

Why Junior High School Students Care About the Environment: Attitudes, Self-Efficacy, and Science Literacy in Ponorogo

Diana Hapsari¹, Aristiawan²

^{1,2}Universitas Islam Negeri Kiai Ageng Muhammad Besari, Ponorogo, Indonesia

ARTICLE INFO	ABSTRACT
Keywords: Attitude toward the environment; Environmental self-efficacy; Science Literacy; Environmental care, Junior high Sshool	This study aims to examine the relationship between attitudes towards the environment, environmental self-efficacy, and science literacy towards caring for the environment, especially students in Ponorogo schools. This study is a quantitative research with a correlational type to see the influence of several variables on other variables. The research was conducted in June 2025 with a sample of 261 junior high school and Madrasah Tsanawiyah students in Ponorogo with data taken using a closed questionnaire that has been confirmed for validity and reliability. The data analysis technique used is multiple regression analysis to determine the influence of variables on each other. Based on the output of the regression analysis of attitudes towards the environment, environment self-efficacy, and science literacy have a significant influence on environmental care of junior high school and MTs Ponorogo students with an influence presentation of 49.5% with the rest of the calculation being influenced by other factors outside the variables studied. The conclusion of this study is that science literacy, environmental self-efficacy, and attitude towards the environment have an influence on students' environmental concerns. The results suggest that schools should design learning experiences that simultaneously strengthen students' scientific understanding of environmental issues, foster positive environmental values, and provide authentic opportunities for students to successfully participate in environmental activities

Corresponding Author:
Diana hapsari
Email: hapsarid310@gmail.com

INTRODUCTION

The environment is an aspect that cannot be separated from human life. In any part of the world, and in any sector, humans depend on the environment. Including in Indonesia, which has a high level of urbanization increasing dependence on energy. Even though the majority of Indonesia has been using non-renewable energy. This uninterrupted energy dependence will contribute greatly to increased greenhouse gas emissions and other environmental problems. The impact of Indonesia in the last few decades has experienced several quite serious environmental problems. One of them was found to be a haze that is estimated to be air pollution in Indonesia, precisely in Bekasi according to the news uploaded by .

One of the environmental problems that is in the spotlight of the world is rampant deforestation. The area of forest that has decreased due to land conversion for infrastructure, housing, agriculture, mining, and plantations is the definition of deforestation. This leads to pollution and the loss and even extinction of biodiversity. Deforestation is also one of the causes of global warming. Land conversion carried out by burning forests causes global warming which is characterized by an increase in the earth's temperature that becomes hotter, and erratic changes in weather. Deforestation also contributes to drought, as it increases the risk of reducing the water capacity of the soil to hold water.

Drought also has a wide impact on human life in various sectors as well as damage to ecosystems and the environment. The very urgent environmental problems that exist around are not only limited to natural resources. Waste is also a very important main concern in Indonesia considering the increasing waste production every year. The release of large plastic waste over a very long period of time will affect the environment.

Environmental problems need to be introduced to students in learning so that they can understand and analyze problems in their surroundings. Environmental problems are very closely related to daily life that can be integrated with learning. The existence of learning that teaches an attitude of caring for the environment is expected to be able to increase students' awareness of their environment. Education plays an important role in fostering a sense of environmental care with environmental education applied. Therefore, learning in the classroom should not only be directed at mastering the material, but also targeting students' concern for the environment.

Concern for the environment is a person's attitude or behavior regarding his or her obligation to protect nature, love, and preserve nature. Environmental care shows attitudes towards environmental quality which are manifested in actions that improve and maintain environmental quality in attitudes that involve the environment. According to Dunlap & Jones, 2002 in Naalchi Kashi, 2019 to the extent to which a person is aware of environmental problems, supports efforts to reduce or solve environmental problems, and or shows a willingness to contribute to environmental problems is the definition of environmental concern. Another meaning of environmental concern according to is a person's awareness and insight that nature is threatened due to overexploited resources and pollution due to human activities.

Environmental concern is influenced by several things, one of which is the student's attitude towards their environment. Attitudes and actions as an effort to prevent damage to

the natural environment and the surrounding area as well as efforts to restore environmental damage that has occurred are the meaning of attitudes towards the environment. A person's indifference to the environment results in the emergence of problems that occur for environmental sustainability. Indifference to the environment can be characterized by the conversion of green land such as forests, rice fields, plantations that are converted into settlements, offices, factories, recreational facilities and so on . The cultivation of attitudes and character of caring for the environment needs to be instilled as early as possible. With the value of caring for the environment that protects nature and avoids from natural damage .Students who know environmental problems will find it easier to provide solutions and practice directly .

In carrying out environmental care practices, it will run more optimally when students have the belief that what they have and do can bring about positive and significant changes in environmental conservation efforts. This attitude is known as env self-efficacy. Self-efficacy according to Albert Badura (1997) refers to a person's assessment of how to deal with possible things in the future. Which can be known by a person's ability or belief in completing certain tasks. There are four main influences in self-efficacy, namely the experience of mastery, the experience of representation, social purpose or persuasion, and emotional and physiological conditions. According to Habibie, self-efficacy refers to an individual's confidence in their personal abilities, where individuals can perform certain tasks that can be successful. In the aspect of self-efficacy towards the environment, it shows an individual's attitude that can control their behavior in creating environmental sustainability. Self-efficacy on the environment can be done as an example of individual attitudes in recycling, resource conservation, reforestation efforts and so on .

The emotional component of the construct of self-efficacy is directly related to feelings and expectations that potentially make self-efficacy useful for understanding the experiences, expectations and decisions of dealing with climate change . According to Badura, 1997 in ESE or Environmental Self-Efficacy is an individual's belief in their ability to have the desired impact on the environment through their own actions or behaviors. Belief to change the environmental situation is not enough by being based on trust alone. It takes a complete understanding of the environment so that what students do has a more real impact. Therefore, it is important to involve science literacy in learning. An ability, skill, and ability possessed by students regarding knowledge and understanding of scientific concepts and processes in identifying, trying to gain new knowledge, explaining scientific phenomena, and drawing conclusions based on nature and natural changes through human activities is the definition of science literacy. Science literacy has a broad meaning not limited to reading and understanding science concepts, but is the ability to understand and apply the principles of science in science-based problems and the use of technology in life . Science literacy is a person's ability to apply scientific knowledge to explain phenomena and solve the natural environment and the environment that includes human interaction. Based on research conducted by showing the environmental literacy (EL) value of students in Ponorogo based on the adiwiyata predicate in junior high school. It shows that the EL value is still very low with 51% of respondents still below level 3, which is the EL standard.

Therefore, this study aims to examine the relationship between why students in

schools care about the environment if examined in attitudes towards the environment, environmental self-efficacy, and science literacy, especially students in Ponorogo schools. Existing research has largely focused on how teachers can foster environmental awareness through pedagogical interventions using learning strategies or instructional models. However, to understand why some students demonstrate stronger environmental concern than others, greater attention must be paid to the psychological and cognitive characteristics of the students themselves. Research that simultaneously examines environmental attitudes, environmental self-efficacy, and science literacy as predictors of environmental concern remains limited, particularly among Indonesian adolescents. By integrating these three constructs into a single framework, this study provides new evidence regarding the internal determinants of environmental concern among junior high school students. Even though the attitude inherent in students also has an influence. Beyond that, research usually only covers one school. This study involves several schools in Ponorogo representing junior high schools and MTS, so the data provided will be more heterogeneous.

RESEARCH METHOD

This study is a quantitative research with a correlational type to see the influence of several variables on other variables the relationships among environmental attitudes, environmental self-efficacy, science literacy, and environmental concern among junior high school students. The multiple regression data analysis technique was used to analyze the relationship between research variables. This analysis requires several prerequisite tests such as normality tests, multicollinearity tests, homokedasticity and autocorrelation tests. Data were analyzed using IBM SPSS Statistics version 22.

The target population consisted of junior high school students enrolled in public schools and Madrasah Tsanawiyah in Ponorogo, Indonesia. The sample consisted of 261 students selected using a proportional multistage random sampling method to ensure representation from various schools and grade levels. Schools were first grouped based on their characteristics; participants were then randomly selected from each stratum in proportion to the number of students. This sampling technique was chosen to obtain a representative sample and reduce sampling bias. Data collection will be carried out in June 2025, data collection will be carried out using questionnaires in the form of closed-ended questions. This questionnaire has been verified for validity and reliability before it is used to retrieve data. Construct validity was examined using Pearson product-moment correlation, with all item correlation coefficients exceeding the acceptable threshold ($r > 0.30$). Internal consistency reliability was assessed using Cronbach's alpha, yielding coefficients greater than 0.70 for all variables, indicating satisfactory reliability

RESULT AND DISCUSSION

Result

Based on the results of the analysis of multiple regression data that previously met the requirements of normality tests, linearity tests, multicollinear, homokedasticists, and the absence of autocorrelation, the results were obtained as shown in Figure 1.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703 ^a	.495	.489	1.797

a. Predictors: (Constant), Sikap Terhadap Lingkungan, Literasi Sains, Environmental Self-Efficacy

Figure 1 coefficient of determination result

Based on the results of the R square value or the determination coefficient which functions to measure the extent to which independent variables affect dependent variables. The calculation results were obtained with a result of 0.495. This shows that the contribution of science literacy variables, environmental cell-efficacy, and attitudes towards the environment with environmental care is 49.5%, which is then influenced by other variables that are not included in the existing variables for this study.

The influence of each variable in the study is explained in Figure 2.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	1.541	1.202	1.282	.201
	Literasi Sains	.130	.048	.135	.007
	Environmental Self-Efficacy	.268	.046	.323	.000
	Sikap Terhadap Lingkungan	.402	.058	.388	.000

a. Dependent Variable: Peduli lingkungan

Figure 2 regression test results

Based on the results of the regression analysis output on the coefficient table, it can be seen that the significance value of the variable attitude towards the environment towards environmental care is 0.000. Based on the results of the analysis, the significance shows that the significance results are below or less than $\alpha = 0.05$, it is known that there is a significant influence between attitudes towards the environment and caring for the environment. Based on the interpretation of the results, the positive relationship between attitudes towards the environment and environmental care in students in schools in Ponorogo Regency was tested.

Discussion

Based on the results of the regression analysis output on the coefficient table, it can be seen that the significance value of the variable environment self-efficacy on environmental concern is 0.000. Based on the results of these significance results which show significance results that are below or equal to $\alpha = 0.05$, there is a significant influence between environmental self-efficacy and environmental care. Based on these results, it can be interpreted that the positive relationship between environmental self-efficacy and

environmental care in students in schools in Ponorogo Regency has been tested.

Based on the results of the regression analysis output on the coefficient table, it can be seen that the significance value of the science literacy variable on environmental concern is 0.007. The significance result of a smaller than $\alpha = 0.05$ shows that there is a significant influence on science literacy and environmental care. Based on the results of this interpretation, it can be concluded that there is a positive relationship between science literacy and environmental care for students in schools in Ponorogo Regency is tested.

Attitudes towards the environment

Based on the results of the significance of attitudes towards the environment with environmental concern reaching a value of 0.000 which is smaller than $\alpha = 0.05$, there is a significant difference between attitudes towards the environment and environmental concerns of students in Ponorogo Regency schools. Based on the questionnaire on attitude towards the environment that has been carried out by students, among other things, it is important to have an attitude to protect the environment in daily life, students feel that the environment must be maintained, students show that there is empathy for the damaged environment, not only that students are also committed to and contribute to efforts to preserve the environment. Environmental attitudes are defined as psychological dispositions expressed through individuals towards certain environmental objects or issues. Based on Collado et al. (2003) in stating that direct recreational experiences can improve students' attitudes towards the environment.

Improving attitudes towards the environment is a challenge of education. It is necessary to pay attention to appropriate methods and perspectives to produce transformative education. It is important to promote knowledge and awareness about environmental issues. Acting to protect the surrounding environment is one of the opportunities for adolescents to be transformative power related to environmental issues . Therefore, transformative education is needed to increase environmental awareness so that environmental care in adolescents increases.

The relatively high environmental attitudes observed among junior high school students in Ponorogo may be attributed to the integration of environmental education into classroom learning, participation in school-based environmental programs such as the Adiwiyata program, and repeated involvement in activities that encourage sustainable practices. These educational experiences enable students to internalize environmental values, increase their awareness of environmental problems, and foster positive beliefs regarding the importance of protecting natural resources. Previous research supports this finding. Wibowo et al. (2023) reported that environmental education integrated into the Adiwiyata curriculum and participatory environmental activities significantly strengthened students' environmental care attitudes. Their study also emphasized that continuous environmental learning and school environmental programs cultivate students' ecological values and responsibility toward the environment . Similarly, Ibrahim et al. (2021) found that environmental attitude significantly influences students' environmental concern and their intention to engage in environmentally responsible behaviors, demonstrating that positive attitudes toward the environment are an important psychological foundation for developing environmental concern .

Environment self-efficacy

Based on the results of the significance between environment self-efficacy and environmental care with a result smaller than $\alpha = 0.05$, namely with a regression result of 0.000, there is a significant result between self-efficacy environment and environmental care in students in junior high school/MTs in Ponorogo Regency. Environment self-efficacy is shown by students with several statements, namely students trying to reduce the use of single-use plastics, students trying to maintain environmental cleanliness and making persuasive invitations to peers to continue to protect the environment, consistently maintaining an environmentally friendly lifestyle and inspiring actions to protect the environment. Based on the green self-efficacy or environmental self-efficacy, it is how much an individual's capacity for behavior is to maintain or be responsible for the environment. Self-efficacy can increase in high school students with education so that environmental concern such as understanding the causes of climate change and what actions can prevent the increase in heat that causes climate change. With knowledge, the sense of responsibility in adolescents will increase and involvement in climate change mitigation or prevention will increase. So that with high self-efficacy towards the environment in students, it causes an increase in the sense of responsibility in the face of an attitude of caring for the environment.

This finding can be explained by Social Cognitive Theory, which states that self-efficacy influences individuals' motivation, persistence, and willingness to engage in specific behaviors. Students with high environmental self-efficacy believe that their individual actions, such as reducing plastic waste, conserving water and electricity, and participating in environmental activities, can contribute meaningfully to environmental protection. Consequently, these students are more likely to develop a stronger sense of responsibility and concern for environmental sustainability.

The present finding is consistent with previous studies. A study by Santika Rahayu Wiguna and colleagues reported a strong positive relationship between environmental self-efficacy and students' participation in environmental action programs ($r = 0.769$, $p < 0.01$), indicating that students with higher confidence in their environmental abilities are more actively involved in environmental conservation activities. Likewise, a recent study published in Current Research in Ecological and Social Psychology demonstrated that environmental self-efficacy is a significant predictor of pro-environmental behavior, together with environmental awareness and subjective norms, suggesting that students who believe in their capability to make a positive environmental impact are more likely to engage in environmentally responsible behaviors.

Science Literacy

Based on the results that show significant results with the existence of science literacy in students in Ponorogo Regency, it is evidenced by the results of regression analysis of 0.007 which is less than $\alpha = 0.05$. Indicators in science literacy are that students know the concepts of science learning such as climate change, pollution and other environmental problems, with science literacy students can take actions to apply the science knowledge they have gained to overcome various problems such as recycling waste, considering information from environmentally friendly products, and digging up information about disaster management and ways to overcome it. Students who have done science literacy usually have a higher

character of caring for the environment than students who do not do science literacy. Science literacy in elementary school students obtained through science learning will foster environmental awareness. With the implementation of science literacy, it aims to improve skills in understanding scientific concepts and the process in analyzing various problems in life. Science literacy also has a contribution to increasing students' environmental awareness. According to Lesrati and Prasetyo (2020), attitudes of caring for the environment and understanding of the impact of human activities on the student ecosystem tend to be better if students have good science literacy. Science literacy makes students more informed and more skilled about the environment. Science literacy in caring for the environment is the ability to understand and apply scientific knowledge about the environment in an effort to protect and protect nature. By understanding science literacy in caring for the environment, students understand what human activities that damage the environment such as pollution, global warming, and the extinction of biodiversity can affect the environment. Students are also responsible for preserving the environment by reducing plastic waste, recycling, using environmentally friendly energy based on renewable energy, and supporting nature conservation efforts.

Based on the results of the determination coefficient of 0.495 or 49.5%, that variable independent science literacy, environment-cell-efficacy, attitude towards the environment has an influence on variable dependents of environmental care. The remaining 50.5% is another factor that is not found in the study that affects students' environmental concerns in Ponorogo Regency schools. Saptiani stated that the use of the environment-based TPS learning model with the conventional learning model has differences in environmental attitudes. According to Putri & Sha'ban, the attitude of caring for the environment is influenced by the knowledge of environmental impact analysis by students. So that 50.5% of the factors that are not contained in the study can be influenced by factors during the study of students in school about environmental care attitudes.

These findings support contemporary perspectives in environmental education, which emphasize that pro-environmental dispositions develop through the interaction of knowledge, attitudes, and personal beliefs. Practically, the results suggest that schools should design learning experiences that simultaneously strengthen students' scientific understanding of environmental issues, foster positive environmental values, and provide authentic opportunities for students to successfully participate in environmental activities. Such experiences may include inquiry-based learning, project-based learning, citizen science projects, and environmental action programs integrated into the school curriculum.

This study has several limitations. First, the participants were limited to junior high school students in Ponorogo Regency, which may restrict the generalizability of the findings to students in other regions or educational contexts. Second, the study employed a cross-sectional correlational design; therefore, causal relationships among the variables cannot be established. Third, the data were collected using self-report questionnaires, making the findings susceptible to social desirability bias and subjective responses. Finally, although science literacy, environmental self-efficacy, and environmental attitudes explained a substantial proportion of students' environmental concern (49.5%), approximately 50.5% of the variance remained unexplained. This indicates that other variables, such as environmental

knowledge, place attachment, family environmental practices, peer influence, school climate, environmental values, and socioeconomic background, may also contribute to students' environmental concern.

CONCLUSION

The conclusion of this study is that science literacy, environmental self-efficacy, and attitude towards the environment have an influence on students' environmental concerns. It is evidenced by a significance value of science literacy of 0.007, a significance value of environment self-efficacy of 0.000, and an attitude towards the environment with a significance of 0.000 that is less than 0.05. The coefficient of determination of 3 independent variables of science literacy, environmental self-efficacy, attitude towards the environment towards the dependent variable of environmental care was 0.495, where the rest was influenced by other factors other than in the study. Collectively, these three variables explained 49.5% of the variance in students' environmental concern, while the remaining variance may be attributed to other psychological, social, educational, or contextual factors that were not examined in this study. Overall, the findings highlight that strengthening students' environmental concern requires not only improving science literacy but also cultivating positive environmental attitudes and enhancing students' confidence to engage in environmentally responsible actions.

Recommendations for the next research are to examine attitudes towards the environment, environmental self-efficacy and science literacy towards environmental concern with more data or samples so that the data is more heterogeneous. Develop more indicators of each variable to find out the factors that affect the variables on students' environmental concerns.

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