

The Implementation of Service-Learning Model to Enhance Students' Ecological Care

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Abstract-This study was conducted by considering the importance of students to have awareness and care in this era of ecological crisis that threatens human life. Service learning is one of alternative learning models used to enhance students' ecological care and responsibility with the concept of direct experience, applications and real work. This study is a qualitative research using a case study method with an interpretive paradigm. The population of this study is students of Civic Education Department in Syiah Kuala University. The research subjects were purposively selected using the purposive sampling technique. To collect the data, this study accomplished interview and observation to students, community members and 20 students' supervisors (lecturers). This study reveals that: students have a level of ecological concern when they experience the reality, observe, experience and see ecological damage directly by themselves. Besides, they must initiate to take action so that the environment exists harmoniously with nature.

Keywords: *ecological citizenship, service-learning, ecological intelligence*

I. INTRODUCTION

The world keeps changing. These changes occur so fast including the environmental ecological awareness, care and responsibility. It is in line with the paradigm of Civic Education which focuses on developing "civic competences" namely civic knowledge, civic disposition

and civic skills in each citizen [15] And the development of civic disposition of changes that actually lead to environmental crises. Globally, the environmental crisis happens in this world mostly starts from environmental problems (ecology) [1]. Ecological crisis is a real threat for human life. Indonesia is one of countries that cannot avoid the ecological problems. Nowadays, Indonesia is more appropriate to be known as a disaster country (Andisi, 2012), because Indonesia often experiences natural disasters such as landslides, floods, drought, earthquake, etc. [2][3]. Moreover, Indonesia is a country with climate and nature which are very vulnerable to global climate change which is triggered by global warming [4].

States that there are two main factors affecting the ecological crisis, namely: the use of natural resources that exceeds its growing capacity and the lack quality of human resources involved in the management of natural resources and the environment [5]. It is undeniable that the environmental problems (ecological) we experience today in the all over the world especially in Indonesia are more caused by human attitudes and behavior towards the environment [6], where human expectations are excessive for the capacity of the environment itself [7]. Paretiyo and Budimansyah argue that the main cause of the environmental problems and damages is the lack of awareness of citizens in protecting and preserving the environment [8]. Therefore, building and growing awareness and responsibility for preserving the environment

continues to be encouraged by the international community today, because of the threat of an environmental crisis [9].

Considering the alarming condition of ecological problems, experts and scholars have interested to conduct studies on ecological issues and done ecological-themed movements to increase ecological awareness, care and responsibility, such as the *ecoliteracy* paradigm [10]–[12]. Ecological Citizenship Ecopedagogics [13] and Environmental Education (Palmer, Joy A. and Philip Neal, 1994 5-6; Kumar, De Anil and Arnab de Kumar, 2004, 36). Moreover, in Indonesia, ecological problems integrated in some subjects, namely: History, Geography, Economics, Sociology, Anthropology, and Civic Education [14].

Civic Education as character education has an obligation to take a part in fostering citizens is rooted in the concerns, awareness, care and responsibilities of citizens. Care and responsibility itself are decisive-moral behaviors arising from feelings and originally released from the implementation of roles both in the form of rights and obligations [16]. The development of student character in the Civics Education Program is manifested through various academic and non-academic activities because students' ecological awareness, care and responsibility are not yet maximally developed. It might because students have no experience of implementing the knowledge they have gained in the lectures in the community. According to Yunansah and Herlambang ecological awareness is not built through an educational process that is only focused on transferring knowledge, but it needs a learning process that places students as active subjects in learning [17]. Citizens' awareness in the ecological field can be built by learning more about the environment, involving them protecting the environment and preserving the environment responsibly [18], [19].

One of the alternative ways is by giving students the opportunity to see, feel and experience the reality in the field to improve and increase their ecological awareness and responsibility. It is because the nature of learning must be closely related to real problems, situations and tasks (Tee, 2005a). Even Arthur K. Ellis states that the keyword of Civics learning is participation. Practically, learning Civics should reflect the efforts to form active citizenship through the process of knowledge and participation [20], [21]. Civic education needs to build citizens who actively participate and have "authentic experience" in their learning so that they do not only become "good citizens" but also become "active citizens" (Qualified and Curriculum Authority, 1998). Relying on the opinions of the experts, the civic education study program routinely organizes programs to facilitate the achievement of the purpose as a service learning activity.

These recent years, service learning has been widely used by universities as a method of learning, because it is in line with the *tridharma* (three pillars of higher education):

education, research, and community service. Conceptually, definition of service-learning is stated by Mintz and Liu, as follows: *The National Service-Learning Cooperative defines service-learning as a teaching and learning method that connects meaningful community service experience with academic learning, personal growth, and civic responsibility*"[22]. National Commission on Service-Learning and Terry and Bohnenberger also add that *"Service-learning is an innovative teaching methodology that integrates community service with academic study to teach community engagement, enrich learning, and strengthen communities* [23]. It is also strengthened by some scholars such as Wilczenski and Coomey defining that *Service learning is a service-based learning that is manifested through a learning-experience approach to create a meaningfulness* [24].

According to Assow (1988, 1989), *service-learning activities do not only respond to gifted students' interests and personalities, but they also further enhance their sensitivity to and interest and engagement in community, society, and world issues*. Therefore, it is reasonable if *Service learning* is implanted in several countries, even the USA government requires to service-learning to be involved in the education curriculum [12], [25] *Researchers and educators propose that service-learning can provide gifted students with challenging, appropriate curriculum and instruction that go beyond what is typically given to them in their classrooms*.

Service learning is able to improve, develop and motivate students to care and be responsible for ecology. Service-Learning holds three main principles, namely: helping each other, serving others and serving to manifest the theory into practice and hone care and responsibility [12]. In implementing service learning, students apply theories and concepts learned in the classroom into practice, then, they reflect on services and make reports on the implementation of activities. And, the manifestation of their knowledge is based on the contents of the material learned [26]. There are stages of service-learning in this research, namely: Investigation, Planning, Action, Reflection and Demonstration.

Based on the literature, the advantages of service-learning are: Astin, in *The Higher Education Research Institute* presents the impact of service learning on student progress in the areas of academic outcomes, values, leadership, careers, and plans to continue serving after higher education [27]. Meanwhile, Judge et al., revealed that service learning can develop life skills, increase a deep material development, and social awareness. Service-learning also improves academic abilities, including communication, building teamwork, and critical thinking [28].

Proposes some advantages of Service-Learning as follows "students have real responsibilities, challenging

tasks, helped to plan the project, and made important decisions, involvement in Service-Learning projects has significant and substantial impacts on students' increases in self-concept, political engagement, and attitudes toward out-groups" [29]. In addition, service-learning could make students satisfied because they realize that they can make a positive impact in the communities around them [30]. Moving on from that exposure, service learning is expected to be able to increase students' ecological awareness and responsibility and bridge academic theory with real problems in society. The purpose of this study is to design learning activities using service learning to enhance Civic students' awareness and responsibility for the ecology.

II. THEORETICAL REVIEW

The great challenge of our time is to build and nurture sustainable communities-communities that are designed in such a way that their ways of life, businesses, economies, physical structures, and technologies do not interfere with nature's inherent ability to sustain life. The first step in this endeavor is to understand the principles of organization that ecosystems have developed to sustain the web of life. This understanding is what we call ecological literacy.

Based on the explanation above, understanding of ecology must basically begin with the concept of life regulation and community connection to nature in order to create a harmonious relationship. Ecological understanding can be started from the way of life, business, economy, physical structure, and technology as well as understanding that ecosystems form networks of life. These days, it is very important that ecological understanding be taught to support the continuity of human life and the active involvement of citizens together in overcoming ecological issues. Even ecoliteracy movements has evolved towards ecopedagogy ones. Ecopedagogy is defined as a movement back to nature by re-exploring the values contained in the cultural heritage related to nature conservation [31].

Ecology-related discourse has begun in citizenship education as the concept of citizenship education is very broad or multidimensional, including all lines in the lives of citizens, both privately and publicly. Although the concept of citizenship was viewed as a mere traditional concept at first, for it was only seen from the standpoint of political status alone, today the concept of citizenship has continued to develop in line with changes in citizens' lifestyles. Nowadays the ecological problems have become transnational problems as they are experienced by all citizens of the world that, therefore, become initial reason for to initiate a concept called ecological citizenship [32]. Ecological citizenship refers to a concept that emphasizes the idea of participatory citizenship, i.e. the type of citizenship that is willing and able to participate in saving the earth or the environment [32].

Conceptually, service-learning is stated by John Dewey as "give the pupils something to do, not something to learn; and the doing is of such nature as to demand thinking; learning naturally result" [33]. Service-learning can be defined as a learning model that emphasizes the ability of students to construct meaning from reality in the application in order to sharpen and develop their thinking. Moreover, the National Service-Learning Cooperative defines service-learning as "a teaching and learning method that connects meaningful community service experience with academic learning, personal growth, and civic responsibility" [23].

Based on some literature, service-learning refers to a service-based learning that uses an experience approach to students to create meaningfulness [24]. Overall, the definitions of service-learning are almost the same one another with the similarities in terms of the focus on the activity, meaningfulness, participation, and service concepts. Therefore, it can be concluded that service-learning is a field learning model that emphasizes the activeness of learners to discover or construct existing realities in society with a combination of academic learning, personal development, and responsibilities as citizens.

Based on several opinions, service-learning is relevant when related to the 21st century learning in which students must be connected with reality in the community or society so that the learning becomes challenging. State that service-learning has some advantages, including that "students have real responsibilities, challenge in tasks, helped to plan the project, and made important decisions, involvement in Service-Learning projects had significant and substantive impacts on students, increases in self-concept, political engagement, and attitudes toward out-groups". Further, service-learning even gives satisfaction to students since they realize that they can make a positive impact in the community around them [30].

Nevertheless, the service-learning model also has some weaknesses. According to Peters, these weaknesses include: (a) it consumes a lot of time; (b) it requires a lot of costs if carried out as activities in the form of a large project; (c) some learners do not really like to do the service-learning activities; (d) it is difficult to balance the appropriate time; and (e) chances are communication failures between students and students and between students and community [34].

III. RESEARCH METHODS

This study is a qualitative research using a case study with interpretive paradigm. The case study aims at describing the process of implementing service learning in enhancing students' ecological awareness, care and responsibility. The service learning program was held in the Mangrove area of Jaya Baru District, Banda Aceh, Aceh. The informants purposively selected in this study were all

students who participated in service learning programs, the community members and students' supervisors (lecturers). The data were collected by referring to Stone Method (1978) that is by conducting library research and field studies (Interviews and Observation).

The data in the form of reports contains a description of all service learning processes starting from Investigation, Planning, Action, to Reflection. Primary data used in this study were collected using interviews addressed to students at the beginning and end of service learning activities and direct interviews with the community and lecturers companion. While, secondary data come from service learning activity reported by students. In this study, the authors employ data analysis techniques which are in line with the case study approach and the tradition of qualitative approaches.

IV. RESULTS AND DISCUSSION

Generally, the implementation of service learning in increasing the ecological concerns and responsibilities of students is conducted based on the service learning model divided into three stages, namely:

1. Pre-service learning
 - a. Giving a lecture or providing a subject that is an introduction to ecology to students of civic education program in Syiah Kuala University in academic year 2018/2019.
 - b. Conducting ecological observation simulation in the environment of Syiah Kuala University.
 - c. Doing library research about ecological care and responsibility.
2. Investigation service learning
3. Planning service learning
4. Action service learning
5. Reporting the Service Learning Activity

1. Pre-Service Learning

At the first meeting students were introduced to ecology engaging with civic education, impact, and eminences as well as public policies issued by the government and the introduction of the concept of service learning. It aims at making students understand about the importance, the essence and urgency of ecology for human life and the application of the service learning model including its processes / stages that must be accomplished, namely observation, plan development, implementation, evaluation and reflection. After the students were given the material and have a background knowledge and understanding of ecology, they are encouraged to do the observation related to the ecology they have done in the university, plant trees and waters them every morning and afternoon for 5 days. And, the last step was conducting a literature review / library research from various sources

about citizens' ecological care and responsibility in various countries.

2. Investigation Service Learning

At this stage, students discussed the service learning program that would be implemented with their supervisors. Students were directed to observe several areas that would become the alternatives sites of the service learning program. It aimed at mapping and identifying the ecological problems in the determined area through observation, interviews and documentation. This stage was conducted for more or less one week, due to the large area and the limitations of the information students had regarding ecological damage. After collecting the data needed, the students held a discussion and agreed on a service learning program to be held in the Mangrove area in the Jaya Baru District, Banda Aceh City, Aceh.

Service learning activities were held in the Mangrove area in Jaya Baru District, Banda Aceh City. It is because mangrove land has reduced and damaged due to reclamation of mangrove land into community ponds, human settlements, shops and become tourism areas. Moreover, the damage of the mangrove forest has caused abrasion, decreased coastal fishing results, some diseases due to landfill and reduced biodiversity (flora and fauna). Moreover, this area was also hit by the tsunami in 2004, where before the tsunami mangrove land area was 1.8 km² and the tsunami caused a substantial reduction of the land up to 1.2 km².

3. Planning service learning

This stage is conducted by actively participating in developing Service Learning Implementation Plan with students. This was done by considering the Class Schedule, fees and housing. The service learning in the Mangrove land in Jaya Baru Sub-district, Banda Aceh City was held for 3 days. It was because of the costs incurred during the activity that was so expensive, while, the program was not sponsored by other stakeholders and because of the diverse conditions students' financial ability, as well as students' schedules. Regarding the residence and lodging, the head of the study program, the supervisors and student representatives initially observed the location, ask for permission and assistance from the village officials and community leaders in implementing the service learning program.

4. Action service learning

Service Learning activities are accomplished in two (2) main activities, namely: 1) educating the community about the ecology and ecological conditions in their environment and planting trees together and cleaning the location of the implementation of the service learning program. The initial activity was the whole group visited people's homes to give and introduce ecological education as well as interviews /

dialogues about the problems caused by ecological damage in the area. All students were assisted by the community to hold a seminar on ecological issues by inviting speakers of Civics Education Study Program and participated by most of the community. The second or final activity of the service learning program was that all students and the community jointly clean up the residence and mangroves, and plant 100 mangrove trees.

5. *Reporting the Service Learning Activity*

Next is the final stage where all students based on the group are directed to make a report on service learning activities that had been carried out starting from the pre to compiling the report, as well as reflecting on all stages of the activity as well as providing input to the organizer related to weaknesses during the process for future improvement. In general, the report contains mangrove forest damage, community conditions and solutions that can be done to care and maintain the ecology. The report was compiled for 1 week and submitted for correction and re-confirmed to students regarding the data and discussion and were assessed by the lecturer.

Referring to the results of the interviews and observations to each student, it can be seen that the ecological care and responsibility increase as their knowledge of ecology increases. It is based on lecturers' exposure during the lectures and the results of library research. The increment of students' ecological care and responsibility can be seen from the results of interviews conducted to the informants; although, there were some students who realized about the ecological problems after they directly observed it. This was known from the results of interviews, where most students had only heard about the problems but never seen directly the ecological problems especially ecological damage. Yet, they often got the information about ecology and natural damage through mass media both offline and online.

It is assumed that students' ecological care and responsibility before participating service learning activities was lack. It is seen from the number of students throwing garbage in the classroom during learning process but after carrying out service learning activities their care and responsibility have begun to increase. It is proven by the finding when they were given the responsibility to plant trees and care for these trees. After doing the interviews with several informants, some of them claimed that it was difficult to care for one tree, so they promised to keep and not cut down the trees for the future.

Service learning activities are new experiences for all students. This learning model gives them valuable experience and knowledge about ecology more than just sitting in class and accessing information from existing sources, because service learning presents problems in reality so that they can understand and memorize the

memories. Some informants even said that this activity would be remembered and will be applied in their regions, because their area also experiences ecological problems. Furthermore, students suggest that service learning programs should be routinely carried out by expanding the scope of the area, problems and time of activities. The interview result also shows that many students have held similar activities with service learning activities, such as community service and activities involving other communities. However, in its implementation, students were not comprehensively involved neither in planning, nor in the implementation and students did not have sufficient knowledge so that in carrying out their activities they tended to implement it half-heartedly. It is very different from the service learning that they have participated in, where service learning prioritizes knowledge and planning as well as involving students' ideas so that they have the responsibility to succeed the service learning program activities.

In implementing service learning activities, students are very enthusiastic to apply the knowledge they have gained in lectures directly to the community. It is proven by the efforts of students to convince and make people aware that ecological damage will adversely affect their life in future. Students' care and responsibility of students have increased as evidenced by the results of interviews with several communities where all students were involved in the implementation of activities and students were very enthusiastic and active in carrying out all these activities, even if they had other activities. Besides care and responsibility, through the report, this study also discovered other characters that appeared after carrying out this service learning activity, namely creativity, tolerance, hard work, and communication skill because in planning the trees and implementing programs students were required to be creative especially to adjust the program with problems in society.

At the beginning of the program, some students felt confused because basically they did not have knowledge about ecological activities and problems. Their confusion revolved around determining the location of service learning program and determining topics / themes; even though, at the in the end, they could determine and plan the program well. After carrying out service learning activities, all students felt happy and satisfied with the activities they carried out. It is because they could share, provide solutions and invite people to get involved in protecting the environment / ecology. The knowledge they get in college becomes the main capital in carrying out service learning activities. Some students even think that this service learning activity is continuously carried out and is continuously being improved, especially issues related to Civics material to develop the abilities, care and responsibilities of citizens. Then the service learning activities carried out by students also received positive

responses from the community, especially community leaders.

V. CONCLUSION

Education has an important role to solve the nation's problems, especially ecological problems that keep becoming alarming issues. Therefore, students' care needs to be nurtured. It was believed that service-learning is able to foster student awareness in dealing with ecological problems, because they are invited directly to see, observe and feel the damage and even provide solutions to the community in the form of education related to the problems encountered. Students felt enthusiastic in running the learning service program because they were given the chance to educate the community, then worked together in groups to solve problems and tried to understand the character and culture of the local community. Service learning activities in the community integrated in the subject need to be implemented sustainably to explore the values of local wisdom and overcome problems encountered by the community.

REFERENCES

- [1] F. L. Wilczenski dan S. M. Coomey, *A practical guide to service learning: Strategies for positive development in schools*. Springer Science & Business Media, 2007.
- [2] L. m. H. Program, "Kondisi Permukaan Air Tanah dengan dan tanpa peresapan buatan di daerah Bandung : Hasil Simulasi Numerik," *J. Geol. Indones.*, vol. 4, no. 3, hal. 177–188, 2009.
- [3] Pratiwi dan C. S. Nugroho, *Studi Pengaruh Pengetahuan dan Perilaku Warga Kecamatan Coblong , Kota Bandung dalam Menyikapi Sampah Rumah Tangga terhadap Akumulasi Sampah Rumah Tangga*. Lembaga Administrasi Negara, 2015.
- [4] M. Ahdiyana, "Meningkatkan kepedulian terhadap kelestarian lingkungan hidup melalui pemilahan sampah mandiri," 2014.
- [5] R. Utina, "Kecerdasan Ekologis," *Pidato Pengukuhan*, 2018.
- [6] V. A. K. Staf, "Pengetahuan, Sikap Dan Kepedulian Mahasiswa Pascasarjana Ilmu Lingkungan Terhadap Lingkungan Hidup Kota Jakarta," *EKOTON*, vol. 8, no. 2, hal. 1–24, 2008.
- [7] Botkin, D. B, dan E. A. Keller., *Environmental science: Earth as a living planet*. Wiley, 2009.
- [8] W. H. Prasetyo dan D. Budimansyah, "Warga Negara dan Ekologi : Studi Kasus Pengembangan Warga Negara Peduli Lingkungan Dalam Komunitas Bandung Berkebun," *J. Pendidik. Hum.*, vol. 4, no. 4, hal. 177–186, 2016.
- [9] A. S. Keraf, *Etika lingkungan hidup*. Jakarta: PT Kompas, 2002.
- [10] F. Capra, *The web of life: A new synthesis of mind and matter*. HarperCollins, 1996.
- [11] D. W. Orr, *Ecological literacy: Education and the transition to a postmodern world*. Suny Press, 1992.
- [12] M. Billig, "The language of critical discourse analysis: the case of nominalization.," *Discourse Soc.*, vol. 19, no. 6, 2008.
- [13] M. Gadotti, "Reorienting Education Practices towards Sustainability," *J. Educ. Sustain. Dev.*, vol. 4, no. 2, 2010.
- [14] Mutiani, "IPS Dan Pendidikan Lingkungan : Urgensi Pengembangan Sikap Kesadaran Lingkungan," *SOSIO Didakt. Soc. Sci. Educ. J.*, vol. 4, no. 1, hal. 45–53, 2017.
- [15] U. S. Winataputra, *Strategi Belajar Mengajar*. Jakarta: Pusat Penerbitan Universitas Terbuka, 2001.
- [16] M. S. Branson, *Belajar civic education dari Amerika*, no. 5. Yogyakarta: Kerja LKIS dan The Asia Foundation, 1999.
- [17] H. Yunansah dan Y. T. Herlambang, "Pendidikan berbasis ekopedagogik dalam menumbuhkan kesadaran ekologis dan mengembangkan karakter siswa sekolah dasar," *EduHumaniora J. Pendidik. Dasar*, vol. 9, no. 1, hal. 27–34, 2017.
- [18] E. . Isin dan B. . Turner, *Handbook of Citizenship Studies*. New Delhi: SAGE Publications, 2002.
- [19] B. Szerszynski, *Local landscapes and global belonging: toward a situated citizenship of the environment*. Environmental citizenship, 2006.
- [20] A. K. Ellis, "Teaching and learning elementary social studies." Ally and Bacon, Boston, 1995.
- [21] N. Haas, *Using we the people.... programs in social studies teacher education. dalam John J. Patrick dan Robert S. Leming, Principles and Practices of Democracy in the Education of Social Studies Teachers*, Bloomington, IN: ERIC Clearinghouse for Social Studies/Soc. Jakarta: ERIC Clearinghouse for International Civic Education, and Civitas, 2001.
- [22] S. Mintz dan G. Liu, *Service Learning: An Overview*. Washington, DC: Corporation for National and Community Service, 1994.
- [23] A. W. Terry dan J. E. Bohnenberger, "Service learning: Fostering a cycle of caring in our gifted youth," *J. Second. Gift. Educ.*, vol. 15, no. 1, 2003.
- [24] F. L. Wilczenski dan S. M. Coomey, *practical guide to service learning: Strategies for positive development in schools*. London: Springer Science & Business Media, 2007.
- [25] S. H. Billig, *Adoption, implementation, and sustainability of K-12 service-learning*. Advances in service-learning research 1, 2002.
- [26] E. Karliani, "Membangun Civic Engagement Melalui Model Service Learning Untuk Memperkuat Karakter Warga Negara," *J. Pendidik. Pancasila dan Kewarganegaraan*, vol. 27, no. 2, 2014.
- [27] A. W. Astin, L. J. Vogelgesang, E. K. Y. Ikeda, dan J. A. Ee, *How service learning affect student*. University of California: Higher Education Research Institute, 2000.
- [28] L. J. Eales-Reynolds, B. Judge, E. McCreery, dan P. Jones, *Critical thinking skills for education students*. Learning Matters, 2009.
- [29] B. W. Honadle dan P. Kennealy, "sing service-learning & civic engagement to educate students about stakeholder analysis," *Partnerships A J. Serv. Learn. Civ. Engagem.*, vol. 2, no. 1, 2011.
- [30] L. Dominguez dan J. McDonald, "Environmental Service-learning Projects: Developing skills for action," *Green Teach.*, vol. 76, no. 13, 2005.
- [31] N. Supriatna, *Ecopedagogy: Membangun kecerdasan ekologis dalam Pembelajaran IPS*. Bandung: PT Remaja Kosdakarya, 2016.
- [32] T. I. M. Hayward, "Ecological Citizenship : Justice , Rights and the Virtue of Resourcefulness," *Env. Polit.*, vol. 15, no. 3, hal. 435–446, 2006.
- [33] A. S. Waterman, *An overview of service-learning and the role of research and evaluation in service-learning programs. In Service-learning*. Routledge, 2014.
- [34] Ian McCallum, "Ecological intelligence: Rediscovering ourselves in nature," 2005.