Comparison of Students' Attitudes toward Natural Sciences in Rural Middle Schools in Jambi Province

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Abstract: *The purpose of this study is to determine the students' attitude towards science subjects through several indicators. The type of research is quantitative research. This study involved two different schools, namely SMP 17 Batanghari Regency with a sample obtained by 140 students and SMP 3 Muaro Jambi with a sample of 145 students. The data were analyzed using inferential statistic. The students' attitudes were noticed in several indicators, namely the social implications of science, the adoption of science attitudes and the enjoyment of learning science. As the result, from the three indicators, the attitude of the SMP 3 Muaro Jambi students were dominantly in good category, whereas those of the students in Batanghari District were dominantly in quite good category. In conclusion, there were differences between the two school students' attitude toward natural science which was reinforced by the results of t tests that have been done.*

INTRODUCTION

Science is one of the subjects that must be studied in junior high schools. Science deals with how to find out about nature systematically, so that learning science is a process of experiencing and resulting in the acquisition of knowledge in the form of understanding of concepts (Putra, Abdurrahman, & Suana, 2015;Utami, & Habibah, 2014). To achieve good learning, a good attitude is needed. In learning science the character of a student must be instilled in the learning process by having good characters so that the knowledge to be understood will be gained faster (Phillips, 2008).

The attitude in learning that students must have is a scientific attitude. Scientific attitude is very meaningful in social interaction, science, and technology. Scientific attitude is as an establishment

(tendency) towards a certain stimulus that is always oriented to science and scientific methods (Astika, Suma, & Suastra, 2013; Astalini, Kurniawan, Perdana, & Kurniasari, 2018). According to Trumper (2006), scientific attitudes greatly affect the learning process which involves the attitudes of students. Students who have a high scientific attitude will help the process of learning science and physics. This is because scientific attitudes can shape learners to think creatively and critically. Seeing the importance of attitude in the learning process can evaluate the performance of teaching staff in educating students. The positive attitude of students towards science subjects will have a good impact on social implications, learning pleasure, and scientific attitude. If scientific attitude has been formed in students, good role models for students will be realized, both in carrying out research

63

or interacting with the community (Guido, 2013; Sardinah & Tursinawati, 2018). The aspect of scientific attitude in science learning is very important to be developed because attitude is the foundation of students to be able to appreciate the work of others and respect themselves. With scientific attitudes embedded and developing in students, the students are expected to be able to be sensitive to the environment, able to find out what they find, what they do not know and students are expected to be able to act and solve problems in their environment with their own abilities (Suryani, 2016).

The social implications of science can be seen from the science subjects themselves, such as knowledge, observation, and experimentation. According to Satrianingsih, Haryani, & Dewi(2017), some students can answer because they have knowledge based on what they see in their daily lives. Students try to remember the knowledge they already have. In addition, the implications of this science learning make students better interpret learning that has been experienced. According to Sudiman, Raharjo, & Haryono (2003), interpreting learning as an activity that emphasizes the learning process, the planned efforts to manipulate learning resources so that the learning process occurs within students. Learning process experienced by these students will affect the level of student achievement. There are factors that affect student achievement, including internal conditions and external conditions of students. Internal conditions are factors inherent in students including initial abilities, prerequisite knowledge that students have, activities, creativity, scientific attitudes, intelligence, learning styles, social interactions, talents, and analytical skills (Yuliani, Hadma, & Sunarno: 2012). Students' attitudes toward one or several other subjects have been shown to lead to good performance in these subjects. Negative attitudes towards certain subjects make learning difficult, while positive attitudes stimulate students to make an effort and lead to high achievement in these subjects (Xavier & Croix, 2016).

The positive attitude of the students can help themselves so that they can excel in education. This can be seen in the students' interest in the subject they are taking and can motivate themselves. According to Alannasir (2016), in increasing the motivation of a student, the first thing to create is students' pleasure in learning through the use of interesting learning. Pleasure in learning is a positive impact of attitudes embedded in students (Djiwandono, 2017). Pell (1985) states that the pleasure in learning is determined by the class atmosphere that is suitable for students and the way of learning that suits students. The pleasure in learning science is influenced by likes and dislikes. According to Suharyat (2009), attitude is the most important determinant in human behavior. Attitude can be interpreted as the willingness of the human soul to carry out an action or activity, or it can also be interpreted as an individual's tendency to deal with a stimulus that is assembled with feelings of pleasure or displeasure towards the stimulus (Sultan & Bancong, 2015).

The gap that often occurs with students is the lack of students' attitudes about what they are experiencing. This students' attitude is the goal of character education. The purpose of this study is to identify and find out whether there are differences in attitudes that students have in science lessons in Muaro Jambi and Batanghari Districts, with the following research questions.

1. What is the attitude of the students to the social implications of science?
2. What is the attitude of the students in adopting scientific attitudes in science?
3. What is the attitude of the students to the pleasure in science learning?
4. Are there differences in attitudes in the students' science learning between junior high school students in Muaro Jambi and Batanghari?

METHOD

The research design used was quantitative research using survey research designs. Quantitative research is research that is structured and quantifies data to be generalizied (Puspitaningtyas, 2016). Survey research determines and reports the way things are. It involves collecting numerical data to test hypotheses or answer questions about the current status of the subject of study. One common type of survey research involves assessing the preferences, attitudes, practices, concerns, or interests of a group of people(Gay, 2012).

The sampling technique that was used in this study is total sampling and purposive sampling, i.e., a sample determination technique with certain considerations (Sugiyono, 2014). The total number of sample was 285 students, in which 140 students from SMP 17 Batanghari Regency and 145 students from Muara Jambi Regency.

In this study, researchers used a questionnaire of attitudes towards science. This questionnaire instrument was adopted from Kurniawan who has Cronbach's Alpha 0.842 with a factor analysis of validity and reliable items (Astalini & Kurniawan, 2019). In this questionnaire, there are positive and negative statements about the science subjects. This questionnaire totaled 56 statements in positive and negative ones. The scale used in this questionnaire is the Likert scale, where there are 5 scales namely, (STS = strongly disagree, TS = disagree, N = neutral, S = agree, SS = strongly agree, namely the social implications of IPA with the revelation item 7, adoption of 7 statements scientific attitude, and enjoyment in learning science with 8 statements, then the total statement in these 3 indicators is 22 statements. The following indicators of attitudes to the subjects of science are listed in table 1:

Table 1. Indicators of Attitudes in Subjects

Variable	Indicator	Statement		Item Amount
		(+)	(-)	
Science Subject Attitudes	Social Implications of Science	1, 14, 20. 39	7, 27, 32	7
	Adoption of Scientific Attitudes	3, 16, 28	10, 23, 39, 53	7
	Fun in learning science	4, 17, 24, 42	11, 24, 36, 48, 52	8

Analysis of the data used in this study was the descriptive and inferential statistics. According to (Hasan (2011), inferential statistics or inductive statistics are parts of statistics that study interpretations and draw conclusions that are generally accepted from available data. Inferential statistics use sample data to make estimates, decisions, predictions, or other generalizations about larger data sets (Singpurwalla, 2017).

RESULTS AND DISCUSSION

The renewal of this research is found in the indicators used to describe the comparison of students' attitudes towards science subjects in SMP 17 Batanghari and SMP 3 Muaro Jambi. Indicators used in this study are the social implications of natural science subjects, the adoption of scientific attitudes toward natural science subjects, and pleasure in natural science subjects.

Results
Adoption of Scientific Attitudes

The questionnaire results in the indicators of scientific attitude adoption that have been disseminated and processed in 17 Batanghari Middle School can be seen in the following table 2:

Table 2. Adoption of Junior High School Scientific Attitude 17

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
7.0-12.6	Extremely Bad	0						0
12.7-18.2	Not good	37						26.4
18.3-23.8	Enough	61	21.38	21.00	3.91	1.00	33.00	43.6
23.9-29.4	Good	39						27.9
29.5-35.0	Very good	3						2.1
TOTAL		140						

The questionnaire results in the indicators of scientific attitude adoption that have been disseminated and processed in Muaro Jambi Middle School 3 can be seen in the following table 3:

Table 3. Adoption of the Scientific Attitude of Muaro Jambi Middle School 3

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
7.0-12.6	Extremely Bad	0						0
12.7-18.2	Not good	6						4.1
18.3-23.8	Enough	56	24.22	24.00	3.21	16.00	31.00	38.6
23.9-29.4	Good	77						53.1
29.5-35.0	Very good	6						4.1
TOTAL		145						

In table 2, there are 27.9% (39 out of 140 students) categorized as good and 2.1% (3 out of 140 students) in addition there was a sufficient category of 43.6% (61 out of 140 students) and not good category 26. 4% (37 out of 140 students). In this indicator, it appears that the adoption of the attitude of science students is very weak. This can be seen from the data of the number of students who have chosen based on the statement and entered into the categories presented by researchers. Furthermore, in Table 3 there are students 'responses to students' scientific attitudes namely good category 53.1% (56 out of 145 students) and good category 4.1% (6 out of 145 students). While the category is sufficient 38.6% and the category is not good 4.1% (6 of 145 students).

Social Implications of Science

The results of the questionnaire in the indicators of the social implications of SMP 17 Batanghari Regency can be seen in the following table 4.

Table 4. Social Implications of SMP 17

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
7.0-12.6	Extremely Bad	2						1.4
12.7-18.2	Not good	41						28.3
18.3-23.8	Enough	53	21.1	21.00	4.21	12.00	31.00	36.6
23.9-29.4	Good	43						29.7
29.5-35.0	Very good	1						0.7
TOTAL		140						

The results of the questionnaire in the indicators of the social implications of SMP 3 Muaro Jambi Regency can be seen in the following table 5

Table 5. Social Implications of Middle School 3

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
7.0-12.6	Extremely Bad	0						0
12.7-18.2	Not good	0						0
18.3-23.8	Enough	24	26.95	27.00	3.451	19.00	35.00	16.6
23.9-29.4	Good	83						57.2
29.5-35.0	Very good	38						26.2
	TOTAL	145						

In table 4, it appears that there are 30.7% students (43 students out of 140) categorized as good and 0.7% students (1 student out of 140) categorized very well. This shows that students now the impact of the implications of the social attitude of science on their own lives. There are 37.9% of students (53 students from 140) categorized enough that we can interpret that there are still many students who are confused about the social implications of science in their lives. Besides, there were 29.3% of students (41 students out of 140) who were categorized as not good and 1.4% of students (2 out of 140 students) who were categorized as not very good. These show that students could not yet understand the social implications of science in his life. Furthermore, in Table 5, there are results where 57.2% of students (83 out of 145 students) are in the good category and 26.2% are in the excellent category. These show that students can understand well the social implications of this science can be his life. In addition, there were 16.6% students (24 out of 45 students) who were categorized as sufficient.

Fun in Learning Science

The results of the questionnaire in Pleasure in learning science at SMP 17 Batanghari Regency can be seen in the following table 6.

Table 6. Learning pleasure in junior high school science subjects 17

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
8.0-14.4	Extremely Bad	2						1.4
14.5-20.8	Not good	13						9.0
20.9-27.2	Enough	79	25.85	26.00	4.81	14.00	38.00	54.5
27.3-33.6	Good	35						24.1
33.7-40.0	Very good	11						7.6
	TOTAL	140						

The results of the questionnaire in Pleasure in learning science at SMP 3 Muaro Jambi Regency can be seen inm the following table 7.

Tabel 7. Fun of learning science subjects in junior high school 3

Characteristics			Mean	Median	Standard Deviation	Min	Max	%
Interval	Attitude	Total						
8.0-14.4	Extremely Bad							
14.5-20.8	Not good	3						2.1
20.9-27.2	Enough	65	27.59	28.00	3.67	18.00	39.00	44.8
27.3-33.6	Good	70						48.3
33.7-40.0	Very good	7						4.8
	TOTAL	145						

In table 6, it appears that the pleasure in learning science in junior high school 17 can be categorized as very good 17.1% (24 out of 140 students) followed by students who are in the good category with a number of 47.1%, a sufficient category of 26.4% and

a category not good is 5%. It can be interpreted that the pleasure of learning about science is very good. This can be seen from the categories described in the table above. Furthermore, in Table 7, from the above data, it can be said that Muaro Jambi Middle School 3 has a very good level of learning pleasure towards Natural Sciences.

Normality and Homogeneity Test

Table 8. Normality and Homogeneity Tests

	Test Of Normality		Test Of Homogeneity
School	SMP 17 BATANGHARI	SMPN 3 MUARO JAMBI	17 Batanghari Middle School and Muaro Jambi 3 Public Middle School
Statistics	0.062	0.080	1.449
df1	135	140	1
df2			283
Sig	0.200	0.051	0.230

In table 8, it can be seen that the normality test at SMP 17 Batanghari and SMP 3 Muaro Jambi experiences differences. This is a reasonableness that occurs because there are different sample data. Normality test was conducted to determine whether the population data was normally distributed or not (Rojihah, Akhrani, & Hasanah, 2016). Furthermore, Kabasarang, Setiawan, & Susanto (2013), describe that the normality test is part of statistical science that is used to test whether the data obtained have a normal distribution or not so that it can be used in parametric statistics. This normality test can be said to be normal if the sig value> 0.05. According to Senjayawati (2015), to test the normality of the pretest data, the Kolmogorov-Smirnov statistical test was used, with a significance level of 0.05 with the following hypothesis: H0 = sample originating from a normally distributed population, H1 = sample originating from a population that is not distributed normally. It can be seen that the significance values of SMP 17 Batanghari and SMP 3 Muaro Jambi have sig values of 0.2 and 0.051, so it can be said that the data were normally distributed. According to Aprisinta (2015), homogeneity test is used to determine whether the research has the same variance or not. Furthermore Aryani & Mansur (2017) state the homogeneity test in this study uses the Levene's Test from two independent samples. With the following test criteria: If the value of Levene's test or Sig> 0.05 then the variance is homogeneous, while if the value of the Levene's test <0.05 then the variance is not homogeneous. From the table above, it can be seen that the homogeneity value is 0.230, so this data can be said to be homogeneous, because the sig value > 0.05.

Independent Sample t-Test

The independent sample t-test is used to test the research hypothesis (Amalihah, 2017). According to Putra & Syarif (2014), independent t-test aims to determine whether there are significant differences between the two samples studied. The independent t-test is said to be significant if $p < 0.05$. The following is a table t-test.

This can be seen from the category of students who answered the statement from the questionnaire: very good category (26.2%), good category (58.6%), and enough category (13.1%). These data show the pleasure in learning science is very good, but there is no good category that is 0.7%.

Table 9. Test t-test		
T	Sig(2-tailed)	Mean Difference
11.330	0.002	-22.29581
11.322	0.002	-22.29581

From table 9, it appears that there is a comparison of attitudes towards science subjects. This dedicates that the attitude of the students of the 17 Batanghari Middle School and Muaro Jambi Middle School 3 has a significant comparison. It is useful that this comparative study can continue.

It is seen that Muaro Jambi 3 Junior High School is more dominant than SMP 17. This can be seen in the student good categorized well on the social applicability indicator of the Science with the percentage of 57.2% for 83 of 145 students. Then the indicator of adoption of scientific attitudes with a percentage of 48.3%. In contrast to SMP 17 Batanghari, the percentage data shows that these students belong to sufficient categories.

Discussion

Adoption of Scientific Attitudes

The most dominant attitude of students of SMP 17 Batanghari is in the sufficient category with a percentage of 43.6%. This can be seen from the number of statements selected by students from several available statements. Unlike in SMP 3 Muaro Jambi, the dominant percentage is in the good category with a score of 53.1% so that we can say that SMP 3 Muaro Jambi has a high category. Scientific attitudes of students can affect student understanding of learning, scientific attitudes have a positive influence on students' achievement (Pertiwi & Husna, 2013). According to Hendracipta (2016), the scientific attitude that can be instilled is the attitude of wanting to investigate (curiosity), i.e., is high. This attitude can be instilled when the teacher raises a problem by proposing an interesting phenomenon / bringing something interesting related to the problem.

Implications of the Natural Sciences

The results of the questionnaire data analysis using SPSS showed the social implications of the Natural Sciences in junior high school 17 leading to the quite good category. Based on the data obtained, the results were 37.9%, while SMP 3 Muaro Jambi showed high social implications, namely 57.2% with both good and very good categories. The social implications of this science will have an impact on students' social lives. Students have different attitudes and characters in each individual. In line with it, Akpinar et al., (2009; and Putra, (2014) state that a positive attitude towards science is associated with a positive attitude about the usefulness of science. There are so many social implications that can be applied in social life. One of them is an experiment assigned by the teacher. From the results of Mulyani (2015), students are more interested in the experiments assigned by teachers in the classrooms. Furthermore, students will play an active role, and the learning situation will be more enjoyable, so that the learning objectives to be achieved will be easily carried out as expected (Rukinem, 2018). From the data analysis above, it can be seen that these two SMPs have good social implications.

Fun in Learning Science

The results of data analysis of the indicator of pleasure in learning science in SMP 17 leads to the good category. This can be seen from the percentage of 47.1%. Based on these data, it appears that the attitude of students on this indicator is very good. This is influenced by internal factors found in the classrooms. According to Hapnita, Abdullah, Gusmareta, & Rizal(2018), poor teaching methods will affect students' learning. In order that the students can learn well, the methods of teaching shoud be made as attractive as possible. Furthermore Sucia (2017), explains that the pleasure created by the teachers makes the students feel happy

about the subjects given. Something positive can increase student motivation and increase student enthusiasm for learning.

From the obtained results, there are weaknesses that occur in **each** indicator. This was obtained from the number of students who answered the questionnaire that was distributed to students in SMP 17 Batanghari and SMP 3 Muaro Jambi. At SMP 17 Batangahari. There are 2 students who have social implications from science in the very low category. This weakness is influenced by the learning process that occurs, according to Chairunnisa (2017), in learning activities the role of the teacher is very important especially in motivating students in learning. Furthermore, the attitude indicator of scientific attitude shows that SMP 3 students are more dominant in both categories than SMP 17 students. In contrast with SMP 17, this SMP has sufficient categories and has 37 students who are categorized as not good. In the pleasure category in natural science subjects, the more dominant students were found in SMP 3. This can be seen in the number of students categorized as good with a total of 48.3%. In SMP 17 students were included in the quite good category with a percentage of 54.5%. From the results, the more dominant students were found in SMP 3 Muaro Jambi. Seeing the importance of students' attitudes towards science, the education staff must improve students' attitudes towards science subjects at school. According to Tunisa, Kosasih, & Hamdu(2017); Fitria & Idriyeni (2017) point out that the success of the learning process in shaping students' scientific attitudes is inseparable from the teacher's ability to develop learning models. The development of appropriate learning models aims to create learning situations that enable students to be actively involved in learning so that students can achieve optimal learning outcomes.

CONCLUSION

Based on the results that have been described, it was found that from the three attitude indicators examined in this study, the dominant results were good for students in Muaro Jambi district, whereas for students in Batanghari District, the dominant results were quite good, from this it can be seen that there are differences, and this is reinforced by the results of the t test that have been done, where, the sig obtained is less than 0.05, then there are differences in attitudes held by students in science lessons.

REFERENCES

Akpinar, E., Yildiz, E., Tatar, N., & Ergin, Ö. (2009). Students' attitudes toward science and technology: an investigation of gender, grade level, and academic achievement. *Procedia Social and Behavioral Sciences. Turkey: Science Direct*, *1*(1), 2804–2808. https://doi.org/https://doi.org/10.1016/j.sbspro.2009.01.498

Alannasir, W. (2016). Pengaruh Penggunaan Media Animasi Dalam Pembelajaran Ips Terhadap Motivasi Belajar Siswa Kelas Iv Sd Negeri Mannuruki. *Journal of Educational Science and Technology (EST)*, *2*(2), 81. https://doi.org/10.26858/est.v2i2.2561

Amalihah, R. (2017). Hasil Belajar Biologi Materi Sistem Gerak Dengan Menerapkan Model Pembelajaran Kooperatif Tipe Rotating Trio Exchange (Rte) Pada Siswa Kelas Xi Sman 4 Bantimurung. *Jurnal Dinamika*, *08*(1), 11–17.

Aprisinta, D. (2015). Jurnal Akademis daN Gagasan matematiKA Edisi Ke Dua Tahun 2015 Pengaruh Media Pembelajaran Tiga Dimensi Terhadap Jurnal Akademis Dan Gagasan Matematika Edisi Ke Dua Tahun 2015 Halaman 68 hingga 74. *Jurnal Akademis Dan Gagasan Matematika*, *2*.

Aryani, W., & Mansur. (2017). Pengaruh Penggunaan Alat Peraga Mistar Hitung Terhadap Hasil Belajar Siswa Pokok Bahasan Penjumlahan Dan Pengurangan Bilangan Bulat. *Primary: Jurnal Keilmuan Dan Kependidikan Dasar*, *9*(1), 55–78.

Astalini, A., & Kurniawan, D. A. (2019). Pengembangan instrumen sikap siswa sekolah menengah pertama terhadap mata pelajaran ipa. *Jurnal pendidikan sains (jps)*, *7*(1), 1. https://doi.org/10.26714/jps.7.1.2019.1-7

Astalini, A., Kurniawan, D. A., Perdana, R., & Kurniasari, D. (2018). Identification of Student Attitudes toward Physics Learning at Batanghari District High School. *The Educational Review, USA*, *2*(9), 475–484. https://doi.org/http://dx.doi.org/10.26855/er.2018.09.003

Astika, I. K. U., Suma, I. K., & Suastra, I. W. (2013). Pengaruh model pembelajaran berbasis masalah terhadap sikap ilmiah dan keterampilan berpikir kritis. *E-Journal Program Pascasarjana Universitas Pendidikan Ganesha Program Studi IPA*, *3*(2), 1–10.

Chairunnisa. (2017). Meningkatkan Motivasi Dan Hasil Belajar Siswa Konsep Hidrokarbon Dengan Menggunakan Model Pembelajaran Cooperative Script Berbantuan Media Adobe Flash Pada Siswa Kelas XI MIA-3 MAN 3 Banjarmasin Tahun Pelajaran 2016/2017. *Jurnal PTK Dan Pendidikan*, *3*(2), 1–9.

Djiwandono, P. I. (2017). The Learning Styles Of Millennial Generation In University: A Study In Indonesian Context. *International Journal of Education*, *10*(1), 12. https://doi.org/10.17509/ije.v10i1.5085

Fitria, Y., & Idriyeni, I. (2017). Development of Problem Based Teaching Materials for the Fifth Graders of Primary School. *Journal Ta'dib*. 20(2), 99-106.Gay, L. . (2012). *Educational Research Competencies for Analysis*. Florida International University.

Guido, P. R. M. D. (2013). Attitude and Motivation towards Learning Physics. *International Journal of Engineering Research & Technology (IJERT)*, *2*(11).

Hapnita, W., Abdullah, R., Gusmareta, Y., & Rizal, F. (2018). Faktor internal dan eksternal yang dominan mempengaruhi hasil belajar menggambar dengan perangkat lunak siswa kelas xi teknik gambar bangunan smk n 1 padang tahun 2016/2017. *Cived Jurusan Teknik Sipil*, *5*(1). https://doi.org/https://doi.org/10.24036/cived.v5i1.9941

Hasan, I. (2011). *Pokok-Pokok Materi Statistik*. Jakarta: Pt Bumi Aksara.

Hendracipta, N. (2016). Menumbuhkan sikap ilmiah siswa sekolah dasar melalui pembelajaran ipa berbasis inkuiri. *Jurnal Pendidikan Sekolah Dasar (JPsd)*, *2*(1), 109–116.

Kabasarang, D. C., Setiawan, A., & Susanto, B. (2013). Uji Normalitas Menggunakan Statistik Jarque-BeraBerdasarkan Metode Bootstrap. *Journal Matematika*, *8*(1).

Mulyani. (2015). Penggunaan metode eksperimen untuk meningkatkan hasil belajar tentang rangkaian listrik seri dan paralel pelajaran ipa pada siswa kelas vi sd negeri 3 karanggandu kecamatan watulimo kabupaten trenggalek. *Jurnal pendidikan profesional*, *4*(3).

Pell, A. W. (1985). Enjoyment and Attainment in Secondary School Physics. *British Educational Research Journal*, *11*(2), 123–132. https://doi.org/https://doi.org/10.1080/0141192850110205

Pertiwi, D. A. B., & Husna, E. (2013). Peningkatan Sikap Ilmiah Siswa Melalui Metode Praktikum Dengan Pendekatan Inkuiri Pada Materi Termokimia Di Kelas Xi Ipa Sma Negeri 3 Sanggau. *Jurnal Pendidikan Dan Pembelajaran*, *2*(6).

Phillips, S. (2008). *Refleksi Karakter Bangsa – Makalah*. Jakarta.

Puspitaningtyas, Z. (2016). *Metodologi Penelitian Kuantitatif*. Yogyakarta: Perpustakaan Nasional RI.

Putra, A., & Syarif, H. (2014). Perbandingan Kecerdasaan Emosional Mahasiswa Konvensional Dan Kbk Pada Program Studi Ilmu Keperawatan-Fakultas Kedokteran Universitas Syiah Kuala. *Idea Nursing Journal*, *5*(1).

Putra, N. A. R., Abdurrahman, & Suana, W. (2015). Pengaruh Keterampilan Proses Sains Dan Sikap Ilmiah Terhadap Pemahaman Konsep Ipa. *Jurnal Pembelajaran Fisika*, *3*(4).

Putra, H. E. (2014). Sikap Mahasiswa bahasa inggris terhadap penggunaan teknik team game tournament (TGT) pada mata kuliah reading comprehension III. Journal Ta'dib. 7(2), 157-176.

Rojihah, Akhrani, L. A., & Hasanah, N. (2016). Perbedaan Political Awareness Dilihat Dari Peran Gender Pemilih Pemula. *Jurnal Mediapsi*, *1*(1), 59–66. https://doi.org/http://dx.doi.org/10.21776/ub.mps.2015.001.01.7

Rukinem. (2018). Penggunaan Metode Eksperimen untuk meningkatkan Hasil Belajar Siswa tentang Cahaya di Kelas V SDN 07 Silaut Kecamatan Silaut. *JPPI (Jurnal Penelitian Pendidikan Indonesia)*, *4*(1), 34. https://doi.org/https://doi.org/10.29210/02018189

Sardinah, S., & Tursinawati, T. (2018). Relevansi Sikap Ilmiah Siswa Dengan Konsep Hakikat Sains Dalam Pelaksanaan Percobaan Pada Pembelajaran Ipa Di Sdn Kota Banda Aceh. *Jurnal Serambi Ilmu*, *13*(2).

Satrianingsih, C. J. P., Haryani, S., & Dewi, N. R. (2017). jiseModel Pembelajaran Berbasis Masalah Berbantuan Science Pocket Book untuk Meningkatkan Kemampuan Kognitif dan Sikap Terhadap Sains. *Journal of Innovative Science Education*, *6*(2).

Senjayawati, E. (2015). Penerapan Pendekatan Kontekstual Untuk Meningkatkan Kemampuan Komunikasi Matematik Siswa Smk Di Kota Cimahi. *Didaktik*, *9*(1), 33–39.

Singpurwalla, D. (2017). *A Handbook of statistic An overview of statistical methods*. London: Bookboon The ebook company.

Sucia, V. (2017). Pengaruh Gaya Komunikasi Guru Terhadap Motivasi Belajar Siswa. *Komuniti: Jurnal Komunikasi Dan Teknologi Informasi*, *8*(5), 112–126. https://doi.org/https://doi.org/10.23917/komuniti.v8i5.2942

Sudiman, A. S., Raharjo, & Haryono, H. (2003). *Media Pendidikan, Pengertian, Pengembangan dan Pemanfaatannya*.

Sugiyono. (2014). *Metode Penelitian Kombinasi (Mixed Method)*. Bandung: Alfabeta.

Suharyat, Y. (2009). Hubungan antara sikap, minat dan perilaku manusia. *Jurnal Region*, *1*(3), 1–19.

Sultan, A. D., & Bancong, H. (2015). Pengaruh Pendekatan Multiple Intelligences Melalui Model Pembelajaran Langsung Terhadap Sikap Dan Hasil Belajar Fisika Peserta Didik Kelas XI IPA SMA Negeri 11 Makassar. *Urnal Pendidikan Fisika-Journal of Physics Education*, *5*(1), 51–60. https://doi.org/https://doi.org/10.26618/jpf.v5i1.341

Suryani, I. (2016). Pengembangan Instrumen Penilaian Sikap Ilmiah Pada Pembelajaran Dengan Model Latihan Penelitian Di Sekolah Dasar. *PEDADIDAKTIKA: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, *3*(2), 217–227.

Suwito, A. (2012). Integrasi Nilai Pendidikan KaTrumper, R. (2006). Factors Affecting Junior High School Students' Interest in Physics. *Journal of Science Education and Technology*, *15*(1), 47–58.

Tunisa, F. R., Kosasih, K., & Hamdu, G. (2017). Pengaruh Model Pembelajaran Latihan Penelitian terhadap Sikap Ilmiah siswa di Sekolah Dasar. *PEDADIDAKTIKA: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, *4*(2), 149–157.

Utami, R., Sumarni, W., & Habibah, N. . (2014). Efektivitas Lembar Kerja Siswa (Lks) Ipa Terpadu Tema Pencemaran Lingkungan Terhadap Penanaman Nilai Karakter Dan Pemahaman Konsep. *Unnes Science Education Journal*, *3*(2).

https://doi.org/https://doi.org/10.15294/usej.v3i2.3345

Xavier, M., & Croix, S. J. de la. (2016). Attitude of Physics Students towards Physics at College of Science and Technology – University of Rwanda. *The Rwandan Journal of Education*, *3*(2), 1–10.

Yuliani, Hadma, & Sunarno, W. (2012). Pembelajaran Fisika dengan Menggunakan Pendekatan Keterampilan Proses dengan Metode Eksperimen dan Demonstrasi di Tinjau dari Sikap Ilmiah dan Kemampuan Analisis. *Universitas Sebelas Maret*, *1*(3), 207–216.