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Environmental Knowledge and Attitude at Secondary School Students

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Abstract: ***The research aims to investigate the influence of environmental knowledge toward students' attitude about ecological awareness. This study is ex-post facto research, the conducting in the eighth-grade secondary schools the academic year 2016/2017 with 422 students as the total number. In taking the sample as many as 117 students, random sampling used. The tests, questionnaires, and semi-structured interview used in collecting the data. The data analyzed by using descriptive statistics and regressions. The findings show that: (i) Environmental knowledge of the students mostly included in the high category, (ii) There is a significant influence on the understanding of the students about environment towards the attitude of the students about environmental awareness***

Keywords: Knowledge, Attitude, Environmental, Awareness

1. Introduction

The global environmental awareness is getting concerned because there has been a lot of excessive damage in various areas such as waters and settlements caused by human activity. Even in forest area, there has been a lot of damage. As a result of the accidents, the natural balance disrupted. There are many disasters such as droughts, floods, landslides, storms, and so forth. The disruption of the natural balance cannot separate from human behaviors that exploit the natural resources and the environment indefinitely.

Related to human behavior towards the natural resources and environmental conditions that tend to be less concerned. The change of human behavior has duly become a priority in addressing the ecological crisis. The fact about today's environmental crisis can only resolve by a shift in perspective and practice on nature fundamentally and radically. One of the efforts to change the human behavior and standpoint towards life and the environment is through education [1].

Environmental education is the process to increase the human recognizing for ecological problems. The educational concept is the inter-relatedness among human with the culture and the biophysical surroundings [2]. Specify to education in schools; the teachers have a crucial role in promoting the awareness and positive attitude of the students related to the environmental issues [3]. The teachers should educate and conduct learning about the environmental awareness by the appropriate curriculum.

Environmental education should be teaching at the kindergarten, elementary, secondary, and high schools. Therefore, the understanding of the meaning of our lives as the human beings needs to be embedded in the early age, starting from the responsibility and obligation of a human along with the fellow creatures of God Almighty. Hence, the sense of understanding and love lives of all living raises. The growing sense of respect, love, and understanding the fellow creatures early in students can foster a sense of environmental awareness. Because one of the ways to appreciate, cherish and follow other living creatures is to maintain and care for their neighborhoods. So, if they care about their fellow beings, they will also indirectly be concerned with the environment of the living creatures dwelling [4].

Based on above descriptions, the research was conducted to investigate the influence of knowledge toward the students' attitude about the environmental awareness with the problem statements: (1) How are the students' environmental knowledge and the students' attitude about the environmental awareness? (2) How is the influence of environmental knowledge towards the students' attitude of the environmental awareness?

The theoretical based of environmental knowledge is Bloom's Taxonomy [5] that includes four indicators (factual, conceptual, procedural and metacognitive) is describes in Table 1.

Table 1. Dimension of Knowledge

Factual Knowledge	Knowledge of terminology
	Knowledge of specific details and elements
	Knowledge of classifications and categories
Conceptual Knowledge	Knowledge of principles and generalizations
	Knowledge of theories, models, and structures
	Knowledge of subject-specific skills and algorithms
Procedural Knowledge	Knowledge of subject-specific skills technique and methods
	Knowledge of criteria for determining when to use appropriate procedures
	Strategic knowledge
Metacognitive	Knowledge about cognitive tasks
	self-knowledge

Factual knowledge includes the essential elements used by experts in explaining, understanding, and systematically managing their disciplines. Accurate knowledge contains the vital elements that students should know if they will study a control or solve problems in the subject.

Conceptual knowledge includes knowledge of the categories, classifications, and relationships between two or more

complex and organized groups of experience. Theoretical knowledge comprises schemes, models, mental, and theories that present the human understanding of how a study material is orderly and structured, how parts of the information are systematically interrelated, and how these elements work together. Procedural knowledge is "knowledge of how" to do something. This experience includes knowledge of skills, algorithms, techniques, and methods, all of which are called procedures [6][7][8].

Metacognitive knowledge is a new dimension in the revision taxonomy. The inclusion of metacognitive experience in the category of knowledge dimension based on the results of recent studies on the crucial role of students' understanding of their cognition and their control over the perception in learning activities [9][10]. One of the characteristics of learning and research on developing education is the emphasis on methods to make students more aware and responsible for their knowledge and thinking.

2. Method

This research is ex-post facto. The data are taken from state secondary schools in Pinrang Regency, South Sulawesi, Indonesia in the academic year 2016/2017. The populations in this research are all students of the eighth grade as many as 422 students. The samples selected by using random sampling as many as 117 students. The instruments used in this research are a test to measure the students' knowledge about the environment and a questionnaire to measure the students' attitude about the environmental awareness. The data obtained were analyzed with descriptive and inferential statistical tests such as regressions. Table 2 describes the research method.

Table 2: Variables, Indicators and Instrument

Variables	*Indicators*	*Subject*	*Research Instrument*
Environmental knowledge	Factual and conceptual knowledge	Forest	Test
		Water resources	
		Waste	
		Pollution	
Environmental attitude	Value and responsibility	Forest	Questionnaire
		Water resources	

3. Result and Discussion

3.1 Data Description of the Research

Distribution of categorization of environmental knowledge variable showed in Table 3.

Table 3: Distribution of Categorization of Environmental Knowledge

Rate Interval	*Amount*	*(%)*	*Description*
85–100	3	2.56	Very High
65 – 84	52	44.44	High
55 - 64	32	27.35	Medium
35 - 54	23	19.66	Less
0 - 34	7	5.98	Very Less
Total	117	100	

Table 3 informs that there were 44.44% students who have knowledge about the environment in high category from the total sample, 27.35% categorized as medium, 19.66% classified as less, 5.98% of the students have very less knowledge, and the remaining 2.56% have knowledge about the environment in extremely high category. While the distribution categorization of the attitude of environmental awareness variable can see in Table 4.

Table 4: Distribution Categorization of the Attitude of Environmental Awareness

Rate Interval	*Amount*	*(%)*	*Description*
121 - 150	70.00	59.83	Very High
101 - 120	41.00	35.04	High
81 - 100	6.00	5.13	Medium
61 - 80	0.00	0.00	Low
30 - 60	0.00	0.00	Very Low
Total	117.00	100.00	

The table 4 shows that the majority of students (59.83%) have an extremely high concern for the environment, others (35.04%) have a high awareness of the situation, and the rest (5.13%) have an attitude of environmental concerns classified as moderate.

3.2 The Influence of Environmental Knowledge towards the Attitude of Environmental Awareness

The regression analysis of environmental knowledge variable (X1) and the attitude of environmental awareness (Y) can see in Table 5.

Table 5: Results of Regression Analysis of X1 Variable towards Y Variable

Regression Coefficient (r)	*Determinant Coefficient (R^2)*	*α value*	*Sig.*
0.477	0.228	0.05	0.00

Table 5 indicated that the regression coefficient of X1 variable (environmental knowledge) to Y variable (the attitude of environmental awareness) is 0.477. It means that the level of the influence categorized as strong enough. Furthermore, in order to see the size of the contribution of the variable of X_1 to Y, it can be determined by the determinant coefficient formula: KP = R2 x 100% = 0.228 x 100% = 22.8%. That is knowledge of the environment contributes to the attitude of environmental awareness for 22.8%, and other variables determine the remaining for 77.2%.

Based on the data findings of this research, it is known that the environmental knowledge owned by the majority of secondary school students in Pinrang Regency classified into a high category. Based on the observations of the researchers from the test results about the environmental knowledge, the students know the environmental issues related to forest, water resources, waste, and pollution. The research findings related to environmental awareness variable show that most of the secondary school students in Suppa District have had a caring attitude with the very high category.

Knowledge of the environment does have an essential role in increasing the environmental awareness for the students., environmental education is a crucial element in raising the awareness and understanding of the environmental issues in schools and in changing the behavior for a sustainable future [11]. If the students' knowledge of the environment can be improved, then the attitude of student concern for the environment can also be increased. The is in line with the argument from [12] that the knowledge influences positively and significantly towards the attitude of environmental awareness of the students. The means that the higher the students' knowledge about the environment, the higher the students' attitude and awareness of the environment. Based on this, the active role of the educational institution is needed, more especially for those educators to enhance the students' knowledge about the environment further so that the future generation will care more about the situation.

Environmental knowledge does have a significant role towards the students' concerns on the environment. Besides being able to improve the attitude of environmental awareness, it can also improve students' motivation to be more creative in finding solutions for the environmental problems. The knowledge and skills in environmental education were the supporting part to motivate all human to take part in environmental protection. The human will make many plans and activities that will generate the new ideas for the solution of the ecological problems [13].

4. Conclusions

Several conclusions can be drawn based on this research, among others are environmental knowledge of the students is classified into a high category, and the attitude of the students about environmental awareness is mostly into the extremely high group; and there is a significant influence on the students' environmental knowledge and the students' attitude about environmental awareness. Environmental knowledge of the students has a strong influence towards the attitude of the students' environmental awareness.

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