

# Curriculum Development of Environmental Education Based on Local Wisdom at Elementary School

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**Abstract.** This research aims to develop environmental education curriculum based on local wisdom. This is a research and development (R&D) using Borg & Gall procedures (2003) namely; 1) preliminary study, 2) planning design development, and 3) try out and revision. The research results of Environment Education curriculum development based on local wisdom showed satisfactory results. Based on input from experts and assessments, the developed curriculum can be distributed to elementary schools in the area UPTD (the District Education Office) Kedamean, Gresik Indonesia. There are five curriculum principles that are raised as the main characteristics of local wisdom. The five points include: 1) the local farming systems; 2) the provision of green open land; 3) water treatment systems; 4) the processed food products which are based locally; 5) the livelihoods of local patterned communities.

**Keywords:** Curriculum, Environmental Education, Local Wisdom.

## 1. Introduction

Environmental damage in Indonesia is getting serious in that the condition has directly threatened human life. The level of any nature damage increases the risk of natural disasters. The cause of the occurrence of natural damage can be caused by two factors, namely the result of natural occurrences and consequences of human behavior. Damage to the environment can be defined as the process of deterioration or reduction (deterioration) environment. Environmental deterioration is characterized by a loss of resources of soil, water, air, its extinction of wild flora and fauna, and ecosystems (Pratomo, 2008).

Environmental damage gives immediate impact to human life. In 2004, the High Level Threat Panel of the UNITED NATIONS, Challenges and Change, incorporating environmental degradation is one of the top ten threats to humanity. World Risk Report, released by the German Alliance for

Development Works (Alliance), the United Nations University Institute for Environment and Human Security (UNU-EHS) and The Nature Conservancy (TNC) in 2012 mention that the environmental damage is one of the important factors that determines the height of the low risk of catastrophe in a region. The pollution of many different countries take place, one of them is China. Offered in a journal on *Motori* by Greenpeace, water conditions of China in some provinces cannot be used as it should be, and it is estimated to occur in rivers of Indonesia.

According to Karim (2003) and Supardi (2011), of the human side, environmental problems are caused by the inability to develop a system of social value and life style which are not able to make a living in harmony with the environment. How to build your lifestyle and attitude towards the environment in order to live in harmony with the environment is not an easy job which can be done in a short time. Therefore the educational path is the right means to build communities that are implementing the principles of sustainability and environmental ethics. Educational paths can be reached starting from the pre-formal level of education until College.

To support the principles of sustainability and environmental ethics in education need a system that can regulate education itself. The thing that can be done is by designing curriculum development. Based on the results of a survey conducted by the researcher randomly in 2015, the schools (elementary, junior, and senior high school) in Gresik Indonesia had been identified that the local content subjects of environmental education was not completed by a representative curriculum. Therefore environmental education is taught following the materials from a book only. From an interview with one of the principals, school grounds to use the book as a reference for environmental education of learning because of the limitations in developing the curriculum. The school never received the training of curriculum development. Moreover, local content subjects (including environmental education) curriculum must be developed by the school itself. This is complicated and a common problem associated with different attitude and mindset of human resources.

In line with that, the mental revolution into social movements of the era of the reign of Jokowi-Jusuf Kalla becomes very important and urgent to change the attitude and mindset of every citizen of Indonesia in terms of addressing the damage to the natural environment. Mental revolution aligned with the world of education, spearheading the first should be able to initiate social movements. To support a mental revolution that can enter into the world of education needs to be formulated outwardly through the education system i.e. curriculum. To sinergize the problem in the natural environment, Environmental Education curriculum development (PLH) is the right step. This is because the curriculum is seen as the main reference to achieve the goal of the educational process itself. Departing from wisdom and local problem, Environmental Education curriculum development will impact effectively against local problem resolution. By completing the environmental problems at the local level, it will also impact the resolution of environmental issues at the national level even globally. Sullivan in Bezzina (2006) states that environmental crisis is a social issue and not simply something that is natural. Environmental education has a very important role in addressing environmental issues that arise at the moment.

In this case, this study is a development of environmental education curriculum based on local wisdom that would have given the answer in solving environmental problems, including helping change attitudes and mindsets of human resources. Thus, this is also a simple step that implies the realization of changes in behavior and attitudes to enhance the knowledge, skills, and public awareness that will be the values of environment and environmental problems in order to play an active role in the preservation and safety of the environment for the benefit of the present and future generation. Therefore this is the long-term hope for the researchers as the concrete steps leading to a mental revolution in the field of the environment at the level of primary school.

## **2. Research Method**

The steps taken in this study are to simplify the ten steps of Borg & Gall (1983) into three steps namely; 1) preliminary study, 2) planning the development of design and 3) test and revision.

The research period was from February until August 2015 carried out in SDN 2 Kedamean, Gresik, with the subjects of research were the Group Managers and curriculum developers i.e. principals, teachers, School Committee, and other relevant sources. The site selection of the research was based on input and coordination with the relevant parties including UPTD (Sub District Education Office) of Kedamean. Both are different levels of school achievement and still in a small-scale for area Office of education in the sub-district of Kedamean. SDN 2 Kedamean is a School of national standards (SSN) which has strategic long term plan to become the school of Adiwiyata, whereas SDN 1 Lampah, is a school in a poor area in Gresik but it is much accomplished. With the differences of their backgrounds of the school, it is expected to give a plausible generalization of the study.

## **3. Findings and Discussions**

### **a. Preliminary Study**

Based on the results of the initial survey in primary schools, it was found: 1) Environmental Education was used as companion mastery of Natural Sciences; 2) Environmental Education refers to the existing textbooks as the main references. While doing the evaluation of the curriculum of environmental education in elementary school, it was found that: 1) Environmental Education curriculum was made solely as a complement to local curriculum; 2) Environmental Education curriculum does not depart from the school's needs; 3) Environmental Education curriculum copy and paste from other schools; 4) environmental education curriculum was created by the purpose of school achievement of Adiwiyata. Studies on the results of the need assessment of teaching indicate that: 1) environmental education is not important because it is not part of five main subjects; 2) educators are reluctant to assess the environmental education completely. From the analysis of environmental problems, it was obtained that: 1) the availability of clean water sources begin to decrease; 2) the decreases of green open-land since the development of construction and industry so that increasing environmental temperature; 3) therefore, the heat is getting severe; 4) rivers are contaminated by wastes; 5) agriculture as livelihood of the majority of society is not attractive to younger

generation; 6) dropping awareness towards environmental sustainability. Analysis of local wisdom reveals some important points: 1) local farming systems; 2) the provision of green open land; 3) water treatment systems; 4) processed food products made locally; 5) livelihoods of local communities which are already settled.

### **b. The Plan for Design Development**

In drawing up the plan development of Environmental Education curriculum, researchers at this stage, perform some activities: 1) socialization; 2) division of tasks. Socialization was carried out by exposing preliminary study results. Socialization is conducted openly in forums include: head of school, School Committee, teachers, and researchers. Socializations are described comprehensively in the need for Environmental Education curriculum development from local wisdom. Mindset change will occur when the socialization run smoothly. In the division of tasks, two teams of the group are formed in that each team is from low-class curriculum and high class. Both teams are accommodated by researchers as an important role in order the contents will be formulated on the design of the curriculum to be sustainable. This is in line with the opinion of Hariani (2011) stating that it needs continuity of content of the curriculum in low grade and high grade in all subjects. Still related to Haryani (2011), Barraza, Laura (2001) also confirms that primary schools have an important role to instill environmental education to students through curriculum system that is measurable, well-planned and sustainable.

### **c. Try Out and Revision**

#### **1) Limited Try Out**

The limited try out is in SDN 2 Kedamean in which the design of curriculum-based on environmental education of local wisdom already made can be implemented according to the expected plan. Nevertheless, there are special entries i.e. the necessity of depth understanding against a master class. The classroom teacher who previously regards the design of the curriculum is too high to be applied, but only after satisfactory result, tested. Testing is only done on the midterm low grade and high grade. Low grade is represented by class II and high class is conducted on class V. The two levels of the classes indicate the maximum results in that they are very responsive to learning with curriculum-based on environmental education of local wisdom. At the try out, students are very enthusiastic in learning environmental education activities. The editorial side of the curriculum also is reasonably easy to understand.

#### **2) Revisions Based on the Results of Limited Try Out**

At this stage the researcher does not do the revisions. Limited try out results from the editorial context are not revised. But from the side of educators (teachers), they need persuasive understanding to give confidence that teachers are optimistic in carrying out Environmental Education of curriculum content. This is in line to change the mindset of teachers in accordance with the vision of a mental revolution. The first and main thing that needs to be done is to change the mindset. The change of mindset will affect the patterns of follow-up activities (Sukmadinata, 1997). Before the design of the curriculum is tested,

teachers are given motivation and understanding about the content of the curriculum in comprehensive environmental education.

### **3) Extended Try Out**

Extended try outs are to preserve on two primary school levels, one has high level of primary school, i.e. SDN 2 Kedamean, another one of the primary school level is namely SDN 1 Lampah. The activity starts by giving motivation and understanding about the content of the curriculum in comprehensive environmental education to the teachers of both schools. Once is considered sufficient, the next execution of the try out is extended. In SDN 2 Kedamean and SDN 1 Lampah, Environmental Education of curriculum design based on local wisdom then is tested throughout the class. More extensive try out is carried out in the middle of the first half after UTS (Midterm Test). On Grade I students do field trips on agriculture to local communities. Working on study tours they are to observe the open land around the green environment done on grade II. While in the rest of the class III, they are observing local wisdom related to the preservation of the environment. For class IV, they are doing observation of reservoirs as local wisdom. Work trips to the villages of processing food products which are developed from local raw materials was done by students of class V. In the sixth grade students, the field trips for villages are to know the livelihoods of rural communities that are already settled. By doing field trips and observations directly to the local community, this gives a special attraction for students to have positive values for the students. For the teachers as well, they can reflect the real pictures in which students really need a refreshing lesson in the form of field trips and observations significantly to society.

### **4) The Revised Design Based on the Extended Try Out**

From the extended try out results, the revised materials are as follows: 1) the word choices need to be expanded, especially in the formulation of basic competencies so that schools are easily to develop and apply; 2) The language structures in the writing basic competences also need to be revised. Based on the revised materials, the researchers improve the draft of environmental education curriculum based on local wisdom as presented in table 1(the results of the developed curriculum).

The development of Environmental Education Curriculum has appropriate stages of development that is Environmental Education Curriculum with local vision which will have global impact. This is in line with the expectations of Apulsari (2013) in the journal of Primary Teacher Education Program of Elementary School at the Faculty of Education, University of Riau, which confirms that environmental education is done at the local level, but can have global impact. This is then a curriculum should be developed by the right team with reference to local knowledge, but still considers the strengths and weaknesses of the previous curriculum. From the editorial context, the experts assess that there should be no change of the content because the formulated standards of competence are already operational and completely represented by local wisdom. This expert opinion is supported by Mulyasa, (2006) who states that local content should be developed from the community itself. Local content should be able to accommodate local culture. Certainly this is not a new thing to raise the local content including Environmental Education as a school subject identifier, however, the developed environmental education curriculum so far is

not the result of the development of local knowledge yet but of copy and paste from other resources which are not the representation of local wisdom (Meilani, 2011). Starting from this, the experts assess the insightful environmental education curriculum of local knowledge is worth to be developed and disseminated in the territory of the District Education Office of Kedamean (UTPD).

**Tabel 1. The Design of Environmental Education Curriculum Based on Local Wisdom**

<b>Class I Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing the simple agriculture of local communities.	1.1 Field trips on farm for local communities. 1.2 Conducting a simple observation of local agriculture.
2. Farming simply in the school environment.	2.1 Planting local vegetables. 2.2 Caring for locally grown vegetables.
<b>Class I Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
3. Harvesting vegetables grown locally.	3.1 Harvesting local vegetables. 3.2 Packing the local vegetables simply.
4. Creating a simple exhibition for marketing.	4.1 Creating a simple exhibition for the marketing of local vegetables that have been packaged to parents / class advisors.
<b>Class II Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing the green open land in the neighborhood.	1.1 Working on field trips to observe the green open land in the neighborhood. 1.2 Conducting simple observations of the green open land (flora and fauna).
2. Opening the green open land in the neighborhood.	2.1 Making simply green open land in the neighborhood.
<b>Class II Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
3. Maintaining the green open land in the neighborhood.	3.1 Caring for the green open land in the neighborhood. 3.2 Observing green open land in the neighborhood.
4. Documenting green open land in the treated neighborhood.	4.1 Documenting photos, video simply of the green open land in the neighborhood which had been treated. 4.2 Making a simple exhibition at the school on green open land.
<b>Class III Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing the local knowledge related to environmental preservation.	1.1 Conducting observations of local knowledge related to environmental preservation. 1.2 Documenting local knowledge related to environmental preservation.
<b>Class III Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
2. Practicing local wisdom related to environmental preservation.	2.1 Practicing activity that shows local wisdom in preserving the environment.

<b>Class IV Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing reservoirs as local wisdom.	1.1 Conducting observations of the reservoirs as local wisdom. 1.2 Documenting observations of reservoirs as local wisdom in the form of a story.
<b>Class IV Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
2. Creating a simple pond in the school environment to preserve the surrounding environment.	2.1 Making a simple pond in the school environment to preserve the surrounding environment. 2.2 Creating an ecosystem naturally. 2.3 Spreading the fish and the water filter in the pond.
<b>Class V Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing the processed food products from local raw materials in the neighborhood.	1.1 Doing field trips for villages that elicit processed food products from local raw materials. 1.2 Conducting observations of processed food products from local raw materials in the neighborhood. 1.3 Documenting observations of reservoirs in the form of a story.
<b>Class V Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
2. Making of processed food products from local raw materials.	2.1 Making of processed food products from local raw materials. 2.2 Marketing of processed food products from local raw materials.
<b>Class VI Semester 1</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
1. Knowing the livelihoods of rural and patterned communities.	1.1 Doing field trips to villages to get to know the livelihoods of rural and patterned communities. 1.2 Conducting observations of livelihoods of rural and patterned communities. 1.3 Documenting observations livelihoods sideline of rural communities in the form of descriptive stories.
<b>Class VI Semester 2</b>	
<b>Standard of Competence</b>	<b>Basic Competence</b>
2. Membuat proyek sederhana untuk memasarkan swasembada hasil pertanian lokal dengan teknologi.	2.1 Membuat evaluasi sederhana pemasaran produk pertanian lokal. 2.2 Membuat proyek sederhana untuk pemasaran produk hasil pertanian lokal dengan teknologi.

The design of Environmental Education Curriculum Based on Local Wisdom as presented in Table 1 can be seen from every level of elementary education outcomes which are as follows: For class one, children will get to know the local agricultural and farming practices, local vegetables to the harvesting and

packaging simply for marketing. The class two is expected to be familiar with green open land and make simple green open land in the neighborhood. For grade three, students are expected to recognize, document, local knowledge and practice related to environmental preservation. While in grade four, students get to know the reservoir and create a simple pond in the neighborhood. In grade five, they are expected to know and make the processing of food products from local raw materials. For grade six, the students are expected to be familiar with the livelihoods of rural pattern of communities and make a simple project to market local self-sufficiency in agricultural products with technology.

This study indicates the need of integrating local wisdom and environmental curriculum to attract students' concerns so that this can promote people in general to be aware of environmental problems. In line with the opinion of Prigi (2012) the public must be able to preserve nature in a way to know and apply it in life. Likewise Sumarmi (2008) in the journal *Science of Education* asserts that it is the school responsibility to educate students to love nature. Contextual approach can be used as a way to educate. According to Chen (2008) that environmental education is a very important tool in providing knowledge, positive attitudes towards the environment and to build skills to protect and improve the environment.

Referring to the results of curriculum development for Environmental Education above, in terms of basic competency of content that is raised can be done by learning which is really meaningful. This is in line with the opinion of Barlia (2008) who states that learning should be meaningful in which this will consider the importance of learning environment in primary schools. Not only in this level, according to Desa, et al (2012) in the journal of *Environmental Awareness and Education: A Key Approach to Solid Waste Management (SWM) -A Case Study of a University in Malaysia*, "every program in the university environment must be rooted mainly that the process of caring for the environment will have the greatest impact if it becomes an integral part of the educational mission of the institution." Ardoin & Sharon (2011) also confirm that the incorporation of environmental education into a program is very important because it will affect the community in decision-making to safeguard the nature.

Results of this study certainly suggest that the Environmental Education curriculum based on local wisdom will support the school in educating students to act in harmony with the natural environment. This harmony with nature would give broad or global impacts on the natural environment.

#### **4. Conclusion**

The research results of curriculum development on Environmental Education based on local wisdom show satisfactory results in which the development already refers to the stage of curriculum development. Based on input from experts and assessment, the developed curriculum can be distributed to elementary schools in the area of UPTD Kedamean (the District Education Office). There are five curriculum contents being raised as the special uniqueness of local wisdom. The five contents include: 1) the local farming systems; 2) the provision of green open land; 3) water treatment systems; 4) processed food products which are based locally; 5) the livelihoods of local

patterned communities. This environmental education curriculum design based on local wisdom will certainly be able to resolve local issues that will impact the global.

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