Analysis Ecological Literacy Skill through Implementation of Learning Instruction Based on Local Potential “Pulau Kembang”

Desy Purwasih¹, Insih Wilujeng²

¹²Science Education Department, Yogyakarta State University, Yogyakarta – Indonesia

INTRODUCTION

Humans and the environment are two interdependent things. Humans get various sources of life from the environment, while environmental sustainability depends on how humans treat the environment. The relationship between humans and the environment takes place in three phases. The first phase is called human, which is a phase in which humans depend on the environment for their lives. The second phase is called human against nature, namely the human phase has been able to develop science and technology so that dependence on the environment begins to decrease. Thus, humans began to destroy the environment. The third phase is when humans begin to realize that environmental damage causes harm to humans themselves, so efforts to improve the environment begin to arise. This phase is human and nature (Supadmimi et al., 2020).

Ideally, the environment and humans are interdependent, based on the 2017 National Socio-Economic Survey data. It is revealed that the Environmental Indifference Behavior Index towards waste is the largest, with 35.53%. This figure is the highest compared to ignorance of private transportation of 34.93%, water saving of 21.68%, and energy management of 7.86%. The low Community Care for the Environment index indicates that human behavior has been Indonesia's
leading cause of disasters in recent years. The low environmental awareness of the community based on the survey results is influenced by several factors, namely education, age, number of household members, knowledge about the environment, attitudes towards the environment, and marital status, which significantly affect the environmental behavior of the community (Ministry of the Environment, 2013). The behavior of people who care about the environment is low, bringing ecological problems. At the beginning of 2021, the most significant flood disaster occurred in 11 districts of the province of South Kalimantan. This is caused by natural damage in the highlands, such as converting forest land into mining, plantation, and tourism areas. The habit of people who also often throw garbage into river areas results in silting the river so that water overflows when the rain discharge is high (Laili, 2021; Puspitarini, 2021).

Environmental problems cannot be avoided because they are related to humans and all their activities. To overcome this, it is necessary to change the paradigm of thinking from the community. One component of society is students at school. Education cannot be separated from the responsibility to form moral and knowledgeable people. In addition, it also prepares students who can adapt. The ability to adapt to the times is essential at this time. Lagging will occur if you cannot adjust. According to changing times, adaptation skills are called literacy (Yonanda et al., 2021). Based on the latest online KBBI searches, literacy now has three meanings: 1) the ability to write and read, 2) knowledge or skills in specific fields or activities, and 3) the individual's ability to process information and knowledge for life skills. Literacy skills are expected to be possessed by students to support an ongoing life.

Ecological literacy ability is based on data submitted from the results of a national survey on the index of people who care about the environment, which shows that people have low concern for the environment. So, it is essential to implement ecological literacy education related to the environment. Ertekin & Yüksel (2014) stated that 21st-century civilization must become an environmental society. This idea must be implemented in schools, both at primary and secondary levels. Ecological literacy is understanding human and environmental interaction (Suwandi et al., 2019). The goal is to provide environmental education practices, from problems impacts to how to overcome them, and messages to love the environment. One of the materials that contain the environment is an ecosystem. Ecosystem studies, especially on the topic of environmental management to overcome environmental pollution and damage (Handayani et al., 2020; Sugiyanto et al., 2018)

Studies about an ecosystem are one way to introduce and train ecological literacy (de Brito Miranda et al., 2017; Ramadoss, 2010). The learning process that uses ecosystem material can use the surrounding environment, such as utilizing local potential in an area. Learning that uses local potential can foster awareness of the environment and the ability to overcome environmental problems (Marlina et al., 2015). Junior high schools in Banjarmasin, South Kalimantan, never did an ecological literacy ability test. Therefore, this study aims to analyze the ability of environmental literacy by implementing learning instruction based on local potential in ecology material.

RESEARCH METHODS

Research Approach

This research uses quantitative descriptive research. Aim to analyze the ability of ecological literacy by implementing learning instructions based on local potential “Pulau Kembang” in ecology materials. This research did not use experimental design, just implementing learning and analyzing ecological literacy by percentage of the data for each indicator.

Research Participants

The research was held in one of the junior high schools in Banjarmasin, South Kalimantan. The population in this research is the students in seventh grade. The number of samples in this study was 60 students from junior high schools in Banjarmasin using a convenience sampling technique.
Research Instruments

The instrument used in this research is the ecological literacy test. The ecological literacy test consists of 10 multiple-choice questions, which are the aspect and the indicators of ecological literacy adapted from Jordan et al. (2009) and Lewinsohn et al. (2015). Experts have validated all of the learning instruction and instrument tests. The validation stage carried out by material and media experts was obtained through assessment data through questionnaires. Aspects and indicators in the instrument tests can be seen in Table 1.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Indicator</th>
</tr>
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<tbody>
<tr>
<td>Based knowledge</td>
<td>Understand the basic concept of ecology.</td>
</tr>
<tr>
<td></td>
<td>Observing</td>
</tr>
<tr>
<td>Scientific thinking skill</td>
<td>Data Collection</td>
</tr>
<tr>
<td></td>
<td>Analysis</td>
</tr>
<tr>
<td>Making Decision skill</td>
<td>Making decision</td>
</tr>
</tbody>
</table>

Data Collection

Seventh-grade students at a junior high school in Banjarmasin will conduct the science learning with ecosystem material using learning instruction based on local potential “Pulau Kembang”. After finishing, the student is given a test to measure ecological literacy. The student fills 10 questions via Google form within an hour. The researcher will analyze the data collected.

Data Analysis

The quantitative data obtained were then analyzed using the following steps: (1) Counting the total score of each respondent. (2) Calculate the percentage of respondents’ answer scores using the formula (Mouromadhoni et al., 2019).

\[
NP = \frac{R}{SM} \times 100\%
\]

NP = Percentage score; R = Obtained Score; and SM = Maximum score. The level of ecological literacy students can be identified with quantitative data obtained and then converted into qualitative data (interval data). The next step is converting percentage to value by category in Table 2

<table>
<thead>
<tr>
<th>Interval (%)</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 – 100</td>
<td>Very High</td>
</tr>
<tr>
<td>61 – 80</td>
<td>High</td>
</tr>
<tr>
<td>41 – 60</td>
<td>Medium</td>
</tr>
<tr>
<td>21 – 40</td>
<td>Low</td>
</tr>
<tr>
<td>0 - 20</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

Results

Ecological literacy is the ability to understand the basic concepts of ecology, including interactions between living things and the environment, the environment and the environment, or living things with living things (Jordan et al., 2009; Lewinsohn et al., 2015). This study aims to analyze the ecological literacy level of students at a junior high school in Banjarmasin, South Kalimantan. The ecological literacy test consists of 10 questions descriptively explained in the table 3.
Table 3. Descriptive Statistic Based on the test

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
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<tbody>
<tr>
<td>Score</td>
<td>60</td>
<td>54.83</td>
<td>15.12</td>
</tr>
<tr>
<td>Indicators 1</td>
<td>60</td>
<td>60.83</td>
<td>33.30</td>
</tr>
<tr>
<td>Indicators 2</td>
<td>60</td>
<td>67.50</td>
<td>34.22</td>
</tr>
<tr>
<td>Indicators 3</td>
<td>60</td>
<td>43.33</td>
<td>28.32</td>
</tr>
<tr>
<td>Indicators 4</td>
<td>60</td>
<td>46.67</td>
<td>33.02</td>
</tr>
<tr>
<td>Indicators 5</td>
<td>60</td>
<td>55.83</td>
<td>34.55</td>
</tr>
</tbody>
</table>

Table 3 Shows that 60 students joined in this test. The student achieved a mean score in this test of 54.83 with a standard deviation of 15.12. Based on the aspect and indicators of ecological literacy, the student achieved an average of 60.83 (indicators 1), 67.50 (indicators 2), 43.33 (indicators 3), 46.67 (indicators 4), and 55.83 (indicators 5). The mean for each indicator can show the level based on categorization in Table 2. The score for each question of the ecological literacy test can be seen in Figure 1.

Figure 1. Average Score for Each Question

Figure 1 shows the score for each question of the ecological literacy test. The test consists of ten questions divided into five indicators. Numbers 1 – 2 include the first indicator, 3 – 4 including the second indicator, 5 – 6 including the third indicator, 7 – 8 contain the fourth indicator, and the last number includes the fifth indicator. Based on the results, the lowest average in this question is seven sevenths, with an average of 20.00. Question number six is included in the third indicator with the aspect of Scientific thinking skills, and the indicator is about data collection. It means the student finds it difficult to collect the data. Because data collection requires sufficient practice and is required for accuracy and accuracy (Insani, 2016), the other question includes medium to high categories. The average level of students’ ecological literacy for each indicator can be seen in Figure 2.
Discussion

The study results show that the student’s ecological literacy ability is in the medium category. The first indicator includes the first aspect, which is about Basic knowledge. Based on the results, the first indicator get high categorize with an average score of 60.83%. This indicates the students’ that have basic knowledge. The student knows humans and natural systems (nature of scientific understanding, basic insight into the functioning of natural systems, earth's physical systems, species collection and interactions, ecosystems, ecosystem functions, human dependence on the environment, humans as ecological variables, understanding of various environmental problems, what is shaping the behavior of individuals and groups towards the environment, human cultural activities and environmental influences, how the government makes and enforces environmental laws, awareness of injustice). That means the student can implement the knowledge daily to save the environment (Wisnu et al., 2021).

The second indicator includes the second aspect, scientific thinking skills. The results show that the second indicator gets the high category with an average of 66.67%. Scientific thinking skill on the second indicator is about observing. Observing is an activity to carefully identify the characteristics of certain objects with their senses, using relevant and adequate facts from observations using tools or materials to observe objects in the context of collecting data or information (Wina et al., 2017). The third indicator includes the second aspect, scientific thinking skills. Based on the results, the third indicator gets the medium category with an average of 43.33%. These indicators indicate that the student can do data collection. Data collection is collecting information from the environment, books, the internet, or others (Wina et al., 2017). The Fourth indicator includes the second aspect, scientific thinking skills. Based on the results, the third indicator gets the medium category with an average of 46.67%. These indicators indicate the student can analyze data. Analysis data is data processing to find useful information that can be used as a basis for decision-making. The last indicator includes the second aspect which is about Decision making. Based on the results, the third indicators get the medium categorize with average 56.67%. Decision making is the process of solving a problem to select the most probable solution (Lepiyanto, 2017). The ability to think scientifically is one of the most important skills to understand the evidence that can support or contradict a theory, and to justify the truth of a theory that explains a phenomenon. The ability to think scientifically shows good results this is because science is closely related to everyday life. If in learning they are trained to apply scientific thinking, students can reason about phenomena and predict things that will happen in the future (Ballard et al., 2008; Imran, 2014; Supeno, 2017).

In the learning that was carried out, students were asked to make observations on pictures and videos of a tourist area, namely Pulau Kembang. The results of the observations are written on the student worksheets that have been provided. After making observations, students continue to collect data in the form of information on an object that is observed. After the data is collected, students do
data analysis. Data analysis is intended to process the information obtained to be used as a basis for making decisions. The implementation of the device that contains a series of scientific activities can train students to be more alert and be able to solve environmental problems based on basic knowledge of ecology and a series of scientific methods (Jordan et al., 2009; Mustika et al., 2016; Nuraisyah et al., 2017; Putra et al., 2014). Activities carried out in class allow participants to develop their ability to think scientifically. Research conducted by Dwianto et al. (2017) shows that learning that elevates surrounding phenomena can improve scientific abilities. One factor is the motivation to learn. Hasanah et al. (2021) stated that learning motivation can be increased by providing something new, both learning models, learning media, or learning resources. This means that teachers must continue to innovate when preparing lessons. The use of phenomena around students in this research is a form of learning innovation to increase students' learning motivation. The findings obtained illustrate that environmental-based learning, such as integrating local potential, can help students to recognize the surrounding environment better and be aware of the importance of protecting the environment (Marlina et al., 2015; Ramadoss, 2010; Van Damme & Neluvhalani, 2004).

CONCLUSION

Based on the research results, students' ecological literacy is in the medium category. There are three aspects of ecological literacy: basic knowledge, scientific thinking skills, and decision-making skills. The findings indicate the second and third aspects with indicators of collecting data, analyzing data, and making conclusions, still need to be improved. These results can be used as a reference for developing environment-based learning so that ecological literacy skills can continue to be trained.

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References


