	13:00
	33.7 - 40	1	0.7	Very good	Maximum	35.00

Students do not want to increase their study time in Natural Sciences, students must be motivated so they can spend more time learning Natural Sciences. According to Hamdu and Agustina [40], by providing motivating to students, students will be moved, directed their attitudes and behavior to spend time learning science.

3.7. Career interests in the natural sciences

The results of the questionnaire that have been disseminated about career interests in the field of natural sciences are presented in Table 8. In the very good category, there are 1.5% (2 of 136) students, the good category is 22.8% (31 of 136) students, the sufficient category is 64.0 (87 of 136) students, the bad category is 11.8% (16 of 136) students. It can be concluded that students are more likely to be in a sufficient category which means that there are still many students who are not yet interested in their future careers in a career in science.

Question: Are you interested in a career and get a job in the field of Natural Sciences?

Answer: No, I am not interested in a career in the natural sciences

Table 8. Career interests in the natural sciences

Variable	Interval	Frequency	Percentage (%)	Category		
Career interests in the natural sciences	9:00 - 16.2	0	0	Very bad	The mean	27.95
	16.3 - 23.4	16	11.8	Not good	Median	28:00
	23.5 - 30.6	87	64.0	Enough	Mode	28:00
	30.7 - 37.8	31	22.8	Well	Minimum	17:00
	37.9 - 45	2	1.5	Very good	Maximum	38.00

Students are not interested in working in the science field. This is because students are less interested in science subjects. Interest plays an important role in students' lives for their future [41]. Students who are interested in studying Natural Sciences will be interested in a career in the Natural Sciences field.

4. CONCLUSION

Based on the results of research that has been done from seven indicators of student attitudes toward science subjects, each of which results, namely, the social implications of science are in the category enough with the percentage of students 69.9% or 95 students. Indicators of scientist normality are in the moderate category with a percentage of 50.7% or 69 students. Indicators of attitude towards science inquiry are in the sufficient category with a percentage of 55.1% or 75 students. For indicators of adoption of scientific attitudes, it is sufficient with a percentage of 58.8 or 80 students. Furthermore, for the indicators of pleasure in learning science also in the category enough with a percentage of 69.9% or 95 students. The indicator of interest in increasing the amount of time for natural science learning is in the sufficient category with the same percentage as the pleasure in learning science that is 60.9% of the number of students 95 students. And for the last one, the indicator of career interest in the field of Natural Sciences is also in the sufficient category of 64.0% with 87 students.

It can be concluded here from the seven indicators of student attitudes toward science subjects, all are in the sufficient category which means there are still very few students who have a positive attitude towards science subjects. The negative attitude of these students causes students to dislike science lessons and are not interested in increasing the amount of time they learn in science and careers in the field of science.

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