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The Effect of Environmental Volunteer Integrated with Service Learning (EV_SL) to Improve Student's Environment Care Attitudes and Soft Skills

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Abstract

Universities are required to provide graduates with environmental care and soft skills to survive in the globalization era. The universities in Indonesia implemented a special curriculum, called 'Kurikulum Merdeka (Independent Curriculum)', that required students to do volunteering activities to the community or do internships in institutions and companies for two semesters.The research aimed: (1) to determine the effect of the Environmental Volunteer model integrated with Service-learning on students' environmental care attitudes, (2) to determine the effect of the Environmental Volunteer model integrated with Service-learning on students' soft skills. This research was conducted on students of geography education program, Malang State University, Indonesia. The data was collected using observation sheets and test sheets, then analyzed using the independent sample t-test in SPSS version 21. The results showed: 1) there was a significant effect in the Environmental Volunteer integrated with Service-learning on students' environmental care attitudes, 2) there is a significant effect of the Environmental Volunteer integrated with Service-learning on students' soft skills. Student's environmental care attitude and soft skills are important assets in creating future leaders to support sustainable development goals.

Keywords: Environmental Volunteer, Environmental care attitude, Service Learning, Soft Skill.

Introduction

Improving environmental care attitude is needed to realize sustainable development. Sustainable development ensures that human life is free from poverty, having peace and prosperity by 2030 (UN, 2015). It can begin by developing environmental care attitude that will contribute to achieving sustainable development goals (Amin et al., 2020; Sumarmi et al., 2020; Susilawati et al., 2021). One of the goals of sustainable development goals (SDGs) is to protect land and marine ecosystems, reduce climate change, and create sustainable cities (UN, 2015).

Environmental care can be demonstrated in various ways through community groups that live with conservation areas (Ibrahim et al., 2015), such as environmental conservation in East Java, Indonesia. This conservation was managed by various institutions, groups, and individuals with different backgrounds. Environmental conservation institutions often accepted volunteer programs from universities for community service programs, internships, and research. Conservation groups need actual data from universities. The data measures environmental damage, rehabilitation innovations, human resources to create educational content, mentoring to conduct education, mapping the area, and others (Binder & Blankenberg, 2016). Collaboration between universities and practitioners in applying science is expected to directly benefit environmental conservation purposes (Binder & Blankenberg, 2016; Choo et al., 2018; Oldfield, 2008)pollution, parks.

Avoiding environmental damage requires an environmental care attitude. The attitude can be shown by active movements in maintaining and preserving conservation areas (Amï n et al., 2020). Individual response in receiving knowledge and processing information based on beliefs to protect the environment is an example of environmental care attitude (Sumarmi et al., 2020). The environmental care attitude can be achieved by a broader behavior following the facts and consequences for the environment (Aprile & Fiorillo, 2017). Students must be aware of the environmental care attitude and train sensitivity to environmental problems (Susilawati et al., 2021).

Involving students in environmental volunteer activities is expected to develop student's environmental care attitude and soft skills (England et al., 2020; Kasi et al., 2018). Soft skills can be defined as interpersonal skills used in communicating with others (Susilawati et al., 2021; Tadjer et al., 2020; Tsaoussi, 2020). Soft skills such as good communication,

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problem-solver, leadership, and team player are basic soft skills that students must have to compete in companies (Ahmad et al., 2019). Companies are more focused on soft skills than the academic value in accepting employees (Finch et al., 2013). Also, student's soft skills can be developed by applying collaborative and student-centered learning (Tadjer et al., 2020). Conventional learning methods such as lectures, discussions, and assignments frequently limit student's potential from developing optimally (Sumarmi et al., 2021) and 2. Therefore, an innovative learning model is needed to explore student's environmental care attitude and soft skills. There are many learning models that involve students in community serving, including experiential learning (Sumarmi et al., 2020; Utomo & Aliman, 2021), digital eco-learning (Sumarmi et al., 2021)and 2, problem-based service learning (Kasi et al., 2018; Sumarmi et al., 2020), EMCO learning (Prastiyono et al., 2021), service learning (Eckersley et al., 2018; Kaye, 2010; Krebs, 2008; Oldfield, 2008; Peters et al., 2006)some universities have developed school-university partnerships that engage their preservice teachers in professional experiences based on project-based learning. Three university partnership collaborations with schools (mostly located in low socio-economic status (SES. One of the learning models that involve students directly in the community is the service-learning model. However, research on the application of service-learning models integrated with environmental volunteer activities has not been widely conducted.

Literature Review

Service Learning is a life-based learning model (Peters et al., 2006). Students can use the information to provide direct service to the community. Service Learning can help students learn about the environment, social, scientific, and other issues (Eckersley et al., 2018; Krebs, 2008). Service Learning helps students construct new knowledge and conduct research projects (Krebs, 2008; Oldfield, 2008). In addition, service-learning helps students develop projects while helping solve community and environmental problems (Kasi et al., 2018; Sumarmi et al., 2020).

The Service Learning model provides a more effective experience to achieve maximum learning goals (Peters et al., 2006). The service-learning model has several advantages, including: a) increasing student motivation to learn, b) facilitating the achievement of learning objectives, c) gaining self-satisfaction, d) beneficial for students and society, e) getting meaningful learning, f) relevance between curriculum and real-world conditions, g) learning while working, and h) meaningful working (Krebs, 2008; Peters et al., 2006). Service Learning will be more meaningful with contextual learning (Dichabeng & Moalosi, 2016).

The Service Learning model has four stages (Kaye, 2010; Peters et al., 2006; Sumarmi et al., 2020): 1) Preparation, including preparation to exploring and analyzing problems in society using interviews or from various sources, such as books, print media, or electronic and compose appropriate programs accompanied by lecturers who are experts in these problems. 2) Action, implementing programs prepared following the Problem Based Service Learning activity program to find the main problems and solutions. 3) Reflection, the process of reflecting on program achievement, assessing the program's success, and identifying obstacles. 4) Demonstration, reporting the activities completed and sharing the success achieved.

Integrating Environmental Volunteer activities with Service Learning is needed to improve students' environmental care attitudes and soft skills (O'Brien et al., 2010; Susilawati et al., 2021). The environmental care attitude and the soft skills acquired as students can be applied to resolving problems in the environment (Oldfield, 2008). Environmental Volunteers integrated with Service Learning can construct new knowledge and solve problems following the topics studied in service activities (Binder & Blankenberg, 2016). Also, students can learn how to make assessments related to these service activities (Sumarmi et al., 2021). Students can support and serve local communities by resolving real-world issues (Al-Balushi & Al-Aamri, 2014). Based on the previous description, research on the application of environmental volunteers combined with service learning in increasing students' environmental care attitudes and soft skills has not been widely discussed. Therefore, this study aimed: (1) to determine the effect of Environmental Volunteer integrated with Service-learning on student's environmental care attitude, (2) to determine the effect of Environmental Volunteer integrated with Service-learning on student's soft skills.

Research Hypothesis

Based on the research objectives, some hypotheses are formulated:

- There is an effect of Environmental Volunteer integrated with Service-learning on student's environmental care attitude.
- There is an effect of Environmental Volunteer integrated with Service-learning on student's soft skills.

Method

Research Design

The research design used a quasi-experimental with a pretest-posttest non-equivalent control group design. The independent variable is the Environmental Volunteer integrated with Service Learning (EV_SL), and the dependent variable is student's environmental care attitude and soft skills. The research was conducted in the 2nd semester of the academic year 2020/2021.

Participants

The subjects of this study were second-year students in the geography education study program, faculty of social sciences, State University of Malang. This research is focused on students in the Environmental Geography courses, namely class G and class H. The experimental group (class G) applied the EV_SL learning as 39 students, and the control group (class H) applied conventional learning as 38 students. The group was selected using a random sampling technique because the two classes have similar learning abilities (Gall et al., 2006).

Implementation

The research subject was selected from students that participated in the Environmental Geography courses for one semester (1 semester = 4 months/16 weeks) with a duration of 100 minutes per meeting. Conventional learning is applied to the control group (class H). Furthermore, students are divided into several groups based on the topics in the syllabus. The pretest was given at the first meeting to determine the environmental care attitude and soft skills. The lecturer explained the topic in the second week, followed by a question and answer session. Students present the subjects discussed and engage in discussion at the next meeting, supervised by the lecturer. Posttest was given at the final meeting to find changes in students' environmental care attitudes and soft skills.

Table 1: Experiment Design

Group	*Pretest*	*Treatment*	*Posttest*
Experimental (E)	Q1	X	Q2
Control (K)	Q1	-	Q2

Source: (Reichardt, 2019)
Information:
E : Experimental group
K : Control group
O1 : Initial test in pretest
O2 : Final test in posttest
X : Treatment using EV_SL
- : Conventional learning using discussion dan research project

The EV_SL learning was applied to the experimental group (class G). The pretest is given to determine the environmental care attitude and soft skills. At the next meeting, the lecturer guided students to read literature and find information in social media about environmental problems in the surrounding environment. Students were divided into 7 groups consisting of 5 students to explore information about environmental volunteer activities in the coastal area of CMC Tiga Warna, Malang Regency, and forest areas in Seloliman, Mojokerto Regency. The stages of implementing the EV_SL learning are explained in the following discussion.

Preparation

Various institutions and volunteer groups are working to conserve the environment in East Java, such as the Bromo Tengger Semeru National Park Center (Taman Nasional Bromo Tengger Semeru) under the Ministry of Environment and Forestry (Kementrian Lingkungan Hidup dan Kehutanan) and the nature enthusiast group of Sahabat Volunteer Semeru (SAVER). Some volunteer groups also gather in the coastal area of Malang Regency, such as Gatra Olah Alam Lestari (Sendang Biru), Pilar Harapan (Bajulmati), Sido Lestari (Sidoasri), Kondang Merak, BOWELE (Lenggoksono). This volunteer group is the subject of experiments aimed to analyze and solve environmental problems. The group preparation is shown in the following Figure 1.

Figure 1 showed the discussion activities between students, lecturer, and the environmental volunteer group. This discussion was conducted to find problems and solutions related to environmental problems. The problems found include: a) the lack of mangrove plants in the coastal area and b) the lack of mahogany trees in the Seloliman conservation forest area.

Action

At this stage, each group of students has designed activities to solve the previously identified problems. The program carried out is planting mangrove seedlings and mahogany trees. This activity is shown in the following Figure 2.

Figure 1: Preparation in CMC Tiga Warna

Reflection

The experimental class then carried out the reflection stage. At this stage, each group analyzed and evaluated the activities conducted. Then, identifying weaknesses and solved unfinished activities. The reflection activity is shown in the following Figure 3.

Figure 3 showed the reflection activity with the lecturer to find out the weaknesses of the previous activity. Students then prepared the activity report after the program ended.

Demonstration

At this stage, each group of students presented the activity report. Furthermore, discussions were held to provide recommendations for future activities to environmental volunteer groups as the main pillars in conserving the area. The demonstration activity is shown in the following Figure 4.

Instrument and Procedures

Tests were conducted to measure the variables of environmental care and soft skills. This test is tested at the beginning of the meeting and the end of the environmental geography course. 5 questions were asked about the environmental care attitude, and 5 questions were asked about soft skills. Environmental care attitude and soft skills indicators have a maximum of 100 points. The measurement is divided into five categories: very good (81-100), good (61-80), moderate (41-60), poor (21-40), and very poor (0-20). The test instrument was developed based according to indicators of environmental care attitude by

Figure 2 (A-C): (A) Planting mangroves at CMC Tiga Warna Sendang Biru; (B) Mangrove Seedling at Tamban Sendang Biru Beach; (C) Planting Mahogany Trees on Mount Penanggungan

Figure 3: Reflection on the Planting Activities Completed

Figure 4. Submitting Reports to Lecturers about implementation and achievement on activity conducted

Table 2: Test instruments for environmental care attitude and soft skills

No	*Environmental Care Attitude*	*Soft Skills*
1	What problems are currently managed about environmental problems on the coast and the sustainability of water sources in the mountains?	How does your group analyze the environmental problems in the coastal area and the water source area?
2	What are the environmental volunteer roles in implementing environmental conservation on the coast and the sustainability of water sources in the mountains?	How does your group design and implement conservation activities to solve existing problems?
3	What are student roles in environmental conservation on the coast and the sustainability of water sources in the mountains?	Is your group capable of communicating effectively in creating and conducting conservation activities? Explain the issues.
4	What do you think about implementing the environmental volunteer internship in the 'Kurikulum Merdeka'?	Can your group collaborate effectively in creating conservation activities? Explain the issues.
5	What activities can you do to make the environment sustainable?	How is Work Ethics (concern, understanding of regulations, hard work) related to solving environmental problem?

(Nazarenko & Kolesnik, 2018) and indicators of soft skills by (England et al., 2020). The instrument then validated by experts in education from State University of Malang and tested to 35 students from the environmental geography course. The validity test was conducted using Pearson correlation test in SPSS version 21 with r count > r table (0.518 > 0.334). While, the reability test was obtained Cronbach alpha value with 0.735 > r table = 0.334. The test results implied that the environmental care and soft skills instrument can used for pretest and posttest. The test instrument is shown in the following table 2.

Data Analysis

Normality tests and homogeneity tests are used as requirements before hypothesis testing or prerequisite test. The normality test used the Shapiro-Wilk normality test to analyze the data distribution. The homogeneity test is used to determine the variance of homogeneous data using Levene's test for equality of variances. The data were analyzed using the independent samples t-test with a significance level of 5% using SPSS 21 for windows. The results produced gain score, the difference between the pretest and posttest scores (Reichardt, 2019).

Result

Student responses of the EV_SL learning

Based on the observations using EV_SL learning, several conclusions were obtained: 1) increasing students' new insights and experiences on environmental conservation. 2) Students have a greater understanding of nature and the surrounding environment. 3) Knowing the process of planting trees. 4) increase motivation in studying geography. 5) Adding a sense of love for the beauty of nature. 6) Satisfy to make a new friend and collaborate on environmental conservation ideas.

Sample t-test

The test was carried out using the unpaired t-test. The basic assumptions used are the normality test using the Kolmogorov-Smirnov test and the homogeneity test using Levene's test.

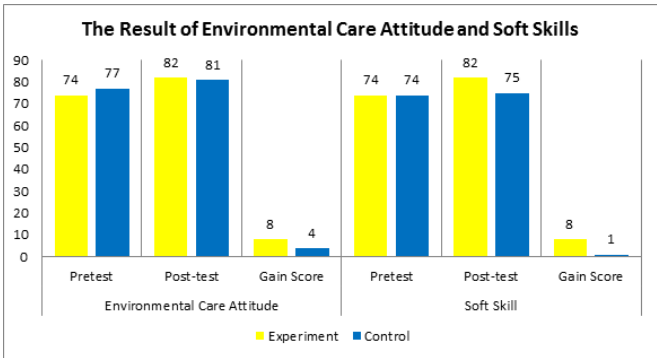

Figure 5: Pretest and posttest scores for student's environmental care attitude and soft skills

The Mann-Whitney U test is used if the data does not meet the assumptions. The variables measured were the gain score for environmental care attitude and soft skills. The gain scores of the pretest and posttest scores for the experimental group and the control group on the variables of environmental care and soft skills of students are shown in the following Figure 5.

Figure 5 showed that the gain score for the environmental care attitude of the experimental group students is higher than the control class. Meanwhile, the average pretest score remains in the 'good' category, but students' environmental care attitudes and soft skills scores increased to the 'good' category in the posttest. Also, the gain score of soft skills in the experimental group was higher than the control class. The normality test and homogeneity test were given later.

Normality test

The normality test aimed to examine the normal distribution of variables to proceed to the next test (Reichardt, 2019). The normality test result is shown in the following table 3.

The results showed that the variables of environmental care attitude and soft skills are not normally distributed with a significance value less than 0.05, so H0 is rejected or the data used is not normally distributed. The homogeneity test of data variance between groups was then used on each variable.

Homogeneity test of variance

The homogeneity test aimed to determine the homogeneity of the data variance between groups. The test results are as follows:

The results showed that student's environmental care attitude and soft skills were homogeneous with a significance value of each greater than (0.05), so that H0 was accepted or the data variance between groups was homogeneous. Furthermore, the Mann-Whitney test was used to test the variables of the student's environmental care attitude and soft skills because the data did not meet one of the tests, namely the normality test.

Hypothesis Testing using Mann-Whitney

The analytical hypothesis used is as follows:

H_0: There is no significant difference between the experimental and control groups related to environmental care attitudes;

H_1: There is a significant difference between the experimental and control groups related to environmental care attitudes.

With the following test criteria:

- if the Z count < -Z table, and the p-value < 0.05, then H0 is rejected;
- if the Z count > -Z table, and the p-value > 0.05, then H0 is accepted.

The effect of the EV_SL learning on student's environmental care attitude

The test results of student's environmental care attitude and soft skills in the experimental and control groups are shown in the following table 5.

Table 5 showed the gain score for the environmental care attitude variable in the experimental group is 8.28±3.82, higher than the control group at 3.74±3.35.

Furthermore, the Mann-Whitney test was used to determine differences in student's environmental attitudes using the EV_SL learning and conventional learning in the following Table 6.

The Mann-Whitney test found that the Z count is smaller than the -Z table (-4.936 < -1.960), and the Asymp value. Sig. (2-tailed) is smaller than (0.000 < 0.050), so that H0 is rejected or there is a significant average difference between the experimental and control groups based on the gain score of the environmental care attitude variable. Table 5 showed that the average gain score for the environmental care attitude variable in the experimental group is higher than the control group, and is significant.

The effect of the EV_SL learning on student's soft skill

The results of student's soft skill in the experimental and the control group are shown in the following Table 7.

Table 7 showed the average gain score for the soft skill variable in the experimental group is 7.92±4.60, higher than the control group at 1.50±4.17.

Furthermore, the Mann-Whitney test was used to determine differences in student's soft skills using the EV_SL learning and conventional learning in the following Table 8.

The Mann Whitney test found that the Z count was smaller than the -Z table (-5.700 < -1.960), and the p-value was smaller than (0.000 < 0.050), so that H0 was rejected or there is a significant average difference between experimental and control groups based on the gain score of soft skills variable. Table 7 showed that the average gain score for the soft skill variable in the experimental group is higher than the control group, and is significant.

Discussion

Student's environmental care attitude in EV_SL

The results of this study are supported by research that the application of the Service Learning model can increase environmental care attitudes (Kasi et al., 2018; Namada et al., 2019). The environmental care attitude increased significantly in the experimental class because implementing the EV_SL model involved students directly in conserving mangroves on the coast and planting trees around the water sources in Mount

Table 3: Normality test

Variable	*Statistic*	*Sig.*
Environmental care attitude	0.129	0.003
Soft skills	0.157	0.000

Table 4: Homogeneity test

Variable	*Statistic*	*Sig.*
Environmental care attitude	3.009	0.087*
Soft skill	0.159	0.692*

Table 5: The results of student's environmental care attitude

	N	*Mean*	*Std. Deviation*	*Std. Error*	*95% Confidence Interval for Mean*		*Minimum*	*Maximum*
					Lower Bound	*Upper Bound*		
Experimental	39	8.2821	3.81789	.61135	7.0444	9.5197	1.00	17.00
Control	38	3.7368	3.35055	.54353	2.6355	4.8381	-10.00	9.00
Total	77	6.0390	4.24091	.48330	5.0764	7.0015	-10.00	17.00

Penanggungan. Student activities that are directly involved in seeing environmental problems improve the environmental care attitude and responses to the environment (Al-Balushi & Al-Aamri, 2014; Ami ̇ n et al., 2020; Nazarenko & Kolesnik, 2018)two instruments were designed: the Environmental Knowledge Test (EKT. It is supported by the student's response stated that, "we are participating in the mangrove forest planting program to gain experience in maintaining the mangrove conservation (DNQ)".

At the Action stage, students have prepared an activity for planting mangroves on the coast and planting trees around the water sources on Mount Penanggungan. Another student responded that the "action" learning stage was presented by student with title "how to plant mangrove properly (DC)". The activities designed by students in this study have a statistically significant effect on students' environmental care attitudes (Amin et al., 2020; Nazarenko & Kolesnik, 2018). Other studies also stated learning that involves students on contextual social issues can increase environmental care (Susilawati et al., 2021). Involving students directly in environmental problems can increase students' interests and improve the environmental care attitude (Aprile & Fiorillo, 2017; Kasi et al., 2018; Sumarmi et al., 2020).

Table 6: Mann-Whitney Test of student's Environmental care attitude

Test Statisticsa	
	Environmental care attitude
Mann-Whitney U	259.000
Wilcoxon W	1000.000
Z count	-4.936
Z table	1.960
Asymp. Sig. (2-tailed)	.000

a. Grouping Variable: Group

Student's soft skills in EV_SL

Environmental volunteer activities that help community groups are a collaboration aimed at resolving environmental problems (Tadjer et al., 2020). Students working with volunteer groups learn indirectly to have a teamwork mindset, be helpful, communicate effectively, and work voluntarily. A studennt stated that,"together with other students, we become closer and comfortable working together on projects like planting mangroves (DG)". Other studies also stated that collaborative learning with EV_SL could improve student's soft skills (England et al., 2020). Also, a learning environment with a good environmental culture can develop student's soft skills (Ahmad et al., 2019). Soft skill also developed because students has known the nature from systemic aspect in environmental ethnic and non-systemic aspect in environmental awareness (Svennbeck, 2005). Soft skills development is also a result of the EV_SL method, which includes reflection and demonstration. At these two stages, students conducted analysis, evaluation, and discussion together to practice good communication skills (Ahmad et al., 2019; Tadjer et al., 2020). Effective communication is one factor that contributes to students' success as professionals (Susilawati et al., 2021).Learning is carried out in developing soft skills by integrating learning models and environmental conservation programs in mountainous or coastal areas. The EV_SL methodology helps volunteer groups throughout the reflection and demonstration stages because it provides recommendations for preserving coastal ecosystems in mangrove forest areas. Recommendations generated include:

Table 7: The results of student's soft skills

					95% Confidence Interval for Mean			
	N	*Mean*	*Std. Deviation*	*Std. Error*	*Lower Bound*	*Upper Bound*	*Minimum*	*Maximum*
Experimental	39	7.9231	4.59625	.73599	6.4331	9.4130	-2.00	22.00
Control	38	1.5000	4.17036	.67652	.1292	2.8708	-6.00	13.00
Total	77	4.7532	5.42934	.61873	3.5209	5.9856	-6.00	22.00

Table 8: Mann-Whitney Test of student's soft skill

Test Statisticsa	
	Soft Skills
Mann-Whitney U	189.500
Wilcoxon W	930.500
Z counr	-5.700
Z table	1.960
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Group	

(1) replanting mangrove forests (reforestation). (2) Planting mangroves with the community. Communities can be involved in breeding, planting, maintaining, and utilizing the mangrove conservation forests. This model benefits the community by creating job opportunities (Sumarmi et al., 2021). (3) Arranging coastal area layout: settlements, vegetation, public areas, and others. Coastal areas can be arranged into ecological cities and used as coastal tourism areas (ecotourism) of natural tourism or other forms. (4) Increasing the motivation and awareness to maintain and use mangroves responsibly. (5) Regulations for business and others should include conservation issues, particularly in coastal areas. (6) Increasing knowledge and local wisdom on conservation. Local wisdom that supports programs on ecosystems and conservation needs to be developed., such as preserving water source areas in the mountains. (7) Improving the coastal ecosystem with the community to improve the welfare of coastal communities (Sumarmi et al., 2021).

Conclusion

The results showed that: 1) there was a significant effect of the EV_SL model on student's environmental care attitudes because students appreciate and feel the relevance of tree planting operations, 2) there was a significant effect of the EV_SL model on student's soft skills because students work together to develop a plan, conduct direct activities, and assess the activity.

Suggestion

Educational institutions like universities play a significant role in building soft skills because these skills are more important than academic values in the industries. Therefore, lecturers required training to integrate learning that fosters student's environmental care attitude and soft skills. This research can be developed using other learning models. Additionally, it is necessary to analyze environmental care attitudes and soft skills based on gender and study programs to support sustainable development goals.

Limitation

This research is limited to soft skills and environmental care on geography prospective teachers. Other factors that influence soft skills and environmental care attitudes are not discussed in this study. In addition, the study was conducted for 6 months to see the development of environmental care attitude. The research is still limited to Malang, Indonesia, so a larger implementation in different areas is required.

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