ENVIRONMENTAL KNOWLEDGE AND LITERACY: DOES IT INFLUENCE ENVIRONMENTAL AWARENESS?

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Abstract. Education has an important role in fostering a self-conscious attitude towards the environment. Social science students as prospective teachers who teach the environment in their curriculum are required to have high environmental knowledge and literacy. It is assumed that this can increase environmental awareness for them. This study aims to 1) determine the effect of environmental knowledge on environmental awareness. 2) Knowing the effect of environmental literacy on environmental awareness. 3) Know the effect of environmental knowledge and literacy on environmental awareness. This quantitative research uses a correlational type. The population in this study were students of the Social Science Education Department, UIN Maulana Malik Ibrahim Malang who were taking the Physical Geography course on the Sub-theme of the Environment and its Conservation with a total of 118 people. The sample taken was 91 people based on the Slovin's formula. The instrument was a questionnaire to measure environmental literacy and awareness, and a test to measure the level of environmental knowledge. The research data were analysed with multiple linear regression. The results showed that 1) environmental literacy affects environmental awareness. 2) Environmental knowledge has no effect on environmental awareness. 3) Environmental literacy and knowledge together affect environmental awareness.

Keywords: *Environmental Literacy; Environmental Knowledge; Environmental Awareness*

A. INTRODUCTION

Recent environmental changes have become an event that we must reflect on. These environmental changes occur in many factors, causing environmental problems. Various environmental problems occur due to human activities. Human activities that are greedy and tend to exploit nature have led to the depletion of natural resources. According to the 2017 Environmental Quality Index (IKLH) Report and the 2017 Status of the Indonesian Environment (SHLI) issued by the Indonesian Ministry of Environment, the total polluted water in Indonesia reached approximately 30%, especially in big cities. Likewise, conditions in the air have decreased due to shrinking green land, air polluted by vehicle fumes and industrial factory fumes (Kemenlkh, 2016).

Various environmental problems occur due to human activities. Human activities that are greedy and tend to exploit nature have led to the depletion of natural resources, for example the use of coal as a source of energy for human life has had a negative impact on the environment such as the greenhouse effect, acid deposition, urban smoke production, toxic emissions and many more. A study conducted in Europe over a 10-year period showed that the use of coal as the material used to produce electricity was 30% more costly than using gas if the cost of environmental and health damage was also included in the calculation (Nelson, 2013).

According to the 2017 Environmental Quality Index (IKLH) and 2017 Status of Indonesia's Environment (SLHI) reports issued by the Indonesian Ministry of Environment, the total water in Indonesia that has been polluted reaches approximately 30%, especially in big cities. Likewise, conditions in the air have decreased due to shrinking green land, air polluted by vehicle fumes and industrial factory fumes (Kemenlhk, 2018). Nowadays, the environment and human health have been degraded by the introduction of pollutants into the environment. Persistent organic pollution (POP) is one of the toxic chemical polution that exists around us and can enter the human body. These POPs have impacts on human health such as additive and synergistic effects, endocrine disruption, reproductive problems, cardiovascular problems, cancer, obesity and diabetes (Alharbi et al., 2018).

Another environmental problem that often occurs in the community is environmental problems related to waste. Based on data obtained from the National Waste Management Information System (SIPSN), it can be seen that the amount of waste in Indonesia in 2021 was 30,997,640.95 tonnes for one year with the largest amount coming from household waste. The amount of waste that exists today can cause environmental pollution in the long run if there is no public awareness at all. This is because the amount of waste production will increase as the human population grows. This environmental problem could be due to the lack of literacy and knowledge as well as the lack of socialisation from the government, community institutions and educational institutions.

Students as agents of change must bring big changes for the better, one of which is related to environmental issues. However, awareness about the environment among students is still relatively low. Based on the experimental video uploaded by the rigid food experiment on 19 December 2022 about students' concern for waste, it shows that concern in the student environment is very low. This is also in accordance with research conducted by Diana Ayu, the results of the study show that the level of student awareness is in the high category, but the level of student behaviour is in the medium category. So it can be concluded that in theory students are aware of the importance of environmentally friendly behaviour but students have not implemented it in their daily lives (Sugiarto & Gabriella, 2020). Based on the facts, the environmental awareness of social science education students at UIN Maulana Malik Ibrahim Malang is still low, this can be found one of them when the learning is finished a lot of garbage scattered in the classroom. This fact is in accordance with research conducted by Saiful Amin et al in 2020 explaining that the social sensitivity of social science education students at UIN Malang is low. This is due to the lack of student concern for the campus environment and dirty classrooms because students think that classroom cleanliness and garbage are the responsibility of the cleaning service (Amin et al., 2020).

One of the efforts that can be made to overcome the various environmental problems above is by raising public awareness of the environment. This can be done by increasing knowledge about the environment and increasing literacy. People who have a high level of knowledge will influence high environmental attitudes and behaviour (Hanafi et al., 2021). The government has begun to make various efforts in maintaining and increasing public environmental awareness, one of which is through the field of education. A concrete example that has been done is by integrating

environmental issues in various subjects and conducting special programmes such as Adiwiyata schools. Based on the government's efforts to raise public awareness through education, it can be concluded that education has an important role in providing environmental insights, especially for prospective teachers.

The world of education has an important role in fostering a self-conscious attitude towards the environment. The government has begun to make various efforts in maintaining and increasing public environmental awareness, one of which is through the education sector. One example is by integrating environmental issues in various subjects and holding special programmes such as Adiwiyata schools (Afrianda et al., 2019).

Teachers are the direct implementers and main actors in the educational process at school. Teachers are also instructors who act as teachers and educators of their students which leads to motivating, guiding, directing and assessing the success of their students. Through teaching and learning activities teachers transform values, knowledge, skills, attitudes and others that cause students' mindsets and behaviour patterns to change for the better. Most importantly, the teacher is a figure who is guided and imitated by his students, therefore all actions and behaviour of the teacher must reflect noble values. For this reason, this research was conducted on social studies education students as prospective teachers of the nation to determine the effect of literacy and level of knowledge on environmental awareness around them which they will apply to their students in the future.

Research with environmental literacy variables and the level of environmental knowledge on environmental awareness in students needs to be done. This study aims to 1) determine the effect of environmental knowledge on environmental awareness. 2) Knowing the effect of environmental literacy on environmental awareness. 3) Knowing the effect of environmental knowledge and literacy on environmental awareness.

B. METHODS

This study uses a quantitative approach with the type of correlation. The population in this study were students of the Social Science Education Department, Maulana Malik Ibrahim State Islamic University Malang who were taking the Physical Geography course on the Sub-theme of the Environment and its Conservation in the 2022/2023 academic year with a total of 118 people. Sampling using the Slovin's formula, so that a sample size of 91 people was obtained.

The questionnaire instrument was used to measure environmental literacy based on indicators of environmental knowledge, cognitive skills, and pro-environmental behaviour. The questionnaire is also used to measure environmental awareness with indicators of receiving information, responding to the environment, respecting the environment, and responsibility for the environment. Furthermore, the test instrument was used to measure the level of environmental knowledge based on indicators of 1) environmental concepts; 2) environmental problems; 3) environmental conservation; 4) solutions to environmental problems; and 5) environmental conservation. All instruments were declared valid and reliable after validity test with product moment and reliability test with Cronbach alpha with values > 0.7.

The data analysis used in this study is 1) classical assumption test consisting of normality, multicollinearity, heteroscedasticity, and homogeneity. 2) Hypothesis testing consists of t test (partial), F test (simultaneous), multiple linear regression analysis test, and coefficient of determination.

C. RESULT & DISCUSSION

Data Analysis Test

Before hypothesis analysis, the data in this study were tested for classical assumptions. The classical assumption test consists of normality, multicollinearity, heteroscedasticity, and homogeneity. The results of the normality test can be seen in table 1.

Table 1. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		91
Normal Parameters[a,b]	Mean	0,0000000
	Std. Deviation	5,48142417
Most Extreme Differences	Absolute	0,088
	Positive	0,054
	Negative	-0,088
Test Statistic		0,088
Asymp. Sig. (2-tailed)		.077[c]

Based on the normality test results in table 1, it can be seen that the significant value obtained is 0.077. This significant value is greater than 0.05 so it can be concluded that the data used in this study have residual values that contribute normally. Furthermore, the multicollinearity test results can be seen in table 2.

Table 2. Multicollinearity Test Results

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	31,770	5,454		5,826	0,000		
	Environmental Literacy	0,136	0,055	0,261	2,494	0,014	0,961	1,041
	Environmental Knowledge Level	0,059	0,313	0,020	0,188	0,851	0,961	1,041
a. Dependent Variable: Environmental Awareness								

Based on the multicollinearity test results in table 2, it can be seen that the tolerant value in this study is 0.96, which means it is greater than 0.10 and the VIF (Variance Inflation Factor) value in this study is 1.041, which means it is smaller than 10.00. From this data it can be concluded that if the calculation results from one variable to another do not occur multicollinearity. Furthermore, the results of the heteroscedasticity test can be seen in Figure 1.

Picture 1. Heteroscedasticity Test Results
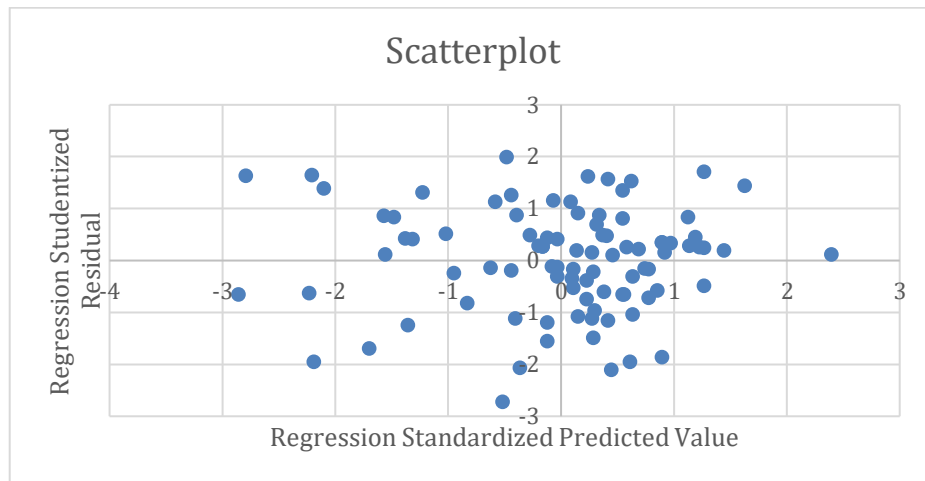
Based on Figure 1, it can be seen that there are no images that form a certain pattern, and the points in the image are spread out and do not form a certain pattern so it can be concluded that there are no symptoms of heteroscedasticity (deviation). Furthermore, the results of the homogeneity test can be seen in table 3.

Table 3. Homogeneity Test Results

Test of Homogeneity of Variances		Levene Statistic	df1	df2	Sig.
Environmental Literacy	Based on Mean	1,741	19	57	0,055
	Based on Median	1,225	19	57	0,271
	Based on Median and with adjusted df	1,225	19	38,668	0,289
	Based on trimmed mean	1,683	19	57	**0,067**
Environmental Knowledge Level	Based on Mean	1,500	19	57	0,121
	Based on Median	1,040	19	57	0,434
	Based on Median and with adjusted df	1,040	19	28,539	0,452
	Based on trimmed mean	1,522	19	57	**0,113**

Based on the homogeneity test results in table 3, it can be seen that the environmental literacy variable (X1) obtained a significance value of 0.067 which means greater than 0.05. In the variable level of environmental knowledge (X2) obtained a significance value of 0.113 which means greater than 0.05. It is concluded that the two variables of environmental literacy and environmental knowledge level are homogeneous.

Furthermore, hypothesis testing is carried out which consists of t test, F test, multiple linear regression test, and coefficient of determination test. The t test results can be seen in table 4.

Table 4. T test Results

Variabel	T_{count}	Significance	T_{table}
Environmental Literacy (X1)	2,597	0,011	1,987
Environmental Knowledge (X2)	0,675	0,502	1,987

The environmental literacy variable has a significant value of 0.011 which means it is smaller than 0.05 and has a t count of 2.597 which means it is greater than the t table which is 1.987 so it can be concluded that there is a significant effect of environmental literacy variables on environmental awareness variables. Furthermore, the environmental knowledge variable has a significant value of 0.502 which means it is greater than 0.05 and its t value is 2.494 which means it is smaller than the t table which is 1.987. It is concluded that the variable level of environmental knowledge does not have a significant influence on environmental awareness. Furthermore, the results of the F test can be seen in table 5.

Table 5. F Test Results

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	206,013	2	103,006	3,352	.040[b]
Residual	2704,141	88	30,729		
Total	2910,154	90			

Based on table 5, it can be seen that F count is 3.352 with a significance value of 0.040 which means it is smaller than 0.050. So, it can be concluded that the independent variables, namely environmental literacy (X1) and the level of environmental knowledge (X2) together have an influence (simultaneously) on environmental awareness. Furthermore, the results of multiple linear regression tests can be seen in table 6.

Table 6. Multiple Linear Regression Test Results

Model	Unstandardized Coefficients	Standardized Coefficients		t	Sig.
	B	Std. Error	Beta		
1 (Constant)	31,770	5,454		5,826	0,000
Environmental Literacy	0,136	0,055	0,261	2,494	0,014
Environmental Knowledge Level	0,059	0,313	0,020	0,188	0,851

Based on table 6, it can be seen that the constant value (a) is 31.770. Then the value of environmental literacy (X1) is 0.136 and the value of the level of environmental knowledge (X2) is 0.59. Then the multiple linear regression equation is as follows:

$$Y = a + b_1 X_1 + b_2 X_2 + e$$
$$Y = 31{,}770 + 0{,}136 \ X1 + 0{,}59 \ X2 + e$$

The results of the multiple linear regression equation show that the constant value of environmental awareness is 31.770, which means that if the environmental literacy variable (X1) and the level of environmental knowledge (X2) are equal to 0, the environmental awareness of students is 31.770. The coefficient of environmental literacy is 0.136, which means that every time there is an increase in the environmental literacy variable (X1) by 1%, the environmental awareness variable will increase by 0.136. Conversely, if there is a decrease in the environmental literacy variable every 1% by 0.136, there will be a decrease in environmental awareness by 0.136. The coefficient of the level of environmental knowledge is 0.59, which means that every time there

is an increase in the environmental literacy variable (X2) by 1%, the environmental awareness variable will increase by 0.59 or vice versa if there is a decrease in the environmental knowledge level variable every 1% by 0.59, there will be a decrease in environmental awareness by 0.59. It is concluded that environmental literacy and the level of environmental knowledge affect environmental awareness. Error is a factor that affects environmental awareness apart from the research design, namely the environmental literacy variable and the level of environmental knowledge. Furthermore, the value of the coefficient of determination results can be seen in table 7.

Table 7. Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,266a	0,071	0,050	5,543

Table 7 shows that the R value is 0.266 and the adjusted R square value is 0.050 which can be interpreted as 5%. These results indicate that the independent variables of environmental literacy and knowledge level have a 5% effect on the environmental awareness variable. So that the factor that affects environmental awareness 95% comes from other variables outside of the variables used in this study.

The Effect of Literacy on Student Environmental Awareness

The results of this study indicate that the understanding of social science education students of UIN Malang about environmental literacy is in the high category. Environmental literacy has an influence on student environmental awareness. Someone who has a high level of knowledge will also have a high awareness of the environment. Conversely, someone with a low level of environmental literacy will affect one's awareness of the environment which means low. There is an important role of environmental literacy on students' environmental awareness.

The results of this study are accordance with Yusup (2021) that the environmental literacy of prospective science teachers of UIN Antasari Banjarmasin is included in the good category. In addition to having the same research results, the environmental literacy materials used cover global climate change, pollution and conservation. This is in accordance with this study, some of the environmental literacy materials used cover environmental problems and energy conservation. In contrast to the research conducted by Idrus & Rahmawati (2021) about environmental literacy in chemistry students at Mataram University, where the results of the study found that the environmental literacy of Chemistry Students at Mataram University was in the moderate category. This environmental literacy is in the moderate category related to environmental pollution material and how to deal with the pollution. In contrast to this study, environmental literacy related to environmental problems is in the excellent category compared to other indicators.

Based on the results of the above research, several studies were also conducted in an effort to find out how to improve environmental literacy in higher education. One of them is research conducted by Anita et al., (2020) on STEM-integrated problem-based learning learning models on environmental literacy of Biology Education Students at Muhammadiyah University Purwokerto which shows that there are differences in environmental literacy skills between students who use PBL learning models and are not applied to PBL learning models, where students who are applied to PBL learning models have a higher level of environmental literacy than those who are not applied to PBL learning models. Similar research was also conducted by Syamsiah et al. (2021) on environmental literacy showing that Outdoor Learning can improve environmental literacy in

Biology Department Students at Makassar State University. From some of the research results above, it can be seen that students' environmental literacy is in the good category and can continue to be improved using various learning models or methods. With good environmental literacy, environmental awareness will also be good. So that the role of students as agents of environmental change will be maximised in protecting the environment around them. Moreover, education students as prospective teachers are expected to have good environmental literacy, so that they can prepare reliable agents of change who care about the environment.

The Effect of Knowledge Level on Student Environmental Awareness

Humans are living creatures that are perfected with the existence of grace in the form of reason so that they are able to distinguish what is bad and good. Armed with this mind, it is hoped that humans can reach the ultimate level of knowledge. Knowledge is a framework of information about facts that are arranged regularly and have meaning and are stored in memory which can then be applied or extracted again when needed (Warsita, 2018). Knowledge is very important in human life, where knowledge has a role as a competitive resource in everyday life, so that someone who has knowledge is able to carry out their role well (Ode & Ayavoo, 2020). The level of environmental knowledge is a process for individuals to recognise and understand the reciprocal relationship between humans and the environment. Environmental knowledge is knowledge that examines the relationship between living things and their environment and its impact on humans. The theory that shows the relationship between humans and nature is anthropocentric theory which states that humans are the centre of nature (Matsna et al., 2017).

Based on the results of research that has been done can be concluded that the level of environmental knowledge of social studies education students is in the high category. But even though the level of environmental knowledge of students is in the high category, it turns out that this study does not affect the environmental awareness of social science education students at UIN Maulana Malik Ibrahim Malang. This is because after someone has high knowledge there are still many things that encourage someone to lead to awareness of the environment. This research is in accordance with a journal written by Murniningsih & Norah (2019) which states that there is no effect of knowledge about the environment and religion on friendly actions towards the environment. This research is also supported by research conducted by Nulyakin (2020) with the results of research that most of the Geography Department students have a high level of knowledge of the environment, but concern for the environment is still low. The same results are also based on Bahri et al. (2017) journal where there is no relationship between the level of environmental knowledge and the level of concern of residents in waste management at the Nusa Indah Waste Bank, this is because there is no environmental background but respondents who are customers of waste banks get knowledge based on direct experience.

Efforts that can be made to increase students' environmental knowledge include actively following social media that explore environmental issues or participating in environmental activities or communities. This is in accordance with the survey conducted by Ocean that apart from the internet, environmental knowledge can be obtained through environmental communities that each individual can join so that the level of participation in the environment can increase (Felix, 2017). In addition, both the school and the government and the community can support activities based on increasing environmental knowledge, for example by organising environmental ambassadors. Green Ambassadors are elected representatives of individuals in an institution or government who have extensive knowledge and play an active role in the environmental field which is expected to invite and build the community to care about environmental sustainability so that the main task of environmental ambassadors is to voice ideas about the environment to the

wider community (Widiyanto et al., 2017).

The Effect of Literacy and Knowledge Level on Student Environmental Awareness

There is a reciprocal and interdependent relationship between humans and nature, where nature provides human needs and nature needs humans to maintain its sustainability so that environmental awareness should be owned by every individual. Awareness in the environment can be seen from a person's behaviour and actions in a situation where a person feels free from pressure. Factors that can affect a person's level of environmental awareness are ignorance factors, poverty factors, humanitarian factors and lifestyle factors (Sugiarto & Gabriella, 2020).

Students are one part of society that has a large enough quantity and quality in their contribution to society. For this reason, the role of students in fostering environmental awareness is very large, this is in accordance with Permatasari et al. (2021) states that environmental management knowledge and environmental awareness together affect student participation in environmental conservation. There is a relationship between environmental awareness, knowledge and environmental care behaviour in secondary students who receive environmental education at school, this is also supported by family factors, teachers, media and school curriculum that support environmental education (Murniningsih & Norah, 2019).

Based on the results of this study, environmental literacy and the level of environmental knowledge simultaneously affect the environmental awareness of social science education students at UIN Maulana Malik Ibrahim Malang. According to Mulyana (2009) that environmental literacy is one of the factors that influence a person's environmental awareness because knowledge can bridge and educate humans to behave well towards the environment. A good level of understanding of the environment will lead students to environmental awareness so that there is a caring behaviour towards the environment and will contribute to creating a friendly environment.

Environmental awareness is a complex issue and involves many parties to realise it. Based on the explanation above, researchers agree that high environmental literacy and the level of environmental knowledge that is applied in life well can foster environmental awareness of social science education students at UIN Maulana Malik Ibrahim Malang even though it has an effect of 5%. Abbas stated that a high level of environmental awareness and good environmental care behaviour cannot always increase student participation in environmental conservation, this means that there are other factors that influence environmental awareness besides environmental knowledge and literacy such as family factors, mass media, age and place of residence (Abbas & Singh, 2012). Social media-based environmental awareness coaching to foster morale in preserving the environment integrates the school curriculum, school learning plans related to the environment with social media so that it is expected that students are able to receive information through social media as a form of technological development that continues to be followed by participants related to the environment and apply it to their daily lives (Saputra, 2017). Research conducted by Sarkawi (2017) that there is a significant difference in the assessment of environmental culture in male students and female students, students who have low environmental knowledge, the value of environmental culture for female students is higher than that of male students. Thus, there are many factors that affect environmental awareness besides the factors in this variable.

D. CONCLUSSION

The results of the study can be concluded that 1) environmental literacy has a significant influence on the environmental awareness of social science education students UIN Maulana Malik Ibrahim Malang. So that the higher the environmental literacy of students, the higher the environmental awareness. 2) The level of environmental knowledge has no effect on the

environmental awareness of social science education students at UIN Maulana Malik Ibrahim Malang. 3) Simultaneously literacy and level of environmental knowledge affect the environmental awareness of social science education students UIN Maulana Malik Ibrahim Malang. The results of the F test show that there is a joint influence between literacy and level of knowledge on the environmental awareness of social science education students of UIN Malang.

Suggestions that can be given based on the results of the study, namely 1) the theories that have been learned need to be applied in everyday life. 2) Environmental awareness needs to be implemented in learning to shape student character in behaviour towards the environment. 3) There is a need for qualitative or mixed method research studies related to the environment to find out more about the reasons why students act towards the environment.

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