JPE 7 (1) (2018)

Journal of Primary Education

http://journal.unnes.ac.id/sju/index.php/jpe

The Role o Students' Critical Thinking and Interpersonal Intelligence in Understanding The Concept of Science

Muhamad Irfan Fauzi✉, Hartono & Udi Utomo

Universitas Negeri Semarang, Indonesia

Article Info

History Articles
Received:
Januari 2018
Accepted:
February 2018
Published:
April 2018

Keywords:
cooperative problem based learning,
critical thinking,
interpersonal intelligence

Abstract

This research aims to: (1) analyze the role of critical thinking of grade V students in Science learning using Cooperative Problem Based Learning model, (2) analyze the role of interpersonal intelligence of grade V students in Science learning using Cooperative Problem Based Learning model as reflected on the Science learning outcome, (3) and acknowledge the influence of critical thinking and interpersonal intelligence of grade V students on their learning outcomes in Science learning using Cooperative Problem Based Learning model. This research used mixed method concurrent embedded. The samples of this research were the students of grade V of Tunon 1 and Tunon 2 State Elementary Schools. The data were taken through observation, test, interview and documentation. The results showed that the critical thinking of grade V students in Science learning using cooperative problem based learning model gave positive and significant impact of 36.3% on the outcome of Science learning. Students with high critical thinking skill tend to have high learning outcomes, students with moderate critical thinking skill tend to have moderate learning outcomes, and students with low critical thinking skill tend to have low learning outcomes. Students who have interpersonal intelligence skill in Science learning using cooperative problem based learning model gave positive and significant impact of 34.0% on the outcome of Science learming. Students with high interpersonal intelligence skill tend to have high learning outcomes, students with moderate interpersonal intelligence skill tend to have moderate learning outcomes, and students with low interpersonal intelligence skill tend to have low learning outcomes. Grade V students' critical thinking skill and interpersonal intelligence together affected their learning outcomes of Science by 53.7%, and the remaining was 100% - 53.7% = 46.3%. Both the critical thinking skill and interpersonal intelligence were complementary abilities in achieving optimal learning outcomes of Science.

✉ Address correspondence:
Campus UNNES Kelud Utara III, Semarang, 50237
E-mail: m.irfanfauzi77@gmail.com

p-ISSN 2252-6404
e-ISSN 2502-4515

INTRODUCTION

One of the existing fields of science in Basic Education is the Science. Natural Science or Science is the basic science of nature and its surroundings. Students learn everything exists in nature, events and symptoms that appear in nature. Science becomes one of the basic science for human life because Science teaches interaction with environment around human beings, both living and non-living environment. Therefore, Science learning should be delivered starting from the Basic Education level. Thinking skill are required in learning science, one of them is the skill to think critically.

The ability to think critically is essential for life, work, and functioning effectively in all other aspects of life. Critical thinking has been long a central goal of education. Critical thinking is an active process; that is in accepting ideas and information from others, it must be through investigation, interpretation, and conclusion making (Fisher, 2009). Someone who thinks critically will make good conclusions, which will lead to better decisions, with confidence, and have values for his mental strength, such as the value of independence, curiosity, humility, and good reasoning. Through the critical thinking skill, students will easily understand the concept and more sensitive to the problem (Fembriani, 2015).

As social beings, humans need to interact with others to live the life. Jufri (2013) states that through social relationships and friendship, learners will learn more effectively than in the learning process that keeps them away from their social environment. Interpersonal intelligence is the basis for being able to foster relationships with others. Gardner (2011) suggests that interpersonal intelligence is the ability to understand people and foster effective relationships with others. Low interpersonal intelligence will affect attitudes and understanding of others, consequently students are more individualistic and insensitive to the environment condition. Humans do not only have one intelligence but eight kinds of intelligence that are mapped into eight intelligences; they are logical-mathematical intelligence, linguistic intelligence, musical intelligence, spatial intelligence, kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence, and natural intelligence.

Based on Trends in Mathematics and Science Study (TIMSS) survey by The International Federation of Education Achievement (IEA) 2015, Indonesia was on the 44th out of 47 countries with an average value of 397 for the achievement of Natural Science (IEA, 2016). The Science competences of Indonesian learners were below the average score (500) and generally in the bottom category or known as the low international benchmark. This low Science competence of Indonesian students could also be seen in the International Students for International Student Assessment (PISA) study conducted by the Organization for Economic Cooperation and Development (OECD).

The PISA study of 2015 showed an increase in Science competence, with an average score of 403 (Kemdikbud, 2016). The increase elevated Indonesia's position to 6th place from the 2nd last position in 2012. Despite this increase, Indonesia was still in the lower category of the PISA study achievement. The reviewed results of TIMSS and PISA surveys showed that Indonesian students' achievement of Science competence was low.

The observations conducted in Tunon 01 and 02 State Elementary Schools showed that the teachers learning method did not vary. They almost always used the lecturing method in the lesson. When discussing a subject matter, the students tended to be passive in the course of the lesson. Only a few students asked questions, even if the teacher forced them to ask questions if they did not understand a thing. This proved that the students are less critical in finding the truth and understanding the material.

There was an interesting incident during the learning, when a student who did not bring textbook and the student sitting next to him did not want to share his textbook until the teacher gave the order to do so. Some students also did not want to lend their stationery to their friends

who missed their stuff, even though they had more than one. In the break time outside the classroom, the students did hang out in groups. There were clever student group and less clever student group. This showed that there was a gap between the students who were clever and less clever.

Based on several existing problems, there were issues that became the main concern, namely the lack of critical thinking skill and interpersonal intelligence. This study consider the importance of critical thinking and interpersonal intelligence that could bring impact to the achievement of learning goals and daily life of the students.

Jufri (2013) suggests that teachers act as educators, it means that teachers help learners to develop values that benefit their lives and future as individuals and as members of the community. Teachers should always be professional by preparing the learning process in accordance to each student's conditions and their level of competences. This students' condition of lacking of critical thinking skills and interpersonal intelliigence needs the right learning models and strategies that can facilitate the skills of critical thinking and interpersonal intelligence. Cooperative Learning and Problem Based Learning models can be used by teachers to facilitate students to develop and drill their critical thinking skill and interpersonal intelligence.

Based on the facts above, it is deemed necessary to apply a learning model that provides learners the stimulus to facilitate their ability of critical thinking and interpersonal intelligence. In this research used the Problem Based Learning (PBL) model, which is one of the innovative learning models applied to develop students' thinking skills in solving a problem. Arends (2008) explains that PBL is a learning model designed to help learners to develop thinking skill and problem-solving skill, learn the roles of adults, and become independent learners. PBL is a learning model applying cognitive and constructive theories for it constructs knowledge and skill. Problem based learning combined with classroom discussion strategies is effective to improve students' critical thinking (Yosepus *et al.*, 2017).

Hamruni (2012), states that PBL has advantage in developing students' critical thinking skill and adjusting with new knowledge as it helps to transfer their knowledge to understand real-world problems. This opinion is reinforced by the results of studies on the application of PBL which has an impact on improving students' critical thinking skill. The results of Park and Choi's research (2015), explains that PBL can improve learning attitudes, critical thinking disposition and decision making and assessment of sub-areas of problem-solving skill. The result of Astika research, *et al* (2013), explains that PBL improves students' scientific attitude and critical thinking skill.

The application of PBL model in this research was combined with cooperative learning where the students worked in small groups to help each other learn the material. In the cooperative class, students are expected to help each other, discuss, debate, assess each others' newest knowledge and fill each others' weaknesses in their respective understandings. Kilcher & Arends (2010) explain that cooperative learning is a learning model that allows two to six students to form a group and work together in completing tasks and to build knowledge and understanding of the learning material. Frey, *et al* (2009) also states that cooperative learning is a teaching model or strategy with characteristics of assigning certain tasks, having common goals, giving structured awards, and maximizing students to be actively involved in discussions, debates, learning with peers, and working in groups of two to six students.

From the description above, the following problems are drawn: (1) how is the role of critical thinking skill in understanding the concept of Science? (2) how is the role of interpersonal intelligence in understanding the concept of Science? (3) how is the influence of critical thinking and interpersonal intelligence in understanding the concept of Science simultaneously?.

METHODS

The research was conducted using mixed method (a mixture of quantitative and qualitative methods). Mixed method research is a combination of quantitative and qualitative methods to be used simultaneously in a research activity, in order to get more comprehensive, valid, reliable and objective data (Sugiyono, 2016). The design used in this research was concurrent embedded with quantitative method as the primary method.

The population of this research was the students of grade V elementary schools of Dewi Sartika Cluster of South Tegal UPPD in Tegal. In addition, the sample of this research was obtained through purposive sampling technique. In this research, the independent variable (X_1) was critical thinking skill, while the independent variable (X_2) was interpersonal intelligence, and the dependent variable (Y) was science learning outcomes. The samples of this research were 42 students of grade V of Tunon 1 and 36 students of grade V of Tunon 2 State Elementary Schools. The reason of choosing both elementary schools was their consistent characteristics with the problem to be observed based on the observation and interview with the teachers and the limited time, energy and cost, considering that this research was conducted on the same material.

The qualitative research subject in this study were six students from each level of students' critical thinking skill and interpersonal intelligence. They are subject 1 (S1), subject 2 (S2), subject 3 (S3), subject 4 (S4), subject 5 (S5), and subject 6 (S6). The selection of students was based on the results of students' critical thinking skills and interpersonal intelligence scores. Non-probability sampling technique was used in the qualitative research, where each object of research taken did not have the same opportunity to be the subject of research. The type of non-probability used was purposive sampling, where the subjects used were based on certain considerations.

The data analysis techniques used were (1) analysis of the learning devices validity; (2) analysis of test instrument data of the learning outcome, essay test on critical thinking skill consisting of validity, reliability, difficulty level, and distinguishing ability; (3) analysis of inventory instruments of interpersonal intelligence; (4) simple linear regression and multiple linear regression analysis. According to winarsunu (2006), the regression equation is $Y = a + bX_1 + cX_2$.

The indicators of critical thinking skill in this study included: Indicators focusing on questions; analyzing arguments; asking and answering questions; considering whether the sources are reliable; observing and considering the observation reports; inducing and considering the induced results; making and determining outcomes; defining terms and considering the terms of a definition; determining an action; identifying assumptions. The indicators of interpersonal intelligence were to understand and communicate effectively both in verbal and non-verbal; recognize and use some ways to interact; be sensitive to others' feelings, motivations and mental state; be active to know new things; be able to influence peers' opinions and actions and become mediator in conflicts; be able to actively interact with peers and teachers; have the skills to work in groups; establish and maintain a relationship. The understanding of science concepts were derived from the results of science learning on the competency standard 7 material in the KTSP curriculum, that was understands the existing natural changes and its correlation with natural resources. It consists of Basic Competencies (BC) 7.4 describes the water cycle process and human activities that can influence it, 7.5 describes the need for water savings, and 7.6 identifies natural events occurring in Indonesia and its impacts on living things and the environment.

RESULTS AND DISCUSSION

This research was conducted in grade V of Tunon 1 and Tunon 2 State Elementary Schools. Both classes implemented Science learning using cooperative problem based learning model. The learning was performed by class teachers, each for three meetings in accordance with the

learning instrument created by the researcher. The purpose of applying cooperative problem based learning model was to facilitate students to develop critical thinking skill and interpersonal intelligence. In this case, the research conducted was to analyze the role of the influence of critical thinking skill and interpersonal intelligence of grade V students in Science learning which was reflected in the science learning outcomes.

Based on the results of the study, students who had high critical thinking skill were 20 students (25.6%), 34 students (43.6%) had medium level, and there were 24 students (30.8 %) at the low level. Quantitatively, to know the role of students' critical thinking skill in understanding the Science concept in Science learning using cooperative problem based learning model which was reflected in the Science learning outcomes, the influence of students' critical thinking skill was compared to the Science learning outcomes (X_1 to Y) and the influence of interpersonal intelligence in understanding the Science concept (X_2 to Y) could be known through hypothesis testing by means of simple regression. The result of simple regression analysis for critical thinking skill in understanding the Science concept in Science learning using cooperative problem based learning model (X_1 to Y) obtained a constant of 3.043 and coefficient of critical thinking skill equal to 0.244. Therefore, the model of regression equation was $Y= 3,043 + 0,244X_1$. The equation model means that every change of score of students' critical thinking skill in Science learning using cooperative problem based learning model will cause an improvement score of 0.244 at the level of understanding of Science concept, therefore its coefficient of determination is 0.363.

The results showed that the critical thinking of grade V students in science learning using cooperative problem based learning model gave positive and significant impact of 36.3% on the results of Science learning outcome. This is in line with the research conducted by Nurul Fazriyah (2015) that there is a very significant correlation between learning model with students' critical thinking skill and the Science learning outcomes.

In understanding the concept of Science, students with high critical thinking skill were able to describe the water cycle process, explain the need for water saving, and able to identify natural events occurring in Indonesia. However, those students were not able to explain human behavior affecting water cycle process and the impact of that behavior. Students who had medium critical thinking skill were able to describe the water cycle process and the need for water saving. However, those students were not able to explain human behavior affecting water cycle process, explain the causes, impacts, and ways of handling natural events occurring in Indonesia appropriately. Students with low critical thinking skill were only able to explain the causes and ways to prevent flood, to mention the use of water for life, how to save water, and the various types of natural events occurring in Indonesia.

Jufri (2013) reveals that students with high critical thinking skills should be able to make critical and creative decisions, however, students with low critical thinking skills could not make complex decisions, moreover to correlate the concepts and themes presented by the teacher through learning. Qualitatively, grade V students with high critical thinking skills tend to have high Science learning outcomes, students with medium critical thinking skills tend to have medium Science learning outcomes, and students with low critical thinking skills tend to have low science learning outcomes, as seen in Tabel 1.

Based on the results of the analysis on interpersonal intelligence of grade V students, there were 35 students (44.9%) with high interpersonal intelligence, 36 students (46.2%) with medium level, and 7 students (8.9%) which included in the low level. Therefore, it can be concluded that students who were in the medium category of critical thinking skill in Science learning using cooperative problem-based learning has the most frequencies. Thus, both students' critical thinking skill and students' interpersonal intelligence in Science learning using cooperative problem based learning in the medium category has the most frequency.

Table 1. The Reflection of Science Learning Outcome based on Grade V Students' Critical Thinking Skill

Science learning outcome	Max score	Critical thinking skill scores					
Competence Standard 7. Understands the existing natural changes and its correlation with natural resources.		High		Medium		Low	
		S1	S2	S3	S4	S5	S6
BC 7.4 Describes the water cycle process and human activities that can influence it	10	7	8	7	6	4	6
BC 7.5 Describes the need for water savings.	7	7	7	7	7	5	5
BC 7.6 Identifies natural events occurring in Indonesia and its impacts on living things and the environment.	8	8	8	4	4	2	4
Total Score	25	22	23	18	17	11	15
Category		High	High	Medium	Medium	Low	Low

The results of simple regression analysis for students' interpersonal intelligence variables in understanding the Science concept (X_2 to Y) obtained a constant of 1.566 and the coefficient of student's interpersonal intelligence of 0.283. Therefore, the model of regression equation is $Y= 1.566 + 0.244X_2$. The equation model means that every change of score of students' interpersonal intelligence in Science learning using cooperative problem based learning model will cause an improvement score of 0.283 at level of understanding of Science concept, therefore its coefficient of determination is 0.340. The results showed that the interpersonal intelligence of grade V students in Science learning using cooperative problem based learning model gave positive and significant impact of 34.0% on the understanding of Science concept. These results are similar to the results of research conducted by Nurwati (2009) that the better the interaction between students with students and students with teachers, the higher the learning outcomes.

Based on the observation results, the percentage score of all aspects is 67%. This reinforces the inventory result where out of 78 students in total, there are 36 students in the medium level. Students with high interpersonal intelligence skills tend to have high learning outcomes, students with medium interpersonal intelligence skills tend to have medium learning outcomes, and students with low interpersonal intelligence skills tend to have low learning outcomes. As seen in Tabel 2.

Basically, students' interpersonal intelligence was in the medium level which means that the students were able to communicate in the average category. It can be considered that the students were good enough in building social relationships. Students' ability to maintain social relationships was sufficient. They had social empathy but it was often accompanied by selfishness.

Qualitatively, it is known that grade V students had the ability to interact well. Grade V students had good skill in working in groups. Some students were able to influence the opinions and actions of peers and mediate in conflict. They also had the ability to interact actively with peers and with teachers.

In addition, grade V students understood and communicated effectively in both verbal and non-verbal forms. Grade V students were able to recognize and used various means to interact and able to form and maintain relationships. Students also showed sensitivity to someone's feelings, motivations and mental state. However, not all active students knew the latest things. The correlation and the influence of interpersonal intelligence in understanding the concept of Science on the learning by using cooperative problem based learning model was a direct relationship. The relationship indicated that interpersonal intelligence had significance in optimally understanding the concept of Science. Interpersonal relationships can be established between students and students, students and teachers, students and school employees, students and parents, also students and the community. The proximity of interpersonal relationships will provide comfort to the students

and support cooperation that fosters motivation and optimize learning outcomes (Desmita, 2011).

Table 2. The Reflection of Science Learning Outcome based on Grade V Students' Interpersonal Intelligence

Science learning outcome	Max score	Iinterpersonal intelligence scores					
Competence Standard 7. Understands the existing natural changes and its correlation with natural resources.		High			Medium		Low
		S1	S2	S3	S4	S6	S5
BC 7.4 Describes the water cycle process and human activities that can influence it	10	7	8	7	6	6	5
BC 7.5 Describes the need for water savings.	7	7	7	7	7	5	5
BC 7.6 Identifies natural events occurring in Indonesia and its impacts on living things and the environment.	8	8	8	4	4	4	2
Total Score	25	22	23	18	17	15	11
Category		High	High	Medium	Medium	Low	Low

The influence of students' critical thinking skill and interpersonal intelligence simultaneously toward the understanding of Science concept in Science learning using cooperative problem based learning model can be known through hypothesis test by multiple regression. The double regression equation based on hypothesis testing is $Y= 7.901 + 0.189X_1 + 0.213X_2$. This shows that each addition of one unit of students' critical thinking score in Science learning using cooperative problem based learning model will be followed by a score increase of 0.189 on the value of understanding the concept of Science, and each addition of one unit of students' interpersonal intelligence score in Science learning using cooperative problem based model learning will be followed by a score increase of 0.213 on the value of understanding the concept of Science. Then, based on the hypothesis testing through multiple regressions, it is obtained double correlation coefficient of 0.733 so that the coefficient of determination is 0.537 or 53.7%. The results showed that students' critical thinking and interpersonal intelligence of grade V students in Science learning using cooperative problem based learning model contributed 53.7% to the understanding of the Science concept. Thus, the remaining 46.3% was influenced by other factors or other variables outside the study. The critical thinking skills of grade V students have a positive impact on the understanding of Science concept. The indicators applied as implementation of critical thinking can be realized; therefore students' critical thinking skills are well shaped as a support in achieving the understanding of the Science concept. Similarly, interpersonal intelligence was drilled in each meeting, students give influence to the understanding of the Science concept by doing group work activities.

The relative contributions for each variable were 36.3% for critical thinking skills and 34% for interpersonal intelligence. This suggests that critical thinking skill has a greater contribution to the understanding of the Science concept than the contribution of interpersonal intelligence. It shows that critical thinking has an important role in understanding the optimal concept of Science, where with good critical thinking skill students are able to analyze the information creatively and logically, then translate it exactly in accordance with logic and ultimately give a conclusion which is deemed to be sustained and justified. Thus they will more easily communicate the ideas resulted from their analysis if they have good verbal intelligence and good interaction with each other, therefore, both skills in the form of critical thinking and interpersonal intelligence are complementary capabilities in understanding the optimal concept of Science.

CONCLUSION

Based on the analysis and discussion above, the conclusions in this research are (1) the analysis of the role of critical thinking skill of grade V students in Science learning using cooperative problem based learning model in understanding the concept of Science were indicated by the influence of critical thinking skill on the Science learning outcome and analyzed using simple regression analysis. The result of simple regression analysis for critical thinking skill toward the Science learning outcome in Science learning using cooperative problem based learning model (X_1 to Y) obtained a constant of 3.043 and coefficient of critical thinking skill of 0.244. Therefore, the model of regression equation is $Y= 3,043 + 0,244X_1$. The equation model means that every change of score of students' critical thinking skill in Science learning using cooperative problem based learning model will cause an improvement score of 0.244 on the outcome of Science learning, therefore its coefficient of determination is 0.363. This shows that the critical thinking of grade V students in Science learning using cooperative problem based learning model gives positive and significant impact of 36.3% on the Science learning outcome. Grade V students with high critical thinking skill tend to have high Science learning outcomes, grade V students with medium critical thinking skill tend to have medium Science learning outcomes, and grade V students with low critical thinking skill tend to have low Science learning outcomes, (2) the analysis of the role of interpersonal intelligence of grade V students in Science learning using cooperative problem based learning model in understanding the concept of Science, was indicated by how big the influence of interpersonal intelligence toward their Science learning outcomes. The results of simple regression analysis for students' interpersonal intelligence variable toward the outcome of Science learning (X_2 to Y) obtained a constant of 1.566 and the coefficient of student's interpersonal intelligence of 0.283. Therefore, the model of regression equation is $Y= 1.566 + 0.244X_2$. This equation model means that every change of score of students' interpersonal intelligence in Science learning using cooperative problem based learning model will cause an improvement score of 0.283 on the outcome of Science learning, therefore its coefficient of determination is 0.340. The results shows that students' interpersonal intelligence in Science learning using cooperative problem based learning model gives positive and significant impact of 34.0% on the outcome of Science learning. Interpersonal intelligence plays an important role in achieving good Science learning outcome. Students with high interpersonal intelligence tend to get high learning outcomes, students with medium interpersonal intelligence tend to get medium learning outcomes, and students with low interpersonal intelligence tend to get low learning outcomes, (3) the critical thinking and interpersonal intelligence skills of grade V students simultaneously contributes 53.7% to the understanding of the Science concept, and the remaining 100%-53.7% = 46.3% is influenced by other factors or other variables outside the study.

Critical thinking skill has greater contribution to the Science learning outcome as 36.3% compared with the contribution of the variable of interpersonal intelligence as 34.0%. Qualitatively, it shows that critical thinking has an important role in understanding the concept of Science, where with good critical thinking skill students are able to analyze the information creatively and logically, then translate it exactly in accordance with logic and ultimately draw a conclusion which is deemed to be sustained and justified. They will more easily communicate the ideas resulted from their analysis if they have good verbal intelligence and good interaction with each other, therefore, both skills in the form of critical thinking and interpersonal intelligence are complementary capabilities in understanding the concept of Science.

REFERENCES

Arends, L. R. 2008. *Learning to Teach*. Yogyakarta: Pustaka.

Astika, I. K. U., Suma, K., & Suastra, I. W.M. 2013. Pengaruh Model Pembelajaran dengan

Masalah (*Problem Based Learning*) terhadap Sikap Ilmiah dan Ketrampilan Berpikir Kritis. *Jurnal Penelitian Pascasarjana Undiksha*, 3(1).

Desmita. 2011. Psikologi Perkembangan Peserta Didik. Bandung: PT Remaja Rosdakarya Offset.

Fazriyah, Nurul. 2015. Pengaruh Model Pembelajaran dan Berpikir Kritis Terhadap Hasil Belajar Ilmu Pengetahuan Alam Sekolah Dasar Depok. *Jurnal Pendidikan Dasar*, 2(2): 209-222.

Fembriani, Khumaedi, Anni, C.T. 2015. Pengembangan Perangkat Pembelajaran IPA *Model Learning Cycle* 7E untuk Meningkatkan Kemampuan Bepikir Kritis, *Journal Of Primary Education*, 4(1): 15-23.

Fisher, A 2009. *Critical Thinking an intruduction. Cambridge*: Cambridge University.

Frey, N., Fisher, D, Everlove, S. 2009. *Productive Group Work How to Engage Students, Bulid Teamwork and Promise Understanding.Alexandria*: ASCD.

Gardner, H. 2011. *Frames Of Mind*. New York: Basic Books.

Hamruni. 2012. *Strategi Pembelajaran*. Yogyakarta: Insan Madani.

IEA. 2015. *Student Achievement Overview* (*Sciene*) *Grade4*.

Jufri, W. 2013. *Belajar dan Pembelajaran Sains*. Bandung: Pustaka Reka Ciptaka.

Kilcher, A. & Arends, R. I. 2010. *Teacher for Students Learning Becoming An Accomplished Teacher*. New York: Roultedge.

Nurwati. 2009. Hubungan antara Interaksi Sosial Siswa dengan Prestasi Belajar Bahasa Indonesia Siswa Madrasah Ibtidaiyah Se-Kabupaten Gorontalo. *Jurnal Cakrawala Pendidikan* (2).

Park, S & Choi, S. 2015. Effects of Problem-based Learning on the Learning Attitudes, Critical Thinking Disposition and Problem-Solving Skills of Nursing Students: Infant Care. *Advanced Science and Technology Letter*s. 103: 192-196.

Sugiyono. 2016. *Metode Penelitian Kombinasi (*Mixed Method*)*. Bandung: Alfabeta.

Winarsunu, T. 2006. *Statistika dalam Penelitian Psikkologi dan Pendidikan.* Malang: UMM Press.

Yosepus A, Hallatu, Prasetyo, K. 2017. Pengaruh *Model Problem Based Learning* terhadap Kompetensi Pengetahuan dan Keterampilan Berpikir Kritis Siswa Madrasah Aliyah BPD IHA Tentang Konflik. *Jurnal penelitian Pendidikan*, 34(2): 183-190.