



# Effects of service-learning with one movement for a nature program on senior high school students pro-environmental behaviors

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## Abstract

This study aims to determine the effect of the service-learning model using one movement for nature activities on students' pro-environmental attitudes. The design used in this study was quasi-experimental. This research was carried out at State Senior High School 1 Tanjung Bumi Madura in class XI IPS 2 as a control class and XI IPS 3 as an experimental class. Data analysis was performed using the SPSS 24.0 application. The results of the normality test suggested that the data were not normally distributed, therefore, the calculation was carried out using the Wilcoxon Signed-Rank test. Based on the results of the Wilcoxon signed-rank test, the Z value was -4.365 and the asymp sig value. (2-tailed) 0.000 was smaller than the five percent alpha level (0.05), signifying that  $H_0$  was rejected while  $H_1$  was accepted. Therefore, the service-learning model using one movement for nature activities carries effects on students' pro-environmental behavior.

**Keywords:** service learning model; one movement for nature; environmental care

## 1. Introduction

The imbalance in human-nature interaction may result in environmental damage. Linearly, Anggara (2017) describes that environmental crises are induced by asymmetrical interaction between humans and nature. Meanwhile, Anikarnisia (2017) mentions that substantial human dependability on nature has driven them to use natural resources in fulfilling their daily needs extensively. Meanwhile, improper nature management results in environmental pollution.

Environmental damages require serious management that demands cooperation between society to prevent environmental pollution. Proper environmental management should involve various environmental groups and policies from the government to ensure its implementation (Yazid, 2018). Gusmadi (2018) states that the implementation of environmental related policies is essential since it helps society to understand decent environmental management procedures.

The minimum knowledge of environmental management can decrease the environment quality. Consequently, the prevention of environmental pollution can be carried out through the socialization of relevant knowledge to society, primarily among the students (Sigit, 2017). Meanwhile, Afrianda (2019) accentuates that people with excellent environmental literacy have great care for the environment. Thus, environmental education provided to students is one of the attempts to grow the respect for the environment as early as possible. This

environmental education is deemed to be effective in enhancing the pro-environmental behaviors in society (Desfandi, 2015).

The pro-environmental behavior refers to people's behavior that reduces environmental damage and promotes nature preservation. Fitriati (2021) defines pro-environmental behavior as the efforts to conserve and improve nature, as well as to avoid further environmental damage. In this rapid era of development and increasing environmental damage, education has become a substantial alternative to ensure that our young generation has great awareness of the importance of environmental preservation. Also, Rizal (2017) highlights that global warming, climate change, and resource depletion are the three environmental issues mostly experienced by humans. Those environmental issues require great care for the environment, motivating people to perform pro-environmental behaviors.

Yaumi (2014) positions pro-environmental behavior as an exemplary attitude that aims to realize an aligned and harmonious environment with a balanced relationship between humans and nature, resulting in individuals who can use natural resources wisely. Once Indonesian citizens have great pro-environmental behavior, Indonesia can avoid possible environmental damages that are induced by other countries. According to the character education curriculum in Georgia (Samani & Haryanto, 2012), respect for the environment refers to upholding the environment, preserving and maintaining its function, as well as avoiding environmental pollution.

The pro-environmental behaviors should be developed as early as possible to ensure that the behaviors are implemented continuously. This pro-environmental behavior will be developed if someone has received accurate information about environmental preservation at an early age (Aliman, 2019). The classroom teaching and learning process can be a proper place that facilitates students to learn from their surrounding society using a specific learning model directly.

In developing students' pro-environmental behavior, contextual learning that allows students to learn directly in nature should be implemented. Besides, the students should also be obligated to preserve nature so that their surrounding society will also be aware of the importance of environmental preservation. Sumarmi (2019) describes that nature is the best teacher since it is capable of affecting students' psychology. Besides, the students' classrooms can be divided into three, namely the natural, social, and artificial classrooms. Thus, nature can be used as a classroom with a contextual learning model to ensure that students can learn effectively.

However, apathetic behavior toward the environment is reported in the State Senior High School 1 Tanjung Bumi as the students cannot maintain the cleanness of their classroom and the surrounding areas maximally. Besides, our initial interviews with the Geography teachers showed that the society around the school also frequently burns the rubbish during the lesson hours, disturbing the teaching and learning process.

As a consequence, the school offered numerous solutions to this issue. Our initial interviews with the teachers conducted in June 2021 showed that the school had implemented the Saturday clean program. However, during that program, four out of 54 students had not actively contributed to the program, while many of them were unable to sort out the inorganic from the organic trash. Therefore, this finding accentuates the need to develop students' pro-

environmental behavior. Additionally, the process of sorting out the inorganic and organic rubbish is also crucial to prevent the piling up of rubbish and air pollution, ensuring great air quality and a clean school environment.

Therefore, this study investigated the use of a service-learning model with one movement for nature activities to enhance students' pro-environmental behaviors. One of the learning activities in this study obligated students to separate the inorganic and the organic wastes. Ratnasari et al. (2019) explain that students need to be exposed to waste related environmental problems to develop their awareness and pro-environmental behaviors. Different from previous studies, this study used one movement for nature activities and required the groups to create digital posters with a theme of environmental protection. The one movement for nature activity facilitates the implementation of a contextual learning model that is expected to aid the attainment of learning purposes. Ramdani (2018) describes that contextual learning train students to be independent and to identify their character values as they are habituated to joining social activities, such as the mutual cooperation activities growing students' great cooperation.

This study aims to enhance students' pro-environmental behavior through a service-learning model using one movement for nature activities and digital poster creation with a theme of environmental protection. Additionally, this study also intends to encourage the surrounding society by uploading the students' activities on their social media. The focus of this study is to improve pro-environmental behavior.

The service-learning model was carried out previously by Kasi (2018) discovered that the learning model is capable of improving students' pro-environmental behavior since it escalates students' learning motivation and trains their thinking process. Differently, in this study, the students were also asked to create digital posters with a theme of environmental protection. The poster was later used to motivate the surrounding society to maintain its environment.

## 2. Method

This study used quasi-experiment design to identify the effects of other variables. We divided our research subjects into the control and experiment groups. The experiment class was treated using service learning and one movement for nature, while the control class only used conventional learning, consisting of lecturing, discussion, as well as question and answer activities. Detailed information on our research design is presented in Table 1, the research procedure is described in Figure 1, the participants' pro-environmental behaviors classification is shown in Table 2.

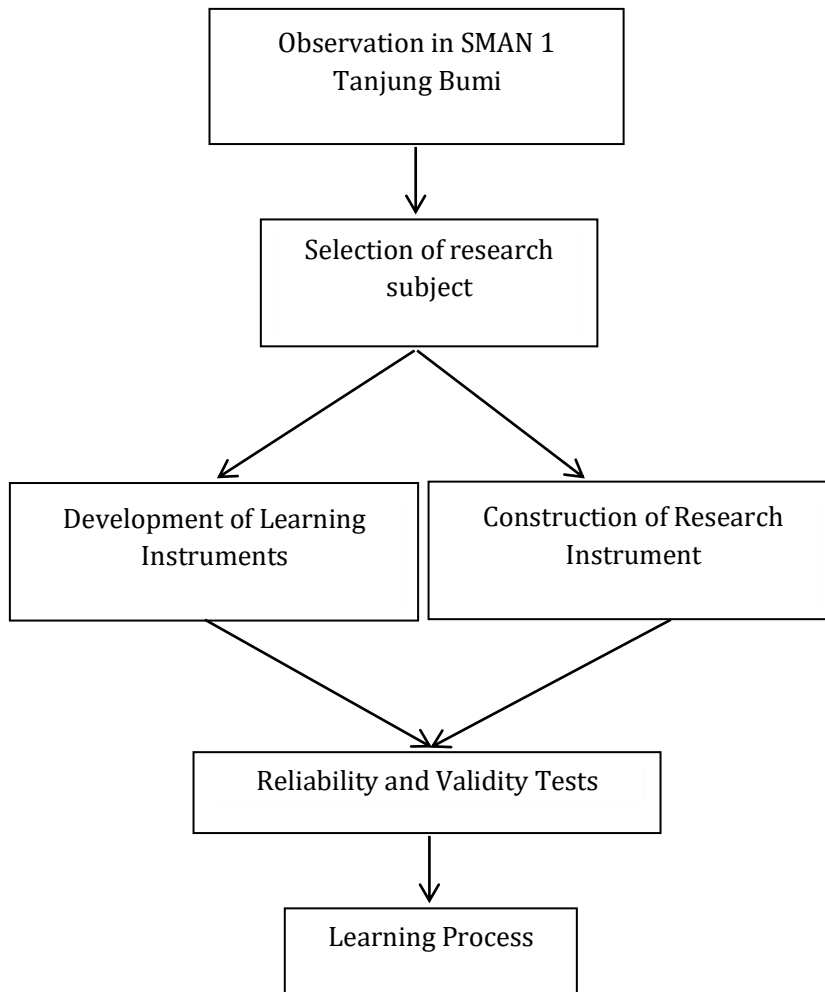
**Table 1. Research Design**

| Group          | Pretest        | Treatment | Posttest       |
|----------------|----------------|-----------|----------------|
| Experiment (E) | O <sub>1</sub> | X         | O <sub>2</sub> |
| Control (K)    | O <sub>1</sub> | -         | O <sub>2</sub> |

**Source: Zulhelmi et al. (2017)**

Description:

- E : Control Class
- K : Experiment Class
- O1 : Observation or initial measurement using pre-test
- O2 : Observation or final measurement using post-test
- X : Service-learning model
- : Conventional learning model through discussion, as well as question and answer



**Figure 1. Research Flowchart**

**Table 2. Classification of Participants' Pro-Environmental Behavior for the Pre-test and Post-test Score**

| Score Range | Classification |
|-------------|----------------|
| 81-100      | Excellent      |
| 66-80       | Good           |
| 51-65       | Sufficient     |
| 0-50        | Poor           |
| Total       |                |

**Source: Mulyani (2019)**

There were three classes in eleventh grade in the State Senior High School 1 Tanjung Bumi, but only two classes were used as research subjects. The research subjects were selected based on their similar pre-test scores. The pre-test results showed that the XI Social Class 1, 2, and 3 attained an average score of 72.93% (26 students), 68.55% (27 students), and 67.14% (27 students), respectively. In the end, XI Social 3 was selected as the experiment class, while XI Social 2 was selected as the control group.

The research instruments consisted of five essays test to measure the participants' understanding of the learning materials and 25 questionnaire items to assess the participants' pro-environmental behavior. Those essays and questionnaire items were distributed to both the control and experiment classes after the learning process. The validity test result of the questionnaire suggested that 2, 8, and 15 items were classified as very valid, valid, and sufficiently valid. Meanwhile, the Cronbach's Alphas for those 25 items was 0.765, categorized as highly reliable. The statistical analysis was carried out using SPSS 24.0, following the validity, reliability, normality, and Wilcoxon Signed Rank tests. The statistical analysis was carried out to identify the gain score, representing the difference between pre-test and post-test scores (Kasi, 2018). Also, the prerequisite tests of normality and homogeneity tests were carried out before the hypothesis test.

### **3. Results and Discussion**

#### **3.1. Questionnaire Data of Pro-Environmental Behavior from Control and Experiment Classes**

The pre-test results showed that in the control class, 18 (67%) and 9 (33%) students attained scores classified as good and sufficient, while no students gained excellent and poor scores. From the pre-test results, the control group presented a different number of students obtaining good and sufficient scores, while the experiment group showed no significant difference in the student getting good and sufficient scores. However, in the experiment class, there were more students with good pre-test scores than the students with sufficient scores.

Additionally, different pre-test and post-test scores were also observed. In the experiment class, different from the pre-test results, there was no post-tests score classified as sufficient. Meanwhile, in the control class, 21 (78%) students attained good scores, while 6 (22%) students still gained sufficient scores.

#### **3.2. Questionnaire Data of Pro-Environmental Behavior (Experiment Class)**

The pre-test scores of the experiment class were classified as low, with 14 (52%) students attaining good scores and 12 (48%) students gaining sufficient scores, with no students obtaining excellent scores. Contrastingly, the post-test scores of this class showed higher scores than the pre-test. As shown in Table 3, 15 (56%) and 12 (44%) students obtained scores classified as excellent and good, respectively. In the post-test results, no students of the experiment class attained scores categorized as sufficient and poor.

**Table 3. Recapitulation of Pro-Environmental Behavior Questionnaire Results from the Control and Experiment Classes**

| No    | Question   | Control Class |          | Experiment Class |          |
|-------|--|---------------|----------|------------------|----------|
|       |  | Pretest       | Posttest | Pretest          | Posttest |
| 1     | In my opinion, the wet and dried trash should be put in different places.                                    | 59            | 66       | 67               | 80       |
| 2     | If the rubbish that I throw goes outside the trashcan, I will take it and put it back in the trashcan.       | 57            | 67       | 75               | 84       |
| 3     | I reprove those who throw cans into the ditch.   | 73            | 73       | 76               | 87       |
| 4     | When there is no trashcan, I will throw the rubbish everywhere.  | 61            | 61       | 77               | 79       |
| 5     | I always shut the faucet off after I use it.   | 72            | 72       | 67               | 81       |
| 6     | I make bio pore water catchment area to catch the rainwater back to the ground.                              | 74            | 74       | 70               | 86       |
| 7     | I always collect the leftover water from washing vegetables and fruits and use it to water plants.           | 75            | 75       | 74               | 81       |
| 8     | When washing my clothes, I rinse my clothes no more than twice.  | 73            | 73       | 72               | 82       |
| 9     | I always turn off all of the lamps in my house at 5 am and do not turn them back on at midday.               | 71            | 68       | 64               | 86       |
| 10    | I will lessen the electricity consumption by 50 watts, during the peak load, between 5-8 pm.                 | 64            | 67       | 75               | 82       |
| 11    | I always plug off the wire from the electricity source whenever it is not used.                              | 62            | 64       | 60               | 89       |
| 12    | I always cover the pan and wok pan when I cook.  | 72            | 75       | 72               | 87       |
| 13    | I always use LPG to cook, not firewood.  | 74            | 76       | 61               | 85       |
| 14    | I always walk for short-distance travel.   | 75            | 75       | 74               | 83       |
| 15    | For travel more than 500 meters, I ride a bike.  | 70            | 78       | 65               | 80       |
| 16    | If I ride a vehicle, I prefer vehicles that produce minimum smoke.   | 74            | 76       | 76               | 84       |
| 17    | I admonish my friends and relatives who throw waste on the drain.  | 63            | 63       | 60               | 87       |
| 18    | I report to the local authorities if my warning is ignored by those who pollute the environment.             | 70            | 72       | 65               | 82       |
| 19    | I always actively participate in the community activities in the village                                     | 65            | 70       | 62               | 88       |
| 20    | I am uncomfortable being near a smoker in a closed room.   | 71            | 65       | 68               | 80       |
| 21    | In my opinion, many people do not follow government policies on environmental preservation.                  | 75            | 68       | 62               | 79       |
| 22    | I always obey the school regulation to maintain the cleanliness of the public facilities and infrastructure. | 73            | 76       | 59               | 83       |
| 23    | I do not ruin or pierce the desk in the school.  | 51            | 79       | 68               | 80       |
| 24    | In my house, I am willing to help my parents clean the house.  | 70            | 73       | 65               | 70       |
| 25    | I remind my friends to clean their desk drawers.   | 72            | 64       | 62               | 72       |
| Total |  | 1716          | 1770     | 1696             | 2057     |
| Score |  | 68.64         | 70.80    | 67.84            | 82.28    |

### 3.3. The Comparison of Pre-Test, Post-test, and Gain Score

The obtained pre-test, post-test, and gain scores are presented in Table 4.

**Table 4. Obtained Pre-test, Post-test, and Gain Scores**

| Test       | Experiment Class | Control Class |
|------------|------------------|---------------|
| Pre-test   | 67.84            | 68.64         |
| Post-test  | 82.28            | 70.80         |
| Gain Score | 14.44            | 2.16          |

Table 4 shows a substantial difference in the gain score between the experiment and control classes. Further, the hypothesis test was carried out using Wilcoxon Signed Rank, a non-parametric test, through SPSS for windows version 24,0.

### 3.4. Wilcoxon Signed-Rank Test

The Wilcoxon test was used to investigate the presence of different scores before and after the learning process. This test can only be carried out if the data is not normally distributed. The results of the Wilcoxon signed-rank test are shown in Table 5.

**Table 5. Results of Wilcoxon Signed Rank**

|                            |                | N   | Mean Rank | Sum Of Ranks |
|----------------------------|----------------|-----|-----------|--------------|
| Experiment-Control Classes | Negative Ranks | 2a  | 3.75      | 7.50         |
|                            | Positive Ranks | 25b | 14.82     | 370.50       |
|                            | Ties           | 0c  |           |              |
|                            | Total          | 27  |           |              |

- a. Experiment Class < Control Class
- b. Experiment Class > Control Class
- c. Experiment Class = Control Class

| Test Statistics <sup>a</sup> |                     |
|------------------------------|---------------------|
| Experiment-Control Classes   |                     |
| Z                            | -4.365 <sup>b</sup> |
| Asymp. Sig. (2-tailed)       | .000                |

Table 5 suggests that the service-learning with one movement for nature activities carries an effect on the students' pro-environmental behavior, with a Z score of -4.365. The effect of service-learning on students' pro-environmental behavior is observed to be significant. Besides, the experiment class that treated using service learning with one movement for nature activities gained higher scores than the control class that used conventional learning.

Therefore, the service-learning model implementation requires a particular activity to ensure the attainment of excellent results. The one movement for nature activities is one of the environmental movements that involve all school members, including the teachers and students. Through this activity, the service-learning method teaches students to preserve their surrounding environment in an effort to enhance their pro-environmental behavior. Nahrudin (2018) describes that in conserving the environment, we should involve all

stakeholders, such as government, society, and private parties, by dividing the collective social responsibility to realize environmentally friendly development.

Our data analysis results show that service-learning with one movement for nature activity carries substantial effects on students' pro-environmental behavior. This effect is induced by the implementation of the service-learning syntax, consisting of: (1) dividing students into some groups heterogeneously; (2) identifying problems through direct field observation; (3) asking students to do group discussion to determine the theme of the problem; (4) asking students to construct a systematic plan to solve the problem; (5) asking the students to perform their plan directly; (6) asking students to reflect and review the success of their plan; (7) asking students to present their activities in front of other groups, while the teachers create a report (Ardani, 2016).

In the experiment class, the students face the issues directly so that they are expected to find a solution for that problem, while in the control class, the students only discuss the issues. Abbas and Nurbaya (2018) explain that the proper implementation of the service-learning model trains students to be creative outside the classroom and affects the continuity of their future.

The application of one movement for nature activities was carried out using students' worksheets to guide the implementation of service-learning outside the classroom. Besides, to ensure the students' efficiency in completing students worksheets, we constructed a number of working steps. Rosada (2019) states that the learning process requires student worksheets as part of the learning material to support the learning process.

The teachers form five groups by dividing the students randomly, following their ability, with four to five students in each group. After that, the students conduct a direct observation of their selected environmental issue in order to construct a proper solution for the problem. Shudur (2017) describes that learning in a group develops students' cooperative skills, facilitating them to attain better achievement.

Each group was asked to clean different places, namely in front of the class, in the back of the class, in the school field, and in the warehouse. In the group, the students attempted to collaboratively resolve the issues in each of their locations. Nurmi (2012) states that learning in a group motivates students to cooperate and participate, enhancing their independent learning.

During the learning process, the groups complete their activity in the school environment, with the supervision of the teacher. The teacher's supervision aims to ensure that the students use their time properly. Each day, the students were given thirty minute to complete their tasks in a week. Meanwhile, Rivai (2021) highlights the importance of supervision in group work so that the students can carry out their work seriously. Also, the students constructed their learning activities, following the guidelines that we provided. The reports were collected, and the groups presented their report in front of other groups alternately. Through the presentation, the students comprehend the activities they had carried out directly in the field (Ardani et al., 2016). The service-learning activities are illustrated in Figure 2.





**Figure 2. Procedures of Service-Learning Activities**

In addition, the students were also asked to make digital posters with a theme of environmental preservation. Further, the students were asked to upload their posters on their social media as an attempt to motivate their surrounding society to participate in environmental preservation actively. Service-learning is a learning method that grows students' awareness to resolve an issue directly (Damons & Dunbar-Krige, 2020). The students' digital posters are presented in Figure 3.



**Figure 3. Posters from Service Learning with One Movement for Nature Activities**

The results of students learning were assessed by the teachers and their friends as a form of reflection. The student's active participation in the one movement for nature activities

aims to habituate students to manage their environment properly. The service-learning method was implemented by combining field experiments and academic learning through critical reflection activities (Setyowati & Permata, 2018).

In addition, our observation results suggest that the students actively participated in the one movement for nature activities, but four students did not enthusiastically join the activities. Further, during the presentation of the report in both experiment and control classes, some students did not listen to the group presentation seriously. This situation is induced by a minimum time allocation of only thirty minutes, for five times since the study was carried out during the Moslem holy month and during the COVID 19 pandemic. Besides, during the observation, some students had no great understanding of the procedures of constructing the working plan since they had never been asked to act directly, as they were habituated only to understanding the material theoretically. This finding is linear with Ratnawati (2016), who explains that the fundamental of learning is a combination of human sense recording and the urge to act. Therefore, learning is a fundamental element of action and reaction chain, forming a habit.

The students were also observed to creatively use the simple infrastructure in the school in carrying out their field activities. However, due to the social distancing policy caused by the COVID 19 transmission, some students were not highly enthusiastic about attending the activities. Similarly, a study conducted by Kasi (2018) also discovered that the service-learning model improves students' average pro-behavioral activities since this learning model motivates students to learn and train their thinking process.

Service-learning is a learning approach that combines the academic purpose and students' character development through community service activities. The learning model that offers knowledge, experience, and reflection process facilitates students to directly use the knowledge they have gathered in the classroom learning to resolve the community problems directly. Besides, the community was determined following the learning material by also considering the issue of discrimination toward the vulnerable groups and the effects of environmental quality degradation on sustainable development. The students carry the role of the volunteer in a community selected based on the learning materials. Meanwhile, the learning achievement is determined based on students' awareness of the measured social problem, measured from their change of perception of the issues faced by a particular group before and after the community service activity (Setyowati & Permata, 2018).

Our final analysis results showed that service-learning improves students' comprehension of the learning material since it is applied contextually, guiding students to implement their attained knowledge. Besides, this finding is also reflected in the post-test scores from the control and experiment classes. This finding is in line with a previous study carried out by Ardani (2016), revealing that learning in two classes may escalate students' learning results. Further, this learning model also aids students in communicating with society properly during field activities. The service-learning model has been adopted by a previous study conducted by Gita, Annisa, and Nanna (2018) on the effects of science learning using service learning and the SSI approach on students' problem-solving skills and respectful-of-fact behavior. That study concludes that service-learning affects science learning and respect toward fact behavior, with an effect size of 0.43 (categorized as low) and 0.63 (categorized as

moderate). Contrastingly, our study did not only use service learning, and we investigated the effect of service-learning on a different learning subject.

Service learning has four primary stages, namely preparation, implementation, reflection, and demonstration (students presenting field results). In the preparation stage, the student directly observes the issues in their surrounding environment to identify the issues and be capable of resolving them based on the recent situation. Meanwhile, in the implementation phase, students carry out an action in their school environment. In this study, during the implementation stage, the students cleaned the rubbish in the determined area. Further, in the reflection stage, students deliver the results of the activity to the teacher. In this study, the students constructed a field report following their field activities. In the last stage of the result presentation, the students present their activity results to the teacher and their friends. The service-learning model positions the learning process both in and outside the classroom, involving the surrounding society directly, such as through social activity. Karlela and Anisah (2016) mention that service-learning is contextual-based and holistic learning that aims to motivate the students to understand the learning material by associating their life context so that they can obtain knowledge, skills, and behavior comprehensively. Therefore, the students obtain knowledge through the natural process that they have carried out, not only through a transfer of knowledge from the teacher.

#### 4. Conclusion

We conclude that the service-learning model with one movement for nature activities carries an effect on student pro-environmental behavior. The effects were observed in the students' change of behavior, in which the students became more enthusiastic in applying their obtained knowledge directly in the field activities. Besides, the digital poster made by the students with a theme of environmental preservation also enhanced their pro-behavioral behavior, as reflected by their willingness to upload the digital poster on their social media. Additionally, the students also gave explanations to the people who usually burn rubbish to not burn them anymore and start preserving the environment. Thus, the students encouraged society to have better pro-environmental behavior. Students' better pro-environmental behavior is shown by higher post-test scores in the experiment class than the control class.

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