The Influence of Outdoor Learning Model in Biology Instruction on the Environmental Care Attitude of the Senior High School Student

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Abstract: This research aimed to know the influence of model outdoor learning to improve environment care attitude on environmental care material of student in X grade of SMAN 1 Madapangga. The used method was quasi-experimental with pretest and post-test controls group design. The instrument is modified questionnaire consist of 6 aspects including habit of maintaining the cleanliness and preservation, maintaining the classroom environment, making habituation to separate types of organic and inorganic waste, programming clean environmental care, planning and carrying out various activities to prevent environmental damage, and provide cleaning equipment. Two classes were chosen by random sampling techniques and each class consist of 30 students. The data used is obtained from the questionnaire and analyzed by one way ANOVA. The result of data showed that the significance level less than 0.05. It can be concluded that the model outdoor learning in biologic instruction effective to improve environmental care attitude student.

Keywords: Biology; Outdoor learning model; Environmental; Student.

1. Introduction
Education is one of the most important components to develop individual potential, develop understanding in making the right decisions, and be able to foster the character of environmental care. The activities carried out are activities carried out through various activities such as observation, discussion, independent information extraction through reading, interviews, and models. Based on interviews with biology teachers at SMAN 1 Madapangga that teachers still use learning in the classroom the teacher still uses a lot of books especially on material changes in the environment, teachers still use conventional models, so students tend to be passive and listen to the teacher's explanation, even though learning material changes the environment should be held in an open environment so that students can see the state of the environment immediately, besides that based on observations at SMA N 1 Madapangga students are still less concerned about the school environment, this is indicated by the habits of students littering, and the state of the school in front of the class is not well maintained, and sometimes students often step on and pick flowers at random. From these findings it can be seen that the environmental care attitude of students is still lacking.

One learning model that utilizes nature as a learning resource is outdoor learning. Outdoor learning is a learning model that prioritizes the use of land around the school or other learning resources outside of school, thus allowing students to learn directly through natural phenomena based on their own
observations. In the teaching and learning process that is carried out outside the classroom, the teacher and students can learn the real situation outside the classroom by exposing students to environmental conditions to be studied and observed. Open space learning that is well designed can bring social interaction, good communication and at the same time become recreation so that it can eliminate boredom in students.

Environmental care has an effect on environmentally friendly behavior. Theory of Planned Behavior [1], explains that environmentally friendly behavior arises because of readiness for behavioral intention. The readiness is influenced by several things, one of which is attitude, which is specifically referred to as environmental attitudes. Environmental care can arise after several stages are fulfilled, namely, knowledge, implementation, and habits.

Based on the above problems, it is necessary to have an effective model and can be used in biology learning in accordance with the material of environmental change. The use of models should not focus on teachers (teacher centered). The outdoor learning model is considered suitable to improve students' environmental care attitudes. Because it can trigger the personal growth cycle of students such as caring for the environment, understanding concepts about natural phenomena around, can make decisions, and can collaborate with other students [2]. Adds outdoor learning model learning allows students to develop positive attitudes towards learning biology through pleasant experiences [3]. Based on the exposure that has been stated, it is necessary to conduct research on the development of outdoor learning models consisting of RPP and LKPD to improve understanding of concepts and environmental care attitudes of class X students on material changes in the environment.

The rest of this paper is organized as follow: Section 2 describes the notion of learning model. Section 3 presents the data used and proposed method. Section 4 presents obtained results and following by discussion. Finally Section 5 concludes this work.

2. Rudimentary

This section presents the notion of learning model.

2.1 Outdoor learning model

Outdoor learning models (Outdoor Learning) can be interpreted as an out-of-class learning model that provides direct experience to develop competencies in order to explore and understand the natural surroundings [4]. Teaching outside the classroom (Outdoor Study) a combination of learning in the classroom and learning outside the classroom and aims to direct students when learning outdoors by utilizing the surrounding environment or the open nature [5]. Outside education is an approach that aims to provide learning in the interaction between experience and reflection based on concrete experiences in authentic situations. This means that experience is to be a basic approach for learning [6]. The application of outdoor education through experiments can help students understand the concept of science [7]. Syntax of outdoor learning used in this study is presented in Table 1.

| Planning phase Syntax | Activity |
|-----------------------|----------|
| Students design the things needed in the observation process |

| Implementation Phase Syntax | Activity |
|----------------------------|----------|
| Students observe objects related to material changes in the environment and the teacher guides students |

| Evaluation phase Syntax | Activity |
|-------------------------|----------|
| Students are asked to evaluate their observations and communicate the results to other groups |

2.2 Environment caring attitude

The attitude of caring for the environment can be built from an understanding of the importance of managing natural resources and the environment can be realized through a learning process that is imposed on students so that students may have an environmentally caring attitude in order to increase students' awareness of environmental sustainability [8]. The awareness and concern of students
towards the environment cannot grow naturally, but must be pursued continuously from an early age, through real activities that are close to daily life [2].

3. Methodology
Using quasi-experiment method with pretest/post-test control group design. The population are 120 students from all the 10th grade in SMAN 1 Madapangga that consisted of four classes. From the four classes, two classes were randomly selected as the sample. Each class consist of 30 students to be experiment by outdoor learning model, and the other using conventional learning process as usual. Data collected by using questionnaire about students’ environmental care attitudes. Retrieval of environmental care data was carried out during pretest and post-test. Analysis data using ANOVA (Analysis of Variance) with Tukey test. Before testing the research hypothesis, before the prerequisite test, i.e. normality test by using Shapiro-Wilk test and homogeneity test by using Lavene test with sig. > 0.05. If the sample is not normal then tested Kruskal.

4. Result and Discussion
The effectiveness of students' environmental care attitudes was measured using questionnaires given before and after learning in outdoor learning classes and conventional classes with commonly method used by teachers.

4.1. Outdoor Learning Class Model
The improvement of students' environmental care attitude in the outdoor learning class was seen from the increase in pretest and post-test scores. Indicators of environmental care attitudes, namely (a) Habit of maintaining the cleanliness and preservation of the school environment, (b) Maintaining the classroom environment, (c) Making habituation to separate types of organic and inorganic waste, (d) Programming clean environmental care, (e) Planning and carrying out various activities to prevent environmental damage, (f) Provide cleaning equipment. The results of the pre-test and post-test of environmental care can be seen from the following Figure 1:

![Figure 1. Pretest-posttest environmental care on outdoor learning class](image)

From Figure 1 above, it can be seen that all indicators of environmental care attitudes on each indicator have increased after being given treatment. The highest value of 81 is the indicator Programming clean love environment and the lowest value of 62 on the indicator Maintaining the classroom environment and Programming clean love environment.

4.2. Conventional Class
The improvement of students' environmental care attitude in the outdoor learning class was seen from the increase in pre-test and post-test scores. Indicators of environmental care attitudes, namely (a) Habit of maintaining the cleanliness and preservation of the school environment, (b) Maintaining the
classroom environment, (c) Making habituation to separate types of organic and inorganic waste, (d) Programming clean environmental love, (e) Planning and carrying out various activities to prevent environmental damage, (f) Provide cleaning equipment. The results of the prestige and post-test environmental care attitude can be seen from the following Figure 2:

![pre-test-post-test conventional class](image)

**Figure 2.** pretest-post-test conventional class

Figure 2 above shows that all indicators of environmental care attitudes on each indicator have increased after being given treatment. The highest value is 74, which is the indicator of the habit of maintaining the cleanliness and preservation of the school environment and the lowest value of 59 on the indicator. Habit of separating organic and inorganic waste, is shown in Table 2 as follows.

### 4.3. Test Results of One Way Anova

Based on results of normality test by Kolmogorov-Smirnov method dan Shapiro-Wilk the pretest and post-test values of both classes are categorized normally. This means that data is normally distributed (see Table 3).

| Test      | Kolmogorov-Smirnov Exp. Class | Kolmogorov-Smirnov Control class | Shapiro-Wilk method Exp. Class | Shapiro-Wilk method Control class | Description |
|-----------|-------------------------------|----------------------------------|--------------------------------|-----------------------------------|-------------|
| Pretest   | 0.081                         | 0.091                            | 0.208                          | 0.208                             | Normal      |
| post-test | 0.091                         | 0.127                            | 0.118                          | 0.201                             | Normal      |

### 4.4. Result of homogeneity test

Based on the result of homogeneity test performed with Lavene test, it is known that Lavene statistic has significance above 0.05 so it can be said that the data variance is homogeneous (see Table 3).

| Test       | Lavene  | Description  |
|------------|---------|--------------|
| Pretest    | 0.90    | Homogeneous  |
| post-test  | 0.617   | Homogeneous  |

### 4.5. Result of Anova test

Based on Table 4 below, the result of Anova test of problem solving shows sig. of 0.000 which means smaller than 0.05. so in this case $H_0$ is rejected and $H_1$ accepted.
Table 4. Results of problem solving skills with Anova

| Test   | Significance | Conclusion   |
|--------|--------------|--------------|
| Anova  | 0.000        | H0 rejected  |

4.6. Discussion

Learning through outdoor learning is one of the basic requirements to develop students' environmental care. One of the learning models that can improve environmental care attitude is the implementation of outdoor learning by Lai in [9] and by Utaberta, et al. in [10]. Syntax outdoor learning relationship with indicators of environmental care attitude can be seen in Figure 3.

![Syntax outdoor learning relationship with indicators of critical thinking skills](image)

Figure 3. Syntax outdoor learning relationship with indicators of critical thinking skills can be seen in figure

The results of the study show that to increase students' understanding of environmental care attitudes on the cognitive and affective aspects that are most suitable to be applied is an outdoor learning model than conventional models. Based on the theory and findings by Priest in [11] which states that outdoor learning model learning can influence students' caring attitudes toward the environment, experimental learning methods by doing, which occur primarily through exposure outside the classroom, in outdoor education, emphasis on learning subjects placed in relationships about human and natural resources. Learning models of outdoor learning is carried out by involving students so that they can blend in with the surrounding environment and can perform various student activities that can lead to the realization of students' care for the environment through awareness, attention, responsibility, and behavior [12].

The results of outdoor learning as a change in thinking, feeling and / or behavior that is generated directly or indirectly from outdoor education [6]. Learning the outdoor learning model can have a big influence on cognitive abilities and affective aspects in the form of attitudes, beliefs, and perceptions of students [13],[14]. Non-classroom learning methods can improve skills and can strengthen human relations with nature. Learning the outdoor learning model allows students to develop positive attitudes towards learning biology through pleasant experiences [3].

Outdoor learning will give students the opportunity to have direct contact with the real world and provide a unique experience so that students can express environmental care attitudes that are never found in the classroom or textbook [15]. Outdoor learning will influence the behavior of students to be more concerned about the environment which is part of the action that results from knowledge, one of which comes from learning [16].

Learning of outdoor learning models to improve students' environmental care attitudes deserves to be used in the learning process, in accordance with the results of the analysis can influence student learning outcomes by using outdoor learning models.
5. Conclusion
In this paper, we have described the pretest and post-test score of experimental and control class. The pretest results of both classes are contiguous, the different condition can be found in the post-test result that showed score the experiment class students were much higher than the control class. Based on the results of research it can be concluded that biology learning by using outdoor learning model is more effective to improve environmental care attitude of high school student on environmental care material when compared to biology learning using conventional learning.

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References
[1] Ajzen, I., (2015), Perceived Behavioral Control, Self-efficacy, Locus of Control, and The Theory of Planned Behavior, Journal of Applied Social Psychology, 32 (4), 665-683.
[2] Neill, James T & Garry E. Richards (1998) Does Outdoor Education Really Work? A Summary of Recent Meta-Analyses. Australian Journal of Outdoor Education. 3 (1), 1-10.
[3] Kubat, U (2017) Of Science Teachers’ Opinions About Outdoor Education. European journal of education studies.3 (2), 344-354.
[4] Cahyono, A., Haryanto, S., & Sudarsono (2016) Peningkatan motivasi dan prestasi sains belajar melalui implementasi Outdoor pembelajaran kooperatif. Jurnal Pendidikan dan Praktek. 7(26), 21-26.
[5] Budiarti, M.R., Rintayati, P., Daryanto, J (2014) Peningkatan Pemahaman Konsep Sumber Energi Melalui Metode Pembelajaran Outdoor Study. Jurnal PGSD FKIP Universitas Sebelah Maret. 2.
[6] Gustafsson, Szczepanski, Nelson & Gustafsson (2011) Effects of an outdoor education intervention on the mental health of schoolchildren. Journal of Adventure Education & Outdoor Learning. 37(41), 1-17.
[7] Dillon, J., Morris, M., O’Donnell, L., Scott, W (2005) Engaging and Learning with the Outdoors – The Final Report of the Outdoor Classroom in a Rural Context Action Research Project. National Foundation for Education Research.
[8] Fagerstam, Emilia & Blom, Jonas (2012) “Learning biology and mathematics outdoors: effects and attitudes in a Swedish high school context”. Journal of Adventure Education & Outdoor Learning, 2012, pp. 1–20.
[9] Lai, C, S (2018) A Study of Fifth Graders’ Environmental Learning Outcomes in Taipei. International journal of research in education and science (IJRES). 4 (1), 253-262.
[10] Utaberta, N., mydin, O., Ismail, N (2015) In the search of green school design in Malaysia: an outdoor learning experience of rainbow troop and toto chan. Jurnal Teknologi. 75 (9), 9-14.
[11] Priest, S. (1986). Redefining outdoor education: A matter of many relationships. Journal of Environmental Education, 17 (3), 13-15.
[12] Amini, R., Munandar, A (2010) Pengaruh model pembelajaran pendidikan lingkungan berbasis outdoor terhadap penguasaan konsep pendidikan lingkungan bagi calon guru sekolah dasar. Jurnal Penelitian Pendidikan. 11 (1), 14-21.
[13] Mygind, Erik A (2007) comparison between children’s physical activity levels at school and learning in an outdoor environment. Journal of Adventure Education & Outdoor Learning. 7 (2), 161-176.
[14] Rickinson, M., Dillon J., Teamey K, Morris M, Young Choi, M, Sanders D., Benefield, P (2004). A review of Research on Outdoor Learning. National Foundation for Educational Research and King’s College London.
[15] Nisa, J (2015) Outdoor learning sebagai metode pembelajaran ips dalam menumbuhkan karakter peduli lingkungan. Social Science Education Journal. 2 (1), 1-11.
[16] Purnomo, A. (2015) Pengaruh pembelajaran outdoor terhadap pengetahuan, dan sikap pelestarian lingkungan mahasiswa s1 pendidikan geografi universitas kanjuruhan malang. Jurnal pendidikan geografi. th. 20 (1), 37-47.