



## ENVIRONMENTAL EDUCATION BASED ON LOCAL VALUES: ITS INTEGRATION IN THE INDONESIAN ELEMENTARY SCHOOL CURRICULUM

Sarbaini<sup>1</sup>

 Asep Herry

Hernawan<sup>2\*</sup>

 Deni Darmawan<sup>3</sup>

 Mohammad Ali<sup>4</sup>

<sup>1</sup>Department of Citizenship Education, Faculty of Teacher Training and Education, Universitas Lambung Mangkurat, Banjarmasin, Indonesia.

<sup>1</sup>Email: [sarbaini@ulm.ac.id](mailto:sarbaini@ulm.ac.id)

<sup>2\*</sup>Department of Instructional Technology, Faculty of Education, Universitas Pendidikan Indonesia, Bandung, Indonesia.

<sup>2</sup>Email: [aseperv@yahoo.com](mailto:aseperv@yahoo.com)

<sup>3</sup>Email: [denidar2015@gmail.com](mailto:denidar2015@gmail.com)

<sup>4</sup>School of Postgraduate Studies, Program of Curriculum Development, Universitas Pendidikan Indonesia, Bandung, Indonesia.

<sup>4</sup>Email: [ema.laith@upi.edu](mailto:ema.laith@upi.edu)



(+ Corresponding author)

### ABSTRACT

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Environmental Awareness is a necessity for all age groups, including elementary school students. Proper understanding of ecological issues requires earlier initiation and introduction of students to local-based content. This paper aims to describe the need to integrate the environmental problems based on local wisdom within the elementary school curriculum. The authors seek to guide education planners in Indonesia on how to incorporate environmental issues based on local values or local content in specific subject content for proper awareness creation among the elementary school students. The target is to address gaps in the teaching of environmental education in primary schools across the archipelago. Elementary school students are the future citizens, whose understanding of how the environment works from a localized perspective will help bring about better future environmental management. The study used a survey method, applying two clusters of random sampling techniques. It was conducted in selected elementary schools around Bandung, the capital city of the West Java Province, Indonesia. To collect data, structured questionnaires were used to examine. Later, data was analyzed using simple statistical methods, drawing inferences and descriptive analytics. Conclusively, this study established that specific environmental education themes based on local values and local content need to be included in the elementary school curriculum for more clarity and understanding of topics. The suggested thematic topics should comprise of issues related to overcoming environmental pollution; preventing global warming; wise use of the environment flora and fauna, and appropriate values needed for ecological conservation and sustainability.

**Contribution/Originality:** This study contributes uniquely as a guide to educational planners in Indonesia on how to incorporate environmental issues based on local values or content in specific subjects for proper awareness creation among elementary school students to enhance sustainable development.

### 1. INTRODUCTION

The need to address environmental challenges is a global agenda that demands urgent-specific measures, strategies, and efforts to solve the problems of global warming, environmental pollution, poor waste disposal, and many such profound and complex climate challenges that have detrimental effects on human existence and the

entire living species (Jorgenson, Stephens, & White, 2019). The teaching and learning of environmental issues can be used to stimulate varying responses and debates among students (Bakhtiar 2016) as future stakeholders.

The need to teach environmental issues through the school curriculum is an unavoidable necessity for today's rapidly changing universe, where climate change and global warming are occurring at a terrible speed. Climate change is a major global problem (Jorgenson et al., 2019). Integrating local environmental themes into the school curriculum is a good method for drawing attention towards environmental issues. Techniques such as teaching environmental issues using local examples, observing the domestic situation, acting through role-playing (Schweizer & Kelly, 2005), and engaging students through critical thematic discussions are good components of quick learning. Environmental issues are easily absorbed when teaching is based on local techniques (Iozzi, 1989; Schweizer & Kelly, 2005).

This study aims to address gaps in the teaching of environmental education content at the elementary level in schools within Bandung, the capital city of West Java Province. This study seeks to establish appropriate themes that may be used to guide education planners in the Bandung City Education Administration department on integrating relevant thematic environmental issues in the elementary school curriculum based on localized content, with a focus on the need for proper implementation of environmental education. Thus, the main objective is to facilitate the development of a better ecological education curriculum relevant to local environmental conservation and sustainability. The author believes that the present study will contribute to stimulating and enhancing knowledge, skills, and attitudes towards better environmental policies and practices in Indonesia, contributing to global environmental and climate campaigns.

### *1.1. The Rationale of Teaching Environmental Issues at Elementary Level in Indonesia*

Indonesia has poor environmental records because it faces many environmental problems including poor waste and disposal management, rampant water pollution, deforestation, air pollution from widespread smoking, and car emissions (Hays, 2015). Environmental problems have made the Indonesian government, like other governments, more severe with environmental education. Exploring the environment and tackling the causes of pollution and other ecological destruction activities (Romeiro, 2012) is an inevitable component of national growth and development.

The main environmental issues faced by Indonesia, compared to other countries, include the effects of global warming and climate change (Hays 2015). The average temperature of the earth's surface has increased by 1.5° through 4.5° Celsius. In contrast, the average increase in sea surface level has risen from 10 cm to 15 cm because of the melting of the Arctic Pole's ice in the summer season (Intergovernmental Panel on Climate Change, 2018). These environmental disorders have influenced the frequency of hurricanes, decreases in sea resources, destruction of coral reefs, and disappearance of species sensitive to temperature (Intergovernmental Panel on Climate Change, 2014). Environmental problems are related to an increase in the world's population. The global population is beyond the capacity of the Earth. The exploitation of the environment for their need fulfillment threatens environmental conservation.

According to the United Nations (2015), in an effort to protect and preserve the planet from degradation, there is a need to sustainably manage the world's natural resources and take the required measures of action on climate change to fulfill the demands of today and the coming period. The use of fossil fuel energy by vehicles and industry produces carbon emissions that threaten the atmosphere. The uncontrolled decrease of the tropical forest from 7.6 million to 10 million hectares per year harms the cycle of carbon, damages biodiversity, and causes the disappearance of some biospheres in the habitat (Chiras, 1991).

To overcome environmental problems, both in terms of finding solutions and avoiding further damage, there is a need to cultivate people's awareness of the importance of environmental conservation. This is linked with environmental education, implemented at primary schools through which the related competencies, that is,

knowledge, psychomotor skills, and attitude of environmental conservation, are cultivated and developed so that learners are not only aware of the importance of the environment around them, but will also change their behavior towards environmental conservation.

Because environmental problems vary among communities, the primary school environment education curriculum needs to be developed based on local needs. The issue of the environment requires solutions at local levels because it has a connection with human life sustainability. As a system, the environment has interrelated and interdependent components that all living creatures need. Conserving such an environmental system requires people's awareness of its sustainability, which can be cultivated only through education. Therefore, one of the educational challenges is how education should cultivate awareness and responsibility among young learners regarding the importance of environmental conservation.

## 2. THEORETICAL REVIEW

Developing youngsters' knowledge, attitude, and skill in local environment conservation is among the attempts to cultivate awareness of education for sustainable development. This must begin as early as childhood and from primary and junior secondary schools. In this regard, related subject matter should be included in the school curriculum. From the perspective of curriculum theory, this effort is part of micro curriculum development. In curriculum development, the phases that should be followed are an attempt to make the content relevant or in line with local community needs. These phases include 1) conducting need assessment, 2) formulating competencies of the pupil's show conducting, (3) defining learn formulating, (4) planning a mode of learning, and (5) Defining per evaluation strategic planning on environment.

Planning is the core of environmental education and needs to be included in the school curriculum to make it relevant to the local community's needs. Therefore, in its development, a school should conduct a need assessment as the first phase, and based on this assessment, the other stages should follow. Formerly, environmental education was a specific subject in the Indonesian junior secondary school (JSS) and senior secondary school (SSS) curricula, but was not included in the primary school curriculum; instead, it was among the contents of social studies subjects. Recently, this subject of environmental education is no longer a part of the curriculum and is now included in the geography curriculum at both the JSS and SSS levels.

The environment education curriculum consists of concepts such that the earth has a continuous, interrelated, and interdependent ecosystem; human life needs biodiversity; nature is homeostatic but has a limited condition to support human life; and advancement in science and technology is the cause of damage to the environment. The curriculum also teaches that it is easy to find a solution and that the situation can be adequately managed by government policy or by influencing human behavior towards the environment (Swan & Stapp, 1974).

According to Chiras (1991), the root of environmental problems is human behavior, which is called *biological imperialism*. When those who occupy the environment cannot manage the situation wisely, it is predicted that they will be destroyed in the future. Therefore, commitment to conserve the environment is needed for future generations. The younger generation should be aware of the wise usage and management of natural resources and the environment, so that they can contribute to a sustainable environment. This is one of the challenges in environmental conservation management.

A study conducted by Swan and Stapp (1974) indicated constraints in implementing environmental education, namely: (1) it is not easy to develop the content of environmental education since it should apply a multidisciplinary approach; (2) it is more burdensome for students if environment education is included in the curriculum, particularly when the education system is centralistic; (3) environmental education should be an integral part of the value of knowledge and not taught separately ; and (4) the content of environmental education is only a small part of the school instruction program, so it is difficult to cultivate value, awareness, and attitude toward environment

conservation. According to Marsidi (1999), the environment and education curriculum is limited and lacks in-depth analysis, and so is teachers' creativity and ability to connect environmental education with real daily life.

The new paradigm of environmental education indicates that it tends to change its direction towards making learners environmentally literate. It aims to educate learners to treat the environment not only to fulfill human needs, but also to be conserved. Therefore, environmental education should be implemented as an educational goal. This implies that implementing such an educational goal provides learners with the opportunity to conserve and improve the quality of the environment. Environment education aims to facilitate students' understanding of the environment as a system so that they can develop the attitude and behavior of the importance of its conservation. This is also helpful in helping them become agents of change in anticipating and finding solutions to environmental problems.

Environmental education implementation is not only confined to a classroom, but also in a real environment where learners acquire practical experiences towards problem solutions. This will also help develop knowledge, awareness, and skills in environmental conservation. However, a big constraint is teachers' understanding of environmental education as a mere transfer of knowledge, so the students acquire only knowledge but fail to develop attitudes and behaviors conducive to environmental education.

According to Gagné (1977), a change in behavior is an indicator of maturity. This is in line with Bloom (1971), who states that education is a process of making students more mature adults. According to Orams (1994), behavior is connected to any *act*. Before any action takes place, there are influencing factors: readiness to act, knowledge of the strategy to serve, experience of the related issue, and individual personality factors, such as attitude, locus of control, and responsibility. The condition of a single act contributes to one's behavior toward the environment. Thus, stakeholders should be involved in the implementation of environmental education.

Development is a continuous, systematic process aimed at life betterment not only in economic and physical aspects, such as facilities and infrastructure, but also in the element of psychology. Development is the process of improving the quality of human life that must be supported by the environment. According to Soerjani and Djajadiningrat (1985), the situation is an essential resource in helping development in the form of space, agriculture, mining, fishery, and tourism. On the other hand, the intensity of environmental exploration, which prioritizes economic growth, could cause environmental destruction, such as forest destruction, water, and air pollution. Data on the background indicate that 29% of the soil in the earth has become desert, 6% of which is categorized as severe.

Tropical forests, which comprise 6% of the earth's surface and its biodiversity, constitute 50% of the world's species being in a risky condition. Every year, between 7.6 million and 10 million hectares of tropical forest have been disappearing. Furthermore, the use of fossil fuels by industry makes a significant contribution to the accumulation of CO<sub>2</sub> in the atmosphere, and this causes 1,5 ° - 4,5 ° Celsius of the earth's temperature and also causes the melting of ice in the north pole, which influences an increase of 25–40 cm in the sea level surface (World Commission on Environment and Development, 1995). These damages worried concerned people and led to the organization of an international conference, namely the United Nations Conference on Human Environment (UNCHE) held in Stockholm, Sweden, in June 1972. This was the first international conference on the environment initiated by the United Nations and attended by delegates from 114 UN member countries. The discussion became the beginning of the global effort in Earth conservation with the motto "Only one Earth' for all human beings. Since the opening ceremony of the conference was June 5th, this date, June 5th, becomes World Environment Day.

Among the conference agreements was the connection between development, poverty eradication, and education improvement. The participants agreed that poverty is the cause of environmental damage; therefore, the forum decided that environmental conservation efforts must be included in national development. The conference also established the United Nations Environmental Programme (UNEP), where its headquarters are in Nairobi, Kenya, to address environmental problems. This organization also promoted the concept of sustainable

development preceded by the Brundtland report in 1987 on "Our Common Future," which formulated the basic principles of sustainable development. According to Ali (2014a), sustainable development is:

*“. . . development that meets the needs of the present without compromising future generations' ability to meet their own needs. It contains within it two key concepts: (1) the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and (2) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (p. 78).*

Following the Stockholm conference, there was a polarization of developmentalism that attempted to prioritize development without considering its effect on the environment and environmentalists who are concerned with environmental conservation. At the 1992 *Earth Summit* organized in Rio de Janeiro, Brazil, this situation was synchronized by the global effort to compromise development and environmental conservation. The conference discussed the problems of pollution, climate change, degradation of ozone, utilization of water and sea resources, widening of forest destruction, desert formation and soil degradation, dangerous waste, and degradation of biodiversity.

In 2002, there was also a World Summit on Sustainable Development organized in Johannesburg, South Africa. The summit formulated and emphasized a plan of implementation that integrated economy, ecology, and society based on good governance. The summit also promoted a green economy and stopped global warming for themes of the following meetings organized in Bali, Indonesia, and Kyoto, Japan.

The limitation of the earth to support human life has become a social concern since Malthus proposed that population growth followed geometric progression. In contrast, food growth follows the arithmetic growth of Todaro (1995). This means that unless there is a serious effort to overcome the problem, natural resources will no longer fulfill the human need to suffer hunger, malnutrition, diseases, and natural disasters. A study conducted by Meadow (1972) concluded that environmental quality degradation would be going through its destruction if human consumption increased exponentially (Van Rensburg 1994).

The environmental problem solution requires a longitudinal process, and its results cannot be identified soon. However, a study conducted by Hayati (1999) indicated that behavioral change as a result of guidance through education is a strategic effort in environmental conservation. A survey conducted by Orams (1994), however, showed that some factors influence every person to act, such as readiness to act, knowledge of the strategy to work, experience with environmental issues, and personal factors such as locus of control, attitude, and responsibility (World Commission on Environment and Development, 1995). A study on the environmental worldview as the basis for developing human behavior concerning global warming indicated a significant difference between the mean score obtained from Hong Kong, with a mean of 2.95, and that of the US people, with a mean of 3.65 (Siu Chau, 1996). This means that every stage of society's development implies developing an environmental view, and the community will adopt this according to the differences in economics, personality, and communication (Rogers, 1995).

### 3. METHODOLOGY

This study employs a survey of clusters of subject samples randomly selected to represent the clusters of Bandung city's elementary school teachers and pupils. In this study, the teacher's sample size was 79 and that of the students was 139, so the total number of participants was 218.

#### 3.1. Use of Questionnaires

This study used structured questionnaires to collect data. The surveys used a rating scale consisting of four ranges: 1 = strongly disagree, 2 = disagree, 3 = moderate, 4 = agree, and 5 = strongly agree. In this study, scale 3 (uncertain-moderate) was checked against and removed to avoid using it as a convenient option.

Before data collection, the questionnaire was examined for readability, content validity, and reliability. Content validity was reviewed by three experts who found the questionnaires reasonably valid. Their authenticity was analyzed using Cronbach’s alpha formula, and the reliability index was 0.68.

3.2. Data Analysis

The collected data were analyzed by applying simple statistical methods of percentage, followed by the chi-square ( $\chi^2$ ) test of independence. For each item of the questionnaire, the chi-square method was used to sort the items for inclusion in the curriculum. Items that received the response Agreed (scale 4) and Strongly Agreed (scale 5) were found in more than 60% of both clusters of respondents (teachers and students) and were included as curriculum contents. The latter (scale 5) was also used to test the dependence of the responses made by both clusters, and it indicated the connection of their responses to each of the items. The  $\chi^2$  test applied stepwise procedures, that is, first, the sorted items of each factor were put in a contingency table; second, calculating its  $\chi^2$  statistic; third, reviewing whether the  $\chi^2$  statistic of every element was significant at what p-value; and fourth, concluding the results about this sign of the  $\chi^2$  by using  $\alpha = 0.05$ .

4. FINDINGS AND DISCUSSION

4.1. Findings

The content of the environmental education curriculum has been categorized into four primary categories, which are discussed below:

4.1.1. Categories of Environmental Issues Integrated into the Elementary School Curriculum

These environmental aspects are thematic concepts that can be introduced or integrated into the teaching of environmental issues within elementary schools. The content category was divided into five topics: environmental pollution caused by industrial waste or by-products, transportation (or motor vehicle emissions), traditional marketplace waste products, human activities (or mass concentration), and domestic waste.

Tables 1 to 10 illustrate the pollution categories. The tables summarize the results for each of the five categories leading to environmental pollution, and have been identified as potential aspects of integration in the elementary school curriculum.

Table-1. Aspects of handling traditional market environmental pollution.

(Students)			
Criteria	Indicator-1 (%)	Indicator-2 (%)	Indicator-3 (%)
Strongly agree	28.777	24.46	15.827
Agree	55.396	55.396	58.273
Disagree	15.827	15.827	25.18
Strongly disagree	0	1.4388	0.7194
Total %	100	100	100

Source: Research Finding, Ali (2017).

Table-2. Aspects of handling traditional market environmental pollution.

(Teachers)						
Criteria	Indicator-1 (%)	Indicator-2 (%)	Indicator-3 (%)	Indicator-4 (%)	Indicator-5 (%)	Indicator-6 (%)
Strongly agree	51.316	47.368	55.263	36.842	42.105	51.316
Agree	46.053	44.737	42.105	57.895	52.632	46.053
Disagree	1.3158	6.5789	1.3158	3.9474	2.6316	1.3158
Strongly disagree	1.3158	1.3158	1.3158	1.3158	2.6316	1.3158
Total %	100	100	100	100	100	100

Source: Research Finding, Ali (2017).

**Table-3.** Aspects of handling transportation environmental pollution.

<b>(Students)</b>		
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>
Strongly agree	37.41	64.748
Agree	57.554	33.094
Disagree	3.5971	2.1583
Strongly disagree	1.4388	0
Total %	100	100

Source: Research Finding, Ali (2017).

**Table-4.** Aspects of handling transportation environmental pollution.

<b>(Teachers)</b>		
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>
Strongly agree	57.895	64.474
Agree	40.789	32.895
Disagree	0	0
Strongly disagree	1.3158	2.6316
Total %	100	100

Source: Research Finding, Ali (2017).

**Table-5.** Handling of environmental pollution caused by waste from mass concentration or human activities.

<b>(Students)</b>		
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>
Strongly agree	15.827	16.547
Agree	63.309	74.82
Disagree	20.144	5.7554
Strongly disagree	0.7194	2.8777
Total %	100	100

Source: Research Finding, Ali (2017).

**Table-6.** Handling environmental pollution in mass concentration.

<b>(Teachers)</b>					
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>	<b>Indicator-3(%)</b>	<b>Indicator-4(%)</b>	<b>Indicator-5(%)</b>
Strongly agree	36.842	48.684	34.211	50	57.895
Agree	57.895	42.105	64.474	42.105	38.158
Disagree	3.9474	7.8947	0	6.5789	2.6316
Strongly disagree	1.3158	1.3158	1.3158	1.3158	1.3158
Total %	100	100	100	100	100

Source: Research Finding, Ali (2017).

**Table-7.** Solid waste from households that can still be recycled and needs to be processed by involving the surrounding population.

<b>(Students)</b>			
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>	<b>Indicator-3 (%)</b>
Strongly agree	18.705	37.41	40.288
Agree	58.993	54.676	50.36
Disagree	20.863	6.4748	7.9137
Strongly disagree	1.4388	1.4388	1.4388

Source: Research Finding, Ali (2017).

**Table-8.** Handling of environmental pollution from household waste.

<b>(Teacher)</b>				
<b>Criteria</b>	<b>Indicator-1 (%)</b>	<b>Indicator-2 (%)</b>	<b>Indicator-3 (%)</b>	<b>Indicator-4 (%)</b>
Strongly agree	47.368	43.421	48.684	50
Agree	51.316	48.684	46.053	47.368
Disagree	0	6.5789	3.9474	1.3158
Strongly disagree	1.3158	1.3158	1.3158	1.3158
Total %	100	100	100	100

Source: Research Finding, Ali (2017).

**Table-9.** Prevention of environmental pollution from industrial waste.

<b>(Students)</b>			
<b>Criteria</b>	<b>Indicator 1 (%)</b>	<b>Indicator 2 (%)</b>	<b>Indicator 3 (%)</b>
Strongly agree	41.007	11.511	15.827
Agree	47.482	49.64	48.921
Disagree	10.791	37.41	29.496
Strongly disagree	0.7194	1.4388	5.7554
Total (%)	100	100	100

Source: Research Finding, Ali (2017).

**Table-10.** Prevention of environmental pollution from industrial waste.

<b>(According to the teacher's opinion)</b>				
<b>Criteria</b>	<b>Indicator 1 (%)</b>	<b>Indicator-2 (%)</b>	<b>Indicator-3 (%)</b>	<b>Indicator-4 (%)</b>
Strongly agree	60.526	23.684	46.053	19.737
Agree	36.842	61.842	44.737	53.947
Disagree	1.3158	11.842	6.5789	23.684
Strongly disagree	1.3158	2.6316	2.6316	2.6316
Total %	100	100	100	100

Source: Research Finding, Ali (2017).

Concerning overcoming environmental pollution,  $\chi^2$  concerning examining teachers' independence and students, each response indicates that each of the five topics  $\chi^2$  is not significant at  $\alpha = 0.05$ . The chi-square statistic of this category (overcoming environmental pollution) is  $\chi^2 = 3.80$ , which is lower than the  $\chi^2$  of the distribution table (7.879). Each statistic chi-square of the five topics indicates that overcoming infection caused by industry  $\chi^2 = 0.140$ , that caused by transportation  $\chi^2 = 0.130$ , that caused by the traditional marketplace  $\chi^2 = 0.400$ , which was caused by the concentration of people  $\chi^2 = 0.230$ , and domestic waste 0.46, which also indicates lower than  $\chi^2$  of the distribution table, which implies that it is not significant. This means that the responses of teachers and students in this particular category and topic are related, depending on who interprets the type. Hence, all five issues are included in the curriculum.

#### 4.1.2. Discussion

##### 4.1.2.1. It is Preventing Environmental Pollution

This content category consisted of five topics: industry, transportation, traditional marketplace, concentration of people, and domestic waste. The chi-square test for examining the independence of teachers and students' responses on the content category of preventing environmental pollution indicated that the  $\chi^2$  of each of the five topics was not significant at  $\alpha = 0.05$ . However, the chi-square statistic of this category (preventing environmental pollution) is substantial ( $\chi^2 = 33.62$ ), which is higher than the  $\chi^2$  of the distribution table of 7.879. Each statistic chi-square of the five topics indicates that preventing pollution caused by industry,  $\chi^2 = 0.210$ ; that caused by transportation,  $\chi^2 = 0.250$ ; that produced by the traditional marketplace,  $\chi^2 = 3.110$ ; that caused by a concentration of people,  $\chi^2 = 0.110$ ; and domestic waste,  $\chi^2 = 0.840$  also indicates lower than  $\chi^2$  of the distribution table, which implies that it is not significant. This means that the responses of teachers and students in this category are vital, and can be interpreted as the reaction of teachers and students to be independent. The answer to each topic depends

on the interpretation of the content category, which can be excluded from the curriculum. Simultaneously, all five issues were included in the curriculum.

#### 4.1.2.2. *Wise Environment Usage*

This content category consists of two topics: wise environment usage, dealing with city space usage, and water usage. The chi-square of this content category is  $\chi^2 = 5.01$ , which is not significant at  $\alpha = 0.05$ . The chi-square statistic of each of the two topics was not significant, that is, wise environment usage dealing with city space usage,  $\chi^2 = 1.420$ , and wise environment usage dealing with water,  $\chi^2 = 1.420$ . Each of the statistic chi-squares is not significant, meaning that teachers' and students' responses to this content category and the topics relate to one another, implying that the curriculum can be included.

#### 4.1.2.3. *Acculturalization of Environment Conservation*

This content category consists of two topics: acculturalization of throwing garbage and environmental betterment. The chi-square of this content category indicates  $\chi^2 = 7.58$ , which is not significant at  $\alpha = 0.05$ , as the chi-square of the distribution table is 7.879. The chi-square statistic of each of the two topics was not substantial, that is, acculturalization of throwing garbage,  $\chi^2 = 8.490$ , and wise environment usage dealing with water,  $\chi^2 = 4.650$ . None of the statistic chi-squares is significant, meaning that teachers' and students' responses to this content category and the topics relate to one another, which can be included in the curriculum.

Environmental conservation is one of the three primary dimensions of sustainable development. Therefore, education, the main component of environmental education (EE), can be connected to the school for sustainable development (ESD). As ESD is UNESCO's Global Action Program (GAP), to achieve its goals (ESDGs) within the decade—2015-2024, EE's implementation is among the efforts to attain some ESD-specific goals.

EE's implementation concerning ESD is cultivating awareness, value, knowledge, and skills toward environmental conservation, notably sustainable development, in general. According to [Kahrman-Ozturk, Olgan, and Guler \(2012\)](#) in the implementation of ESD, it is recommended that principles, values, and practices of sustainable development be integrated into all aspects levels of educations and learning starting from the early childhood. According to [Ali \(2016\)](#), ESD should be carried out to provide the necessary understanding, skills, and values for a sustainable social life. It is seen as the responsibility of all, so each member of society should take part.

Theoretically, ESD should be integrated into all school subjects ([Hofman, 2015](#)). The integration was done in the form of themes; each includes various topics, such as education for eradicating poverty, human rights, gender equality, democracy, and good governance ([Ali, 2016](#)). Since EE can be viewed as one of the ESD dimensions, it can also be integrated into a particular school subject's curriculum in the form of themes related to environmental problems to be solved.

Some environmental problems are commonly encountered at the national level, and some meet explicitly at the local level. Therefore, Bandung City faces challenges both as it is frequently encountered at the federal and provincial levels because EE at primary school needs to be connected to local environmental problems, so its curriculum is better formulated based on local-related needs.

The findings of this study consist of four contents, namely: Overcoming environmental pollution. This content category comprises five topics: i.e. overcoming environmental pollution caused by industry, transportation, a traditional marketplace, the concentration of people, and domestic waste. This prevents environmental pollution. This content category also consisted of five topics: i.e. preventing environmental pollution caused by industry, transportation, a traditional marketplace, the concentration of people, and domestic waste. Wise environment usage. This content category consisted of two topics: i.e. calm environment usage dealing with city space usage and water usage. Acculturalization of environmental conservation. This content category included two issues: the acculturalization of throwing garbage and environmental betterment.

The findings are based on this study, and are needed as the primary school EE curriculum content. To implement the curriculum, each topic was elaborated on into themes. This study also assessed the items as an elaboration of each item. These are topics for overcoming environmental pollution caused by industry and consist of three issues: recyclable solid waste, recyclable solid waste, and usable solid waste.

The topic of overcoming environmental pollution caused by transportation consists of two sub-themes, namely, minimizing the negative effect of air pollution by developing several city parks and reducing the negative impact of air pollution through tree plantations in house yards. The topic of overcoming environmental pollution caused by the traditional marketplace comprises three themes: recyclable solid waste, recyclable solid waste, and liquid waste.

The topic of overcoming environmental pollution caused by a concentration of people, such as in railways, bus stations, and hospitals, consists of two themes: provision of diversified trash and plantation of trees for decreasing air pollution. Overcoming the environmental pollution caused by domestic waste involves separating organic and non-organic waste and sorting nonorganic waste.

The topic of preventing environmental pollution caused by industry comprises three themes: recyclable solid waste, recyclable solid waste, and usable solid waste. The issue of avoiding ecological infection caused by transportation consists of two sub-themes, namely, minimizing the negative effect of air pollution by developing several city parks and reducing the negative impact of air pollution through tree plantations in house yards.

The topic of preventing environmental pollution in the traditional marketplace consists of three themes: recyclable solid waste, recyclable solid waste, and overcoming liquid waste. The problem of avoiding environmental pollution caused by a concentration of people, such as in railways, bus stations, and hospitals, consists of two themes: provision of diversified trash and plantation of trees for decreasing air pollution. The topic of preventing environmental pollution caused by domestic waste consists of two issues: separating organic and non-organic waste and sorting non-organic waste.

The topic of wise city space usage consists of two themes: the realization of the city space and the establishment of small city parks. The problem of careful water usage consisted of three items: recycling water waste, water usage for fuel, and the use of water waste for agriculture. The topic of wise solid waste consists of two themes: industrial waste usage for handicrafts and sorting of usable domestic and dry wastes.

The topic of the acculturation of throwing garbage, regarding environmental conservation, consists of three themes: using organic waste for fertilizer, trash provision in a public place, and trash provision in the street. The topic of acculturation of environment betterment, regarding environmental conservation, consists of two themes: (1) improvement of the environment, upgrading of drainage, and plantation of trees to decrease air pollution.

Environmental education should cultivate value and an understanding of the relationship between themselves and other creatures, as well as their relationship with the natural environment. The school teaches the importance of appreciating other animals, understanding diversity and differences, and justice and responsibility, and tries to bring out dialogue on the subjects. Therefore, education can be an essential means of promoting ESD. In its implementation, it must be adjusted to the local environmental and socioeconomic conditions.

Educational reorientation, which focuses on the development of knowledge, skills, perspectives, and norms related to EE, has become important for present and future generations. A review of the objectives, contents, and teaching methods of the existing curriculum is required to develop a trans-disciplinary understanding of social, economic, and environmental issues. Awareness of such matters should be introduced in childhood (Ali, 2014a, 2014b, 2016).

Developing the related curriculum also needs to be prepared for an effective teaching-learning strategy and evaluation. Its implementation should emphasize practical experience in cultivating awareness, attitudes, and value systems toward environmental conservation. This is in line with the concept formulated by Cincera (2013) "According to our experience, it seems to be reasonable to use experiential education as a theoretical background for ESD

programs," p.35. Furthermore, according to Baiquni and Astuti (2015), the key to the success of teaching and learning is critical learning, joyful learning, and competitive learning on environment betterment, which require long-term and various learning processes.

## 5. CONCLUSION

Environment education needs to be included in the Bandung primary school curriculum to cultivate pupils' values related to environmental conservation. Its implementation should be connected to sustainable development education. The contents of environmental education must be included in the Bandung primary school curriculum, which consists of four content categories. Each of the four curriculum content categories consists of topics concerning environmental education, which should be elaborated into themes that need to be included in the Bandung city primary schools' thematic curriculum to cultivate pupils' awareness and competencies for local environmental conservation.

The Bandung city primary school environment education curriculum, which was developed based on this study, should also be implemented in the context of the implementation of education for sustainable development regarding the early cultivation of sustainability awareness among pupils' particular schools.

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