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The Influences of Outdoor Learning Process (OLP) on Conceptual Understanding and Environmental Concern: Implementations on the Ecosystem Subject

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Abstract. This research aims to determine the influences of Outdoor Learning Process (OLP) on conceptual understanding and environmental concern of tenth grade students on Ecosystem subject. It was conducted on tenth grade students of SMA Negeri 1 Bintan Utara 2017/2018 with quasi experiment method used the Pretest-Posttest Non-equivalent Control Group design. One subject group was given a specific treatment (experimental) and the other one as the control group. The influence of OLP method as independent variable and conceptual understanding and environmental concern as dependent variables. The results showed, there is a significant influence between learning by using the OLP and the conceptual understanding. On the other hand, there is no significant influence between learning with OLP and the environmental concern. In experimental group, the average level of the conceptual understanding increased from the 65.72 up to 76.38. Results of analysis, value of 0.000074, this value is smaller than significance value of 0.05. Hence, there is a significant influence of learning by using OLP on the conceptual understanding. Result of analysis of environmental concern, is bigger than significant of 0.05 that is 0.064. It means that there is no significant influence between learning with OLP and the environmental concern.

1. Introduction

Learning Biology directly in the environment will provide an experience for the students to get a more meaningful concept. This type of learning could help them to understand the concept of the materials taught and apply the concept, since the nature of biology as a science is to find out, to understand the natural phenomena, and to develop the understanding through the application of the whole concepts. The environment can be used as a resource for biology learning. Through the utilization of the surrounding environment as a source of learning, students will not only get the materials and understand the concept directly but could also grow the environmental concern. By utilizing the environment as a source of learning, students will experience. From experiencing, students will use their senses. The more they involve their senses in the learning process, the easier it will be for them to understand the concepts. [14] stated that the nature of a learning process is the interaction between the students and the learning objects,
so the learning process does not only depend on the existence of the teacher as the learning manager. This is the reason why we should not set aside the role of sources and learning media in the learning process. One of the methods used in biology learning in the outdoor environment is the Outdoor Learning Process (OLP) method. OLP is a science learning method by doing adventure in the environment, added with observation which the result will be written in the Observation Worksheet. Learning science with Outdoor Learning Process method (OLP) consists of three parts of observation, namely environmental observation, plant observation, and animal observation [3]. [7] stated that outdoor learning is a process of learning that can build meaning (input). Then, the process will go through the cognitive structure so that it can be memorable for the students (memory reconstruction). The ecosystem subject, especially the seagrass bed ecosystem is a learning object that can be observed directly by the students in their school’s environment.

Through the observation of seagrass, it is expected that the students are able to increase their conceptual understanding. [6] explained that the definition of conceptual understanding in the context of natural science based on expert opinions is the ability of the students to understand the conceptual relationship with each other so that it can be applied to solve the problems. An understanding of less established concepts can be characterized by not understanding the meaning of the knowledge content, definitions, and reasons of interrelated pieces of knowledge.

[15] through his research stated that outdoor learning process is important for the cognitive, affective, physical and social development of the students. Schools have an important role in educating the students to be active and responsible to their environment. [8], argued that outdoor learning process can increase the students’ knowledge and provide an opportunity to have an experience directly with the nature. In the study by [12] through her research concluded that the application of outdoor learning increases the students’ activity and learning outcomes. Outdoor learning contributes to integrated learning. It also provides recommendations for teachers to understand how they can increase the conceptual development of the students [10]. Outdoor learning is very valuable. It can be implemented in the school’s environment and improve the students’ knowledge and provide an opportunity to have an experience directly with the nature. In the study by [12] through her research concluded that the application of outdoor learning increases the students’ activity and learning outcomes. Outdoor learning contributes to integrated learning. It also provides recommendations for teachers to understand how they can increase the conceptual development of the students [10].

Based on those researches, the previous research focuses on the influence of the application of outdoor learning on the development of cognitive, activity, and social attitudes of students. This research examines the influence of outdoor learning process on the environmental concern and conceptual understanding of students, especially on the material of the seagrass bed ecosystem that is very close to the daily life of the students at SMA Negeri 1 Bintan Utara. There are still many students who do not know the concept and just memorize the subject materials. The underlying factor in understanding the concept is that students are not given enough practice to solve learning problems. Students become unaccustomed to link the previously acquired knowledge that is stored in their memory with the new acquired knowledge. The result is that the students also find it difficult to sort out the necessary knowledge in the learning operation. In terms of environmental concern, outdoor learning becomes a method for teachers to embed the values of students’ attitude towards environment. Basically, the characters could be built through the stages of knowledge, implementation and practice. Thus, by learning with OLP, students will have a tendency to care about their environment. The outdoor learning in this research is expected to influence the students’ level of conceptual understanding and the application through environmental concern. Students will engage directly with the objects of learning that can help them to build the concept in their knowledge independently. To achieve the basic competencies established, students should have a thorough understanding of the subject materials.

Therefore, this research aims to know the influences of outdoor learning process on conceptual understanding and environmental concern based on the observation of the seagrass bed ecosystem subject. The problem raised in this research is the influence of learning OLP with seagrass bed ecosystem subject on conceptual understanding and environmental concern. The learning subject is actually very rarely given the outdoor learning activities. The significance of this research is improving students’ understanding about seagrass bed ecosystem and environmental concern and values.
2. Research Method
This research was conducted at SMA Negeri 1, Bintan Regency, Riau Islands Province, from February to March 2018 in class X semester 1 in the academic year of 2017/2018. This research used the quasi experiment method. The design used was the Pre-test-Post-test Non-equivalent Control Group design, means that one subject group was given a specific treatment (experimental) and the other one was appointed as the control group. The independent variable is the influence of outdoor learning process and dependent variables are conceptual understanding and environmental concern. The subject of this research is the tenth grade students of SMA Negeri 1 Bintan Utara in the first semester in the academic year of 2017/2018. This school is one of the schools in Bintan Island that has untapped learning resources. The population in this study is all tenth grade students of SMA Negeri 1 Bintan Utara. The sample was determined by using purposive sampling. In this research, the class of X MIA 1 is the control class and X MIA 3 is the experimental class. The experimental class is a class that was given the treatment of using Outdoor Learning Process (OLP) method on the seagrass bed ecosystem subject, while the control class is a class taught without using the method of outdoor learning process, or by using the method of learning commonly used by teachers during teaching and learning process in SMA Negeri 1 Bintan Utara (conventional method). The techniques and instruments of data collection in this research are observation, documentation, and test. The observation technique was done by giving questionnaire to find out the environmental concern of the students and observation sheets done by the observer. Documentations techniques were conducted to record relevant information during the study. The test was conducted to determine the level of conceptual understanding of the students on the seagrass bed ecosystem subject in the form of questions and multiple choice descriptions. The content and construct validity of the test were retrieved from the expert judgment by using the face validity. That consideration was determined because the subject (the seagrass bed ecosystem) was not taught in the previous lesson. The data analysis technique was the SPSS version 23 with the significance level of 0.05.

The preliminary test includes normality and homogeneity test. The normality test was done by using the pre-test data in both classes (control and experimental), the hypothesis can be seen as follows:

H0: The data from population is normally distributed.
H1: The data from population is not normally distributed.

The results of the homogeneity test show that if the significance is more than 0.05 then the variant is homogeneous or in the same variant, and if the significance is less than 0.05 then the variant is different or not homogeneous. After the assumptions test was conducted, the influence of OLP on conceptual understanding and environmental concern of the students was then analyzed by using ANOVA.

3. Result and Discussions
3.1. Conceptual Understanding
The results of the pre-test and the post-test descriptive analysis are shown in Table 1. Table 1 shows that the average pre-test of the experimental class (65.72) is larger than the control class (63.42), and the post-test average the experimental class (76.38) is also larger than the control class (67.57).

| Descriptions     | Control Class |          | Experimental Class |          |
|------------------|---------------|----------|--------------------|----------|
|                  | Pretest       | Posttest | Pretest            | Posttest |
| N                | 35            | 35       | 36                 | 36       |
| Highest score    | 90            | 85       | 90                 | 90       |
| Lowest Score     | 32.5          | 47.5     | 40                 | 55       |
| Average          | 63.42         | 67.57    | 65.72              | 76.38    |
| Standard Deviation | 13.55       | 8.38     | 12.08              | 9.19     |
Based on Table 1, we can see that the average increase of students’ conceptual understanding of the experimental class is higher than the control class. That increased happened because the experimental class used the OLP with direct experience of students with the object materials. Students become more curious to ask about things that they had not known before. Through working on the worksheet in groups, students are more active, and can create the social interaction with their friends, enhance the teamwork, develop their motor, and strengthen solidarity. OLP can make learning biology more interactive and meaningful. As suggested by [2], outdoor activity contributes to cognitive, linguistic, motor, and social emotional development of children in school. Teachers should be informed about outdoor learning (OLP) and that it also should be incorporated into education curricula.

The data of pre-test and post-test on conceptual understanding between the control class and the experimental class indicated that there is a different significance increase. The comparison of pre-test and post-test graph average between control and experimental class is presented in Figure 1 below.

![Figure 1. The Comparison of Pre-test and Post-test Average Score On Conceptual Understanding between Control and Experimental Class](image)

From Figure 1, we can see that the average score of pre-test and post-test in the experimental class is higher than the control class. Before the ANOVA test, the assumption test must be required. The assumption test is the normality and the homogeneity test. The Kolmogorov-Smirnov normality test was performed on the data of conceptual understanding in control and experimental class with SPSS 23 program. The normality test result is shown in Table 2 below.

| Method  | Statistic | df  | Sig.  | Conclusion     |
|---------|-----------|-----|-------|----------------|
| Pretest |           |     |       |                |
| Kontrol | 0.104     | 35  | 0.200*| H0 is accepted |
| Eksperimen | 0.104 | 36  | 0.200*| H0 is accepted |

Based on Table 2, it is found that the data is normally distributed from the normality test. The hypothesis is as follows:

H0: The data from the population is normally distributed.
H1: The data from the population is not normally distributed.

It can be seen from the data that sig. value is higher than alpha coefficient (0.05), and it is concluded that H0 is accepted because 0.200>0.05.

The homogeneity test was done by using the Levene’s Test with SPSS 23 program. The homogeneity of the data can be accepted if the sig. value > alpha coefficient (0.05). It can be concluded that the H0 of data from the sample is homogenous. The homogeneity result is presented in Table 3.
Table 3. The Result of Homogeneity Test

| Dependent Variable | Sig. | Conclusion  |
|--------------------|------|-------------|
| Conceptual Understanding | 0.394 | H₀ is accepted |

The ANOVA test was done to find out the influence of OLP on conceptual understanding on the fulfillment of the preliminary test. The result of ANOVA is presented in Table 4 below.

Table 4. The Result of ANOVA Test

| Dependent Variable | Sig.          | Conclusion |
|--------------------|---------------|------------|
| Conceptual Understanding | 0.000074     | H₀ is rejected |

Based on the data analysis, it can be concluded that learning biology with OLP could make a positive influence on the conceptual understanding of the tenth grade students in SMA Negeri 1 Bintan Utara. Decision-making was based on the significance of using 0.05. If the significance is greater than 0.05 then H₀ is accepted, and if the significance is less than 0.05 then H₀ is rejected.

The main reason why the researcher used the seagrass bed ecosystem for the students’ observation is because there’s always a misunderstanding between seagrass and seaweed. Another reason is that students believe that seagrass bed has no ecological function, and only disrupt the aesthetics of the beach. Conceptual understanding is not only remembering and knowing, but also describing the examples and by doing that way students can explain the subject deeper. Students are required to work as teams to finish the worksheet. Through the worksheet, students can present their ideas or point of views about the abstract phenomena while doing an observation in the seagrass bed ecosystem. Field study is a part of outdoor learning that directly makes the students experience in the environment of the object being studied to link the theory and practice in field and improve their skills in observations, analysis, activity, awareness to their environment, teamwork, and argue their ideas independently.

[13] stated that conceptual understanding is an important psychological element in the learning process. Understanding is a high learning type of knowledge. Furthermore, [4] mentioned that students who have understood the material will be able to construct the meaning of learning messages, both oral and written. In the process, there is a full involvement of students in order to be able to find the materials learned and relate it to real life situations that encourage them to apply [1]. OLP can be a solution for teachers who use learning resource with a specific subject. An appropriate learning methods will provide an opportunity for students to be able to build the concept through a problem-solving process because of direct observation. As suggested by [10] outdoor learning provides recommendations for teachers to understand how doing it in the environment can increase the conceptual development of the students.

Outdoors learning helps the students to develop their thinking skills, the awareness of the complexity of the real world, and link the learning materials with their daily life [11].

3.2. Environmental Concern

The values in environmental concern include the sensitivity to surroundings phenomena, participations toward social activities and how to take care of the school environment. The data was collected by using questionnaire on environmental concern with the total of 30 items. The questionnaire was given after the students learned with OLP to find out their perceptions about environmental concern. The OLP influence data on environmental concern was obtained by using the SPSS 23 program. The result of the analysis on the influence of OLP on environmental concern is presented in Table 5 below.
Based on Table 5, it can be concluded that OLP has no influence on the environmental concern. The decision-making was based on the significance of using 0.05. If the significance is greater than 0.05 then H₀ is accepted, and if the significance is less than 0.05 then H₀ is rejected. There is no influence of OLP on environmental concern because there were only three meetings. The first meeting was when the researcher asked the teacher to introduce the OLP method. The second meeting was when the students learned in the field (seagrass bed ecosystem). Lastly, the third meeting was when the students finished the post-test. According to [5], outdoor learning can educate students, increase their score, and improve their achievements, while characters can be developed through the knowledge, implementation, and customs. After the students know the environment directly through the process of outdoor learning, students begin to care about the environment; the habit will come and eventually form the character of environmental concern. There were only three meetings of the learning so it could not be said that students have an environmental concern since the attitudes or characters will be built through habituations. In this preliminary research, OLP is only the media for teacher to use the learning resource especially environment. The value of environmental concern such as taking care of school environment actually has been seen in students. They put the trash into the bin, sort out the organic and nonorganic waste and shut down air conditioner without being ordered by the teacher.

Environmental concern is defined as the psychological tendency expressed by evaluating the natural environment at several levels to preserve, improve, and prevent environmental problems and it is important to be built early [15]. Schools have an important role in educating students to be active in social and environmental responsibility. Environmental education will be more beneficial for students if teachers conduct regular outdoor learning as direct experience for the students. Students need to have a relationship with the surrounding environment and around the school, especially those who live in the downtown where it is very difficult to interact directly with the nature every day.

4. Conclusion
Based on the result of the research, it can be concluded that 1) OLP has a significance influence on conceptual understanding students at SMA Negeri 1 Bintan Utara on the seagrass bed ecosystem subject and 2) OLP has no significance influence on environmental concern of the students at SMA Negeri 1 Bintan Utara but, the value and the tendency is already exist even if can only be observed.

5. Recommendation
Learning Biology with Outdoor Learning Process method requires students to make observations on the environment around the school. If the school environment is too wide, the teachers will find it difficult to monitor the learning activities. Therefore, the teacher should conduct observations on the location before the learning implementation. Teachers should be able to manage the time and students’ condition during the learning process since the implementation of learning with OLP methods by utilizing the school environment as a source of learning requires appropriate time and conditions. Teachers need to conduct learning with OLP in one semester with the appropriate learning materials at least. In addition, it is expected that there will be further research on OLP with different subjects.

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