ENVIRONMENTAL LITERACY OF BIOLOGY EDUCATION STUDENTS

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Abstract.
Environmental literacy needs to be possessed by the current generation for the sustanability of future generations come, as do teaching students who will play a role in educating furure generations. This research aims to determine the environmental literacy abilities of students with a larger research sample, not only students who take Environmental Knowledge and Management courses, but also all Biology Education students at FKIP Universitas Muhammadiyah Luwuk. This research used a descriptive method with a research sample of 33 Biology Education students. The data collected in this research were questions and questionnaires containing four domains in environmental literacy consisting of 15 questions regarding the knowledge aspect, 15 statements regarding the cognitive skills aspect, 9 statements regarding the attitude aspect and 8 statements regarding the behavioral aspect. The questionnaire is filled out by students online via Google Forms. The data obtained was analyzed quantitatively descriptively. The research results show that the overall environmental literacy abilities of Biology Education students at FKIP Universitas Muhammadiyah Luwuk are in the "high" category with a score of 172.08.

A. INTRODUCTION

Environmental damage occurs a lot in Indonesia, including in Banggai Regency. The environmental damage that has occurred is no longer the responsibility of individuals but the responsibility of all parties. All parties are obliged to protect and preserve the environment in order to create a balanced relationship between humans and the environment. It is very necessary to instill an understanding and attitude of concern for environmental sustainability in the younger generation as the next inheritors of responsibility.

Environmental issues have become a serious problem today and threaten sustainability in the future. Future generations need to understand environmental literacy in order to form an environmentally friendly generation (Bybee, 2008). Peffective learning that makes a significant contribution to environmental literacy in the younger generation is still lacking (Ardoin et al., 2020). Environmental literacy is a crucial aspect in education, especially for Biology Education students as prospective teachers, they need to understand environmental problems and make conservative efforts that can be done. This is because students will play an important role in

forming attitudes and behavior that care about the environment for future generations.

With environmental literacy, students will be able to be responsible for the environment through knowledge, skills, attitudes and concern for the environment. In line with this, there are four indicators that are domains in the concept of environmental literacy, namely knowledge, (2) cognitive skills, (3) attitude, and (4) behaviour (Bouwma-Gearhart et al., 2018). Environmental literacy is a condition of environmental literacy so that a person can behave, be responsible, care and be aware of the existence of the environment (Ariesandy, 2021; Fitri & Hadiyanto, 2022). Environmental literacy can be built by studying the conditions of the surrounding environment because there is interaction between humans and the environment. This literacy is greatly influenced by internal and external aspects which require the cooperation of many parties. Therefore, environmental literacy must be increased in every element of society, so that it becomes a unified whole to build a better environment.

Several studies related to environmental literacy have been conducted measuring the four domains of environmental literacy. The research results show that environmental literacy skills FKIP UNSRI Biology Education students are overall in the "medium" category with a score of 144 (Anggraini & Nazip, 2022). Based on the results of research on the environmental literacy of prospective science teacher students at UIN Antasari Banjarmasin, it can be concluded that the environmental knowledge of prospective science teacher students at UIN Antasari Banjarmasin is included in the good criteria, attitudes towards the environment are included in the positive criteria, and the behavior of prospective science teacher students is included in the good criteria (Yusup, 2021). The results of the research (Irawati et al., 2023), show that prospective FKIP UAD teacher students have sufficient environmental literacy so that they can be used as a provision for learning at school.

Based on several previous research results, this research aims to determine the environmental literacy abilities of students with a larger research sample, not only students who take Environmental Knowledge and Management courses, but also all Biology Education students at Universitas Muhammadiyah Luwuk.

B. RESEARCH METHOD

This research used a descriptive method with a research sample of 33 Biology Education students. The descriptive method is a method that does not provide treatment, change the data or manipulate the sample so it does not require a control class and an experimental class. Data collection in this research was carried out using several instruments consisting of tests and non-tests. The test is in the form of questions and the non-test is in the form of a questionnaire containing four domains in environmental literacy consisting of 15 questions in the knowledge aspect, 15 statements in the cognitive skills aspect, 9 statements in the attitude aspect and 8 statements in the

behavioral aspect. The questionnaire is filled out by students online via Google Forms. The data obtained was analyzed quantitatively descriptively.

These answers were scored using the raw score transformation method used by NELA (2008). Description of score ranges and categories for each component:

Knowledge: Range = 0-60, Low = 0-20, Medium 21-40, High = 41-60.

Cognitive Skills: Range = 0-60, Low = 0-20, Medium 21-40, High = 41-60.

Attitude: Range = 15-60, Low = 15-30, Medium 31-45, High = 46- 60.

Behavior: Range = 12-60, Low = 12-27, Medium 28-44, High =45- 60.

Environmental Literacy: Range = 27-240, Low = 27-98, Medium 99-169, High = 170-240.

C. RESULTS AND DISCUSSION

The data obtained in this research was collected through the results of environmental literacy test answers. The collected data from completing the questions is then analyzed and presented in the form of descriptive statistical data. The environmental literacy questions prepared by researchers contain four domains in environmental literacy, namely knowledge, cognitive abilities, attitudes and behavior. Data processing uses simple calculations using Microsoft Excel.

The results of the analysis of answers containing four domains of environmental literacy are listed in Table 1.

Table 1. Literacy Level of Biology Education Students at Universitas Muhammadiyah Luwuk.

No.	Aspect	Score Rata-Rata	Category
1	Knowledge	55,35	Height
2	Cognitive skills	57	Height
3	Attitude	33,12	Currently
4	Behavior	26,60	Low
5	Environmental literacy	172,08	Height

In general, the environmental literacy abilities of Biology Education students at FKIP Luwuk Muhammadiyah University are listed in Figure 1.

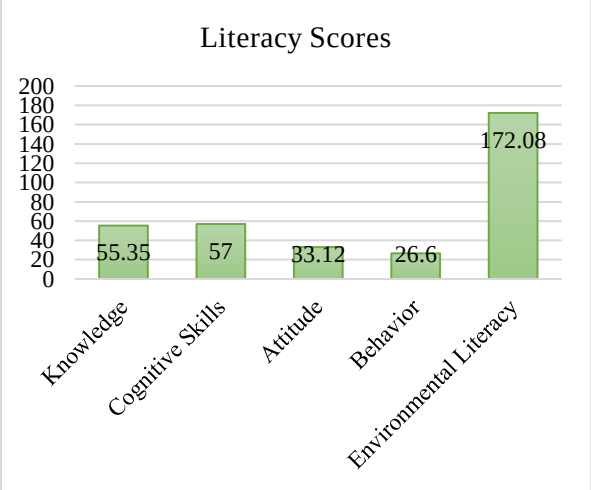

Figure 1. Environmental Literacy Score and Details Per Domain

Based on the analysis results, students' environmental literacy is in the high category. The results of environmental literacy abilities are obtained from the combined score of each domain in environmental literacy. The combined score is calculated into one, so that the environmental literacy results desired by the researcher can be known. Based on the results of the test answers, it can be seen that students are environmentally literate. Domains

in environmental literacy are measured to describe students' environmental literacy.

The first aspect includes that students' knowledge of the environment is in the high category, indicating that students have adequate knowledge about the environment. The second aspect regarding cognitive skills is in the high category, meaning that one has the ability to think about the environment, sensitivity to the environment and feelings towards the environment. The third aspect includes attitudes in the medium category, indicating that students do not yet fully have personal responsibility for the environment, attitudes and attention to the environment, and sensitivity to environmental problems. The fourth aspect includes behavior in the low category, this means that students' level of concern for the environment is still low. According to Cantrell & Hughes, (2008), environmental literacy means being responsible, caring and aware of the existence of the environment. The test results have been analyzed so that it can be seen that students are environmentally literate or environmentally literate.

Students' attitudes towards the environment will be influenced by their knowledge and will produce activities or behavior that are beneficial to the environment (Haske & Wulan, 2015). Behavior is produced through the learning process, not by itself. One of the requirements for responsible behavior is an understanding of environmental challenges and the various activities that can be carried out to overcome them. Individuals with the knowledge, abilities and attitudes required to have a good attitude towards the environment and pro-environmental behavior usually have the goal of demonstrating appropriate behavior (Elisa., Prasetyo & Hadi, 2019).

Students' concern for the environment is not only an obligation for themselves, but also for the academic environment where they study. Students who have knowledge about the environment develop a positive attitude towards the environment and care more about the surrounding environment. Instilling the value of caring for the environment can be done in various ways, one of which is by teaching students to think critically about the environment. This can help in developing students' cognitive skills, which is one of the domains of environmental literacy. The implications of this research are that students can behave, be responsible, care and be aware of the existence of the environment. A person's environmental literacy status can be measured based on the criteria of environmental literacy components, namely: knowledge, cognitive skills, attitude and environmentally responsible behavior.

Based on the results of this research, researchers want to use as a means of information the need to have environmental literacy among the public, especially students. In this way, the achievement of caring for the environment becomes information that must be disseminated, as a perspective in creating a curriculum related to the environment. Next, to find out the achievements in each domain in environmental literacy, researchers describe

the achievements of each domain one by one.

Environmental literacy is not just human interaction with the environment, but also interaction with oneself which reflects the need for responsible behavior towards the environment. The teacher's responsibility in instilling environmental literacy in students is very important to foster sustainable thinking and behavior. Even though prospective teachers have sufficient foundation to encourage environmental literacy, direct involvement in environmental issues is very necessary. Direct engagement with nature and scientific practices are important to encourage environmentally responsible decision making. Experience of direct activities in nature can be a big asset for student teachers, so that when they become teachers they can combine outdoor activities and direct activities to increase students' environmental literacy (Irawati et al., 2023).

One multidisciplinary approach that has the potential to develop students' environmental literacy is an integrated learning approach*science, technology, engineering, and mathematics* (STEM) (Doerschuk et al., 2016).

D. CONCLUSION

The research results show that the overall environmental literacy abilities of Biology Education students at FKIP Universitas Muhammadiyah Luwuk are in the "high" category with a score of 172.08. The environmental literacy measured also includes domains that are included in environmental literacy. The first domain is knowledge, based on the test results it is known that the students' scores are high. The second domain is cognitive skills, where in this domain the test results show that students are also in the high category. In the attitude domain, environmental literacy is included in the medium category and the fourth domain, namely behavior, is included in the low category.

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