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Relationship Between Students' Knowledge and Concern for Environmental Conservation at SMA 16 Makassar

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Abstract: Environmental conservation is an important issue that should be instilled in students through education, as it plays a vital role in shaping environmentally responsible attitudes and behaviors. Adequate environmental knowledge is expected to enhance students' concern for environmental conservation. This study aimed to analyze the relationship between students' environmental knowledge and their concern for environmental conservation at SMA Negeri 16 Makassar. The study employed a quantitative approach with a correlational research design. The population consisted of 216 eleventh-grade students, while a sample of 60 students was selected using simple random sampling. Data were collected through an environmental knowledge test and an environmental concern questionnaire, both of which were validated through expert judgment. Data were analyzed using descriptive and inferential statistics, with the Pearson Product-Moment correlation test conducted using IBM SPSS Statistics version 29. The findings revealed that the mean score of students' environmental knowledge was 61.20, while the mean score of environmental concern was 51.20, both categorized as moderate. The Pearson correlation analysis indicated a strong and statistically significant positive relationship between environmental knowledge and students' concern for environmental conservation ($r = 0.754$, $p < 0.001$). These findings suggest that higher levels of environmental knowledge are associated with greater concern for environmental conservation among students. Therefore, strengthening environmental education through contextual learning and the continuous promotion of environmentally friendly practices in schools is essential to foster students' environmental concern.

Keywords: environmental awareness, environmental education, environmental knowledge.

INTRODUCTION

Public perception of the environment has undergone significant changes in recent decades. Awareness of global issues, such as climate change, sustainability, and the conservation of natural resources, has grown rapidly alongside increasing environmental literacy and the role of the media. The public is increasingly aware that the quality of human life is greatly influenced by environmental conditions, so that preserving nature is no longer merely an option but an urgent necessity. Environmental awareness reflects the level of understanding, concern, and individual responsibility regarding the impact of their decisions and behaviors in daily life. This understanding is increasingly relevant as global environmental conditions show signs of a crisis that cannot be ignored (Ahmadi, 2024).

The environmental crisis poses a serious threat to the future survival of humanity. The environmental damage currently taking place is not limited to the local level but has spread to the regional and global levels. Increasing global warming is driving climate change, the melting of polar ice, rising sea levels, and an increase in the intensity of natural disasters. These impacts are degrading the quality of the environment and threatening the stability of ecosystems. This situation calls for concrete measures in the form of the protection, management, and wise and sustainable use of natural resources. However, these efforts cannot be separated from the involvement of the younger generation, who must be equipped from an early age with character education that emphasizes environmental awareness (Sukananda & Nugraha, 2020).

Character education is one of the key pillars in shaping a generation that is not only

intellectually intelligent but also socially aware and environmentally conscious. The values of environmental awareness in character education are becoming increasingly relevant amid ever-more-complex ecological issues. An understanding of environmental issues must be accompanied by tangible behavioral changes, such as through simple habits like reducing plastic use, keeping the environment clean, and participating in reforestation activities. By instilling values of environmental care from an early age, character education can foster individuals who are aware, responsible, and capable of making positive contributions to the preservation of nature. The importance of character education has led to various government policies that integrate environmental education into formal educational practices (Handayani et al., 2024).

The Indonesian government's policies support the strengthening of environmental education through a number of programs, one of which is the Adiwiyata Program. This program aims to create environmentally conscious and eco-friendly schools by integrating environmental values into the curriculum, school policies, and the daily activities of the school community. Schools are expected to become environments that not only impart knowledge but also foster positive habits among students. The success of the Adiwiyata program is greatly influenced by the extent to which students possess knowledge of and concern for environmental issues. Research by Suryawati and Osman (2017) reveals a gap between students' ecological knowledge and their actual attitudes toward environmental conservation. These findings underscore that knowledge alone is insufficient without concern and concrete action, making the relationship between the two a crucial aspect for further investigation.

Environmental knowledge encompasses an understanding of ecological concepts, environmental issues, and ways to preserve nature. Environmental concern places greater emphasis on emotional aspects, active involvement, and an individual's willingness to contribute to nature conservation. The relationship between knowledge and concern is very close, as knowledge can serve as the foundation for developing a caring attitude, although it does not always guarantee the development of actual behavior. Measuring the extent to which students understand theory while also demonstrating concern in their daily behavior is essential for evaluating the effectiveness of environmental education. This connection becomes even clearer when viewed through the lens of the process of shaping students' personalities in school (Khasanah et al., 2025).

Instilling knowledge, skills, and an environmentally conscious attitude starting in elementary school serves as the foundation for character development that will shape future society. Schools play a vital role in fostering positive habits, such as maintaining cleanliness, sorting waste, and carrying out sustainable environmental initiatives. The issue of waste, which is one of the main concerns in schools, requires special attention because it directly impacts the quality of the school environment and the health of the school community. Character education plays a strategic role in strengthening students' mental and moral aspects and habits so that they align with educational goals namely, shaping individuals of good character who are also environmentally conscious (Nuboba & Yarmalinda, 2024).

The effectiveness of instilling these values can be clearly seen in schools that face daily environmental challenges, one of which is Makassar State High School No. 16. Based on observations, Makassar State High School No. 16 is a school located in an urban area and has great potential for implementing environmental education. The school's surroundings face various challenges typical of urban areas, such as plastic waste, air pollution, and a reduction in green spaces. These conditions make the school a strategic setting for instilling both environmental knowledge and awareness in students. Initial observations indicate that although the school has carried out various activities such as community service, reforestation, and garden maintenance student participation remains inconsistent and has not yet been systematically measured.

Based on this background, the researcher will conduct a study on the extent of students' knowledge and concern regarding environmental conservation at State Senior High School 16 in Makassar. The study will focus on students' understanding of environmental issues, their attitudes toward conservation activities, and their actual involvement in environmental programs at school. The results of this study are expected to serve as a foundation for designing more effective policies and programs aimed at fostering a

younger generation that is aware of and concerned about environmental sustainability.

METHODS

This study employs a quantitative approach using a correlational research design to analyze the relationship between students' level of knowledge and their concern for environmental conservation. The study was conducted during the even semester of the 2025/2026 academic year at SMA Negeri 16 Makassar. The study population consisted of all 216 eleventh-grade students at SMA Negeri 16 Makassar. Sampling was conducted using simple random sampling, resulting in the selection of two classes XI A3 and XI B2 with a total sample size of 60 students.

The research instruments consisted of two types. The knowledge variable was measured using a 20-item essay test covering basic environmental concepts, environmental issues, environmental conservation efforts, environmentally conscious school programs, and the impacts of environmental conservation. The variable of concern for environmental conservation was measured using a four-point Likert-scale closed-ended questionnaire consisting of 20 statements, covering aspects of environmental concern, participation in environmental activities, environmentally friendly behavior, environmental values and norms, and social roles regarding the environment. Prior to use, the instrument underwent content validity testing through expert judgment to ensure the alignment of the instrument's items with the research indicators.

The data were analyzed using descriptive and inferential statistics with the aid of IBM SPSS Statistics software, version 29. Descriptive analysis was used to describe students' levels of knowledge and concern based on mean scores, standard deviations, frequencies, and percentages. Next, inferential analysis began with a normality test using the Kolmogorov-Smirnov test and a linearity test to ensure that the assumptions of the analysis were met. The relationship between students' levels of knowledge and concern regarding environmental conservation was analyzed using Pearson's product-moment correlation test at a significance level of 5% ($\alpha = 0.05$).

FINDINGS AND DISCUSSION

Findings

The study aimed to examine the relationship between students' level of knowledge and their concern for environmental conservation at State Senior High School 16 Makassar. The study involved 60 eleventh-grade students selected through simple random sampling. Data were analyzed using descriptive statistics to describe the characteristics of each variable and Pearson's product-moment correlation to determine the relationship between knowledge and environmental concern.

Table 1. Descriptive Statistics on Students' Knowledge and Awareness of Environmental Conservation

Variable	N	Minimum	Maximum	Mean	SD	Category
Knowledge	60	24	91	61.20	15.571	Fair
Awareness	60	22	75	51.20	11.663	Fair

The average score of students' knowledge regarding environmental conservation was 61.20, while the average score of environmental concern was 51.20. Both variables were classified in the fair category. The distribution of students according to each category is shown in Table 2.

Table 2. Distribution of Students' Levels of Knowledge and Awareness Regarding Environmental Conservation

Category	Knowledge n (%)	Awareness n (%)
Very High	7 (11.67)	0 (0.00)
High	21 (35.00)	14 (23.33)
Fair	27 (45.00)	34 (56.67)
Low	5 (8.33)	12 (20.00)
Very Low	0 (0.00)	0 (0.00)

Most students' knowledge was categorized as fair (45.00%), followed by good (35.00%) and very good (11.67%). Likewise, environmental concern was predominantly categorized as fair (56.67%), while 23.33% of students were classified as good and 20.00% as low. Before testing the hypothesis, the assumptions of normality and linearity were examined.

Table 3. Results of the Prerequisite Tests for Analysis

Test	Result	Sig.	Decision
Knowledge Normality	Kolmogorov–Smirnov	0.200	Normal
Awareness Normality	Kolmogorov–Smirnov	0.200	Normal
Linearity	Deviation from Linearity	0.188	Linear

The normality test indicated that both variables were normally distributed ($p > 0.05$). In addition, the linearity test showed a significance value of 0.188 (>0.05), indicating a linear relationship between the variables. Pearson's product-moment correlation analysis was then performed to test the research hypothesis.

Table 4. Results of the Pearson Correlation Test between Knowledge and Awareness

Variable	r	Sig. (2-tailed)	Interpretation
Knowledge–Awareness	0.754	<0.001	Strong positive correlation

The Pearson correlation coefficient was $r = 0.754$ with $p < 0.001$, indicating a statistically significant and strong positive relationship between students' knowledge and their concern for environmental conservation.

Discussion

The findings reveal that both students' knowledge and environmental concern were classified in the fair category. This indicates that although students have acquired a basic understanding of environmental conservation, their knowledge has not yet reached an optimal level. Environmental knowledge may have been obtained through classroom learning, digital media, and daily experiences. However, the moderate level of knowledge suggests that schools should strengthen environmental education through more contextual learning approaches, such as Project-Based Learning (PjBL), Problem-Based Learning (PBL), outdoor learning, and field observations. These approaches enable students to connect theoretical concepts with real environmental issues, thereby enhancing conceptual understanding and environmental literacy.

Similarly, students' concern for environmental conservation was also categorized as fair, indicating that environmental awareness has not yet been fully translated into consistent pro-environmental behavior. This finding suggests that environmental concern is influenced not only by cognitive understanding but also by behavioral and social factors, including school culture, family support, peer influence, and opportunities to engage in environmental activities. Therefore, schools should continue implementing environmental programs such as waste sorting, recycling initiatives, tree-planting campaigns, waste banks, and regular environmental service activities. These experiences can strengthen students' environmental values through direct participation and habit formation.

The correlation analysis demonstrated a strong positive relationship between students' environmental knowledge and their concern for environmental conservation ($r = 0.754$, $p < 0.001$). This finding supports educational theories suggesting that knowledge serves as an important foundation for the development of positive attitudes. Students with greater understanding of environmental issues tend to demonstrate higher levels of environmental concern because they are more aware of the consequences of environmental degradation and the importance of conservation efforts. Nevertheless, because this study employed a correlational design, the findings do not imply a causal relationship. Environmental concern is also shaped by various factors beyond knowledge, including environmental values, motivation, personal experiences, and social influences.

The present findings are consistent with previous studies. Mangensiga et al. (2023) reported that environmental knowledge is positively associated with environmentally responsible behavior, indicating that increased knowledge contributes to stronger environmental awareness. Likewise, Widyaningrum and Handayani (2024) emphasized that a school culture promoting environmental education significantly enhances students' environmental concern. These studies reinforce the importance of integrating cognitive learning with experiential environmental education to cultivate sustainable environmental attitudes and behaviors.

Overall, this study highlights the strategic role of environmental education in fostering environmentally responsible citizens. Improving

students' environmental knowledge through meaningful and engaging learning experiences should be accompanied by the development of environmentally friendly habits and supportive school programs. Such integration is essential for preparing future generations who not only understand environmental conservation but also consistently practice sustainable behaviors in their daily lives.

CONCLUSION

This study shows that the level of students' knowledge and concern regarding environmental conservation at Makassar State High School 16 falls into the "adequate" category. These results indicate that most students already have a basic understanding of environmental conservation and demonstrate concern for the environment; however, both areas still need to be improved through more contextual learning and the cultivation of environmentally friendly behaviors at school. The results of the Pearson correlation test indicate a strong and significant positive relationship between students' level of knowledge and their concern for environmental conservation ($r = 0.754$; $p < 0.001$). These findings suggest that the higher students' level of knowledge regarding environmental conservation, the higher their level of concern for the environment. Therefore, increasing students' knowledge through environmental education integrated with hands-on learning experiences and an environmentally conscious school culture is expected to strengthen their concern for the environment and encourage the development of sustainable environmental conservation behaviors.

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