IMPROVING CRITICAL THINKING SKILLS AND ENVIRONMENT CARING ATTITUDE THROUGH INTEGRATED ENVIRONMENT-BASED LEARNING MODEL

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Abstract

This study aims to determine the differences in critical thinking skills and environmental care attitudes among learners using an integrated environment-based learning model with which using conventional learning model. The method used in this research is quasi experiment with Nonequivalent Control Group Design. The population in this study were all fifth grader students of Dayeuhkolot 07 State Elementary School, Bandung Regency with the sample used were 40 students. The experimental group were given a treatment using an environment-based learning model, while the control group were given a conventional learning model. The instrument used in this study was a test to get insights into the critical thinking skills and questionnaires to get insights into the attitude of environmental care. Data analysis used in this study was independent sample t-test. The results demonstrated that (1) There was a difference in critical thinking skills among learners using an integrated environment-based learning model compared to those using a conventional learning model. (2) There was a difference of environmental care attitude among learners using an integrated environment-based learning model compared to those using conventional learning model. Therefore, it can be concluded that the application of integrated learning model based on environment can improve critical thinking skill and environmental attitude of learners.

Keyword:
Integrated environment-based learning model, critical thinking skill, environmental caring attitude

The environment is an integral part of human life. Humans meet the needs of life from natural resources provided by the surroundings. However, nowadays serious problems encounter the environment such as environmental pollution, global warming, forest destruction, and so on. Ironically, these are caused by humans who utilize the natural resources excessively without considering the impact on the environment. One effort that can be done to improve the quality of the environment is to provide environmental education from an early age through the process of education in Elementary School. This is very important, because children act as change agents who can take action in overcoming environmental problems in the future.

Environmental education is an education that helps individuals to become more familiar with their environment, develop responsible behavior and environmental skills to improve environmental quality (UNESCO and Nordström in Kimaryo, 2011, p.24). Environmental education in elementary schools has basically been given in separate subjects namely Environmental Education (in Indonesian context known as PLH). But in fact, learners have not shown positive behavior towards the environment. There are still many students who throw garbage in any place, do not flush toilets, scribble benches, damage plants, waste water, and so on. Some of the contributing factors are the low level of environmental caring attitude and the thinking ability of learners to assess their behavior critically.

Those problems might be caused by the learning model used in the Elementary School which is a conventional learning model. This learning model only emphasizes the acquisition of knowledge. In fact, Environmental Education learning should promote problem-solving skills, critical thinking, and action-oriented insights relating to interdisciplinary and practical issues. Learners should be incorporated into the position of active thinkers in the investigation of real environmental issues that are ready to act in response to these environmental issues and can improve their caring attitude to the environment (Fauville et al., 2014, p.3)

One of the learning models that is expected to improve critical thinking skill and environmental caring attitude is an integrated

environment-based learning model. According to Fogarty (1991, pp. 64), integrated learning is a learning approach using interdisciplinary approaches, integrating ideas from subject matter content, and finding overlapping skills, concepts and attitudes in several fields of study. In this study, Environment Education is integrated with various subjects and environmental themes used as a binder. In addition, the learning process encourages the interaction of learners with their environment. This learning is in accordance with the level of cognitive development of elementary school students. They are in concrete operations stage in which the activities are focused on the object or real event. At this stage also, learners are able to connect a number of different aspects simultaneously (Piaget in Desmita, 2012, pp. 105).

Chatzfotiou (in Kimaryo, 2011, p.29) suggests that holistic learning allows learners to examine and interpret the environment from different perspectives, develop an in-depth understanding through experience, actively participate in solving environmental problems and also help to develop knowledge, skills and the necessary attitudes toward the environment. Frantz and Mayer (2014, pp. 2) add that the interconnectedness of the environment can enhance thinking, attitude, motivation, the ability to decide on how to preserve the environment, and to take responsible actions to its environment.

Integrated environment-based learning model is synonymous with scientific approach in learning process mandated in Curriculum 2013. Through this learning model, learners are actively involved in investigating a phenomenon in the environment through observation, questioning, gathering information, associating, and communicating (Kemendikbud, 2014, p. 18). The learning synergistically develops three important aspects of learners: attitude, skills, and knowledge. Thus, an integrated environment-based learning model is expected to improve critical thinking skills and environmental attitudes of learners.

Method

This research employed quantitative approach with quasi experimental method embracing nonequivalent control group design. The subjects in this study were the fifth grader students Dayeuhkolot 07 State Elementary School, Bandung Regency. The number of samples of this study were 40 students consisting of parallel classes. The 5A class became experimental class and 5B class became control class. The description of the design of this study can be seen in Figure 1 as follows (Ruseffendi, 2010, p. 53).

$$\begin{array}{ccc} O & X_1 & O \\ O & X_2 & O \end{array}$$

Figure 1. Non-equivalent Control Group Design

Information:

O = the result of pretest or posttest

X_1 = treatment in the experimental group using an integrated environment-based learning model

X_2 = treatment in the control group using the conventional learning model

Figure 1 shows that participants in control and experiment classes are given pretest questions. Furthermore, they were given treatment and then posttest. The experimental class was given an integrated environment-based learning model, while the control class was not given treatment by the researcher. The instrument used was a test to measure critical thinking skills and questionnaires to measure attitudes about the environment. The test instrument had been tested its feasibility with validity and reliability test. Data analysis in this study using independent sample test t-test on SPSS 20 for Windows. Before performing the hypothesis test, normality test of data distribution was conducted using Shapiro-Wilk test and homogeneity test of variance between groups using Levene's test.

Results

Description of Results of Critical Thinking Skills

A description of the results of pretest and posttest of critical thinking skills in the control and experimental groups can be seen in Table 2.

Table 1. Description of Results of Critical Thinking Skills

	Pretest		Posttest	
	Control	Experiment	Control	Experiment
N	20	20	20	20
Mean	45,68	45,00	58,45	76,72
Std. Deviation	9,616	9,190	8,773	12,307
Std. Error	2,150	2,055	1,962	2,851

It can be seen in Table 1 that, on the average, pretest of critical thinking skills in the control group and experimental group are almost the same. While in posttest, the average critical thinking skills in the control group were lower than the experimental class.

Hypothesis Testing of Critical Thinking Skills

Before hypothesis testing, the data should be tested normality and homogeneity. Based on the normality and homogeneity test, it was found that the data were normally and homogeneously distributed. Therefore, the hypothesis test was done using independent sample t-test. Hypothesis test results are shown in Table 2.

Table 2. T-Test Results Posttest Value of Critical Thinking Skills

Pretest Score	*t-test for Equality of Means*				
	t	*df*	*Sig. (2-tailed)*	*Mean Difference*	*Std. Error Difference*
Equal variances assumed	-5,281	38	0,000	-18,276	3,461

Table 2 shows a significance number of 0.000 less than 0.05, then Ho is rejected. That is, there are differences in critical thinking skills among learners using an integrated environment learning model compared to learners using conventional learning models.

Description of Environmental Care Attitude

The description of environmental caring attitude in control and experiment group can be seen in Table 3.

Table 3. Description of Environmental Care Outcome Results

	Pretest		Posttest	
	Control	Experiment	Control	Experiment
N	20	20	20	20
Mean	83,850	82,300	88,400	99,850
Std. Deviation	8,567	6,720	6,541	8,450
Std. Error	1,916	1,502	1,463	1,889

It can be seen in Table 3 that the pretest score average of environmental caring attitude in the control group is similar to that of the experimental group. In contrast, the average posttest score of environmental attitudes in the control group was lower than the mean grade of the experimental class.

Hypothesis Testing of Environmental Care Attitude

Before hypothesis testing, the data should be tested normality and homogeneity. The normality and homogeneity test results indicate that the data are normally distributed and homogeneous. Then, the hypothesis is tested using independent sample t-test. Hypothesis test results are shown in Table 4.

Table 4. Test Results-t Postes Score Attitude Care for the Environment

Pretest Score	*t-test for Equality of Means*				
	t	*df*	*Sig. (2-tailed)*	*Mean Difference*	*Std. Error Difference*
Equal variances assumed	-4,792	38	0,000	-11,450	2,389

Table 4 shows the number of significance less than 0.05, meaning that Ho is rejected. That is, there are differences in environmental caring attitude among learners using an integrated environment-based learning model compared to those using conventional learning model. Thus, it can be concluded that an integrated environment-based learning model can improve the environmental attitude of learners.

Discussion

Critical Thinking Skills

Based on the hypothesis test, the posttest of critical thinking skills using independent sample t-test shows that there are differences in critical thinking skills among learners using an integrated environment-based learning model compared to those using conventional learning model. This is because the model provides an opportunity for learners to construct their knowledge independently through five scientific learning activities that include observing, questioning, gathering information / experimenting, associating, and communicating so as to improve higher order thinking skills, one of which is critical thinking skills (Kemendikbud, 2014). This is in line with Moon's statement (in Kimaryo, 2011, p.24), "to develop critical thinking skills, learners need to be actively involved in learning and face-to-face with real-life situations."

Desmita (2012, pp. 157) argues that critical thinking is formed by looking at multiple points of view. If learners are able to interpret information more than one point they will be able to draw the right conclusions for problem solving and not relying on their own experiences and expectations. This is in accordance with the principle of an integrated environment-based learning model that integrates multiple subjects into an environmental theme. The interconnectedness of the environment in the learning model can also enhance the thinking of learners, as they constantly experiment with the objects they encounter in the environment, manipulate them and manipulate the effects of their actions (Desmita, 2012, pp. 98).

Finally, they are able to decide on how to preserve the environment, and to take responsible actions to their environment (Frantz and Mayer, 2014, pp. 2).

Integrated environment-based learning model is also collaborative. Learning involves learners to interact with other learners through discussion, giving opinions or ideas, and asking questions. Collaboration requires learners to think in different perspectives and think about better cooperation. Opportunities to collaborate can also encourage high-quality thinking itself. Finally, creative thinking also combines the attributes of critical thinking, such as open-mindedness and flexibility. All these attributes enhance learning experiences for learners and stimulate their intellectual and personal growth (Lai in Beckmann and Weber, 2015, p. 54).

Based on the above explanation, it can be seen clearly that the integrated environment-based learning model can improve the critical thinking skills of the learners. With the critical thinking skills they have, learners are expected to have the ability to solve various problems, take decisions and appropriate action of life against environmental problems.

Environment Caring Attitude

The result of hypothesis test using independent sample t-test shows that there are differences of environmental cares attitude between learners using integrated environment-based learning model compared to those using conventional learning model. Thus, the application of an integrated environment-based learning model improves the environmental attitudes of learners.

The Increase of environmental attitudes of learners through the model is because the model provides direct experience through investigation activities to the surrounding environmental problems. These activities provide an opportunity for learners to interact with nature and to investigate the various environmental problems. Thus, learners can determine the right solutions and make learners more concerned with the environment and the problems (Kimaryo, 2011, pp. 159).

From an environmental perspective, learners have the opportunity to take responsibility for an environment that directly affects themselves and to gain a personal approach to global environmental concerns (Fauville et al., 2014, p3). In addition, the interaction of learners with the environment allows them to understand holistically how and why an environment has an impact on their lives, and what their impacts on the environment (Ministry of Education, 2014, p. 1). In other words, learners will be able to perceive a phenomenon they encounter in their surroundings from multiple perspectives, thus increasing their thinking about how appropriate attitudes and actions to protect the environment and take responsibility for their environment (Frantz and Mayer, 2014, pp. 2).

The increase of critical thinking skills also contributes to improving the environmental attitudes of learners. This is not without reason, because critical thinking itself has a logical and reflective sense of reasoning that focuses on deciding what to believe or do (Norris and Ennis in Fisher, 2009, p.4). This means that when learners have good critical thinking skills, they will react appropriately and value to the surrounding environmental issues, which ultimately can make decisions about appropriate actions to overcome environmental problems. This is in line with what Hasslöf and Malmberg (2015, p. 244) argue, that by thinking critically, learners have the ability to assess their behavior, for example, distinguishing good and bad behavior toward the environment.

Based on the above description, it can be concluded that the application of an integrated environment-based learning model can improve the attitude of environmental care to learners. Thus, if the attitude of environmental care is continuously developed through learning in schools, it is expected that learners can behave positively and responsibly to the surrounding environment.

Conclusion

Based on the descriptions, the conclusions obtained in this study are as follows: 1) there are differences in critical thinking skills among learners using an integrated environment-based learning model compared to those using a conventional learning model, and 2) there is a difference in environmental attitudes among learners uses an integrated environment-based learning model compared to those using a conventional learning model.

Therefore, the integrated environment-based learning model is expected to be an alternative learning and applied continuously to improve the competence of attitudes, knowledge, and skills in an integrated manner.

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