The Use of Project Citizen Learning to Enhance Students Environmental Literacy at Senior High School Gayo Lues-Indonesia

Sanusi Sanusi[1], Rusli Yusuf[2], Maimun Maimun[3]

Department of Pancasila and Civic Education, Faculty Teacher Training and Education,
Syiah Kuala University, Banda Aceh[1,2,3]

{sanusi@fkip.unsyiah.ac.id[1], rusliyusuf@fkip.unsyiah.ac.id[2], maimunaceh@unsyiah.ac.id[3]}

Abstract. This study aimed at describing the knowledge and competence of environmental literacy of students at experimental, and examining the effect of the use of Project Citizen learning model. To achieve the objectives of this study, a quasi-experimental. The findings show that: 1) the knowledge of students' environmental literacy developed and it was proven by the result of the t-test that was 0.222, while the result of the control group was-0.057; 2) there was a significant effect of the use of Project Citizen learning model on the enhancement of students. It can be seen from the value of Sig. (2-tailed) that was 0.000 meaning that it is less than 0.05 (<0.05) with the mean score for experimental group and control group was 4.094 and 3.468 respectively.

Keywords: Environmental Literacy, Project Citizen

1 Introduction

In society, the environmental attitude and behavior is highly needed and important to be concerned on. The environmental attitude is defined as people reaction to environment by not destroying natural environment. Humans have psychological potentials such as creativity, feeling, and desire. With environmental attitude and behavior, health and clean environment might be created. The potentials keep developing in human life so that humans are classified as educated creature (Kutanegara, 2014). Suyadi (2013) also adds that the main characteristics of environmental awareness are powerful attitudes, behaviors and actions to protect environment. The development of these characteristics of environmental awareness should be developed individually by every human so that he or she can protect and take care of environment (Al-Anwari,2014). To build the awareness especially environmental awareness, young people should aware of the environment and be the agents of change for long-term environmental protection and management (Erhabora & Don, 2016).

Environmental awareness can be initiated by every person through simple and small actions. The character of environmental awareness can be integrated to learning process of every subject (Hamzah, 2013). It is in line with what has been recommended by Ministry of Education and Culture of Indonesia stating that the development of national culture and character can be involved in every subject, self-development and school culture (Ministry of

Education and Culture of Indonesia, 2013). Culture is a core that should be combined from various elements of human life so that in the culture inheritance, human mindset should be involved in (Ardiansyah, Suharno, & Triyanto, 2018).

In formal education, environment education is involved in school curriculum for every education level. The efforts to integrate the elements of environmental literacy with school curriculum are performed in various ways in some countries. Several countries, environment education is studied as one of subjects of learning (Krnel & Naglic, 2009). However, some other countries involve environmental awareness in other subjects such as science, biology, geography, ecology, and social science integrated with learning materials related to environmental attitude in social environment (Chun et al, 2007; Erdogan, Kostova, Marcinkowski, 2009; Kostova & Vladimirova, 2010).

Environmental literacy is an ability or competence to understand and to interpret the health system of environment and to use appropriate strategies or to make good decisions to take care of, recover and improve the condition of the environmental system (Nurwaqidah, 2019). Environmental literacy is also defined as a knowledge of the environmental concept, problems, issues, attitudes, cognitive disposition, cognitive skills and ability, competence, appropriate trust and behavior to make sound and effective decision in various contexts of environment. By comprehending the environmental literacy, society can create an individual with environmental awareness to take care of the environment. It is in line with the goal of environmental literacy which are to conduct and develop research, investigation, and analytical skill to gain the knowledge about environment and system process that is beneficial for human by developing the skill and ability to understand and deal with environmental problems; and to be citizens who are responsible for their own decision regarding environment (environmentally responsible behavior) (NAAEE, 1999; Archie, 2003).

Environmental literacy can be measured by using instrument (indicators) developed by Simmons in form of theoretical framework with some criteria of analysis (Simmons in Chu et, al, 2007; Endorgan et al, 2009). The indicators of environmental literacy adapted from Simmons include: 1) environmental attitude or behavior; 2) ecological knowledge; 3) socio-political knowledge; 4) environmental knowledge; 5) cognitive ability; 6) environmentally responsible behavior; and 7) additional indicators of environmentally responsible behavior. It is supported by Afrinda, R, Yolida, B., & Marpaung, R.R. T, (2019) stating that environmental literacy is carried out to make people understand and be able to solve the environmental issues or problems in their environment both individually and collectively. The study found that the students' environmental literacy was relatively low because of some factors one of which was students' lack of interest or curiosity to know and study about environmental issues (Cunningham, 2008; Abu, Hola, 2009; Sontay, 2015).

Individual with environmental literacy must have the positive environmental attitude or behavior, it is strengthened by Chawla (2006) stating that environmental literacy could build human behavior and character. It is in line with UNESCO in NAAEE saying that environment education is a media to develop the environmental awareness (NAAEE, 2011).

Based on the finding of the observation conducted, the environment condition in Kuta Panjang is extremely poor. It is observed from the waste around the river and road. It is also supported by a journalist documenting or reporting a training on improving waste management in Gayo Lues (Putra, 2018). Gayo Lues is a district in Aceh belonging to Gunung Leuser National Park with nature that must be protected by the local community (Sinamo, 2019). The sustainability of the biodiversity in this area is a represent of the wise attitude of the local community to live harmoniously with the nature (Putra, 2008).

Concerning on the problems in Gayo Lues specifically the environmental problems, it needs an advance improvement to cope with the problems. As an educator or academician, I am required to contribute and act to solve the said problems under the shelter of education. Education is a fundamental tool for the change of human environmental attitude and for the enhancement of their environmental literacy (Code & Sanchez, 2010). The development of students' environmental literacy is the main goal of environment education (Chu, et al, 2007; Culen, 2005; Disinger, 2005; Hsu, 2004; Mcbeth & Volk, 2010). The knowledge about environment education needs to be developed to prepare the citizens to actively contribute to create a sustainable environment and to increase the awareness, responsibility, appreciation and understanding about the importance of environmental literacy in human activities dealing with the nature (Chu, et, al, 2007).

The Project Citizen learning model is a learning model that is based on the problems put and written in the portfolio, in this matter, students have the chance to collaboratively solve the problems that appear in their social environment (Budimansyah, 2009). The Problem-Based educational program or Field-Based educational program is a learning model that can improve the ability to provide meaningful and beneficial chance or potential for students (Kinslow, et al,.2019). Huckle also states that the environmental knowledge or environmental literacy can only be achieved by practical learning process and direct project, so that the students can contribute to solve the environmental problems in their environment, in this context, it is called as Project Citizen Learning model (Mariyani, M, 2017). Project Citizen learning model is not merely constructive to develop students' understanding of the concept and scientific principle but also to build students' collaboration skill, communication skill, innovation skill, critical thinking skill, confidence, and awareness of social problem and to participate in social environment (Fajri, I., Yusuf, R., & Ruslan, R., 2019; Mulyoto, G. P., & Samsuri, S., 2017).

Grounded in the said research problems above, this study was accomplished to identify the effect of Project Citizen learning model on the development of students' environmental literacy entitled "The Use of Project Citizen Learning Model to Enhance Students' Environmental Literacy at Senior High School Kuta Panjang, Gayo Lues". This study formulated two questions of the study, namely: 1) How was the environmental literacy of the students of experimental group given Project Citizen model treatment and students of control group given conventional model; and 2) was there any effect of Project Citizen learning model in enhancing students' environmental literacy at Senior High School Kuta Panjang, Gayo Lues.

2 Research Methodology

This study used quantitative method that is quasi experimental design with pre-test and posttest and non-equivalent control group technique. There are two groups in this study, one experimental group and another one is control group. For experimental group, the students were given a treatment using Project Citizen learning model while for control group, the students only experienced conventional learning model. Before learning process begun, all of students from both groups were given pretest in form of a questionnaire regarding environmental literacy. The aim of this step was to measure initial environmental literacy skill of the students. After that, the experimental group was given a treatment using Project Citizen learning model and the control group was given conventional learning model. Next, all the students from both groups were given a questionnaire (posttest) which was the same as the

questionnaire given for pretest. This stage was aimed to identify students' environmental literacy skill after given the treatment. The table of the design of this study is presented below.

Table 1. Presttest-Posttest Nonequivalen Control Group Design

Group/Class	Pretest	Treatment	Posttest
Experimental (Project Citizen)	O1	X	O2
Control (convenstional)	O1		O2

Annotation:
O1   : Pretest
O2   : Posttest
X   : Treatment Project Citizen learning model)

This study was conducted at Senior High School 1 Kutapanjang, Gayo Lues. The population of this study were all students grade XII- Natural Science and XII-Social Science divided into 4 classes with the average number of students around 20 students in each class. In this study, both experimental and control groups were selected by using purposive sampling technique, a sampling technique that selects the samples based on certain criteria. It aimed at dividing the groups equally considering the classes were various (2 Social-science Classes and 2 Natural Science classes). Therefore, for the sample of the study, students at XII-Natural science 1 were selected as the experimental group and students at XII-Social Science 2 were selected as control group.

To collect the data needed, questionnaires consisting of 40 questions formulated based on the variables of environmental literacy were distributed to the students (samples of this study). The questionnaire used Likert scale from 1 to 5. From 40 questions, 30 questions were positive questions and 10 questions were negative questions. Next, the data gathered were analyzed by using descriptive statistical method to describe the variables of the environmental literacy. And, to test the hypothesis, this study employed Independent t-test technique by using SPSS Version 22 for Windows by marks statistical significance at the alpha 0.05.

3   Result and Discussion

In this context, Project Citizen learning model is a problem-based learning process which aims at developing and enhancing students' environmental literacy. The principles of Project Citizen model are active students' learning activity, collaborative learning activity, participatory learning and reactive teaching process (Surmatini, 2018). Budimansyah states that the citizen project model is one of the problem-based instructinal treatments to develop the knowledge, skills and character of democratic citizenship that trigger and encourage students' participation and contribution in civil society (Budimansyah, 2009:1). The goal of Project Citizen learning model is to motivate and empower students in using their democratic citizenship rights and responsibilities through an intensive study on public policy at school or society by preparing supportive skills and massive information (Budimansyah, 2009, p 1-2).

Project Citizen learning model consists of 6 main stages. They are: 1) identifying the problems, 2) selecting the problems to be examined and discussed in the classroom, 3) collecting the data or information, 4) developing portfolio, 5) presenting the portfolio and 6) reflecting on learning experience (CCE, 2006, p 4; Budimansyah, 2009, p 34) .

Fig. 1. The Stages of Project Citizen Learning Model

The enhancement of students' environmental literacy was conducted at school by using Project Citizen learning model under one theme namely citizens' rights and responsibilities for environmental conservation. The theme was selected by the students on the first stage that was identifying the problems in their community that they would study. This theme was intended to raise students' awareness towards the fundamental of taking care of the environment to prevent global warming. In the pilot study, this model was performed on the civics subject at Senior High School level.

Meanwhile, environmental literacy is an awareness of environmental health and the fundamental action to take care, recover or to improve the quality of the environment for sustainable environmental preservation (Hollweg, 2011; Ingbokwe, 2012). As previously stated, the goals of environmental literacy are to conduct and develop research, investigation, and analytical skill to gain the knowledge about environment and system process that is beneficial for human by developing the skill and ability to understand and deal with environmental problems; and to be citizens who are responsible for their own decision regarding environment (environmentally responsible behavior) (NAAEE, 1999; Archie, 2003).

Considering the importance of environmental literacy for each individual, the students' environmental literacy needs to be investigated. In this context, the environmental literacy skill can be measured by using the indicators of environmental literacy adapted from Simmons include: 1) environmental attitude or behavior; 2) environmental knowledge; 3) socio-political knowledge; 4) cognitive ability; 5) environmental behavior; 6) the intention to take action and 7) environmental curiosity (Simmons dalam Chu et al, 2007; Endorgan et, al, 2009; Hollweg, 2011; Stevenson et, al, 2013; Marcinkowski, et al, 2014). However, this study only used some criteria or variables, namely: 1) students' environmental knowledge, 2) cognitive competence, 3) environmental attitude and 4) environmental behavior.

Fig. 2. The Variables of Environmental Literacy
(Adopted from Simmons in Negev, M. et al, 2008)

Based on the statistical analysis, the result of students' environmental literacy was revealed. The result was used to identify and compare the score of the samples between students in experimental and control groups before and after the treatment was given. As previously stated, the students' environmental literacy was measured through the questionnaire with Likert Scale from 1 to 5. The result of the analysis is presented in the table below.

Table 2. The Result of The Descriptive Statistical Method of The Students' Environmental Literacy

Statistic	Experimental Group		Control Group	
	Presttest	**Posttest**	**Presttest**	**Posttest**
Number of Samples	25	25	25	25
Mean	3.872	4.094	3.705	3.648
Standar Deviation	0.343	0.413	0.241	0.294
Range	1.725	1.550	1.375	1.525
Variance	0.118	0.171	0.059	0.087
Highest value	4.825	4.925	4.375	4.525
Lowest value	3.100	3.375	3.00	3.000

The table 2 above pictures that the environmental literacy of the students who were selected as the samples of this study. The students were students at Class XII-Natural Science 1 and Class XII-Natural Science 2. The number of the samples was 25 students for each group, 25 students for Experimental group and 25 students for control group. Referring to the data presented in the table, it can be concluded that the students' environmental literacy was developed using Project Citizen learning model. Therefore, it can be said that Project Citizen learning model affected the enhancement of environmental literacy of students at Senior High School 1 Kutapanjang. To be more detail and clearer, the increment of the students'

environmental literacy through Project Citizen Learning Model can be seen in the table of the percentage of frequency below.

Tabel 3. The Percentage of Frequency and Categories of Environmental Literacy

Score	Experimental Group				Control Group				Category
	Pretest		Posttest		Pres\test		Posttest		
	f	%	f	%	F	%	f	%	
1,00 – 1,80	0	0 %	0	0 %	0	0 %	0	0 %	Very Poor
1,81 – 2,60	0	0 %	0	0 %	0	0 %	0	0 %	Poor
2,61 – 3,40	1	4,0 %	1	4,0 %	2	8,0 %	4	16,0 %	Fair
3,41 – 4,20	22	88,0 %	16	64,0 %	22	88,0 %	20	80,0 %	Good
4,21 – 5,00	2	8,0 %	8	32,0 %	1	4,0 %	1	4,0 %	Excellent
Total	25	100 %	25	100 %	25	100 %	25	100 %	

The Table 3 shows the percentage of frequency and category of environmental literacy from each group based on the result of both pretest and posttest. For experimental group, the percentage of students' environmental literacy for Excellent category significantly increases from 8% to 32%. It is different from the result of control group in which the percentage of students' environmental literacy for Good category decreases from 88% to 80%. Whereas, from the average score of students' environmental literacy before and after applying the Project Citizen learning model to experimental group and conventional learning model to control group is presented in the table below.

Table 4. The Result of The Percentage of Frequency and Categories of Environmental Literacy

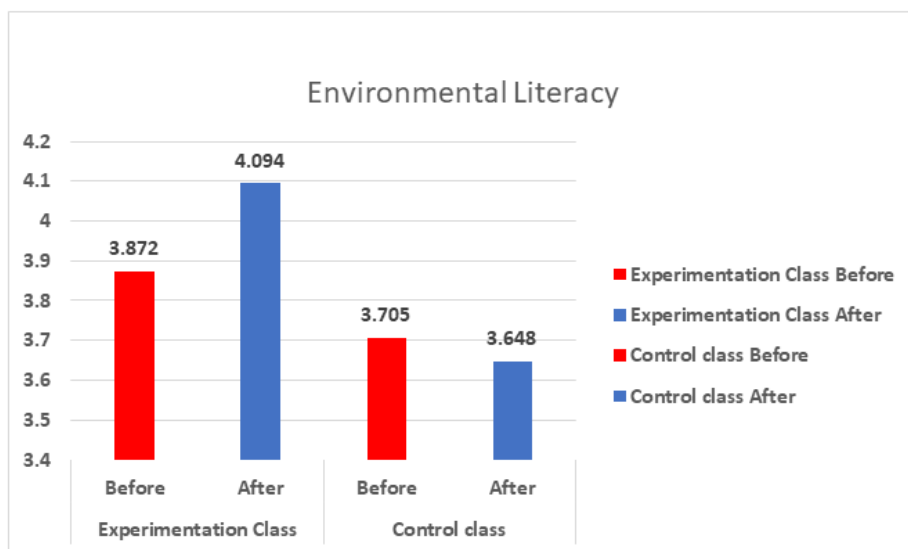| Group	Before	After	Increment
Experimental	3,872	4,094	0,222
Control	3,705	3,648	-0,057

Fig. 3. The Increment of the Average Score of Students' Environmental Literacy

Grounded in the result of the data analysis, firstly, the researcher did normality test and homogeneity test to test the hypothesis. The result of the normality test is sig. 0.116 and sig.0.200 for experimental group and control group respectively. Thus, the data distribution for both groups is normal as the sig. value is greater than α=0.05 (sig. value > 0.05). For more detail, it can be seen in the table 4 below.

Table 5. The Data of Normality Test
One-Sample Kolmogorov-Smirnov Test

		Experimental	Control
N		20	20
Normal Parameters[a,b]	Mean	4,09775	3,67875
	Std. Deviation	,412513	,206995
Most Extreme Differences	Absolute	,174	,135
	Positive	,174	,090
	Negative	-,110	-,135
Test Statistic		,174	,135
Asymp. Sig. (2-tailed)		,116[c]	,200[c,d]

a. Calculated from data.
b. Lilliefors Significance Correction.
c. This is a lower bound of the true significance.

After doing the normality test, the researcher did homogeneity test to reveal that the data of the samples come from the same variant of population. The result of homogeneity test for the environmental literacy of students from both experimental and control groups is Sig. 0.085. Therefore, it could be claimed that the data distribution of both experimental and control groups is homogenous.

Table 6. The Result of Homogeneity Test of
Students' Environmental Literacy

Levene Statistic	df1	df2	Sig.
3,095	1	48	,085

After conducting normality test and homogeneity test, the hypothesis test can be carried out. In this study, hypothesis test was accomplished by using sample t-test, a technique of hypothesis test to compare two different groups (Ghozali, 2013, p 64). In this context, the groups were experimental group and control group.

Table 7. The Result of Statistical Analysis of Experimental Group and Control Group
Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Environmental Literacy	Experimental	25	4.09400	.413338	.082668
	Control	25	3.64800	.294915	.058983

By using SPPS, the result of students' environmental literacy can be presented. The number of the samples is 25 students for each group, 25 students for Experimental group and 25 students for control group. Next, the mean value is 4.094 and 3.648 for experimental group and control group respectively. The value of Standard Deviation (SD) of experimental group and control group is 0.413 and 0.294 respectively. While, for Std Error mean, its value is

0.082 for experimental group and 0.589 for control group. The comparison of the average score between experimental group and control group is presented in form of diagram below.
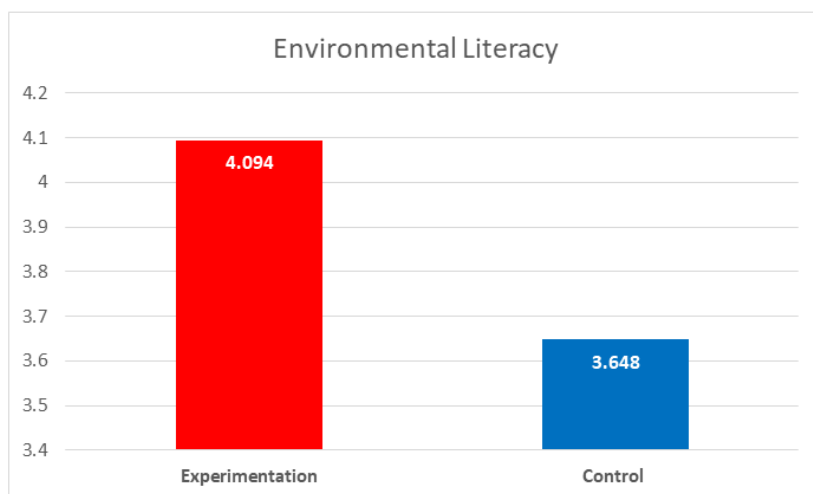

Fig. 4. Diagram of the Average Score of Environmental Literacy of Students of Experimental Group and Control Groups

Table 8. The Result of T-Test
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Literasi Lingkungan	Equal variances assumed	3,095	,085	4,392	48	,000	,446000	,101553	,241815	,650185
	Equal variances not assumed			4,392	43,406	,000	,446000	,101553	,241255	,650745

The result of t-test shows that the significant value is less than 0.05 (0.000<0.05); therefore, the Ho is rejected, and Ha is accepted. It means that there is a significant difference of the environmental literacy skill between the two groups. Based upon this, the hypothesis (Ho) of this study is accepted, namely there is a significant effect of the use of Project Citizen learning model to enhance the environmental literacy of students Class XII Senior High School Kutapanjang, GAyo Lues. It is supported by some scholars stating that Project Citizen learning model is a learning model that is based on the issues or problems in the social environment (local community) (Craddock, Fischer & Subreenduth, 2007; Haas, 2001; Vontsz, Metcalf & Patrick, 2000; Vontz & Nixon, 1999). Budimansyah also strengthens that Project Citizen learning model The citizen project model is a learning model aiming to develop the knowledge, skills and character of democratic citizenship that trigger and encourage students' participation and contribution in civil society (Budimansyah, 2009, p.1).

Numerous studies have found that there is a positive effect of the use Project-Based learning on students' environmental literacy. Faridah's study presents that Project-Based

Learning is a constructive and proper learning model to enhance students' environmental literacy. It is proven by the facilities provided by Project-Based Learning to students to build and empower their knowledge, skill and attitude to develop environmental literacy (Farida, et al, 2017). It is like Project Citizen learning model that provides spaces for students to develop their environmental awareness skills including knowledge, abilities and attitude. It can be observed from every stage of the learning model that encourages students to work collaboratively to solve the problems discussed. It is in line with Vontz & Patrick statement saying that this learning model will provide the chance for students to actively participate in government and society by practicing critical thinking, dialogue, debate, negotiation, collaboration and politeness as well as decision making for the betterment of all citizens (Mulyoto, G. P., & Samsuri, S., 2017). Several stages of Project Citizen Learning Model mentioned above can response and stimulate students to learn continuously by increasing their curiosity and to encourage students to keep questioning as well as to keep looking for the answer or solution (Dharma, S., & Siregar, R. 2015).

In this context, the variables of environmental literacy used as the indicators are: 1) students' environmental knowledge, 2) cognitive ability, 3) environmental attitude and 4) environmental behavior. Environmental knowledge indicator is the understanding about the relation between human and nature in order to develop environmental awareness. In this study, the students have good knowledge proven by the stages of Project Citizen learning model passed by students to solve the environmental problems or issues found in their society. The knowledge of the response to environmental issues or problems that can affect our structural understanding including local, regional understanding and global understanding (Mailinda, 2017). Besides to build the environmental knowledge, Project Citizen learning model can also build students' environmental attitude. Environmental attitude is important to build students' character to protect their environment. The process of the development of environmental attitude through this model is internalized in every stage of the model. This learning model will significantly help students not only understand the scientific concept and principle but also develop students' collaboration skill, communication, innovation, critical thinking, confidence, social awareness, as well as actively participate in society (Fajri, 2019; Mulyoto, 2017).

Next, for cognitive ability, through this model, the students can reach good knowledge including their critical thinking in solving the environmental issues or problems found. One of the abilities is students' ability in finding and identifying the sources in order to cope with the environmental issues or problems discussed. It is performed on the stage of collecting the relevant information. Luqman claims that through Project Citizen Model, students are demanded and trained to care, to be critical and to creative with the environment (Luqman, 2017). This model also gives the space for students' involvement in the society, so they can actively and constructively contribute to overcome the problems. The involvement of society is a strategic effort to create supportive and sustainable environment (Gifford & Nilsson, 2014; Knasova, 2015).

Project Citizen learning model can also build and improve students' attitude toward society. Environmental awareness is an attitude towards various environmental problems and the efforts to actively contribute to solve the environmental problems and issues (Hesham & Dajeh, 2011). Project Citizen learning model facilitates students to play their roles in coping with the environmental problems. It is in line with Trisiana's study (2016) revealing that the implementation of Project Citizen learning model in civic education at Senior High School level could produce effective and intellectual reinforcement that affect social attitude, social skill, and spiritual attitude for environmental preservation (Trisiana, 2016).

4 Conclusion

Referring to the findings presented above, it can be concluded that the use of Project Citizen learning model can enhance students understanding of environmental literacy which consists of 4 indicators, namely: 1) students' environmental knowledge, 2) cognitive ability, 3) environmental attitude and 4) environmental behavior. The finding shows that there is a significant increment of students in experimental group in understanding the environmental literacy proven by the result of statistic descriptive test that is 0.222. meanwhile, compared to the control group experiencing conventional learning model, the result of statistic descriptive is only -0.057. It indicates that the conventional learning model cannot enhance students' understanding of environmental literacy. Next, based on the hypothesis test and analysis, this study reveals that there is a significant effect of the use of Project Citizen learning model to enhance the environmental literacy of students Class XII Senior High School Kutapanjang, GAyo Lues. It is proven by the Sig. value (2-tailed) that is less than 0.05, namely 0.000 (Sig. 0.000<0.05) and mean value for experimental group and control group is 4.094 and 3.648 respectively. Thus, it can be claimed that Project Citizen learning model can enhance the environmental literacy understanding of students at senior high school level.

References

[1]   Afrianda, R., Yolida, B., & Marpaung, R. R. T. (2019). Pengaruh Program Adiwiyata terhadap Literasi Lingkungan dan Sikap Peduli Lingkungan. Jurnal Bioterdidik: Wahana Ekspresi Ilmiah, 7(1), 32-42.

[2]   Ardiansyah, R. (2018). Inheritance National Culture Through Learning in Elementary School at Disruptive Era: Case Study in Surakarta Indonesia. International Journal of Educational Research Review, 3(4), 48-53.

[3]   Azhar, A., Basyir, M. D., & Alfitri, A. (2015). Hubungan pengetahuan dan etika lingkungan dengan sikap dan perilaku menjaga kelestarian lingkungan. Jurnal Ilmu Lingkungan, 13(1), 36-41.

[4]   Budimansyah, D. 2009. Inovasi Pembelajaran Project Citizen. Bandung:Program Studi PKn SPS UPI.

[5]   Carlina, E. (2019). Science Project-based Learning Integrated with Local Potential to Promote Student's Environmental Literacy Skills. Advanced Journal of Social Science, 4(1), 1-7.

[6]   Chen, X., Peterson, M. N., Hull, V., Lu, C., Lee, G. D., Hong, D., & Liu, J. (2011). Effects of attitudinal and sociodemographic factors on pro-environmental behaviour in urban China. Environmental Conservation, 38(1), 45-52.

[7]   Chu, H. E., Lee, E. A., Ryung Ko, H., Hee Shin, D., Nam Lee, M., Mee Min, B., & Hee Kang, K. (2007). Korean year 3 children's environmental literacy: A prerequisite for a Korean environmental education curriculum. International Journal of Science Education, 29(6), 731-746.

[8]   Coyle, K. 2005. Environmental Literacy in America. Washington, DC: The National Environmental Education and Training Foundation.

[9]   Dharma, S., & Siregar, R. (2015). Internalisasi Karakter melalui Model Project Citizen pada Pembelajaran Pendidikan Pancasila dan Kewarganegaraan. JUPIIS: Jurnal Pendidikan Ilmu-Ilmu Sosial, 6(2), 132-137.

[10]   Ehrlich, P. R., & Ehrlich, A. H. (2013). Can a collapse of global civilization be

avoided?. Proceedings of the Royal Society B: Biological Sciences, 280(1754), 20122845.

[11]   Erdoğan, M., Kostova, Z., & Marcinkowski, T. (2009). Components of Environmental Literacy in Elementary Science Education Curriculum in Bulgaria and Turkey. Eurasia Journal of Mathematics, Science & Technology Education, 5(1).

[12]   Erhabora, N. I., & Don, J. U. (2018). Impact of environmental education on the knowledge and attitude of students towards the environment. Tạp chí Nghiên cứu dân tộc, (24).

[13]   Fajri, I., Yusuf, R., & Ruslan, R. (2019, May). Project Citizen Learning Model in Developing Civic Disposition Of High School Students Through The Subject Of Pancasila Education Citizenship. In International Conference on Early Childhood Education (pp. 393-403).

[14]   Farida, I., Hadiansyah, H., Mahmud, M., & Munandar, A. (2017). Project-based learning design for internalization of environmental literacy with Islamic values. Jurnal Pendidikan IPA Indonesia, 6(2), 277-284.

[15]   Farida, I., Hadiansyah, H., Mahmud, M., & Munandar, A. (2017). Project-based learning design for internalization of environmental literacy with Islamic values. Jurnal Pendidikan IPA Indonesia, 6(2), 277-284.

[16]   Hammarsten, M., Askerlund, P., Almers, E., Avery, H., & Samuelsson, T. (2019). Developing ecological literacy in a forest garden: children's perspectives. Journal of Adventure Education and Outdoor Learning, 19(3), 227-241.

[17]   Hamzah, S. (2013). Pendidikan lingkungan: Sekelumit wawasan pengantar. Bandung: Refika Aditama.

[18]   Haske, A. S., & Wulan, A. R. (2015). Pengembangan E-learning berbasis MOODLE dalam Pembelajaran Ekosistem untuk Meningkatkan Literasi Lingkungan Siswa pada Program Pengayaan. In Seminar Nasional XII Pendidikan Biologi FKIP UNS.

[19]   Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C., & Zoido, P. (2011). Developing a framework for assessing environmental literacy. Washington, DC: North American Association for Environmental Education.

[20]   Kemendikbud. (2013). Materi Pelatihan Implementasi Kurikulum 2013. Jakarta: Badan Pengembangan Sumber Daya Manusia dan Kebudayaan dan Penjaminan Mutu Pendidikan.

[21]   Kinslow, A. T., Sadler, T. D., & Nguyen, H. T. (2019). Socio-scientific reasoning and environmental literacy in a field-based ecology class. Environmental Education Research, 25(3), 388-410.

[22]   KOSTOVA, Z., VLADIMIROVA, E., & ATASOY, E. (2010). Development of environmental literacy by interactive didactic strategies. AT THE BEGINNING OF THE 21 ST CENTURY IN TURKEY, 366.

[23]   Krasny, M., Carey, J., DuBois, B., Lewis, C., Fraser, J., Fulton, K., ... & Marcos-Iga, J. (2015). Climate Change and Environmental Education: Framing Perspectives. Ithaca NY: Cornell University.

[24]   Krnel, D., & Naglic, S. (2009). Environmental literacy comparison between eco-schools and ordinary schools in Slovenia. Science Education International, 20, 5-24.

[25]   Kutanegara, P. M. (Ed.). (2014). Membangun masyarakat Indonesia peduli lingkungan. Gadjah Mada University Press.

[26]   Luqman, L. (2017). Penerapan Model Pembelajaran Project Citizen untuk Meningkatkan Keterampilan Berpikir Kritis dan Kreatif Siswa. Ilmu Pendidikan: Jurnal Kajian Teori dan Praktik Kependidikan, 2(1), 44-59.

[27] Marcinkowski, T. H. O. M. A. S., Shin, D. O. N. G. H. E. E., Noh, K. I., Negev, M., Sagy, G., Garb, Y., & Erdogan, M. (2013). National assessments of environmental literacy. International handbook of research on environmental education, 310-330.

[28] Mariyani, M. (2017). Strategi Pembentukan Kewarganegaraan Ekologis.

[29] Meilinda, H., Prayitno, B. A., & Karyanto, P. (2017). Student's Environmental Literacy Profile of Adiwiyata Green School in Surakarta, Indonesia. Journal of Education and Learning, 11(3), 299-306.

[30] Mukminin, A. (2014). Strategi Pembentukan Karakter Peduli Lingkungan di Sekolah Adiwiyata Mandiri. Ta'dib: Journal of Islamic Education (Jurnal Pendidikan Islam), 19(02), 227-252.

[31] Mulyoto, G. P., & Samsuri, S. (2017). Pengaruh model project citizen dengan pendekatan saintifik terhadap penguasaan kompetensi kewarganegaraan dalam pembelajaran Pendidikan Pancasila dan Kewarganegaraan. Jurnal Civics: Media Kajian Kewarganegaraan, 14(1), 105-118.

[32] North American Association for Environmental Education, & National Project for Excellence in Environmental Education (US). (1999). Excellence in Environmental Education: Guidelines for Learning (K-12). North American Association for Environmental Education.

[33] Nurwaqidah, S., & Ramli, M. (2019). Environmental Literacy Mapping Based on Adiwiyata and Non Adiwiyata at Junior High School in Ponorogo. KnE Social Sciences, 179-190.

[34] Panuntun, L. W. (2018). Optimalisasi berpikir tingkat tinggi melalui model project citizen dalam konteks pembelajaran abad 21. In prosiding seminar dan diskusi pendidikan dasar.

[35] Putra, R. H. (2018). Masyarakat Aceh Dan Konservasi Kawasan Ekosistem Leuser. Prosiding Biotik, 2(1).

[36] Putra. (2018). Tuntaskan masalah sampah di galus sekda ajak masyarakat ikut cari solusi, https://orbitdigitaldaily.com/tuntaskan-masalah-sampah-di-galus-sekda-ajak-masyarakat-ikut-cari-solusi/

[37] Robina-Ramírez, R., & Merodio, J. A. M. (2019). Transforming students' environmental attitudes in schools through external communities. Journal of Cleaner Production.

[38] Sinamo, L. K. (2019). Pemetaan Daerah Rawan Konflik Manusia–Harimau Sumatra (Panthera tigris sumatrae) di Sekitar Wilayah KPH VI Kabupaten Aceh Selatan Provinsi Aceh.

[39] Stevenson, K. T., Peterson, M. N., Bondell, H. D., Mertig, A. G., & Moore, S. E. (2013). Environmental, institutional, and demographic predictors of environmental literacy among middle school children. PLoS One, 8(3), e59519.

[40] Suyadi. (2013). Strategi Pembelajaran Pendidikan Karakter. Bandung: PT Remaja Rosdakarya Offset.