International Journal of Research Studies in Education
2015 July, Volume 4 Number 3, 67-72

Environmental education model for the resistance reef and social-ecological system in Thousand Islands, Jakarta

Samadi ✉
Universitas Negeri Jakarta, Indonesia (adinote@gmail.com)
Nadiroh
Universitas Negeri Jakarta, Indonesia (nadirohdr@yahoo.com)
Basleman, Annisah
Universitas Negeri Jakarta, Indonesia (anisahbasleman@yahoo.com)

ISSN: 2243-7703
Online ISSN: 2243-7711

OPEN ACCESS

Received: 8 August 2014 **Revised**: 30 December 2014 **Accepted**: 7 January 2015
Available Online: 9 January 2015 **DOI**: 10.5861/ijrse.2015.917

Abstract

The purpose of this study was to determine the environmental education model that fit the needs of the implementation of environmental education in the context of environmental sustainability and social and ecological systems of coral reefs in Kepulauan Seribu DKI Jakarta, and to develop learning tools that are relevant. The experiment was conducted in Pari Island, District of Kepulauan Seribu Selatan, Administrative District of Kepulauan Seribu, Jakarta Province. The study was conducted over 16 months, since the month of March to July in 2012, and continued in the month of February-December 2013.This study used a qualitative approach through the development of research methods. Characteristics of the study objectives include students' knowledge of environmental issues, strategies student action in the form of understanding and positive attitudes towards the environment. Samples were students in Grades IV Elementary School of Satu Atap in Pari Island, through purposive sampling technique. Based on the expert assessment, syllabus and teaching materials in this research is considered feasible. Validity of the research instruments is valid. Reliability of the instrument is based Cronsbach's Alpha of 0.05 produces highly reliable data (instrument reliability of 0.951).The results showed that the condition of coral reefs is still relatively good. However, the presence of a growing population and increasing tourists feared further lead to damage and environmental pollution around the coast, especially the low education and environmental awareness of local residents. In the trials of teaching materials to small groups of students obtained the result that the readiness to accept an otherwise good lesson, but when students answer questions related to the subject matter teachers and the student activity was relatively still asking less. In trials to large groups, excellent student readiness, ability students are able to also excellent. This increase is compared to previous trials. Early material in the development process of teaching materials belonging to the same application with schools, do not have the characteristics of marine and coral reefs, so the student assessment process is only done with formative and summative tests. Later in the development process of teaching

materials, in this research, in order to prioritize meaningful learning, which begins from the knowledge of the learners as well as guidance in developing and building a structure of ideas based on knowledge of students, thus encouraging students' ability to interact socially as well as damage to not produce negative effects on the environment.

Keywords: environmental education; social-ecological; coral reefs; curriculum design

Environmental education model for the resistance reef and social-ecological system in Thousand Islands, Jakarta

1. Introduction

The link of the coral reef ecosystem to the dynamics of the physical environment and socio-economic environment caused coastal areas has high biological productivity and play an important role as a supporting resource. It can be seen from the fact that the lives of about 85% of tropical marine life, including in Indonesia, relies on coastal ecosystems. Pari Island on Thousand Islands Jakarta, problems recorded were: (1) The condition of coral reefs in Pari Island has continued to decline on the number and distribution despite it is still relatively in good condition; (2) The majority of the population has low average level of education (generally only completed basic education) and not supported by sufficient knowledge about the importance of protecting coastal and marine resources; it is assumed to trigger more environmental degradation; (3) high population growth and the rapid development of ecological causes increased pressure in coastal areas of Pari Island, either directly (eg aquaculture, land conversion, and tourism activities) or indirectly (for example, the impact of waste pollution and ship oil spill) ; and (4) The shift in the perspective of local residents (including children of primary school age), on coral reefs in the waters of the Pari island and the surrounding. This can be seen from the development of coastal and marine tourism (attractions banana boat, flying boat, snorkeling, and diving) in order to earn families income.

Long before Pari Island is widely known as a tourist attraction, the island community is more dominant to work as fishermen and seaweed farmers. This shift resulted in the protection of coral reef habitat decreases due to coastal and marine tourism activities that are not directly interfere with coral reefs. The examples are the tourists diving activities which often run and trampled on the surface of coral and junk food and drinks in the area of protection of coral reefs. Other examples such as increased waste generation, detergent foam from household waste and dirty water from the location of the nearest tourist accommodation that directly discharged into the waters. Description of the above problems, in the end will lead to the degradation of the quality of the coastal environment, so it is necessary to increase the ability of individuals, communities, and local institutions in anticipation of environmental conditions changes.

2. Research Methodology

The purpose of this study was to obtain an overview of environmental education models for environmental sustainability and socio-ecological system of coral reefs in the waters of the Thousand Islands in Jakarta. The study focused in Pari Island which is entered into the administrative area of Tidung Island Village, Thousand Islands District of Southern Administrative District Thousand Islands, Jakarta Province. Research carried out for 21 months, from April 2012 until December, 2013. This study uses the research and development of models of Borg and Gall (2002). This study was designed in two stages process. The first stage of a preliminary investigation was a methodological design to produce the desired model. The process was done through expert validation, testing the instruments, and conduct research in the field. While in the second phase of the research development activities consisting of planning, implementation of the first phase of the trial, the implementation of the second phase of the trial.

The participants in this study are residents in the Village of Tidung Island, District of South Thousand Islands, Administrative District Thousand Islands, Jakarta Province. Samples were obtained through purposive sampling technique. On this basis, the study sample was selected of Class IV student at the State Primary School One-Stop Pari Island. Data was collected through observation of the condition of the initial factual biotic components of coral reefs. This step was taken by the transect method directly using the Line Intercept Transect method. Observations were taken using the GPS position. As for the process of data collection component of the

social, economic and education at State Primary School One Roof Pari Island was obtained through questionnaires and observation sheets to identify the needs and desires of the community in Pari Island and the surrounding area. And to strengthen the abiotic components of data on socio-economic conditions and education, selected secondary data obtained from the appropriate agencies. While the research instruments are divided into: (1) The field observation, (2) The instrument of socio-economic-ecological, and (3) The test (pre-test and post-test).

The observation of the condition of coral reefs were analyzed using the image processing program package Idrisi-ANDES (Version 15) through the analysis of Iso-clusters in the program package module. Iso-cluster is a program of habitat classification without a guided automatically. As for the socio-economic data, analyzes the data were analyzed descriptively. Measurement of the success of the model is done by means of a multiple choice test, observation discussion activities, and essay to the students. Related research purposes, measuring the effectiveness of teaching materials in this research is based on several criteria which re-excavated from several sources with the main subjects are the experts. In this aspect, the measurement parameters used are based on the model of CIPP (Context, Input, Process, Product) from Daniel Stufflebeam's.

3. Results

3.1 Analysis of the terrestrial environment

Pari Island elongated in diagonal direction Southwest-Northeast follows the pattern of faulting in the region. The development of soil formation and sedimentation of sand takes place in several phases decrease in sea water at the time of the Holocene about 5,000 years ago. Based on this information and geomorphological analysis of satellite imagery, the Pari Island is including the Lower Mainland Island

3.2 Analysis of coral reef

Coral reefs are still in good condition with a mean density of coral reef reaches 8%. The results of mapping coral reef habitats include in sea/lagoon, ocean/lagoon is shallow/edge reefs, shoals, coral/rubble, white sand (sometimes overgrown sea grass), a combination of sand, rubble and sea grass, and the mainland.

3.3 Analysis of socio-economic components

Analysis of the social system - Interviews include the public perception of the changes that occurred on the island as well as the cause and effect. Changes that are felt by society is population that continues to grow, which causes the residential areas continues to grow, resulting in damage and environmental pollution around the coast, and coastal change. The cause of the change in society is perceived as an increasing number of population, pollution, and lack of education and environmental awareness.

Analysis of the development of desirable and undesirable - Some aspects of the development of desired respondents in Pari Island including the quietness, population with a more virtuous behavior-manners, cleanliness, safety, and environmental education community. Another aspect is the sequential desired conservation and better management of resources, absence of control on population growth and comers, ownership and implementation of fisheries regulations related to good, better cultural conservation, site conditions such as the situation in the past, as well as urbanization out of the island.

As for the respondents' perceptions related undesirable development in Pari Island include the construction (roads, vehicles, high-rise hotel building), more tourists are coming, immigrants, the population is too much, of tourism and tourists irregular activity, environmental degradation, development that is not well planned, dirty location, arrival of bad people to the island, as well as social problems (alcohol, drugs, unemployment).

Analysis of the components and characteristics of social-ecological systems - The condition of public

infrastructure in research locations such as dock (damaged condition), access roads, the need for additional access to telecommunications, increased access to health and education, as well as access to electricity. In addition, the three above institutions also should monitor the potential influence of the external environment (climate effect) as well as the need for tourism policy applied impartial between resource utilization with conservation efforts.

Analysis of the interaction of the main components forming the social-ecological system - Related to the reciprocal relationship between the resources and the local community, particularly the management of coral reef resources play an important role for the community because it became a tourist attraction as well as act as a fishing ground. In addition, the relationship between the community and infrastructure providers were only seen passive, where the community is only as users of public infrastructure that was built by the local government. This condition results in relation of infrastructure providers (local government) with the infrastructure itself is static, where the existing infrastructure tend not to be monitored, so there is no repair and rebuilding of damaged parts; in addition to the uneven development of infrastructure (roads and electricity), especially in the North and East of the island.

Relationships related to the interaction between public infrastructure and resources; it was seen that still linkage between the interaction of public infrastructure with society interaction and resources; for example, the existence of the dock (although now in poor condition) greatly affects the interaction between people and resources. The relationship between people and infrastructure; it was seen that as a community resource users only utilize the existing infrastructure without management. Meanwhile, the dynamics of individual infrastructure (households); people tend to provide their own, such as a well or water source in his home (rain water tanks). And if the attention of the potential external influences on the island of existing infrastructure, it can be argued that external influences such as adverse weather allow the destruction of resources and infrastructure (roads and docks). In addition, the potential for winds and waves disaster damage the dock (not repaired), so that the potential external influences on the infrastructure providers will also be greater.

3.4 Models produced teaching materials

The design of the model requires three important stages, namely: (1) Focus on strengthening the theoretical aspects activity based learning framework for environmental education locally. So (2) the results obtained in the first stage can be disseminated in the form of activities such as talk shows, limited public discussion, and information to the public at large. And (3) implement the action plan for decision-making and the formulation of related issues concerning environmental quality. Structure of teaching materials through intervention strategies in environmental education in school curriculum (teaching materials lattice) with the contents of complete teaching materials consist of:

Chapter 1: Ecosystems
- Input and output ecosystem
- Coral reef ecosystems

Chapter 2: Community and population environment
- The natural environment and the built environment/artificial
- Quality of the environment
- Limitations of ecological

Chapter 3: Human and environmental
- Environmental pollution
- Pollution of beaches

Chapter 4: Solid Waste
- The composition and characteristics of waste
- Management of solid waste islet

4. Conclusion

Components of coral reefs - Coral reefs in the waters of Pari island and surrounding are relatively still in good condition.

Component of environmental sustainability and social systems - A change felt in Pari Island community is a population that continues to grow and continue growing residential areas in addition to increasing tourist number; these problems lead to damage and environmental pollution around the coast. This problem is compounded by the lack of education and environmental awareness.

The success of the model - The use of teaching materials related to the purpose of this study will be able to increase the value of students' performance, both individually and on average the class where the average value of the results of multiple-choice tests of students increased 72.86 on the first test in a small group and increased to 79.42 at the time of the second trial in the large group. An increase in the value of essay student achievement, both individually and on average result in good grade at the time of the first test in a small group of students while testing both in the large group. This suggests that the content of teaching materials for environmental education and environmental sustainability of social-ecological systems of coral reefs in the study site can be occupied by students and used as a viable local content learning.

4.1 Implications

In the internal factors, it is known that there is a strong relationship between the factors and the strength of the supporting factors (opportunities), namely: (1) the existence of discretion of the content of teaching materials has environmental education purposes; it is the power to capture the chance of student skills to conserve coral reefs. (2) Optimizing cognitive aspects; this is an opportunity to capture the performance level of the learners. (3) Utilizing affective aspects; this is to harness the power of teaching materials accuracy. (4) Optimizing the purpose of environmental education teaching materials in originality, it is an opportunity to harness the power of originality teaching materials.

At the factors that can weaken the strength, we found several aspects that need to be considered, namely: (1) Efforts to improve the ability of the strategy or method and the allocation of time to capture the breadth of content opportunities of teaching materials. (2) Improving the learning scenarios to capture opportunities accuracy of teaching materials. (3) Enhance the selection of instructional media sources or to seize relevant and competent opportunities. (4) Improve the organization of teaching materials to seize opportunities on teaching materials. (5) Improving the teaching material to the purpose and characteristics of the students to seize opportunities on originality of teaching materials.

For external factors, factors that could have become a force's ability to grow because of the threat. And hence require the efforts: (1) Optimizing the purpose to minimize the threat of environmental education teaching materials standard. (2) Utilize the facilities available (coral reefs) in order to minimize the threat of the interpretation of the results. (3) Minimize the allocation of time.

The following factors are Factors to be taken seriously if the teaching materials are to be developed, namely: (1) Improving the strategy or method and the allocation of time to cover the allocation of time is not long. (2) Improve the clarity of learning scenarios to cover environmental education standards. (3) Improve the organization of teaching materials for the interpretation of the results. (4) Improving the teaching material according to the characteristics of students to complete the integration of environmental education.

5. References

Gall, M. D., Gall, J. P., & Borg, W. R. (2002). *Educational research: An introduction*. Boston: Pearson Education, Inc.