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Analysis of Environmental Literacy of Puspita High School Students, Air Kumbang District, Banyuasin Regency

Siti Nurhayati[a], Wulandari Saputri[b]
[a]*SMA Puspita Air Kumbang, Sumatera Selatan, Indonesia,
hayatisitinur13@gmail.com
[b] Universitas Muhammadiyah Palembang, Indonesia, wulandari_saputri@um-palembang.ac.id

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Correspondence: hayatisitinur13@gmail.com

Abstract
This study aims to analyze the environmental literacy of students at Puspita High School, Air Kumbang District, and Banyuasin Regency related to biotic and abiotic components in oil palm plantations. This study uses a quantitative descriptive approach with a data collection method through an environmental literacy questionnaire. The population of this study is 175 students of class X phase E, and the research sample of class X1 is 35 students. The results showed that most of the population had environmental literacy skills at a "High" level, with a frequency of 13 people. The "Medium" and "Very High" categories also have a significant number, 9 and 8 individuals, respectively. The "Very Low" and "Low" categories have the lowest frequencies, with only 2 and 3 individuals, respectively. Overall, this data shows that most individuals in the population have a pretty good level of environmental literacy, with the most significant being in the "High" category. Percentage scores varied from 61.1% to 93.1%. This value shows variations in students' environmental literacy achievement by various aspects or components measured. The highest score is 93.1%, indicating excellent performance in that aspect or component. The lowest score was 61.1%, indicating areas that need further improvement or attention in environmental education. The data provided does not list the average value for all items except for the first item, whose average is 80.74%. It may show a general average of the entire data or just a specific item. Consistency in the maximum score shows that each item has the same maximum score of 72. It indicates that each aspect or component assessed has the same weight or level of difficulty. Overall, the data showed the level of environmental literacy among students, with significant variations in the achievement percentage. Relatively high scores in some aspects suggest that there are areas where learners have a good understanding, while lower scores indicate areas that require further attention in environmental education.
Keywords: Environmental Literacy, Puspita High School Students, Knowledge and Attitudes of the Oil Palm Plantation Environment.

1. Introduction

Cognitive learning outcomes and environmental literacy are closely related because literacy can increase quality and provide insightful human resources. According to Astirini Swarastuti et al. (2024), literacy describes a person's ability to identify, understand, interpret, create, communicate, and use their knowledge in various contexts. Environmental literacy is a person's understanding of everything related to the environment, including knowing the existing problems and finding solutions to overcome a problem in the surrounding environment (Humaida, 2024). Ummi (2017) added that environmental literacy is knowledge about ecological issues and concepts as well as attitudes, motivations, cognitive abilities and skills, beliefs, and behaviors that are appropriate for decision-making related to the environment. Environmental education can help people become more literate about their environment and actively overcome their problems (Adlika, 2020; Yulida et al., 2019). Therefore, environmental researchers agree that ecological education is the primary goal of forming a society with environmental literacy because a person with environmental literacy has the nature of caring for the environment (Noumi, 2023).

In environmental literacy, there are several components, according to Kusumaningrum (2018), as follows: 1) Knowledge of ecology in communicating and applying ecological

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concepts. 2)Cognitive behavior skills can identify, define, and analyze environmental problems and synthesize and evaluate information on environmental issues using existing sources. 3) Ability to select strategies, create appropriate actions, and evaluate and implement action plans. 4) Ability to conduct scientific investigations and analyze ecosystem components and their interactions.

The literacy carried out in this study includes two indicators, namely indicators about environmental knowledge of oil palm plantations and attitudes towards the oil palm plantation environment. Instilling environmental literacy from an early age is essential as a character possessed by students. However, environmental literacy at Puspita High School has not been carried out optimally in subjects, especially biology learning on ecosystem materials.

To support the strengthening of these research results, several relevant research studies on environmental literacy in oil palm plantations, as well as research from Nurrita (2018), revealed the level of environmental literacy among oil palm plantation workers in Indonesia. The research method involves in-depth surveys and interviews to gauge workers' understanding of environmental issues related to plantation practices. The results show that despite the essential awareness of the importance of environmental sustainability, many workers still need more understanding of best practices for safeguarding local ecosystems. This study recommends a more comprehensive environmental education program for workers. Then, research from Ramadan (2023) evaluated environmental awareness and practices in oil palm plantations through surveys conducted in various locations in Indonesia. The study found a significant variation in the level of environmental awareness among workers, primarily influenced by their educational background and work experience. The study recommends tailored educational approaches to improve environmental literacy in different groups of workers.

Air Kumbang District has the potential for Natural Resources (SDA), namely oil palm plantations. The existence of the oil palm plantation means a lot to the students. Most students can work in oil palm plantations in the morning, and in the afternoon, they study at school. Oil palm plantations can be used as a natural learning resource by Puspita High School, Air Kumbang District students to carry out environmental literacy related to ecosystem materials about biotic and abiotic components and the interaction between these components.

The results of interviews and questionnaires for class X phase E students of Puspita High School, Air Kumbang district, related to a complex subject, namely ecosystem material. Students said that ecosystem materials have many foreign terms about the components that make up the ecosystem and have not been able to understand and distinguish various interactions in the ecosystem due to limited learning resources; teachers' explanations are still abstract, such as biotic and abiotic components and their interactions. In addition, teachers do not actively involve students in the learning process, so students only focus on the teacher's explanation in front of the class. Conditions like this make it difficult for teachers to find students who can express ideas and ask questions about the material being studied. Students feel bored with participating in learning, resulting in low learning outcomes, with a percentage of grades below the KKM of 84.63% and a percentage of students who reach the KKM of 15.63%. Students expect teaching materials to be used to make learning clearer and easier to understand.

2. Method

The type of research used is quantitative research. This research was carried out at Puspita High School, Air Kumbang District. This research was carried out from August 2024 to October 2024. The population of this study is 175 students of class X phase E, and the research sample of class X1 is 35 students.

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The data collection technique used in this study is the dissemination of questionnaires. The questionnaire in this study aims to determine students' environmental literacy at SMA Puspita Kec. Air Kumbang on the Indicators of Knowledge About the Oil Palm Plantation Environment and Attitudes Towards the Oil Palm Plantation Environment:

Table 1.
Environmental Literacy Indicators

Environmental Literacy Indicators	Sub-Indicators
Knowledge of the Oil Palm Plantation Environment	Artificial ecosystems
	Factors influencing oil palm growth
	Biotic and abiotic factors of oil palm plantations
	Benefits of palm oil plantations
	Types of plant epiphytes in palm oil trunks
	Interactions between biotic and astrological components
Attitude towards the Oil Palm Plantation Environment	Concern for the environment

The data analysis technique in this study uses descriptive statistics. The data processed with descriptive statistics is recapitulated data of students' answers to environmental literacy indicators. The research data that has been collected is then analyzed using descriptive statistics and adjusted to environmental literacy criteria. The criteria for environmental literacy are as follows:

Table 2.
Criteria for Students' Environmental Literacy Ability

Percentage (%)	Criterion
90– 100	Very High
80 – 89	High
70 – 79	Mid
60 – 69	Low
≤ 59	Very Low

Source: Adlika (2020)

3. Results and Discussion

The study's results displayed students' environmental literacy levels through score distribution. From these results, it will be seen how high the level of environmental literacy among students is. Environmental attitudes will be assessed based on their views on the importance of ecological conservation, while environmental behavior will be analyzed based on actual actions taken by students.

1) Results of the Calculation of the Environmental Literacy Questionnaire
Table 1.
Results of the Environmental Literacy Questionnaire

NO	KKM	Scoring	Assessment Criteria	Average
1	72	73,6	Mid	80,74
2	72	72,2	Mid	

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3	72	86,1	Very High
4	72	75,0	Mid
5	72	73,6	Mid
6	72	93,1	Very High
7	72	84,7	High
8	72	79,2	Mid
9	72	77,8	Mid
10	72	80,6	High
11	72	73,6	Mid
12	72	86,1	Very High
13	72	84,7	High
14	72	66,1	Low
15	72	84,7	High
16	72	73,6	Mid
17	72	51,1	Very Low
18	72	58,1	Very Low
19	72	86,1	High
20	72	88,9	High
21	72	87,5	High
22	72	96,1	Very High
23	72	97,5	Very High
24	72	67,5	Low
25	72	81,9	High
26	72	86,1	High
27	72	90,3	Very High
28	72	90,3	Very High
29	72	86,1	High
30	72	86,1	High
31	72	75,0	Mid
32	72	69,4	Low
33	72	80,6	High
34	72	96,1	Very High
35	72	88,9	High

Table one explains the questionnaire results distributed to students regarding environmental literacy. The maximum score indicates that the maximum achievable score is 72 for each aspect or component assessed. The percentage of the score obtained from the maximum score. This is the actual score that students get compared to the maximum score that can be obtained—the average value of all the percentages given for each aspect or component of the assessment.

The data from Table 1 and Figure 1 clearly explain that the percentage of scores varies from 61.1% to 93.1%. This value shows variations in students' environmental literacy achievement by various aspects or components measured. The highest score is 93.1%, indicating excellent performance in that aspect or component. The lowest score was 61.1%, indicating areas that need further improvement or attention in environmental education. The data provided does not list the average value for all items except for the first item, whose average is 80.74%. It may show a general average of the entire data or just a specific item.

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Consistency in the maximum score shows that each item has the same maximum score of 72. This indicates that each aspect or component assessed has the same weight or difficulty level.

Figure 1.
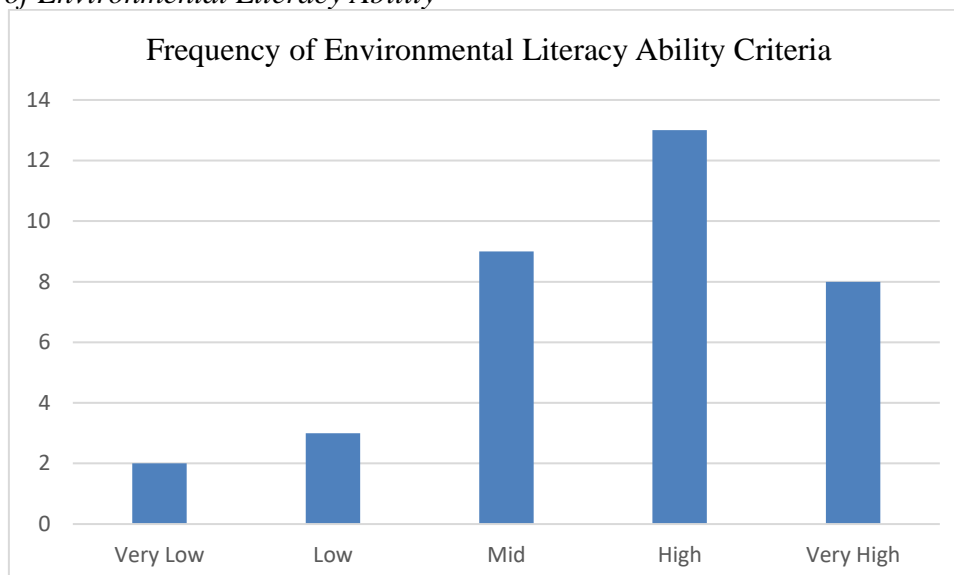*Frequency of Environmental Literacy Ability*

Figure one explains the bar chart that shows a population's frequency distribution of environmental literacy abilities. The data is divided into five categories: Very Low, Low, Medium, High, and Very High. A different color represents each category, and the number of frequencies for each category is also shown in the diagram. This diagram shows that most of the population has environmental literacy skills at the "High" level, with a frequency of 13 people. The "Medium" and "Very High" categories also have a significant number, 9 and 8 individuals, respectively. The "Very Low" and "Low" categories have the lowest frequencies, with only 2 and 3 individuals, respectively.

Overall, the above data indicates the level of environmental literacy among students, with a significant variation in the achievement percentage. Relatively high scores in some aspects indicate areas where learners have a good understanding, while lower scores indicate areas that require further attention in environmental education.

Figure 2.
Results of Environmental Literacy Indicator Analysis
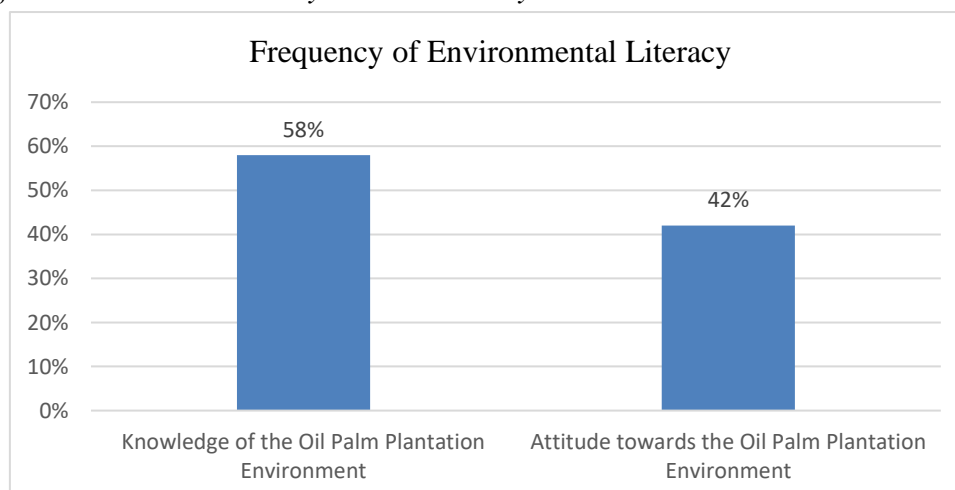
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Figure 2 illustrates the bar chart above showing the frequency of two environmental literacy indicators related to oil palm plantations, namely Knowledge of the Oil Palm Plantation Environment and Attitudes Towards the Oil Palm Plantation Environment. 1) Knowledge about the Oil Palm Plantation Environment has a frequency of 58%. The percentage is grouped according to the suitable criteria. The study results can be described as the environmental literacy ability of students at Puspita High School on the knowledge indicator grouped in good criteria because it obtained a percentage of 58%. 2) Attitudes toward the Oil Palm Plantation Environment have a frequency of 42. The percentage is grouped in a moderate criterion. The study results can be described as the environmental literacy ability of students at Puspita High School, Air Kumbang District, on the attitude indicator grouped in a medium criterion because it obtained a percentage of 42%. This difference in frequency suggests that although many individuals are knowledgeable about the environment in the context of oil palm plantations, their attitudes towards the environment may be less than their knowledge level. This could indicate a gap between knowledge and action that requires further approaches to increase environmental positivity among those working or related to oil palm plantations.

2) Knowledge of the Oil Palm Plantation Environment

Table 2.
Grid of Sheets Questionnaires Environmental Literacy

Indicators Literacy Environment	Indicators	Statement Type		Total
		Positive	Negative	
Knowledge of the Oil Palm Plantation Environment	Artificial ecosystems	1		1
	Benefits of Oil Palm Plantations	2, 3, 5, 13		
	Biotic and abiotic factors of oil palm plantations	4, 6		2
	Factors influencing oil palm growth	7, 8		2
	Types of plant epiphytes in palm oil trunks	9, 10, 11,		3
	Interactions between biotic and abiotic components	12, 14, 15		3

Table two provides an environmental literacy evaluation framework focusing on students' understanding of various aspects of the oil palm plantation ecosystem. Each indicator includes several questions that evaluate students' knowledge, understanding, and attitudes toward the topic. The environmental literacy column lists the main aspects of environmental literacy measured in the research. Each indicator covers specific subtopics relevant to the oil palm plantation environment. For the question indicators, 15 questions are used to measure students' understanding of environmental literacy. The presence of positive and negative statements helps ensure that the measured understanding covers a wide range of perspectives and complexities of related environmental issues**.**

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3) Attitude towards the Oil Palm Plantation Environment

Table 3.
Grid of Sheets Questionnaires Environmental Literacy

Indicators Literacy Environment	Question	Statement Type		Total
		Positive	**Negative**	
Attitude towards the Oil Palm Plantation Environment	➤ Concern for the environment	16	17, 18	3

Table three explains environmental literacy indicators focusing on attitudes towards the oil palm plantation environment. The question indicator shows the question numbers related to the indicator of attitudes toward the oil palm plantation environment. Three questions are related to this indicator, indicating that attitudes toward the environment are assessed through various viewpoints to get a more comprehensive picture. This question number refers to the questions in the questionnaire or test used to measure students' attitudes. Attitudes towards the environment of oil palm plantations This indicator focuses on how students view and respond to environmental issues related to oil palm plantations. The measured attitude includes the level of concern and concern for the environmental impact of the plantation activities.

Discussion

This study aims to analyze the level of environmental literacy among students of Puspita High School, Air Kumbang District, Banyuasin Regency. Environmental literacy includes knowledge, attitudes, and actions related to environmental issues. The research method used is quantitative descriptive, with data collection through questionnaires designed to measure various aspects of environmental literacy.

From the study results, the percentage of scores varied from 61.1% to 93.1%. This value shows variations in students' environmental literacy achievement by various aspects or components measured. The highest score is 93.1%, indicating excellent performance in that aspect or component. The lowest score was 61.1%, indicating areas that need further improvement or attention in environmental education. The data provided does not list the average value for all items except for the first item, whose average is 80.74%. It may show a general average of the entire data or just a specific item. Consistency in the maximum score shows that each item has the same maximum score of 72. This indicates that each aspect or component assessed has the same weight or difficulty level

The analysis results show that the students' knowledge of artificial ecosystems such as oil palm plantations is adequate. Most students understand the biotic and abiotic factors that affect the growth of oil palms and their benefits to the environment and society. However, there is variation in understanding of the types of plants found in oil palm plantation areas and the interactions between ecosystem components, which indicates the need for improved learning materials in these areas (Kotagama et al., 2014). From the attitude towards the environment most of the students showed a positive attitude towards environmental protection, especially in the context of oil palm plantations. This is reflected in the high level of approval for statements that reflect environmental concern and responsibility (Clough et al., 2016; Handoko, 2016). However, some students show a neutral attitude or lack of care, which may be due to a lack of exposure to environmental information or hands-on experience.

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Analysis of indicators shows 1) "Knowledge of the Oil Palm Plantation Environment" refers to the level of understanding and information individuals or groups have regarding various environmental aspects of oil palm plantations. This includes an understanding of the positive and negative impacts of oil palm plantations on ecosystems (Ummi, 2007), biodiversity (Yulida et al., 2019), land (Taufik et al., 2019), water (Adlika, 2020), air (Adedokun et al., 2010), as well as best practices that can be done to minimize environmental impacts (Yunus, 2017). This knowledge also includes understanding environmental regulations, sustainable agricultural techniques, and how plantation management can be carried out in an environmentally friendly manner to maintain environmental sustainability and the welfare of the communities around the plantations (Puspa, 2019; Wati et al., 2020). This level of knowledge is fundamental because it is the basis for wiser and more sustainable decision-making in oil palm plantation practices. 2) Attitudes towards the Oil Palm Plantation Environment" refers to the views, feelings, and behavioral tendencies of individuals or groups towards environmental issues related to oil palm plantations. This attitude includes how one assesses the importance of preserving the environment in the context of oil palm plantations (Apriyanto et al., 2019; Hutasoit et al., 2015), as well as the extent to which they support or reject practices that can have a positive or negative impact on the environment (Mayulu, 2021; Nurfathiyah & Rendra, 2019; Sibarani et al., 2015).

This attitude can be manifested in the form of support for sustainable plantation practices, such as the use of organic fertilizers, good waste management, and protection of biodiversity. Conversely, negative attitudes can be reflected in indifference or rejection of environmental protection measures, possibly due to a lack of awareness or urgent economic interests. This attitude towards the environment is essential because it affects how individuals or groups act in oil palm plantation management. Positive attitudes towards the environment tend to encourage more responsible and sustainable actions, while negative attitudes can lead to practices that harm the environment.

Supporting research in strengthening the results of this study was obtained from Adlika (2020), who explained that students at Pontianak City State High School showed a higher level of environmental literacy compared to Puspita High School students, especially in terms of pro-environmental behavior, such as recycling and reducing the use of plastic. This is due to the existence of an environmental education program that is integrated into the curriculum and extracurricular activities. In addition, students' knowledge of global environmental issues is better due to greater exposure to media and technology. Then, the research of Taufik et al. (2019) used a quantitative descriptive approach with questionnaires as a data collection tool. The main focus is students' understanding of local environmental issues, such as agriculture and waste management. The results showed that students in high schools in rural areas had good knowledge of local environmental issues, such as the use of pesticides in agriculture and domestic waste management. However, their awareness and understanding of global environmental issues are lower compared to students in urban areas. This is similar to the findings at Puspita High School, where knowledge of global environmental issues is underexposed. This comparison shows that geographical and socioeconomic contexts greatly influence students' environmental literacy (Purwanto, 2023; R.A. et al. et al., 2024). Schools in urban areas with better access to media and structured environmental education programs tend to have students with higher levels of environmental literacy in knowledge, attitudes, and behavior. In contrast, schools in rural areas, despite having a solid knowledge of local issues, are often less exposed to global issues and less involved in pro-environmental activities (Susanto et al., 2022).

This study implies that although basic knowledge about the environment is quite good, there still needs to be more understanding of certain aspects, such as epiphytic plant types and

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biotic-abiotic interactions. In addition, positive attitudes toward the environment do not always translate into pro-environmental behavior (Hanadya et al., 2022; Marsinah Marsinah et al., 2024). Factors such as the need for an in-depth environmental education program and practical experience may influence this. Then, the relationship between attitude and data knowledge shows a significant relationship between environmental knowledge and attitudes. Students with higher knowledge tend to have a more positive attitude towards the environment. This shows the importance of improving environmental education to form a better attitude.

4. Conclusion

The study found that although Puspita High School students have good environmental literacy, there is still room for improvement, especially regarding actual behavior and in-depth knowledge of specific issues. From the results obtained, three students have yet to reach the maximum score, and 32 students have reached the maximum. This means that students have adequate knowledge about local aspects related to the environment, especially regarding artificial ecosystems such as oil palm plantations, biotic and abiotic factors, and their benefits and impacts. However, the understanding of epiphytic plant types and interactions between biotic and abiotic components still varies, suggesting that there is room for improvement in the educational materials. Students generally show a positive attitude towards the environment and are concerned with local environmental issues. Most students agree with statements that reflect responsibility and concern for environmental protection. However, some students still need more care, which may be due to a lack of understanding or exposure to environmental issues. The recommendations in this study are aimed at improving the curriculum and teaching. Improving the quality of the environmental curriculum in schools, emphasizing practical and local aspects relevant to students' daily lives. Field-based projects and collaborations with local communities can strengthen understanding and engagement. Then, Improving school facilities that support pro-environmental practices, such as recycling bins and school greening programs, can help encourage pro-environmental behavior among students.

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