The Profile Ecoliteracy of Students at Adiwiyata School

Moh Salimi ¹, Tri Saptuti Susiani ¹, Ratna Hidayah ¹, Karsono Karsono ¹, Muna Fauziah ²

¹Universitas Sebelas Maret, Indonesia
²Institut Agama Islam Nahdlatul Ulama Kebumen, Indonesia

Abstract – Ecoliteracy and Adiwiyata School are pillars that support Education for Sustainability Development (ESD). However, most Adiwiyata schools only focus on process management, not yet on student outcomes. The purpose of this research is to describe the ecoliteracy profile at the Adiwiyata School. This study uses a case study research method with principals, teachers, parents, and students as participants. The research was conducted at the Adiwiyata School in Kebumen Regency. Data collection techniques comprise questionnaires, observation, interviews, and document studies. The data analysis technique uses interactive qualitative data analysis techniques. The results of the study show that ecoliteracy abilities include: (1) cognitive aspects showing the ability to think systematically in solving natural and social environmental problems; (2) the affective aspect shows a sense of acceptance, care, and empathy for the natural and social environment; (3) the activity aspect shows the ability to care for the surrounding environment and save energy; and (4) the spirit aspect shows admiration for the natural environment. This profile should be the focus of the development of Adiwiyata schools. The findings of this study can be a reference for implementing adiwiyata-based education by paying attention to students’ ecoliteracy.

Keywords – Adiwiyata School, ecoliteracy, education for sustainability development.

1. Introduction

Indonesian education focuses on Education for Sustainable Development (ESD), one of which focuses on environmental conservation. This is in accordance with the objectives of ESD in the form of creating environmental insight, social justice, and economic justice [1]. ESD is a comprehensive and transformational education that addresses pedagogy, content and learning outcomes, and the learning environment. ESD integrates content such as climate change, poverty and sustainable consumption into the curriculum. In addition, ESD also creates interactive and learner-centered teaching and learning settings. Integration with various components in education needs to be done to implement ESD. The integration consists of: (1) integrating ESD into programs, strategies and policies; (2) integrate ESD in textbooks and curricula; (3) integrating ESD into teacher professional education; and (4) explaining ESD in classrooms and other learning places. In response to this, the government through the ministry of education created an environmental education program, namely education that focuses on protecting the environment [2].

In addition, there are Adiwiyata school programs ranging from basic education to secondary education. Adiwiyata school is a program that aims to create responsible school citizens in efforts to protect and manage the environment through good school governance to support sustainable development [3]. The Adiwiyata program is a form of government commitment to environmental management and protection through education. The policy made by the government through the Minister of Environment Regulation No. 5 of 2013 was translated into the Adiwiyata school program [4]. This program also focuses on developing basic norms, including: openness, togetherness, equality, fairness, honesty, and environmental sustainability.
In this regard, the main principles of the Adiwiyata school program are: (1) Participatory, that is, each activity has to involve all school members starting from planning, implementing and evaluating according to their respective duties and responsibilities; and (2) Sustainable, namely all activities have to be carried out in a planned and sustainable manner [5].

As a form of adiwiyata embodiment, schools fulfill at least four program components, namely insightful policies, environmental-based curriculum implementation, participatory-based environmental activities, and management of environmentally friendly supporting facilities. These four things are a unified whole. In accordance with its components, Adiwiyata schools have an important role to help continue development based on environmental sustainability. As explained by Vasconcelos and Orion [6] that the essence of sustainable development is to meet human needs in maintaining the earth's living systems.

The form of commitment that has to be carried out by schools is to conduct environmental education to prepare people with knowledge, skills, values and attitudes to care for the environment so that they can actively participate in solving environmental problems [7]. A school is a place for students to learn to prepare knowledge, skills, values, and attitudes to care for the environment. In addition, schools are also places to understand the causes and impacts of human behavior on the environment and as a place to live sustainably [8].

Unfortunately, these needs have not been fully met. Educational institutions have not succeeded in forming human characters who care about the environment. This failure was also caused by the low participation of school residents to understand environmental problems, inadequate and applicable materials and methods of implementation, lack of ability to allocate environmental education budgets, inadequate facilities and infrastructure, and weak coordination between education actors and related agencies [9]. Then, one of the efforts to overcome these weaknesses, schools have to provide effective learning practices. The learning process has to lead to the cultivation of an attitude of caring for the environment by providing learning opportunities outside the classroom. This realization can be maximized by establishing Adiwiyata program in schools.

Currently, the success of Adiwiyata is only seen from the management side, it has not led to the various abilities of students [10], [11]. Several studies have revealed the impact on students' abilities, but they are still focused on one area of ability [10], [12]. Therefore, a study is needed regarding the impact of Adiwiyata on abilities that cover many domains of ability.

One ability that covers many domains of ability is ecoliteracy. Ecoliteracy is a complex ecological intelligence. This intelligence is supported by affective (social and emotional), cognitive, and psychomotor elements. Awareness to save the damaged environment is based on affective aspects. The will to preserve the environment is based on cognitive and environmental knowledge. Furthermore, actions to preserve the environment describe psychomotor aspects [13].

Ecoliteracy studies in Adiwiyata schools are interesting. This is because there are many school programs that lead students to have an awareness of saving the environment. However, the form of awareness of saving the environment alone is not enough. Consciousness is only included in the emotional realm/aspect that already exists in the learner. For an ecoliteracy profile to be more complete, other aspects, such as cognitive, activity, and spirit, have to also be described in detail. In addition, ecoliteracy according to Capra and the Center for Ecoliteracy are cognitive (head), emotional (heart), spirit (connection) and activity (hand). Each of these aspects has several indicators that characterize each aspect of ecoliteracy.

In accordance with its objectives, the Adiwiyata school has the goal of realizing responsible school citizens [14]. This can mainly be seen in efforts to protect and manage the environment, as well as sustainable development through good school management. The Adiwiyata program is also implemented with the principles of educative, participatory, and sustainable. Thus, it is said to be relevant if the research is carried out in Adiwiyata schools.

The purpose of this study was to describe the ecoliteracy profile of students at Adiwiyata schools. Based on these objectives, the research problem formulation focuses on: (1) How is the ability of ecoliteracy in the cognitive aspect?; (2) How is the ability of ecoliteracy in the emotional aspect?; (3) How is the ability of ecoliteracy in the aspect of activity?; and (4) How is the ability of ecoliteracy in the spirit aspect?

2. Methods

This research is qualitative research with a case study method [15]. The subjects of this study were the principal, teachers, parents, and students of the elementary school, Kebumen Regency.
The school was chosen for the following reasons: (1) the school's vision and mission focus on environmental preservation; (2) schools, families and communities collaborate to develop green schools; and (3) as a high school in Central Java Province. The following is a map of the location of Kutosari Kebumen 1 Public Elementary School as the location of this research in Figure 1 below.

![Map of the research location](image)

This research was conducted in May-August 2022. The main participants of this research were students, teachers and principals of the elementary school, Kebumen Regency. In addition, there are additional participants, namely parents of students and the surrounding community.

Collecting data in this study was done using observation, questionnaires, interviews and document studies [16], [17]. Data validation was done using technical triangulation and source triangulation [18]. Data analysis was done using interactive data analysis patterns [19]. The determination of the criteria in the questionnaire refers to the criteria for the success rate according to Chen et al. [20], and Widoyoko [21]. The criteria for the success rate are presented in Table 1 below.

<table>
<thead>
<tr>
<th>No</th>
<th>Aspect of Ecoliteracy</th>
<th>Average</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>head/cognitive</td>
<td>3,50</td>
<td>87,50</td>
</tr>
<tr>
<td>2</td>
<td>heart/emotional</td>
<td>3,46</td>
<td>86,46</td>
</tr>
<tr>
<td>3</td>
<td>hands/active</td>
<td>3,08</td>
<td>77,08</td>
</tr>
<tr>
<td>4</td>
<td>spirit/connectional</td>
<td>3,19</td>
<td>79,69</td>
</tr>
</tbody>
</table>

3. Results and Discussion

This study focuses on describing the ecoliteracy profile of students in Adiwiyata schools. The ecoliteracy profiles studied include: head/cognitive, heart/emotional, hands/active, and spirit/connectional. The description of students' ecoliteracy was explored through questionnaires, observations and interviews. The results of the questionnaire, observation and interviews are as follows.

3.1. Head/ Cognitive

The results of the questionnaire in Table 2 show that the head/cognitive aspect reached an average of 3.50 or equivalent to 87.50%. These results can be interpreted that students already have high knowledge of ecoliteracy. In detail, it can be seen that students already have a perspective in themselves when dealing with problems or situations with their approach. In addition, students have also been able to understand basic ecological principles, are able to think critically and creatively when solving problems, and apply knowledge to new situations. On the other hand, students begin to be able to assess the impact and ethical effects of technology and human actions, and can take into account the long-term consequences of the decisions they make.

Furthermore, the results of observations showed that during class discussions, students had brought up conversations with the teacher and their friends. Students have been able to convey the benefits of rice, eggplant, and fruit plants. Not only that, students are also able to convey the types of plants that produce oxygen and carbohydrates; plants that can be made into finished products such as tables, chairs, and beds; and plants need light, water, soil, and fertilizer. Finally, students express the idea that humans cannot live without plants. If there is no food, then humans cannot eat and survive.

The results of the questionnaires and observations were also supported by the results of interviews which showed the findings that most students had been able to express something systematic, such as a forest that functions as a place to absorb water, if it is bare, it will flood and landslide. Students can also explain basic ecology, such as that every creature is interdependent and every creature is different and has its own function.
Furthermore, all students can provide solutions related to experiences based on their knowledge, such as how to respond to flood events and discuss causes and discuss solutions. In addition, students still rarely discuss about human actions that harm nature on their own initiative. For example, students' expressions about the air in Kebumen are getting hotter, because more and more houses are being built in the rice fields. Finally, students have understood the long-term consequences related to the consequences for decision making, such as when students experience the consequences of raising chickens and fish. Cognitive abilities can be seen in activities as shown in Figure 2.

The findings of this study are in line with the opinion of McBride et al. [22] that the cognitive aspects of students are shown by their ability to select and evaluate problem-solving actions. This is also in line with the results of Payne's research which found that students were able and aware of every action they took in their environment [23]. Furthermore, Hollweg et al. also found findings that the cognitive aspect is shown by students with the ability to identify and define environmental problems/issues, as well as analyze and evaluate information about problems that exist in the surrounding environment [24].

3.2. Heart/ Emotional

The second aspect of this research is the heart/emotional aspect. There are three findings obtained in this study. The results of the questionnaire show that students have achieved this aspect with an average score of 3.46 or 86.46%. These results can be interpreted that: (1) Students have a sense of care, empathy, and respect for fellow living beings; (2) Students have an attitude of respect and cooperation with other people from various backgrounds, motivations, and different intentions; and (3) Students can be fair and respectful to everyone.

This finding is in line with the results of observations which show that students have shown a sense of caring and empathy when they share lunches and exchange food. In addition, students' respect and cooperation have been shown when students work together to share tasks in class, such as leading prayers, dividing picket assignments, and watering flowers and plants. Last but not least, students showed fairness and respect when they prayed for a friend who did not go to school because of illness to get well soon and be able to go back to school.

This finding is in line with the results of the interview which showed that all students answered that they felt caring and empathetic when a friend had difficulties. They also respect living beings by not stepping on plants. Students' cooperative attitude is said by students when they work in groups and try to appreciate the work of other friends. Another attitude is that students want to play with other students by not being picky about friends and are willing to invite students with special needs to play. Emotional abilities can be seen in activities as shown in Figure 3.
Based on these data, it can be concluded that: (1) Students have reached the heart/emotional aspect by showing care, empathy, and respect (students share lunch and exchange food); (2) Students have an attitude of respect and cooperation when they share assignments in class and in groups; and (3) Students can be fair and respectful to all living things by praying for friends who do not go to school because of illness, not being picky about friends, and being willing to play with special needs (ABK) friends.

The second aspect regarding the ability of ecoliteracy at the elementary school is seen from the heart/emotional aspect. The findings result that students have shown care, empathy, and respect; have an attitude of respect and cooperation when they share assignments in class and in groups; as well as being fair and respectful to all living things by praying for friends who do not go to school because of illness, not being picky about friends, and being willing to play with ABK friends.

The expressed ability in the heart/emotional aspect agrees with Yukselbilgili et al. [25] who claim that emotions are influenced by the environment in which they are expressed. This action is the result of the relationship between humans and other living things. So, it is not surprising that the attitude taken by students during the study was that they were accustomed to respecting living beings (fellow humans, animals, or plants) and helping friends, sharing with other living creatures, and not being picky about friends when playing. It is similar to what was stated by Fiori and Maillefer [26] by whom the emotional aspect involves a sense that is within the self as well as an attitude of caring for the surrounding environment. In line with that, Sopiani et al. [27] found that the emotional aspect is shown by students from their concern for fellow living beings such as when students respect everyone without discriminating against friends with special needs or normal friends.

### 3.3. Hands/Active

The third aspect of this research is the hands/active aspect. The results of the questionnaire show that students have achieved this aspect with an average score of 3.08 or 77.08%. These findings are interpreted as: (1) Students have been able to make and use tools and objects according to procedures on an ongoing basis; (2) Students can act practically and effectively according to their ecological knowledge; and (3) Students can implement energy and resource saving behaviour.

In addition to the questionnaire data, the results of observations were also found. Observation findings resulted in data that: (1) Students were willing to water the plants every morning; (2) Students are accustomed to eating and drinking with provisions from home, and not using plastic packaging; (3) Students are accustomed to turning off the toilet light and closing the sink faucet after use; and (4) Students are accustomed to using used bottles as flower pots.

Then, the interview data showed that: (1) Students had never planned/made/used a tool for the benefit of the community, such as making windmills for generating electricity and modifying plant sprinklers; (2) Students have acted in accordance with ecological knowledge such as throwing garbage in its place; and (3) All students use energy wisely such as according to faucets and lights after use. Student activities can be seen in activities as shown in Figure 4.
Based on these data, it can be concluded that students have reached the hands/active aspect with their ability to make and use tools and objects according to procedures on an ongoing basis such as watering plants every morning; act practically and effectively according to their ecological knowledge, such as getting used to eating and drinking with provisions from home and not using plastic packaging; and implement energy and resource-saving behaviors such as turning off the toilet light and closing the sink faucet after use, and using used bottles to make flower pots.

The third aspect of the ability of ecoliteracy at elementary school is seen from the hands/active aspect. The findings resulted that students were able to make and use tools and objects according to procedures on an ongoing basis such as watering plants every morning; acting practically and effectively according to their ecological knowledge, such as getting used to eating and drinking by bringing lunch from home; and implement energy and resource-saving behaviors such as turning off the toilet light and closing the sink faucet after use, and using used bottles to make flower pots.

The abilities shown in this study are in line with the opinion of Singleton [28]. He stated that students' ecoliteracy activities were proven by direct or indirect learning related to development activities, planting, environmental improvement, and others. It is in line with the results of Aditya and Oktavilia's research [1] regarding the hands/activity aspect. A person's awareness of the actions taken has been manifested in many daily activities, such as processing waste, doing plant projects, spending food, and saving energy.

3.4. Spirit/Connectional

The fourth aspect of this research is the spirit/connectional aspect. The results of the questionnaire show that this aspect has been achieved by students with an average score of 3.19 or 79.69%.

The meanings are: (1) Students have been able to feel the magic and show admiration for nature; (2) Students can praise nature and all living things that are shown by students when expressing the reasons for gathering near trees that are nice, cool and lots of wind, and are able to express praise for the earth or living creatures; (3) Students are quite able to feel and appreciate the natural conditions shown when expressing a sense of comfort in being in a mountain, river, or other place; and (4) Students can feel comfortable with nature and show it to others as indicated by having discussed or expressed a sense of comfort in being in a mountain, river, or other place. The connectional capability can be seen in the activity as shown in Figure 5.

![Figure 5. Gathering and eating in a cool place](image-url)

Based on these data, it can be concluded that: (1) Students have been able to feel the magic and show admiration for nature shown by students gathering while eating in a cool and shady place; (2) Students can praise nature and all living things that are shown by students when expressing the reasons for gathering near trees that are nice, cool and lots of wind, and are able to express praise for the earth or living creatures; (3) Students are quite able to feel and appreciate the natural conditions shown when expressing a sense of comfort in being in a mountain, river, or other place; and (4) Students can feel comfortable with nature and show it to others as indicated by having discussed or expressed a sense of comfort in being in a mountain, river, or other place. The fourth aspect regarding the ability of ecoliteracy at elementary school is seen from the Spirit/Connectional aspect.
The findings show that: (1) Students have been able to feel and show admiration for nature when they gather to eat chili in a cool and shady place; (2) Students are accustomed to praising all living beings when gathering with friends; (3) Students have felt and appreciated the state of nature by expressing a sense of comfort in being in mountains, rivers or other places; and (4) Students can feel comfortable with nature which is shown through discussions with their friends while in nature.

The findings on the spirit/connectional aspect agree with the findings of Yocum et al. [29] who concluded that the spiritual aspect is characterized by intelligence to judge the actions he sees. In accordance with the research of Desfandi et al. [30] which resulted in the finding that the implementation of spirit/connectional ecoliteracy is shown when all school members are involved in environmental hygiene activities. This intelligence is manifested when students create gardens, maintain plants, cultivate medicinal plant factories, and others. Student involvement is associated with environmental concepts applied in schools. This is done with the aim of providing students with insight into the environment and instilling environmentally friendly attitudes, actions, and skills. As suggested by Monaghan and Curthoys [31], ecoliteracy can be instilled in students through the development of an environmentally friendly culture in schools.

4. Conclusion

From the results of the study, it can be concluded that the ecoliteracy ability of students at the elementary school is characterized by cognitive aspects which are indicated by the ability to think systematically in solving problems of the natural and social environment; characterized by affective aspects which are indicated by a sense of acceptance, concern, and empathy for the natural and social environment; marked by aspects of activity as indicated by the ability to care for the surrounding environment and save energy; and is marked by the spirit aspect which is shown by admiration for the natural environment. This study has limitations, namely it is only analyzing the profile of ecoliteracy in elementary schools. Then, the researcher suggests to future researchers to conduct research on ecoliteracy at the junior or senior secondary level, as well as expand the ability of ecoliteracy at the sub-district or district level. Future research can examine four components of the Adiwiyata school program, namely environment-oriented policies, implementation of an environment-based curriculum, participatory-based environmental preservation activities, and management of environmentally friendly supporting facilities and infrastructure.

References:


