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THE INFLUENCE OF SCHOOL ENVIRONMENT AS THE SOURCE OF LEARNING PROCESS UNDER THE THEME OF ECOSYSTEMS WITH PROBLEM BASED LEARNING MODEL TOWARDS SCIENTIFIC BEHAVIOR OF THE STUDENTS

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Abstract

Based on observations and interviews in SMP N 1 Sumber obtained information that scientific attitude of students is still low. Another obstacle that teacher don't take advantage of school environment as source of learning. This can to cause the student's learning results are low. The various constraints experienced in science learning can be addressed by applying the model of learning and source of learning, it is exploiting of school environment as source of learning with learning model Problem Based Learning. This study aimed to determine the influence of the exploiting of school environment as source of learning with learning model Problem Based Learning towards student's cognitive learning results and scientific attitude of student.The study design was quasi experimental design of nonequivalent control group design. The sample was taken by using purposive sampling technique which is resulted in class VII B as experimental class and class VII A as control class. The data consists of the posttest value and the observation of scientific attitude of student by observer. The result of this study showed that average of posttest value experiment class is 79.34 and control class is 69.76. The resulted of biserial correlation analysis is 0.663 and coefficient of determination is 44%. Therefore, the exploiting of school environment as source of learning by Problem Based Learning model on cognitive learning was resulted with the strong category. Based on the observation, the resulted of spearman correlation analysis is 0,684 and the resulted of coefficient of determination is 47%.Therefore, the exploiting of school environment as source of learning with learning model Problem Based Learning effect on scientific attitude of student with the strong category.

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INTRODUCTION

Natural Science is a knowledge discussing scientific process based on scientific behavior and resulted as scientific products, consisting three universal important components, concept, principle, and theory (Trianto, 2014: 141). Learning process in Natural science is a learning activity involving fun and attractive events, since, the students learn the subject contextually. Contextuality in science comes as the learning materials which are based on the activities happening around the students (Isnaningsih & Bimo, 2013). Basically, contextual learning is a concept of learning helping the teachers in relating the learning concept with students' real worlds and motivating the students in creating relation between their knowledge and their life (Khusniati, 2012).

The results of the observation and the interview in SMP Negeri 1 Sumber in January 2016 obtained some facts regarding natural science objects in the class. It is related to the teacher while giving the students group exercise. The students seem less participative in the group activity. In doing the group exercise, some of the students are doing it by only asking the other groups and copying their answers. It makes the students being less honest in the learning process. In delivering the presentation, there were only few students who are brave enough to ask the other students in their presentation. Their critical thinking was proven less active when they do not really curious regarding the accuracy of the other groups' presentation materials. In the other side, there are still some students who irresponsibly litter their rubbish everywhere. It means that these students still have less caring behavior towards the environment around. Those behaviors show that the students' scientific behavior is low and should be improved.

The other obstacles are the teachers never used the surrounding environment as the source of learning materials. Current learning process of natural science subject is not giving enough chance for the students to explore their knowledge and curiosity towards phenomenon beside them. The students haven't started to investigate their surrounding nature directly. Meanwhile, the environment has many phenomenon and natural phenomena which can be related to science learning. Science learning concept given directly to the students, Therefore, the learning process become less meaningful and the students has less chance to understand the learning materials. This thing makes the students learning results become less optimal. The final-term examination of students in VII grade class shows that only 39% of 177 students can overcome the passing grade of 75. The students who did not pass the required grade were more than the half of the overall students, thus the learning results is less than the expected ones. These obstacles faced in teaching natural science can be handled by applying the right learning model and correct learning sources. The right learning source for ecosystems is the environment around school. The overall theme is highly related to the objects inside, thus, the teachers can utilize it as the source of learning materials. Students can learn outside of the class by observing, seeing, and interacting directly to the object which becomes the learning source. According to Santiningtyas et al. (2012), the existence of direct observation to the objects will make the students directly understand the material; therefore, they can get an improvement in their leaning result based on their genuine and recent real observation. It is in line with the opinion of Pamelasari & Khusniati (2014) that the students will be entertained with outdoor activities comparing to inside classroom ones. By doing the activity outside, the teachers can create more variative activites which can improve their thinking activity.

In observing activity, the students will be able to find the solution of the problems from the environment. The problems in the environment can be the disruption to paddy ecosystem resulting crop failures, bad condition of restrooms, and littered trashes from students' snacks. Therefore, there should be a learning model for the students to solve those environmental problems.

One of the learning models which is related to environment and ordered for problem solving activities is Problem Based Learning (PBL). In accordance to the opinion of Fakhriyah (2014), that Problem-based Learning is a learning model which is used to solve real problems as the basic to obtain the knowledge and concepts. Beside that Gunantara, et al. (2014) states that the PBL can be interpreted as a process by a person to solve the problem he faces until the problem is no longer a problem for himAccording to Sudarmin et al. (2013), Natural science learning with PBL will make the

students directly involved in the learning activities. Therefore, the students can solve the problems in their surroundings. Problem Based Learning (PBL) consists of five steps, including orientation, organization, individual and group investigation, development and presentation, and analysis and evaluation to solve the problems (Arends, 2008: 57).

Batdi (2014) states that Problem Based Learning can improve attitudes on learning. So Problem Based Learning can improve knowledge, science process skills and attitude. Also, PBL in natural science done based on scientific method. These scientific methods insist the students to do a scientific work; therefore, the PBL can give the students chance to improve their scientific skills (Rahayu et al., 2012). In doing this scientific work, the students are expected to build their scientific characters.

The purpose of this research is to discover the use of surrounding environment as the source of learning in Problem Based Learning (PBL) of natural science to students' cognitive and scientific behavior.

METHODS

This research is an experimental research. This research finds the influence of certain treatments towards different variables. The design of this research is using quasi experimental design with nonequivalent group design. This design has control group, but it can't be fully functioned to control the outside variables which influences the experiments (Sugiyono, 2010: 114).

The population of this research was the students of VII SMP Negeri 1 Sumber in academic year 2015/2016 which were taught by the same teacher. The number of students who were involved in the population were 177 students from six classes, including VII-A, VII-B, VII-C, VII-D, VII-E, and VII-F. The samples in this research were taken using purposive sampling under the considerations from the science teacher. The considerations were based on the average score of the class and the behavior of the students which should be similar to the requirement of the population with homogenous variance. The samples in this research were the students from VII B as the experimental class and VII A as the control class. The independent variable in this research was the use of environment as the learning source using Problem Based Learning method. The dependent variable of this research was the learning result of the students from their cognitive learning result and scientific behavior.

The instruments of this research were using lesson's syllabus, lesson plan, observation sheets of the students scientific attitude, students' working sheets students' discussions' sheets, exercises, and evaluation tools in the form of assignments. The method of analyzing the data was using quantitative analysis for reliability, validity, item differentiation, the item difficulty level, two variance analysis (sampling homogeneity test), normality test (posttest score and students' scientific attitute), influential test using biserial correlation (posttest data with normal distribution), spearman correlation test (the data of the students attitude in normal distribution), the influence between variables using determinant coefficient, and descriptive analysis (students' scientific attitude).

RESULTS AND DISCUSSION

The result of the initial analysis used the homogeneity tests of the students' mid-term test results. After fixing the measurement, the obtained Fcount was 1.49 with Ftable 1.87 that F count < F table which means that the data was homogenous, thus the sampling method should use purposive sampling.

The final data analysis was done to answer the hypotheses. In this step, the data was obtained from the cognitive learning results and observation score from the students' scientific attitude. The data from students' cognitive learning result was from the posttest score. Later, the test's normality was assesed. It the distribution of the score was normal, the statistical method sued was parametric, while if not, the statistics methods will be non-parametric. Then, the analysis of treatments' influence towards posttest score was done using determinant coefficient.

Based on the analysis of normality test to the posttest score, the F*count of* the experimental class was= 5.40 and the control class = 9.46. It can be inferred that $x^2count < x^2table$ = 11.07. It means, the posttest was normally distributed; therefore, the next steps was using parametric statistical test. This test was used to analyze the influence of between variables with biserial correlation. After finishing the analysis, the obtained data was rb in 0,663. Based on the

guiding criteria of biserial coefficient interpretation, the analysis result showed that the influence of environment as the learning source through Problem Based Learning model towards students' cognitive earning results was strong. The data was examined with t correlation, and, it was inferred a result stating that tcount > t table Therefore, Ho1 was rejected and Ha1 was accepted. Thus, the hypothesis of there is a significant influence between the use of environment with PBL and students' cognitive learning results. From the biserial coefficient correlation (rb), it can be counted that the determinant coefficient was 44%. Therefore, it can be concluded that the environment for PBL model to students' cognitive learning result was 44%.

The analysis result showed that the learning process using environment for PBL was positively influential to students' cognitive learning result. Since, the learning of environment makes the students able to see, observe, and directly interact with the object of learning source. The students will be able to seek and relate the learning material to their environment around their school, for, the students will be able to remember their learning material easily.

It is directly corresponding to the recapitulation of the data about the students' feedback. Since in the feedback, there were 87.5% of the students who felt easy to remember the concepts of the subjects from the learning methods.

During the learning activity, the students were also able to seek and find the problems of the environment around them at the moment. The students were given a chance to find the concept by several activities, such as finding the causes, effects, and providing solution from the problems in the environment around the school, Therefore, the students can get more knowledge from that. The students will also be able to be directly involved in the scientific activities that make them easily understand the matters behind that. This thing is in line with the opinion of Pratiwi (2014), saying that the problem solving process is a good technique to understand the learning materials. Therefore, the students will have a good result in their evaluation. In the end, the posttest result will show the significant different from the treatment of the different class. Specifically, the posttest score of the experimental class was 79.34, while the control class was 69.76.

Besides analyzing the cognitive learning results, the researcher was also observing the students scientific attitude. The data of observation score from the students' character was analyzed using normality test and analyzed towards the influence between variables. This data is an ordinal data which was transformed to be an interval data using MSI (Method of Successive Interval) and was analyzed using statistical formula of chi-count. From the formula, it was obtained that x^2_{count} was 178.1 and 315.9 for the normality of the students' curiosity from the experimental class and the control class; 302.4 and 630.1 for students' respects in experimental and control class; 527.1 and 362.4 for critical thinking of the students; 423.7 and 487.7 for the creativity and the invention of both class; 426.4 and 633.2 for attitude's normality in open-mindset and cooperation; 317.4 and 331.6 for students' perseverance; and 352.3 and 657.7 for environmental awareness where x^2 was 14.06. Therefore, the $x^2_{count} > x^2_{table}$ shows that the students' scientific attitude was not normally distributed. It means the next test was using non-parametric test of spearman correlation test. Spearman correlated test was used to unveil the influence between variables. The criteria of correlation were observed using the data of the correlated coefficient in the last meeting since the students have finished getting their treatment. Based on the measurement in each aspect, it can be inferred that the strongest correlation percentage is critical thinking with 0.725 correlated coefficients. Meanwhile, the other aspects only have the correlation in the range of 0.51 until 0,681 and were included to the medium correlation category until the strong one. Besides per-aspects analysis, the spearman analysis was also analyzing seven other aspects of students' scientific attitude. in the last meeting, the obtained correlation was 0.684 with strong category.

Based on the measurement, it can be inferred that the Ho2 was rejected and Ha2 was accepted. The accepted hypothesis was the significant influence between the use of environment through PBL model and the students' behavior. From the correlated coefficient, the determinant coefficient was 47%. Therefore, it can be concluded that the influence of environment as the source of Problem Based Learning (PBL) towards students' scientific attitude was 47%. This thing was influenced by different treatedment in the learning process to

the control group and experimental group. In the experimental group, the students were trained to solve the problems of the environment by explaining the causes, effects, and solution to the problems. The students should also be able to relate the learning materials with the object in the environment around them. These activities are influencing the students' scientific attitude. Beside the analysis using spearman correlation test, the data of students' scientific attitude was also analyzed descriptively in each aspect. The score percentage of their curiosity is explained in Figure 1.

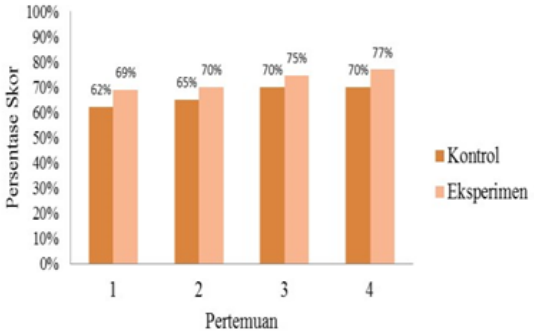

Figure 1. The percentage of students' curiosity

According to Figure 1, there is a significant improvement of students' curiosity in experimental class while the control group does not have the same level of improvement. The scoring percentage of the experimental group is higher than the control ones. It is because of the learning process in the experimental group was using PBL model with school environment as the learning source. The students felt curious on finding solution and the learning concept from the environment. These treatments can improve students' curiosity in 77% percent in the last meeting. In contrast, the control class does not have any chance to find and solve the problem regarding environment eround them, so, their curiosity was improved insignificantly at the point of 70% in the end of the meeting. Then, the second aspect of the students' respect is explained on the facts portrayed in Figure 2.

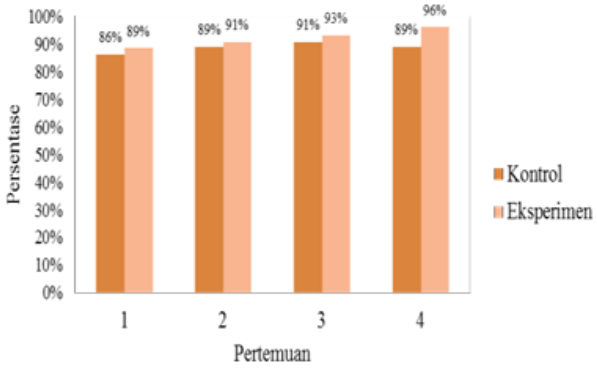

Figure 2.. The Scoring Percentage of Students' Respects to Data/Facts

Figure 2 shows that the scoring percentage of the experimental group in experimental class is higher than the control group. But, the discrepancies of both sides are low. The scoring percentage in the experimental class or control class is included in a very good category where the respects of the students to facts and data have been seen. This thing is caused by the learning process whether experimental or control in which the students are suggested to be honest in every activity. The respects to data/facts are easily built in students' mind, thus their scored really high in this.The third aspect is critical thinking. The data of this aspect is portrayed in Figure 3.

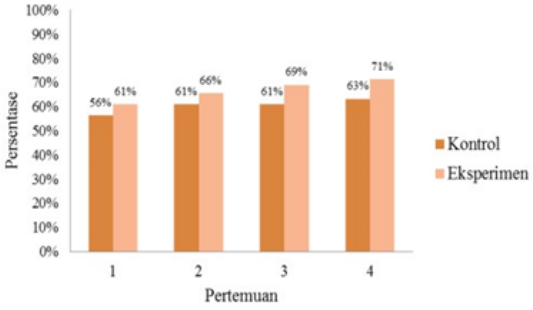

Figure 3.. The Scoring Percentage of Critical Thinking

Like what has been described in Figure 3, the score in the experimental class has meaningful improvement in every meeting while the control group does not have significant improvement there. The scoring percentage of the experimental class is higher than the control class. The discrepancy between both class is relatively high, as what has been proved in the fourth meeting with 8 points. This thing happened because of the students in the experimental class was trained to explain the

cause of environmental problem around them and solve the problem. These activities can build the students critical thinking. In contrast, the students in the control class were not habituated to solve certain problems, thus, their critical thinking behavior is not developed well. Nevertheless, the scoring percentage of critical thinking of both classes is good though the percentage has not achieved the very good category, since the learning process is not really enough to do that. The fourth aspects are the discovery and creativity, the obtained data from both classes is shown in Figure 4.

Based on Figure 4, the scoring percentage in the experimental class is higher than the group. That is to say, the scoring percentage in the experimental class is categorized as very good where 84% of students has shown good behavior in discovering and creativity. Meanwhile, the control class is included in the good category, where 76% of the students shows a good behavior in discovering and creativity. It is because the students in experimental class were trained to find facts and solution from the problems from the surrounding environment.

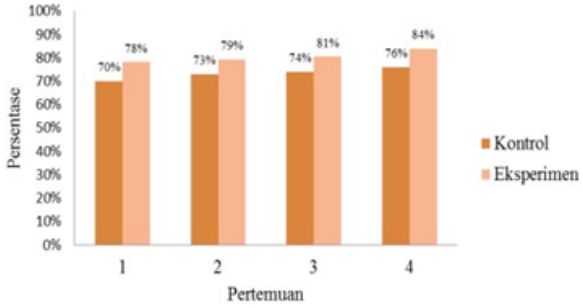

Figure 4. The Percentage of Scoring in Dicovery and Creativity

The students can find the facts and package it in the forms of essay based on their creativity. Then, the control class does not have a chance to directly find and relate their lesson material to the environment, so, the discoveries are not maximum.The fifth aspect is related to open mindset and cooperativeness. The obtained is shown in Figure 5.

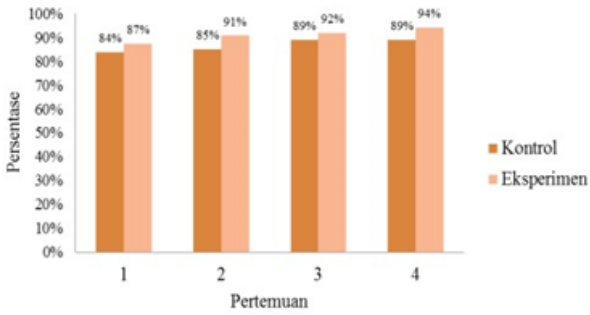

Figure 5. The Scoring Percentage for Open Mindset and Cooperativeness

Based on Figure 5, the scoring percentage of experimental class and control class are already in the very good category. It is because of these class has been adapted with group discussion and cooperation. As stated by Riyanti et al., (2016) cooperative learning model helps to establish cooperationgroups in solving problems or discussion results. Nonetheless, the scoring percentage in experimental class is higher than the control class. Since, the discussion in the experimental class was done inside and outside of the class instead of the control class which is only inside of the class.The sixth aspect is perseverance. The data of this aspect is shown in Figure 6.

Figure 6 shows the scoring percentage of students' perseverance in the experimental class is higher than the control class. The scoring percentage in the experimental class or control class is very good with high level of perseverance. It happens since the learning process in both class make the students have to finish their exercise in time with good quality. But, the higher percentage in the experimental class is caused of the students' independence in finding the material of the environment. The last aspect is environmental awareness which is shown in Figure 7.

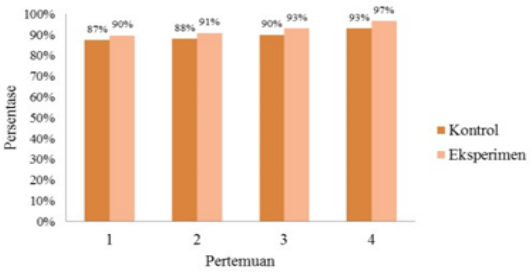

Figure 6. The scoring percentage for students' perseverance

The scoring of environmental awareness is done during the learning process when students do littering in their table or throwing their rubbish around them. Besides, students' awareness is portrayed through their ability to mention many environmental problems under ecosystem theme.

In Figure 7, the scoring percentage in the experimental class experience consistent improvement, but, the control class improvement is inconsistently occurred, so, the experimental class experienced higher score than the control one. This thing is caused of the class experiment demanded highly participative activities from the students during their observation to the environment and solves the problems about it. The students can understand the causes and effects from the problems that the students become aware to the environment around them.

Oppositely, there was no any problem solving occurred in the control class which can make them highly aware to preserve and maintain their environment's cleanliness. The observation analysis result for the students' scientific attitude is delivered in Figure 8.

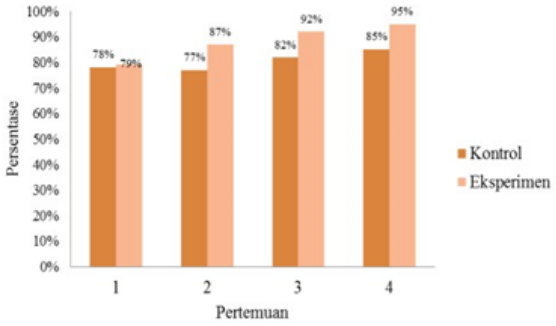

Figure 7. The scoring percentage for students' environmental awareness

Based on Figure 8, the average score of experimental class was proven higher than the control class. This result is in line with the research done by Yustina et al. (2014) that the Problem Based Learning can improbe the students' scientific attitude. The average percentage of students' scientific attitude in the experimental class is higher than the control class. This research provides questionnaire to the students as the supporting data. The data from the questionnaire's tabulation prove that 80% of the students give very good opinion to the usage of school environment as the learning source in the Problem Based learning method, while the other 20% says that the method was done well. Besides, the overall average of each was very high. It means this method of learning accept positive reviews from the students. There are many students who agree that this method provides them fun and helpful learning.

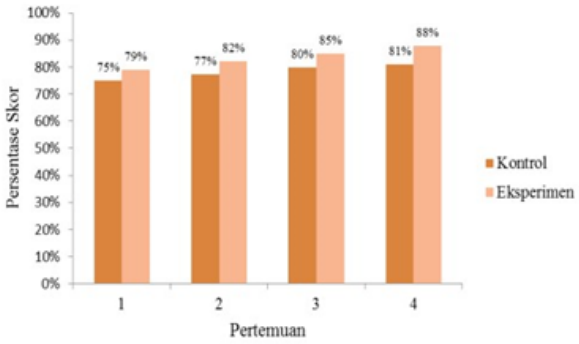

Figure 8. Scoring Percentage of Students' Scientific Attitude

This learning method makes the students protect the environment more. This thing is proven in the learning process when the students were highly attracted to the activities inside of the learning process. Thus, the learning process affects the learning result of the experimental class positively. The learning process with school environment though PBL was accepted as one of the variations that is rarely done by the previous teacher.

According to the previous research, there are some benefits of science learning using school environment as learning source of PBL: (1) the students will be able to identify the problems of the environment more, (2) the learning process will be more fun and less boring that the students actively observe and seek the environment outside of the class, (3) the students understand and remember more materials since they can find the learning concept in the environment by themselves, (4) the learning process will be more advantageous and it can be applied in daily activities, like protecting and preserving the surrounding ecosystems in specific and the environment in general. Moreover, the students will be able to maintain the cleanliness of the environment.The lack of this research is the students are still unfamiliar with Problem Based Learning where the learning process demands them to solve the environmental problems around them in the first meeting. So, the teacher should guide and direct the students more optimally. But, the students

become familiar in the next meeting which makes the learning process run smoothly.

CONCLUSION

According to the results of the research, it can be concluded that the use of environment as the learning source with PBL influence the students' cognitive learning result, and, the result obtained rb in the total of 0.663 with strong category. The use of school environment as the learning model in PBL influence students' scientific attitude in rs of 0.684 with the same category as the previous variable.

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