The Correlation Between Attitudes and Discipline Toward Science of Secondary School

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Abstract: The purpose of this research was to study the attitudes and discipline of secondary school students in Indonesia and its correlation between those two characters. This was a survey study with total sampling technique of 612 respondents. The grade of discipline and attitutes were measured according to Lickert scale, while the correlation between discipline and attitude was analyzed using Pearson correlation calculation. Based on the results of the study, both the attitude and the discipline of students towards science is good. This research also revealed a significant positive correlation between students' attitudes and discipline. Grade 7th showing the strongest correlation, and it is decreasing by the grade, with the weakest was showed by grade 9th.

Key Words: attitude towards science, discipline toward science, secondary school students

Abstrak: Penelitian ini bertujuan untuk meninjau sikap dan kedisiplinan siswa tingkat sekolah menengah di Indonesia serta hubungan dua karakter tersebut. Penelitian ini merupakan survei dengan mengambil sampel sebanyak 612. Tingkat kedisiplinan dan sikap diukur berdasarkan skala Lickert, sedangkan korelasi antara disiplin dan sikap dianalisis menggunakan perhitungan korelasi Pearson. Berdasarkan hasil penelitian, sikap dan disiplin siswa terhadap sains menunjukkan hasil yang baik. Penelitian ini juga mengungkapkan korelasi positif yang signifikan antara sikap dan disiplin siswa. Korelasi terkuat terdapat pada siswa kelas 7, dan menurun berdasarkan tingkatan kelas, dengan korelasi yang terlemah pada kelas 9.

Kata kunci: sikap terhadap sains, disiplin terhadap sains, siswa sekolah menengah

INTRODUCTION

Education is one of the most important aspects for every individual. Karyadi (2018) stated that education can build a civilization, through consciously efforts carried out by every individual to gain knowledge. Thus, education is the basis for improving and developing the quality of each individual (Maulana et al., 2018). The purpose of education based on the National Education System Law is to build faithful, noble, healthy, knowledgeable, capable, creative, independent, and democratic and responsible individual.

Science learning in secondary school, lower stage of middle school in Indonesia, consists of material which is integrated to the nature. It is very important for every student to study science well. Students can be introduced to the world of science as they explore the natural world, read books, interact with digital media related to science, and make observational studies about nature (Alexander et al, 2012). In addition, science also underlies the progress of technological development and science. Science Literacy becomes a very important thing to be mastered by each individual since it is closely related to how one can understand the environment and other problems faced by modern societies that are very dependent on science and technology development and social issues, as well (Rahayuni, 2016).

Students assumed that natural science is a difficult course (Astuti et al., 2012). The results of research on the assessment of science learning outcomes at the international level organized by the Organization for Economic Cooperation and Development (OECD) of the Program for International Student

Assessment (PISA), scientific literacy scores obtained by students are low. Therefore, the Indonesian government is updating the curriculum to respond to this problem. Improving the quality of education is very dependent on the curriculum (Maulana et al., 2018). Curriculum 2013 currently implemented in Indonesia focuses on character education of student.

Character is a collection of good behavior (Sudewo, 2011) that shows human quality and goodness which is affirmed by society and religion (Lickona, 2012). Character can build student professionalism including their knowledge (cognitive), skills (psychomotor), and attitudes (affective). Building the attitudes can be fostered through consistent self-discipline (Saleh, 2012) by means of education. Scientific attitude and discipline are characters directly related to science activities. Those two characters play important roles in the achievement of scientific knowledge by students.

Attitude is an expression of pleasure or displeasure or evaluation toward object or situation (Eaton & Visser, 2008). It is not only determining what will be done by someone but also a way that would be satisfying or not satisfying for him/her (Suryabrata, 2015). Scientific attitude including the interest in science, support for scientific inquiry, and discipline to act responsibly towards natural resources and the environment (Perwitasari et al., 2016). Attitudes toward science becomes very important because it enhances the student educational achievements of and their affect per-formance" (Liaghatdar, Soltani, & Abedi, 2011). Therefore, attitude is very important to be developed in every student, especially in science.

Self-discipline is a cycle of habits that we do repeatedly and continuously (Saleh, 2012). Discipline towards science can be defined as a good and consistent effort of student to carry out science learning or activities regularly and systematically. There is a positive influence of discipline on learning outcomes (Aslianda, Israwati, Nurhaidah, 2017). It argues that further theoretical development is needed to support science communication's full emergence as a discipline (Trench & Buc-chi, 2010).

From the explanation above, students' attitude and discipline should be developed by the natural sciences courses teachers. In this study the researcher analyzed the students' attitude, students' discipline, and the correlation between students' attitudes and discipline towards natural science subjects in secondary school. The indicators of attitude elaborated in this study including: adoption of scientific attitudes, enjoy-ment and interest in science; while disciplinary indicators including: discipline in taking science lessons, discipline in doing science assignments, as well as science learning discipline at home.

Hence, this paper intends to uncover (1) students' attitude toward science in secondary school, (2) students' discipline toward science in secondary school, and (3) the correlation between students' attitude and discipline toward science.

METHODS

The subjects of the study were seventh, eight, and ninth-grade students in Indonesia. This research took 612 participants. The research was a survey research with a quantitative approach to identify the main variables in the study of research (Creswell, 2016).

Data collection was done by using questionnaire with Cronbach Alpha (α) 0,92 for attitude and Cronbach Alpha (α) 0,95 for discipline. The questionnaire for attitude toward science consisted of 17 statements of attitudes, which were divided into positive statements and negative statements. Meanwhile, the questionnaire for discipline toward science consisted of 17 statements of disciplines. Dimensions of students' attitudes toward science subjects were examined based on predetermined indicators, namely Adoption of Scientific Attitudes, Enjoyment of Science Lessons, and Interest in Science. Dimensions of students' disciplines were examined based on predetermined indicators namely Discipline in Taking Science Lessons, Discipline in Doing Science Assignments, and Science Learning Discipline at Home. All instruments were measured using the Likert scale as follows: Strongly Agrees (SA), Agrees (A), Not Sure (NS), Disagrees (D), and Strongly Disagrees (SD). Each positive item on the instrument has values: SA = 5, A = 4, NS = 3, D = 2, and SD = 1. The data obtained from the questionnaire were processed using descriptive statistic and inferential statistics with the statistical processing software.

RESULTS

Attitude toward Science

Adoption of Scientific Attitudes

The analysis results of the data showed that the attitude category of students categorized as "very bad"

was 0,2%, "bad" was 4.4%, "sufficient" was 37.9%, "good" was 49%, and "very good" was 8.5% out of 612 students. Mean value (3.61) showed that the data was valid and represented all samples. As much as 49% (300 out out of 612) of students were in "good" category, with median value of 4 (Table 1). This result showed that students' attitude toward science based on adoption of scientific attitides was "good".

Enjoyment of Science Lessons

The data analysis result showed that the students' enjoyment of science lessons as much as 0.2% categorized as "very bad" (2 of 612 students), 5.6% (34 of 612 students) as "bad", category as much as, 29.6% (181 of 612 students) as "sufficient", 46.% (281 of 612 students) as "good", and 18.2% (114 of 612 students) as "very good". While based on the attitude scale, the mean value equal was 3.8. It means that the data was valid and represented all the sample. Around 46% of student (281 out of 612) categorized as "good" and the median of 4 indicated a positive attitude to science under "enjoyment learning in science" indicator (Table 2).

Interest in Science

Based on the data analysis the students' interest in science were 2.1% categorized as "very bad" (13 of 612 students), 21.4% as "bad" (131 of 612 students), 45.1% as "sufficient" (350 of 612 students), 19.3% as "good" (118 of 612 students), and 12.1% as "very good" (74 out of 612 students). The mean

value of 3.1 showed that the data was valid and representing all samples. Based on this analysis with 45.1% in "sufficient" category supported by mean and median values in 3.1 and 3.0, respectively, this research found that the "interest in science" is dominant (Table 3).

Discipline toward Science

Discipline in Taking Science Lessons

The students' discipline toward science based on the indicators of *Discipline In Taking Science Lessons* in secondary school was categorized as "very bad" attitude as much as 2.1% (17 out of 612), "bad" as much as 8.5% (52 out of 612), "sufficient" as much as 21.9% (134 out of 612), "good" as much as 33.7% (206 out of 612), and "very good" attitude as much as 33.2% (203 of 612 students). Based on the scale showed the data obtained is the mean value of 3.9 and median value of 4. It means that the data was valid and represented all samples (Table 4). Taken together, these results indicated that student attitude was positive and and their Discipline Toward Science was "good" to "very good".

Discipline in Doing Science Assignments

Students' attitudes toward science based on the discipline in doing science assignments indicator indicated that 1.6% (10 of 612 students) was "very bad", 6.7% (41 of 612 students) was "bad", 27.3% (167 of 612 students) was "sufficient", 40.7% (249 of 612

Table 1. Adoption of Scientific Attitudes

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Amount					
6.0-10.8	Very Bad	1	0.2				
10.9-15.6	Bad	27	4.4				
15.7-20.4	Sufficient	232	37.9	3,61	4	1	5
20.5-25.2	Good	300	49.0				
25.3-30.0	Very Good	52	8.5				

Table 2. Enjoyment of Science Lessons

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Amount					
6.0-10.8	Very Bad	2	0.2				
10.9-15.6	Bad	34	5.6				
15.7-20.4	Sufficient	181	29.6	3.8	4	1	5
20.5-25.2	Good	281	46.0				
25.3-30.0	Very Good	114	18.7				

students) was "good", and 23.7% (145 of 612 students) was "very good". Based on the mean value of attitude scale the mean value of 3.8 showed that the data was valid and represented all samples. These results indicated that students' discipline toward science based on the indicators of discipline in doing science assignments was good. It is also supported by attitude scale (mean = 3.8; median = 4) (Table 5). Therefore, the students' discipline in doing science assignment is positive.

Science Learning Discipline at Home

Based on the results of data analysis, students' discipline toward the science based on indicators of science learning discipline at home can be categorized "very bad" as much as 1,5% (9 of 612 students), "bad" as much as 11,9% (73 of 612 students), "suffi-

cient" as much as 40.2% (246 of 612 students), "good" as much as 33,5% (205 of 612 students), and "very good" attitude as much as 12,5% (79 of 612 students). Based on the mean value of 3.4 and dominant category for "sufficient" was 40.2%, the student's discipline based on the science learning discipline at home indicators was "enough" (Table 6).

Correlation between Attitude and Discipline toward Science

Correlation analysis between attitude and discipline toward science using statistical processing software with "Pearson Corelation test showed that the 7th, 8th, and 9th grades having identical sig value of 0,000 (<0.05). Thus, there was a significant relation-

Table 3. Interest in Science

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Sum					
6.0-10.8	Very Bad	13	2.1				
10.9-15.6	Bad	131	21.4				
15.7-20.4	Sufficient	350	45.1	3.1	3	1	5
20.5-25.2	Good	118	19.3				
25.3-30.0	Very Good	74	12.1				

Table 4. Discipline in Taking Science Lessons

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Sum					
4.0- 7.2	Very Bad	17	2.1				
7.3-10.4	Bad	52	8.5				
10.5-13.6	Sufficient	134	21.9	3.9	4	1	5
13.7-16.8	Good	206	33.7				
16.9-20.0	Very Good	203	33.2				

Table 5. Discipline in Doing Science Assignments

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Sum					
7.0-12.6	Very Bad	10	1.6				
12.7-18.2	Bad	41	6.7				
18.3-23.8	Sufficient	167	27.3	3.8	4	1	5
23.9-29.4	Good	249	40.7				
29.5-35.0	Very Good	145	23.7				

Table 6. Science Learning Discipline at Home

Classification			%	Mean	Median	Min	Max
Interval	Attitude	Sum					
6.0-10.8	Very Bad	9	1.5				
10.9-15.6	Bad	73	11.9				
15.7-20.4	Sufficient	246	40.2	3.4	3	1	5
20.5-25.2	Good	205	33.5				
25.3-30.0	Very Good	79	12.5				

ship between students' attitude and discipline. According to the Pearson Correlation value, 7th grade students showed the strongest correlation between their attitude and discipline toward science compared to grade 8th and 9th. Students of 9th grade had the weakest correlation between attitude and discipline toward science (Table 7).

DISCUSSION

Attitude and discipline are characters that should be embodied in every students. The positive attitude of students towards science will see science as an interesting object. Having a positive attitude toward science affects the ability related to science (Usta & Akkanat, 2015). Good discipline towards science help students to achieve knowledge in science learning (Wirantasa, 2017). Our current study reveals that both students' attitude and discipline are in "sufficient" to "good" category. It means that students in 7th, 8th, and 9th grades of secondary school possess a positive attitude and discipline toward science. In almost all indicators, students showing "good" to "very good" attitude and discipline, except in interest in science and science learning discipline at home. For these two indicators the student possesses enough interest and discipline.

Correlation analysis showing that there is significant positive correlation between students' attitude and discipline (<0.05); the increasing discipline resulted on the better attitude. This means that if every student has good discipline towards science, it affect the student's attitude towards science into a positive atti-

tude, or behavior toward science subjects for each student. However, according to the Pearson correltion value, the correlation is decreasing by the grade. Students in 7th grade showing the strongest correlation value (0.707) compared to 8th and 9th grades, respectively. This phenomenon requires a further study to reveal a more detail reasons and the exact cause including for every indicator elaborated.

CONCLUSION

Based on the results of the study, both the attitude discipline of students towards science is relatively good. Meanwhile, the correlation between attitudes and discipline of secondary school in Indonesia shows a positive one which is decreasing by the grade. Grade 7th shows the strongest correlation between discipline and attitude, while grade 9th shows the weakest correlation. Further study is needed to reveal the reason of this finding.

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Table 7. The Correlation Value Between Attitude and Discipline

7th grade		8th grade		9th grade	
sig	Pearson Correlation	Sig	Pearson Correlation	Sig	Pearson Correlation
0.000	0.707	0.000	0.687	0.000	0.247

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