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Student's Environmental Literacy Profile SMPN 1 Pekalongan

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Abstract: *Education is one effort to overcome environmental problems. This effort needs to start by knowing the profile of students. This research aims to determine the literacy profile of students at SMP N 1 Pekalongan. This research is a type of qualitative descriptive research. The sample in this study was 122 students from class VII. This research indicator refers to NELA, an environmental literacy assessment project implemented in the United States. The data collection technique is through tests using the Middle School Environmental Literacy Survey (MSELS). The test includes four indicators, namely: ecological knowledge, environmental problem-solving skills, attitudes and concern for the environment, and environmentally responsible behavior. Research data was analyzed descriptively based on achievement value criteria. The results of the research show that the environmental literacy level of students at SMP N 1 Pekalongan is 57.32, which is categorized as medium. The ecological knowledge indicator is 50.24 (fair), environmental problem-solving skills is 43.77 (fair), attitude and concern for the environment is 66.25 (good) and environmentally responsible behavior is 69.04 (good). Efforts need to be made so that students' environmental literacy at SMP N 1 Pekalongan in each indicator reaches the outstanding category.*

Keywords*: Profile, Environmental Literacy, SMP N 1 Pekalongan*

1. INTRODUCTION

Environmental conditions are one of the factors that influence the quality of human life. In accordance with Article 1 paragraph (1) of Law Number 32 of 2009 concerning protection and management, the environment is a spatial unit consisting of objects, power, conditions, and living creatures, including humans and their behavior which affects nature itself, humans, and living creatures other (Rusdina, 2015).

Humans play an important role in managing nature for ecosystem survival and environmental sustainability (Bouwma-Gearhart et al., 2018). Environmental damage is caused by human actions that mismanage the environment (Herlina, 2017: Nugroho, 2018).

Environmental problems are now increasingly worrying (Nunez dan Clores, 2017). Efforts to tackle the environment continue to be made, among others, through the field of education. Education focuses on learning processes and outcomes (Halidjah and Pranata, 2021). The knowledge gained becomes a provision that leads to the mastery of knowledge, skills, and good character (Pratiwi, 2017; Yazar, 2015). It is hoped that this mastery will create a generation that can think creatively, and logically, able to solve problems and make the right decisions (Andriyani and Suniasih, 2021). Referring to various recommendations, environmental education experts then developed the term environmental literacy which was pioneered by the United States (Roshayanti et al, 2019).

Someone who has environmental literacy has the basic skills of understanding and feeling about the relationship between humans and the environment (Desfandi, 2015), and can behave, be

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responsible, care, and be environmentally aware (Ariesandy, 2021; Fitri and Hadiyanto, 2022).

Several studies regarding the environmental literacy level of students in Indonesia in general still need to be improved (Anggraini and Nazip, 2022). The instruments used in several of these studies are the standard Middle School Environmental Literacy Survey (MSELS) assessment instruments. According to Hollweg et al (2011), this instrument has been used in the national environmental literacy assessment carried out in the United States, known as the National Environmental Literacy Assessment Project (NELA).

The results of research regarding students' environmental literacy levels show that there are variations in achievement levels in the indicators studied (Santoso, 2021; Maulidya et al, 2014).

Understanding of the environment should be instilled from an early age (Purnomo, 2015). The application of environmental literacy is important for junior high school students considering that they are at the age of children. According to USAID (2000) in Roshayanti et al, 2019), children have high idealism and adults are more tolerant of children's opinions than the opinions of fellow adults. This can be an entry point for environmental education for the community.

The implementation of literacy in schools is expected to produce a younger generation who is smarter in protecting and processing the environment. According to Febriasari and Supriatna (2017), students who have environmental literacy will have the ability to choose to behave responsibly towards the environment through knowledge, skills, and awareness of environmental problems, so environmental literacy plays a role in forming a person's character to care about the environment.

The implementation of environmental literacy in schools needs to consider local conditions, traditions, and possible innovations (Roshayanti et al, 2019). The city of Pekalongan, which is in the northern coastal region, is not free from environmental problems with all their impacts. Especially the tidal problem is becoming more frequent (Faturohim and Baita, 2022) so innovation is needed regarding mitigation or reducing the impact of the tidal problem.

SMP N 1 Pekalongan and other schools in this area need to integrate environmental literacy into the various activities carried out. It is hoped that this effort can increase the environmental literacy of students and the community in the surrounding environment so that they can play a role in anticipating the problems they face.

In this regard, it is necessary to search for information through research on the environmental literacy profile of students at SMP N 1 Pekalongan as a starting point in integrating environmental literacy into various activities at school.

2. RESEARCH METHOD

The method used in this research is a qualitative descriptive research method.

This research was carried out at SMP N 1 Pekalongan. The population in the study was class VII students. The sample used was 122 students.

Determination of sample size using the Slovin formula with a significance level of 5%. The sampling technique used is cluster sampling based on where the students live.

Data collection uses tests. The instrument used was the Middle School Environmental Literacy Survey (MSELS). MSELS includes 4 indicators of environmental literacy among others; components of ecological knowledge (17 multiple choice questions), skills in solving environmental problems (10 multiple choice questions), attitudes and concern for the environment (25 Likert scale type items), and environmental responsible behavior (12 items). The construct validity and reliability test of MSELS has been researched by McBeth and Volk (2010), the results are considered good in measuring the environmental literacy of middle school age students, so it is used as reference material for standard assessments or evaluations for environmental literacy in several countries.

The research data was then analyzed descriptively based on the achievement score criteria for each environmental literacy indicator. The results of students' environmental literacy tests are analyzed by calculating the percentage referring to the percentage assessment level formula as follows:

Assessment level percentage =
(Σ gain score/ Σ maximum score) × 100%
(Purwanto, 2002 in Utami 2017).

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Then the results are converted to the criteria percentage of conformity in Table 1. Conformity Criteria (Arikunto, 2010).

Table 1. Conformity Criteria

Criteria	Percentage (%)
81-100	Very well
61-80	Good
41-60	Enough
21-40	Not enough
≤20	Very little

3. RESULTS AND DISCUSSION

Most of the students at SMP N 1 Pekalongan are students accepted through the zoning route. Students generally live within a radius of less than one kilometer from the school. There are similarities in the impacts they feel at school and home due to environmental changes that occur. Several invitations have been issued by the school through the Adiwiyata school program, likewise by government officials in the environment where students live. Indirectly, they have received information about behavior that supports the environment. The following are the results of research regarding the environmental literacy achievements of students at SMP N 1 Pekalongan.

Based on the analysis of the data obtained, the environmental literacy score of students at SMP N 1 Pekalongan is 57.32 so it is included in the sufficient category.

The results of research regarding the environmental literacy achievements of students at SMP N 1 Pekalongan across all indicators are presented in Table 2 Average Percentage of Environmental Literacy for Students at SMP N 1 Pekalongan.

Table 2. Average Percentage of Environmental Literacy for Students at SMP N 1 Pekalongan

No	Criteria	Value Range	Frequency	Percentage
1	Very well	81-100	0	0.00%
2	Good	61-80	43	35.25%
3	Enough	41-60	78	63.93%
4	Not enough	21-40	1	0.82%
5	Very less	≤20	0	0.00%
Amount			122	100

Table 2 shows the environmental literacy achievement criteria for students at SMP N 1 Pekalongan with a sample size of 122 students. The highest percentage was 63.93%, namely adequate criteria, the percentage with good criteria was 35.25% and the poor percentage was 0.82%.

Based on the results of data analysis, the environmental literacy achievements of students at SMP N 1 Pekalongan are neither very good nor very poor. Based on the average environmental literacy score obtained, the environmental literacy of students at SMP N 1 Pekalongan shows a figure of 57.32, which is at sufficient criteria. This shows that efforts still need to be made to increase the environmental literacy of students at SMP N 1 Pekalongan.

Environmental Literacy Achievements of Students at SMP N 1 Pekalongan for Each Indicator

Environmental literacy has 4 indicators: ecological knowledge, cognitive skills, environmentally conscious attitudes, and environmentally responsible behavior. Data analysis shows that the average value of each environmental literacy indicator for students at SMP N 1 Pekalongan is not the same. The average value of students' environmental literacy for each indicator studied is as stated in Table 3 The Average Value of Environmental Literacy for Students at SMP N 1 Pekalongan for Each Indicator.

Table 3. Average Value of Environmental Literacy of Pekalongan 1 Middle School Students for Each Indicator

No	Indicator	Percentage	Criteria
1.	Ecological Knowledge	50.24	Enough
2.	Cognitive Skills	43.77	Enough
3.	Environmental Conscious Attitude	66.25	Good
4.	Responsible Behavior towards the environment	69.04	Good

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Based on Table 3, the average value of Each environmental literacy indicator for students at SMP N 1 Pekalongan for each indicator can be presented in Figure 1.

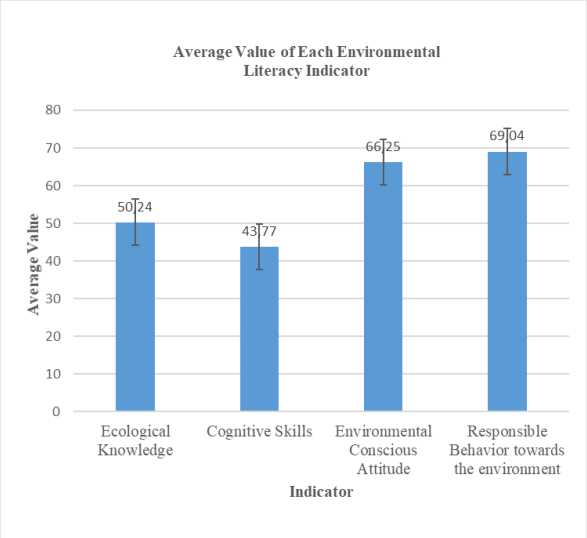

Figure 1. Average Value of Each Environmental Literacy Indicator for Students at SMP N 1 Pekalongan.

Figure 1 shows that the highest average percentage score achieved is the indicator of responsible behavior towards the environment which has an average percentage score of 69.04 so it is a good criterion but still needs to be improved. Meanwhile, the lowest average value is found in the cognitive skills indicator which has an average percentage value of 43.77 with sufficient criteria.

The lowest average percentage of environmental literacy achieved by students at SMP N 1 Pekalongan was found in the cognitive skills indicator. The low environmental literacy scores of students are partly due to their low intention to know and study environmental problems (Rohwedder, 2004 in Nasution, 2016). This shows that teachers as educators need to make various efforts, including providing information and raising awareness that understanding the environment must be the basis of attitudes to be able to participate in solving environmental problems (Nasution, 2016).

Students of SMP N 1 Pekalongan felt the impact of climate change, namely the tidal flood disaster. This disaster is a problem at school and in the home environment, but they do not yet have sufficient knowledge to mitigate this disaster. According to Widarjoto et al (2019), a lack of knowledge influences vulnerability in facing disasters. So, students need information and understanding regarding disaster mitigation, especially tidal flood disasters.

Environmental Literacy Achievements of Students at SMP N 1 Pekalongan for Each Sub-Indicator

Environmental literacy has 4 indicators: ecological knowledge, cognitive skills, environmentally conscious attitudes, and environmentally responsible behavior. Indicators of cognitive skills and environmental awareness have several sub-indicators.

The following is the average value of students' environmental literacy for each sub-indicator which is presented in Table 4. The Average Value of Environmental Literacy for SMP N 1 Pekalongan Students for Each Sub-Indicator.

Table 4. Average Value of Environmental Literacy for SMP N 1 Pekalongan Students for Each Sub-Indicator

No	Indicator	Sub Indicator Code	Average value	Criteria
1.	Ecological Knowledge	A1	50.24	Enough
2.		B1	44.81	Enough
3.	Cognitive Skills	B2	43.31	Enough
4.		B3	42.62	Enough
5.	Environmental	C1	73.2	Good
6.	Conscious	C2	59.87	Enough
7.	Attitude	C3	57.81	Enough
8.	Environmentall y Responsible Behavior	D1	69.04	Good

Information:
A1 = Basic ecological knowledge
B1 = Identify environmental issues
B2 = Analysis of environmental issues
B3 = Environmental action plan
C1 = Verbal commitment (intention to act)
C2 = Sensitivity to the environment
C3 = Feelings about the environment
D1 = Actual commitment (behavior)

Based on Table 4, the Average Value of Environmental Literacy for SMP N 1 Pekalongan Students for Each Indicator, Figure 2 can be presented.

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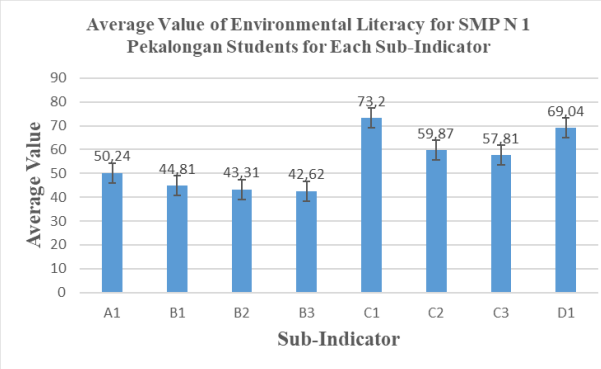

Figure 2. Average Value of Environmental Literacy for SMP N 1 Pekalongan Students for Each Sub-Indicator

Table 4 and Figure 2 showed that of the 8 sub-indicators of environmental literacy for SMP N 1 Pekalongan students, the highest score was obtained from the sub-indicator of verbal commitment with an average score of 73.2 which is included in the good criteria. The lowest value was obtained from the environmental action plan sub-indicator with a value of 42.62 which was categorized as sufficient.

The research results for each sub-indicator are as stated in the following description.

1. *Basic ecological knowledge.*
   The environmental literacy achievement of students at SMP N 1 Pekalongan in the sub-indicator of basic ecological knowledge shows a figure of 50.24, so it is included in the sufficient category. This shows the need to make efforts to improve students' mastery of basic ecological knowledge. According to Erdogan et al (2009) in Rahmawati (2022), basic ecological knowledge will be formed if an understanding of ecological concepts, principles, and theories is provided as well as knowledge and understanding of how nature works and how nature interacts with social systems.
2. *Identify environmental issues.*
   The environmental literacy achievement of students at SMP N 1 Pekalongan in the environmental issue identification sub-indicator shows a figure of 44.81 so it is included in the sufficient category. The instrument for the environmental issue identification sub-indicator consists of three questions that begin with the presentation of a discourse. Then students are asked to conclude what issues are contained in the discourse. Considering that the results are still in the sufficient category, efforts need to be made to improve them.
   This effort can be done by implementing student-centered learning such as problem-based learning. According to research by Mauludah et al (2018), the ability to identify environmental issues can be improved through the application of problem-based learning.
3. *Analysis of environmental issues*
   The environmental literacy achievement of students at SMP N 1 Pekalongan in the environmental issues analysis sub-indicator shows a figure of 43.31 so it is in the sufficient category so efforts need to be made to improve it. According to McBride, et al (2013), the ability to analyze environmental issues can be improved by providing exercises related to environmental problem analysis. According to Mauludah et al (2018), the ability to identify and analyze environmental issues can be improved through the application of problem-based learning. The application of problem-based learning guides students to construct their understanding through the problems raised (Abdurrozak et al, 2016). The teacher's role as a role model, mastery of the material, and pedagogical competence is also needed to overcome issues related to sustainability (Goldman et al, 2013).
4. *Environmental action plan*
   The environmental literacy achievement of students at SMP N 1 Pekalongan in the environmental action plan sub-indicator shows a figure of 42.62, so it is included in the sufficient category. This figure is the lowest figure among all the sub-indicators studied. The instrument in this sub-indicator is in the form of questions that begin with a discourse on land conversion. Students are asked to choose two strategic actions from the eight action options presented. Only 52 of 122 students answered correctly. According to Sulastri and Rustaman (2015), the attitudes and decisions taken by students begin with thoughts based on experience and

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information they have obtained about the environment. To lead students to the most appropriate strategic choices, it is necessary to be provided with knowledge regarding which parties play a role in decision-making and the role of each party. It is also necessary to instill a *sustainability* perspective in understanding a problem. Creative thinking skills are also needed in planning environmental action. This ability, among other things, can be trained by applying synectic learning (Suratno et al, 2019).

5. *Verbal commitment*
The environmental literacy achievement of students at SMP N 1 Pekalongan in the verbal commitment sub-indicator shows a figure of 73.20 so it is included in the good category. Verbal commitment indicates intent to act. As children who grew up in a flood-affected environment, the students of SMP N 1 Pekalongan are well aware that problems are occurring in their environment. This awareness creates an intention in them to help protect the environment. This is in line with the opinion of Deswari dan Dadang (2016), namely that environmental literacy will grow starting from awareness and concern for the environment.
6. *Sensitivity to the environment*
The environmental literacy achievement of students at SMP N 1 Pekalongan in the environmental sensitivity sub-indicator shows a figure of 59.87 so it is included in the sufficient category. Sensitivity to problems can be generated if students are faced with situations that require solutions (Sumantri, 2015). Students need to be trained to solve environmental problems through appropriate learning. Appropriate in selecting topics and learning steps. In line with this, the ICARE learning model (Hadiansah, 2019) and the problem-based learning model can be used as choices (Faudiah et al, 2018). This learning model can also improve critical thinking skills (Syahfitri dan Sulaiman, 2023). Sensitivity and concern for the environment can also be built through the implementation of the Adiwiyata school program. This is as per the results of research from Herlina et al (2021).
7. *Feelings about the environment*
The environmental literacy achievement of students at SMP N 1 Pekalongan in the sub-indicator of feelings towards the environment shows a figure of 57.81 so it is included in the sufficient category. This shows the need for efforts to increase students' environmental literacy as argued by Simon in McBride et al (2013), which states that the environmental literacy component will influence sensitivity and appreciation of the environment.
8. *Environmentally responsible behavior*
Environmentally responsible behavior can be interpreted as any action that has a good impact on solving environmental problems (Suryanda et al, 2020). The environmental literacy achievement of students at SMP N 1 Pekalongan in the sub-indicator of environmentally responsible behavior shows a figure of 69.04 so it is included in the sufficient category. This is different from the verbal commitment sub-indicator which is the intention to act. The verbal commitment value has reached good criteria, namely 73.20, but this does not necessarily mean that action will emerge as expected to be in favor of environmental interests. Students need to continue to be guided to choose the behavior they should carry out so that there is harmony between their intentions and behavior. The form of guidance provided includes effective environmental learning, including implementing EJAS (experiential exploration of the surrounding nature) (Ardianti et al, 2017). Apart from that, outdoor learning increases student motivation and learning outcomes (Dewi, 2021). Effective environmental learning is also needed so that students are encouraged to be more active in activities that use their hands or outdoor activities so that environmental literacy increases Jannah (2013). According to Saltan and Faruk (2017), student involvement in outdoor activities with parents is positively correlated with student interest in environmental issues.

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4. CONCLUSION

Based on the research results, it can be concluded that the environmental literacy of students at SMP N 1 Pekalongan shows a figure of 57.32, so it is included in the sufficient category. The average value for each indicator of literacy varies. The average value of the components of ecological knowledge is 50.24 (enough), skills in solving environmental problems is 43.77 (enough), attitude and concern for the environment are 66.25 (good), and responsible behavior towards the environment is 69.04 (good).

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