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### The Influence of Environmental Knowledge on Environmental Awareness Among Students at SMAN 7 Bengkulu City

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#### ABSTRACT

This study aims to determine the influence of environmental knowledge on environmental awareness among students of SMAN 7 Bengkulu City. The method used is a survey with a quantitative approach supported by literature studies and literature research. The study population was 1,335 students with a sample of 93 students obtained through the Slovin formula with an error rate of 10%. Data collection was carried out through a questionnaire consisting of 11 items for environmental knowledge and 13 items for environmental caring attitudes. The results of statistical analysis showed that the level of environmental knowledge of students was mostly in the moderate category (63%), while for environmental care attitudes, the majority of students were included in the category of quite concerned (47%). Simple linear regression analysis showed a negative but significant influence between environmental care attitudes towards environmental knowledge with a significance value of 0.007 ( $p < 0.05$ ) and a determination coefficient ( $R^2$ ) of 0.077. These results suggest that although the relationship is significant, the magnitude of the effect is relatively small. These findings indicate the need for a more effective learning approach in simultaneously increasing students' knowledge and environmental awareness. This research contributes to the development of environmental education strategies at the

#### KEYWORDS

*Environmental Knowledge, Environmental Awareness, Students, Quantitative Approach, SMAN 7 Bengkulu.*

secondary school level to form a generation that is more aware and concerned about environmental issues.

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## **1. INTRODUCTION**

Environmental issues have become an urgent global concern as the degradation of ecosystems due to human activities increases (Gifford & Nilsson, 2014). In facing this environmental crisis, education has a central role in shaping environmental awareness and behavior, especially through strengthening environmental knowledge among the younger generation (Kollmuss & Agyeman, 2002). Environmental knowledge is the main foundation for students to understand the impact of human activities on nature and encourage them to act sustainably (Hungerford & Volk, 1990).

In Indonesia, the challenges of environmental education are still quite large, especially in terms of consistent curriculum implementation and low integration of environmental issues in teaching and learning activities (Wijaya et al., 2021). This has an impact on the level of environmental awareness which tends to be not optimal among students (Putri & Safitri, 2020). Previous research has shown that although students have a fairly good level of environmental knowledge, it is not always in line with their attitude of caring for the environment (Widianingsih & Herdiansyah, 2015). This phenomenon marks the existence of a research gap between the cognitive and affective dimensions in environmental education.

The urgency of this research lies in the need for a deeper understanding of the relationship between knowledge and environmental awareness, especially at the secondary school level which is a crucial period in the formation of values and behaviors (Orr, 2004). SMAN 7 Bengkulu City was chosen as the research location because it has a representative student population and has implemented environment-based school activities, but there is no empirical data that measures its effectiveness.

Several previous studies have examined aspects of environmental knowledge and awareness, but many of them have focused on the context of higher education or the general public community (Yanti et al., 2018; Maulana & Yuliana, 2022). This research offers novelty by focusing on high school students in urban areas and using a survey-based quantitative approach that allows for more accurate generalization of findings (Sugiyono, 2019).

The purpose of this study is to analyze the influence of environmental knowledge on students' environmental awareness at SMAN 7 Bengkulu City. The theoretical benefit of this research is to enrich the literature in the field of environmental education, while the practical benefit is to provide input for schools and education policymakers in designing learning strategies that are able to increase students' environmental awareness in a sustainable manner.

### **Definition of Environmental Knowledge**

Environmental knowledge refers to a person's understanding of scientific concepts, principles, and information related to environmental conditions and problems, such as climate change, pollution, recycling, biodiversity, and natural resource conservation. This knowledge includes both cognitive (factual knowledge) and conceptual (understanding of the relationships between environmental components) (Kollmuss & Agyeman, 2002). In the context of education, environmental knowledge is the main foundation that influences the

way of thinking, assessing, and making decisions on environmental issues. Without adequate understanding, a person will have difficulty in realizing the importance of maintaining the environment sustainably.

### **Definition of Environmental Awareness**

Environmental awareness is an individual's attitude and sensitivity to the conditions of the surrounding environment as well as the willingness to act to protect and improve it. This awareness reflects the affective dimension of environmental education, i.e. the extent to which a person feels morally and emotionally moved by environmental issues (Hungerford & Volk, 1990). Environmental awareness not only means knowing what is wrong with the environment, but also having a sense of personal and social responsibility to participate in conservation efforts. Examples include disposing of garbage in its place, saving energy, and choosing environmentally friendly products in daily life.

### **The Relationship Between Knowledge and Environmental Awareness**

Environmental knowledge is believed to have a significant influence on a person's level of environmental awareness. The higher the knowledge a person has about environmental issues, the more likely it is that the individual will exhibit attitudes and behaviors that care about the environment (Gifford & Nilsson, 2014). However, these relationships are not always linear, as awareness is also influenced by values, culture, personal experiences, and social support. In the context of education, integrating environmental knowledge into the school curriculum aims to increase students' environmental awareness from an early age, with the hope that they will become agents of change in maintaining the sustainability of the earth (Orr, 2004).

## **2. METHODS**

The research method used in this study is to use the survey method through a quantitative approach. The survey method used by the researcher is in terms of data collection which is carried out by distributing questionnaires. In this study, the population is 1335 students of SMAN 7 Bengkulu City, and the research sample is 93 students of SMAN 7 Bengkulu City. The results of the research sample were obtained using calculations from the Slovin formula, namely:

$$n = \frac{N}{(1 + (N \times e^2))}$$

Information:

- n : Sample Size
- N : Population Size
- e : Error Rate 10 %
- 1 : Constant Number

From the total student population of SMAN 7 Bengkulu City, in this study used an error rate of 10% of the population. So with a population of 1335 students and using an error rate of 10%, the sample is:

$$n = \frac{1335}{(1+(1335 \times 0,1^2))} = 93.03 \text{ rounded up to } 93 \text{ people}$$

Of the 93 students who were sampled in this study, they were then divided into 3 batches. That is:

**Table 1.** Research Sample

No	Class	Sum
1	X	31
2	XI	31
3	XII	31
<b>Total</b>		<b>93</b>

### 3. RESULTS AND DISCUSSION

#### Student Environmental Knowledge

Student data about environmental knowledge Students at school whose data was collected using a student environmental knowledge questionnaire consisting of 11 questions. The data obtained are entered into a frequency distribution table which is used to see the average of students' environmental knowledge, to see the data description of the environmental knowledge variable used data processing with SPSS 22 whose results are illustrated in table 2.

**Table 2.** Distribution of Environmental Knowledge Variables

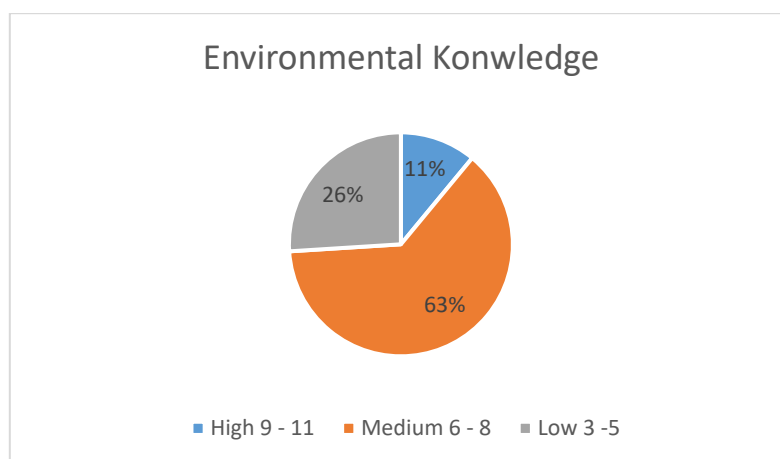
Statistics		
		Knowledge
N	Valid	93
	Missing	0
Mean		6.28
Median		6.00
Mode		6
Std. Deviation		1.741
Variance		3.030
Range		8
Minimum		3
Maximum		11
Sum		584

From the data in table 2., measurements of environmental knowledge were carried out using questioners, with a total of 93 student respondents with a total of 11 questions that had the form of correct answers with a weight of 1 and false with a weight of 0. The results of the analysis showed an overall total of 584 and a mean of 6.28, media 6, mode, std deviation of 1.741. For the lowest score is 3 and the highest score is 11. The classification of scores regarding environmental knowledge is made into 3 categories, namely "high", "medium", and "low". The results of the environmental knowledge categorization are illustrated in table 3.

**Table 3.** Environmental Knowledge Categories

No.	Category	Interval	Frequency	Percentage (%)
1	Tall	9 – 11	10	26 %
2	Keep	6 – 8	59	63%
3	Low	3 – 5	24	11%

In the conditions depicted in table 3., most students have a level of environmental knowledge in the medium category, which is 63%, with a total of 59 students, which means that most students at SMAN 7 Kota Bengkulu already understand environmental knowledge related to environmental knowledge.

**Figure 1.** Environmental Knowledge Level Diagram

#### Data Results of Variable Attitudes of Environmental Care

Variables regarding students' attitudes of caring for the environment were carried out by using a questionnaire on environmental care attitudes consisting of 13 questions. The questionnaire contains attitude questions from "Strongly Disagree (STS) score 1", "Disagree (TS) score 2", "Agree (S) score 3", and Strongly Agree (SS) score 4". The questionnaire regarding environmental care attitudes was also processed using SPSS 22 whose results are illustrated in Table 4.

**Table 4.** Statistics

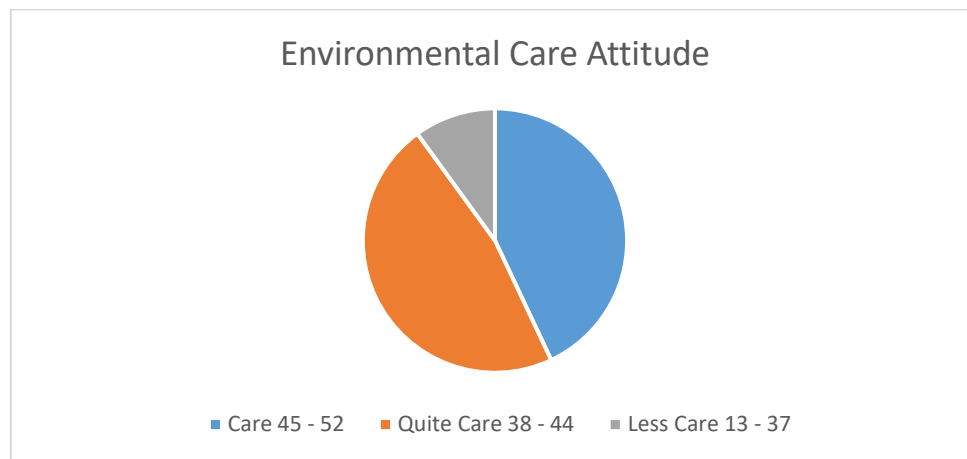
Environmental_Care_Attitude	
N	Valid 93
	Missing 0
Mean	42.35
Median	44.00
Mode	46
Std. Deviation	6.842
Variance	46.818
Range	39
Minimum	13

Maximum	52
Sum	3939

Table 4. regarding environmental care attitudes shows that the overall total score is 3939 and the mean is 42.35, median 44, mode 46, std Dviation 6.842. In the variable attitude of caring for the environment, the lowest score was 13 and the highest score was 52. The score classification for environmental care attitudes is categorized into 3, namely "Caring", "Caring enough", "Not Caring". The division of categories is illustrated in table 5.

**Table 5.** Variables of Environmental Care Attitude

No.	Category	Interval	Frequency	Percentage (%)
1	Care	45 - 52	40	43 %
2	Simply Care	38 – 44	44	47 %
3	Less Care	13- 37	9	10 %



**Figure 2.** Attitude Diagram of Environmental Care

The attitude of caring for the environment at SMAN 7 Bengkulu City in the category of caring is quite concerned as many as 44 respondents by 47%, concerned by 40 respondents by 43%, while less concerned as many as 9 respondents by 10%. This condition for an attitude of caring for the environment can be said that students already have an attitude of caring for the environment students of SMAN 7 Bengkulu City erada in the category of caring enough by 47%.

**Table 6.** Coefficients

Type		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.261	1.099		8.425	.000
	Sikap_Peduli_Lingkungan	-.070	.026	-.277	-2.747	.007

a. Dependent Variable: Knowledge

**Table 7.** Model Summary<sup>b</sup>

Type	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.277a	.077	.066	1.682	.077	7.547	1	91	.007	1.877

a. Predictors: (Constant), Sikap\_Peduli\_Lingkungan

b. Dependent Variable: Knowledge

**Table 8.** NEW ERA

Type	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	21.347	1	21.347	7.547	.007b
1 Residual	257.385	91	2.828		
Total	278.731	92			

a. Dependent Variable: Knowledge

b. Predictors: (Constant), Sikap\_Peduli\_Lingkungan

## Discussion

The results showed that most of the students of SMAN 7 Bengkulu City had a level of environmental knowledge in the medium category (63%), while 26% were in the high category, and 11% were classified as low. This shows that the majority of students already have a basic understanding of environmental issues, but have not yet fully reached a level of deep understanding. This condition reflects the reality of environmental education in Indonesia which is still informative and less applicable (Wijaya et al., 2021).

Meanwhile, in the variable of attitude of caring for the environment, the majority of students were in the categories of caring enough (47%) and caring (43%), and only 10% were classified as less caring. These findings show that although environmental knowledge is not yet fully high, awareness or attitudes towards the environment are relatively positive. This is in line with the findings of Widianingsih and Herdiansyah (2015) who stated that students' environmental awareness can be formed from school social and cultural experiences, not solely from cognitive aspects.

However, the results of a simple linear regression showed that the relationship between environmental care and environmental knowledge was significantly negative ( $\beta = -0.277$ ;  $p = 0.007$ ). This means that the higher the attitude of caring for the environment, there tends to be a decrease in environmental knowledge scores. This is an unusual result and indicates that caring attitudes do not always correlate directly positively with knowledge levels. This phenomenon can be explained by the Value-Action Gap theory, which is the gap between what a person knows (knowledge) and what he does (attitude/behavior) (Kollmuss & Agyeman, 2002).

The authors view these results as an indication that environmental education has not fully succeeded in bridging the cognitive and affective dimensions of students. It is possible that students exhibit caring attitudes due to external factors, such as social norms, peer influences, or environment-based school programs, without truly understanding the scientific concepts

behind those actions. This is in line with the theory of social learning (Bandura, 1986), where individual behavior can be formed from observation and interaction, rather than solely by theoretical understanding.

In today's global context, the increasing phenomena of climate change, plastic pollution, and deforestation require the younger generation not only to have care, but also adequate critical understanding in order to be able to make responsible decisions for the environment. Unfortunately, based on this data, only 26% of students are in the category of high knowledge. This signifies the need to strengthen the curriculum that emphasizes more on the integration of theory with real practice in the field.

When compared to other studies such as those conducted by Maulana and Yuliana (2022), they found that high environmental knowledge was associated with consistent pro-environmental behavior among college students. This means that at higher levels of education, the cognitive and affective dimensions tend to be more synchronized. However, at the secondary school level, this synchronization is still a challenge that needs to be addressed with a more contextual pedagogical approach.

From the author's point of view, the low value of the determination coefficient ( $R^2 = 0.077$ ) also shows that the attitude of caring for the environment only explains 7.7% of the variation in environmental knowledge. This indicates that there are other factors that are more dominant in shaping student knowledge, such as family background, media, information technology, or extracurricular activities that have not been explored in this study.

Thus, even if students show a positive attitude towards the environment, it is important not to neglect efforts to strengthen cognitive aspects through project-based learning, fieldwork, and collaboration between subjects. Interdisciplinary learning strategies that integrate science, technology, and social values can be an alternative approach to addressing the gap between knowledge and environmental awareness (Tilbury, 1995).

In closing, the author suggests that schools and education policymakers not only assess the success of environmental education from attitude indicators, but also pay attention to improving the quality of students' knowledge. Teacher training, the preparation of applicable modules, and collaboration with environmental institutions can strengthen the implementation of more effective and transformative environmental education at the secondary school level.

#### **4. CONCLUSION**

Based on the results of a study conducted on 93 students of SMAN 7 Bengkulu City, it was found that most students had a level of environmental knowledge in the medium category (63%), while only 11% were classified as high and 26% were in the low category. This shows that although most students already have a basic understanding of environmental issues, improving the quality and depth of environmental knowledge material is still indispensable in the learning process.

On the other hand, the results of the analysis of environmental care attitudes show that most students are included in the categories of caring enough (47%) and caring (43%). This means that in general, students have concern for the environment even though there are still 10% who are classified as less concerned. However, the results of a simple linear regression showed a significant negative relationship between environmental care attitudes to

environmental knowledge. These findings indicate that students' concern for the environment is not always accompanied by an adequate level of knowledge.

These results confirm the importance of an environmental education approach that not only focuses on improving attitudes, but also on strengthening the cognitive aspects of students. Environmental education needs to be designed to be more applicative, integrative, and contextual, so that students not only know and care, but also deeply understand the environmental issues they face.

#### **Further Research Recommendations**

Further research is suggested to expand the scope of variables by including other factors such as family influence, social media, green school programs, as well as direct experience in environmental conservation activities. In addition, a mixed-method approach can be used to comprehensively explore the relationship between environmental knowledge, attitudes, and behaviors. Further research can also be conducted at different levels of education (e.g. junior high school or college) and a wider geographic area to get stronger generalizations.

#### **5. ACKNOWLEDGMENT**

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#### **6. AUTHORS' NOTE**

This article is the result of original research conducted by the author and is not in the process of evaluation or publication in other journals. The entire process of data collection and analysis has been carried out independently by upholding the principles of research ethics. There is no conflict of interest in the implementation of this research. The author is solely responsible for the content of the article, including the accuracy of the data and the interpretation of the research results.

This research is focused on a quantitative analysis of the relationship between environmental knowledge and awareness among high school students. All criticisms, suggestions, and questions related to the content of this article can be submitted directly to the main author through the correspondence address provided in the author profile section. With this, the author hopes that this article can make a positive contribution to the development of more effective and sustainable environmental education in Indonesia.

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