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Environmental Literacy of Senior High School Students on Ornamental Plant Maintenance in Serang City, Indonesia

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Abstract

This study aimed to analyze students' environmental literacy by measuring the level of environmental literacy in the process of maintaining ornamental plants at school. The measured environmental literacy relates to students' knowledge, attitudes, and behavior in ornamental plant maintenance activities at school. The location of this research is one of the high schools in Serang City, Indonesia. The method used in this research is the descriptive qualitative method. Sampling was done by random sampling technique with a total sample of 30 students. Data collection techniques were carried out by conducting observations, interviews, and distributing an open-ended questionnaire consisting of 20 questions from the environmental literacy component derived from the modified MSELI instrument. The results showed that the average score of the knowledge component was 43.3 (high), cognitive skills 40 (medium), attitudes 34.6 (medium), and behavior 20.6 (low). Based on the results, it can be concluded that high school students obtained an environmental literacy score of 107.5 (medium) with the lowest score on the behavior component so environmental literacy needs to be improved.

Keywords: Environmental Literacy, Senior High School Students, Maintaining Ornamental Plants

INTRODUCTION

Environmental problems that exist today are closely related to human life and other living things. The course of human life is very dependent on nature so environmental sustainability needs to be maintained. Planting environmental literacy skills in students at school is very important because they will become agents of change in society to create a buzz about the importance of protecting the environment (Indrawan *et al*., 2022). Environmental literacy is an individual skill to explain the observed environmental conditions so that solutions to environmental problems are obtained as an effort to uphold, repair, or improve the state of the environment (Kusumaningrum, 2018). Based on the Environment Education and Training Partnership (EETAP), individuals who understand the state of the environment or are environmentally literate mean that they have good character in protecting the environment not only by utilizing it but also by having the ability to solve various environmental problems due to human activities themselves (Daniyarti, 2022). The level of environmental literacy skills in Indonesia is quite low, even reaching crisis levels and cumulatively still needs to be improved. The reason is the decision-making of the central and local governments that ignore efforts to preserve the environment around the place of residence, especially in the school environment (Anggraini & Nazip, 2022).

School is one of the educational institutions that utilize ornamental plants as a means to beautify the school environment. However, in reality, many ornamental plants are neglected so

special attention needs to be paid by school residents, especially students, to protect and maintain these plants to create a beautiful and beautiful school environment. The process of maintaining plants at school is closely related to the utilization of the school environment as a form of effort to strengthen the character education of environmentally literate students (Subrata & Rai, 2022). This student character education is related to students' environmental literacy skills which can be measured from the level of students' sensitivity and concern for the environment, relatedness to the environment, self-assessment related to efforts made for the environment (locus of control), responsibility for plant sustainability, and direct intention to do something to protect the environment, especially plants (Farwati *et al*., 2018). By knowing students' environmental literacy skills, it can build a sense of love for the environment, especially those at school. The better the environmental literacy skills possessed by students, it is expected that students can take direct action and actively participate in various efforts to maintain ornamental plants at school (Nasution, 2016).

Based on literature analysis, there have been several studies on environmental literacy, one of which is research conducted by Pratama *et al*. (2020) by analyzing the effect of environmental literacy on environmental responsibility in class XI students. The results of this study obtained a score of 81 and entered into high criteria, which means that students with a good level of environmental literacy will greatly affect their responsibility for the environment (environmental responsibility). Other research has also been conducted by Parida *et al*. (2021) on how to develop environmental literacy in schools by collaborating with stakeholders as a piloting project in elementary schools. The results of this study are that the activities carried out by lecturers with the Technical Implementation Unit of the East Sinting Region Forest Management Unit, namely greening training by providing plant seeds, have proven to have a positive influence on students and teachers such as being able to introduce the concept of school environment, broaden the insights and knowledge of students and teachers regarding environmental literacy. Another study was conducted by Maulana (2022) who examined the purpose of activities to instill environmental literacy skills in early childhood with family medicinal plants (TOGA) planting activities. The results of the study prove that the activity of instilling environmental literacy skills in students is an important step in forming humans who have sensitivity to the environment and understand the importance of protecting and caring for the environment. This means that with a high level of environmental literacy, the activities of planting family medicinal plants in early childhood can also run well.

The limited research regarding the level of environmental literacy in maintaining ornamental plants makes it urgent to do this. Apart from that, this research also aims to help

teachers identify the level of environmental literacy that students have so that by knowing it from the start teachers can look for efforts such as creating environmental programs to overcome and improve students' environmental literacy. With environmental programs in schools, it is hoped that students will become more concerned about the environment around them so that they can create a healthy environment.

METHOD

This research used a descriptive qualitative approach to describe the environmental literacy needs of students regarding the maintenance of ornamental plants in schools. The research was conducted in October-November 2023 at one of the senior high schools in Serang City, Indonesia. This school was chosen because it has several ornamental plants that need special attention by the school community so an analysis of students' environmental literacy is needed in the maintenance process.

In this study, the random sampling technique is used in sampling where the sample is randomly selected to reduce data bias with a total sample of 30 students. Class X was chosen because there is material about the environment in biology subjects so it is suitable for research.

This research used a modified system requirement data collection technique, namely the stages of making observations, interviews, and distributing questionnaires. In this study, data was obtained by conducting observations, interviews, and distributing open-ended questionnaires. Observations were made by directly observing the state of ornamental plants at school and the attitudes and behavior of students toward environmental issues around them. In addition, interviews were also conducted using purposive sampling techniques or determining informants according to certain criteria. In this study, the informant used was one of the biology teachers who taught class X. The 20-question instrument in the open-ended questionnaire was distributed through a Google form link following the MSELI instrument by determining scores on four components of environmental literacy, namely knowledge, cognitive skills, attitudes, and behaviors developed by the North American Association for Environmental Education (NAAEE) (Ahmadi, 2022).

The results of observations and interviews were analyzed to see the needs and level of environmental literacy of students of one of the senior high schools in Serang City. The data analysis technique of the environmental literacy open-ended questionnaire used is by adding up the scores of each component of environmental literacy then identifying the score range of each component based on the answers used by NELA (*National Environmental Literacy Assessment*) then analyzing the environmental literacy category based on the average number of each component (Nasution, 2016).

RESULTS AND DISCUSSION

In the research conducted at one of the senior high schools in Serang City related to ornamental plants, it was found that some ornamental plants growing in the park near the parking lot and in each class were quite good. The observation results in terms of students' knowledge about the environment are considered good enough. However, the implementation of the knowledge is still quite lacking, this is evidenced by the discovery of plants in a dry and unkempt state, especially in the area around the parking lot where weeds are found quite a lot.

The results of an interview by one of the biology teachers found that students at one of the senior high schools in Serang City are quite happy with the presence of ornamental plants at school and have sufficient knowledge related to how to preserve plants. However, in terms of taking concrete actions a sense of concern for plants is not so high, and sensitivity in dealing with environmental issues is still somewhat lacking. Some students already have concerns for the school environment such as not cutting plants carelessly, but are contaminated by the influence of other students who have low concerns so that students become embarrassed to maintain and protect existing plants. Therefore, it takes the role of teachers and school agencies in seeking environmental-based programs as a way to instill the character of environmental care both in the knowledge component to the implementation of attitudes and behaviors in maintaining and preserving the environment at school, especially in the maintenance of ornamental plants.

An open-ended questionnaire was created with the aim that students could provide broad answers to all components of environmental literacy. This questionnaire was distributed through a Google form link to facilitate its distribution. This questionnaire consists of 20 open-ended questions based on the development of the four components of environmental literacy consisting of knowledge, cognitive skills, attitudes, and behaviors. Table 1 displays the environmental literacy open questionnaire grid.

Table 1. Environmental Literacy Open Questionaire Grid

No	Components of Environmental Literacy	Indicator	Question Score
1	*Knowledge*	Knowledge related to plant maintenance material	30
		Students' interest in plants at school	30
2	Cognitive Skills	Student sensitivity to plant conditions	10
		Identify environmental issues related to plant maintenance	10
		Analyze environmental issues related to plant maintenance	20
		Design solutions to plant problems	20
3	*Attitude*	Responsibility for plant preservation	20
		Encourage friends to conserve plants	20
		Caring attitude towards plants around	20
4	*Behavior*	Have the intention to take direct action to protect plants	30
		Demonstrate real behavior to take care of the plants around you.	30

The results of filling out the open questionnaire were then analyzed based on the score of each indicator following the questionnaire grid. After that, the scores obtained were identified by the raw score transformation method by NELA (*National Environmental Literacy Assessment)*. Table 2 shows the range of scores and categories for each component of environmental literacy.

Table 2. Score and Category of Each Component of Environmental Literacy

No	Component	Range	Low	Medium	High
1.	Knowledge	0-60	0-20	21-40	41-60
2	Cognitive Skills	0-60	0-20	21-40	41-60
3	Attitude	15-60	15-30	31-45	46-60
4	Behavior	12-60	12-27	28-44	45-60
5.	Environmental Literacy	27-240	27-98	99-169	170-240

(Nasution, 2016)

To illustrate the results of the category analysis of environmental literacy components based on raw score transformation can be seen in Table 3.

Table 3**.** Environmental Literacy Component Analysis Results

No	Component	Average Score	Category
1	Knowledge	43.3	High
2	Cognitive Skills	40	Medium
3	Attitude	34.6	Medium
4	Behavior	20.6	Low
5	Environmental Literacy	107.5	Medium

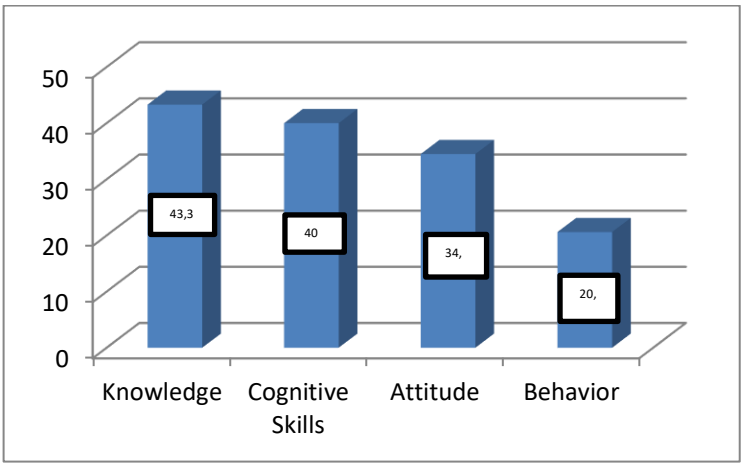

Figure 1. Results of Analysis of the Average Score of Each Component of Environmental Literacy

Based on Table 3 and Figure 1, it is found that the average score of the knowledge component is 43.3, cognitive skills is 40, attitude is 34.6, and the behavior component shows 20.6. It can be concluded overall by combining the scores of each component so that it is known that the environmental literacy score of students at one of the Senior High Schools in Serang City, Indonesia is 107.5 which means it is categorized as "Moderate" with the lowest score on the behavior component.

Based on the data results, it proves that the knowledge component score is greater than the score of other components and the behavior score gets the smallest score. According to Rokhmah & Fauziah (2021), explained that students' environmental knowledge is their ability to absorb various kinds of information related to nature. In other words, students in one of the high schools in Serang City are environmentally literate and know knowledge about the environment, especially related to the maintenance of ornamental plants at school. In addition, the high knowledge score also means that students already have a good interest in learning about the environment. The acquisition of high category scores is usually influenced by the cognitive level (knowledge) of students based on environmental concepts and materials that have been taught well (Anggraini & Nazip, 2022). A good environmental knowledge score means that students already have concern for the school environment, starting from being able to be responsible for preserving the surrounding environment. However, in reality, there are still many students who have not been able to implement their knowledge in their daily lives such as behaving and behaving well in protecting and preserving the environment (Febriani, 2022).

The component of student cognitive skills related to concern and sensitivity to plants obtained a score of 40 which means it falls into the "medium" category. Students' cognitive skills mean an ability related to knowledge and the development of one's intellectual skills.

Students' cognitive skills are related to their abilities and skills in processing information obtained, analyzing environmental issues related to plants, and taking concrete actions in dealing with these issues (Rokhmah & Fauziah, 2021). Students' cognitive skills are influenced by several factors such as the atmosphere of learning and the way educators teach (Rahmawati *et al*., 2018). The acquisition of a medium score on cognitive skills means that students are quite capable of understanding knowledge and applying the knowledge they have related to the environment, especially on plant maintenance at school.

The attitude component score obtained is 34.6, which means it is categorized as "Moderate". The attitude category is the unification of a person's opinions and beliefs about a situation accompanied by certain emotions that affect behavioral responses (Fauzi, 2012). The moderate attitude score means that students are good enough to commit verbally in the form of their readiness to act for the environment in this case related to plant maintenance. This is also confirmed by the results of interviews with biology teachers that students are good enough even though they have not been maximized in implementing it. According to Hafida (2018), explaining that students' concern with the environment, especially attitudes and behaviors, can be instilled through various kinds of activities related to the environment, one of which is environmental maintenance activities. This activity is expected to be influential because the stages of maintaining ornamental plants at school mean that students can actively participate in carrying out these activities and can be used as an effort to socialize environmental care attitudes to students so that they have the desire to play a role in all these activities. The involvement of students in environmental programs, especially plant maintenance, is expected to improve the attitudinal component of students' environmental literacy at one of the senior high schools in Serang City.

In the behavior component, a score of 20.6 was obtained, which means it is in the low category. Student behavior is influenced by a real commitment to the environment. This means that if students already have a verbal commitment by stating their intention and availability to protect the environment, this real commitment is the implementation. Similar to the results of research by Nastoulas *et al*. (2017) there is a relationship between verbal commitment and real commitment, which means that if they have verbal commitment, the level of real commitment is also the same. In addition, one of the factors that can influence pro-environmental behavior is the high intention, belief, and motivation of a person to carry out pro-environmental activities (Simanungkalit, 2021). The low score on this attitude component is influenced by students, educators, or teachers, as well as facilities and infrastructure that are not possible at school. This can be seen from the questionnaire results that students are embarrassed and feel embarrassed

in maintaining plants if done alone so according to them they need guidance from teachers as well as special containers and programs from schools related to plant maintenance so that feelings of embarrassment and embarrassment in making a real commitment in the form of maintaining and maintaining plants at school (I'liyin, 2023).

Overall, based on the results of the environmental literacy score of students at one SMAN in Serang City is in the "Medium" category and has a low score on the behavior component. A person's environmental literacy is influenced by supporting factors such as students' intention to understand and learn about existing environmental problems. This factor can be achieved by one of the efforts, namely education (Sipahutar *et al*., 2023). The low environmental literacy of these students can be caused by the lack of availability of an environmentally sound school environment and the absence of a school program that can provide direct learning experiences for students to interact with the environment and develop high environmental literacy so that the process of maintaining ornamental plants in schools can be maintained and grow well (Aini *et al*., 2021).

CONCLUSION

Environmental literacy is a person's ability and skill to know, understand, and describe the state of their environment so that they can determine appropriate actions to uphold, repair, or improve the state of the environment. Based on the results of research in the form of observations, structured interviews, and open-ended questionnaires, it can be seen that the environmental literacy skills of students at one of the State Senior High Schools in Serang City are in the "medium" category with a total score of 107.5 with each component of knowledge, cognitive skills, and attitudes respectively 43.3, 40, and 34.6 and the lowest score is 20.6 on the behavior component. Therefore, students urgently need to improve environmental literacy by implementing various efforts such as establishing an environmentally sound school program.

Based on these conclusions, the suggestion that can be given by the author to the school is that teachers and related parties are expected to create a program to instill environmental literacy in students. The program that is formed can be in the form of maintenance activities for ornamental plants in schools so it is hoped that with this program students will become more sensitive to various environmental problems and will not hesitate to implement concrete actions that can increase the behavioral components of environmental literacy in preserving the environment to create an environmentally friendly generation.

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