Ecopedagogic: The Influence of Geography Learning On Environmental Care Attitudes

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Abstract.
Environmental problems are closely related to low levels of environmental awareness and attitudes. Students' environmental care attitudes are influenced by educational processes, particularly Geography learning, which integrates ecological and spatial perspectives. This study aims to analyze the influence of Geography learning on students' environmental care attitudes. The research employed a quantitative approach using a simple linear regression model with a sample of 41 students. Data were collected through questionnaires, interviews, and documentation. The novelty of this study lies in integrating ecopedagogic perspectives into Geography learning to strengthen environmental care attitudes among high school students. The results show that Geography learning has a significant positive effect on environmental care attitudes, with a correlation coefficient of 0.516 and a coefficient of determination of 26.67%. This indicates that improving the quality of Geography learning contributes to enhancing students' environmental awareness and attitudes.
Keywords: *Care for the environment and learning geography.*

1. INTRODUCTION

In reality, environmental problems are an attitude of not being aware of the importance of environmental conservation. The main factor that is less aware of environmental awareness is humans. Because it is humans who always play an active role in the continuity of the surrounding nature. [1] Human beings do not have the right sense of love for the environment. Humans consider that this world is part of itself, they do not understand that animals and plants are also part of nature [2]. Humans never think that the consequences of their behavior that damages nature can cause damage to the surrounding nature. In addition, another possibility why humans act as they please is the lack of knowledge about environmental conservation. [3] As a reasonable and reasoning creature. With reason and reason man develops various sciences that he can do through the toeri of theories that yes can. So that humans assume that yes is the "ruler of nature". This is a big mistake, because the truth is that "man is part of nature". It needs to be justified that man is not an opponent of nature, but rather part of nature. For this reason, people should be aware that their actions and behaviors are wrong. And man should also be aware of what consequences will arise from his actions to destroy nature [4].

The United Nation Conference on Environment and Development (UNICED) stated that education needs to emphasize the study of population development in the world regarding the natural environment and the complexity of problems so that it applies to the formation of knowledge, attitudes, motivation, commitment and skills to work individually and in groups facing problems [5].

Environmental education is widely recognized as a key factor in shaping students' environmental awareness and attitudes. Studies show that environmental knowledge, values, and learning experiences significantly influence pro-environmental behavior [6] [7]. Furthermore, the gap between environmental knowledge and behavior remains a major issue, where individuals may understand environmental problems but fail to act accordingly [8].

Indonesia positions the Adiwiyata program as a manifestation of environmental education, which carries out the mission of realizing the mission of realizing school residents who are responsible

for efforts to protect and manage the environment through good school governance to support sustainable development [9]. The statement by UNICED and the Minister of Environment is a global commitment to address environmental issues. The Adiwiyata program is implemented by basing on 4 implementation standards, namely (1) Environmental-based school policies; (2) Environmental-based curriculum; (3) Participatory-based environmental activities; and (4) Management of environmentally friendly facilities and infrastructure (Minister of Environment, 2011) 4 Standards for the implementation of the Adiwiyata program are a form of social order that is expected to be achieved in the social world in schools and glasses of environmental institutions [10].

Ecopaedagogic can be interpreted as an academic movement to awaken students to become individuals who have understanding, awareness and life skills in harmony with the interests of nature conservation [1]. In a different sense [11] argues that eco-agogics is an approach in learning that makes students independent, autonomous learners, able to develop learning potential based on experiences brought from outside the classroom and realize that each of their actions has an impact on themselves and their environment [9].So the researcher was interested in discussing the influence of geography learning on the environmental care attitude of class X social studies students at SMA Veteran Sukoharjo. Geography learning plays an important role in bridging this gap by integrating spatial and ecological understanding into real-world contexts. Previous research indicates that environmental education in schools can significantly improve students' environmental awareness and attitudes [7].

The analysis used in this study is Analytical regression model path which is data analysis, statistical modeling to predict results. This analysis includes various statistical techniques and technologies. The two most common types of analytical models are classification and regression models. [12] There are two types of prediction models, namely classification models and regression models. Regression analysis is one of the most frequently used methods of statistical analysis. Regression analysis is a form of relationship between free variables and bound variables. The relationship of these variables can take the form of logarithms, additives, or multiplications. Regression analysis can be used for the purpose of estimating the value of one variable and the value of another variable. Through this analysis, the influence of geography learning will be analyzed on students' environmental care attitudes.

II. METHODS

The analysis technique used in this study is a simple linear regression analysis technique with the following equation model: $Y = a + bX + e$

Information:

- Y : Response variable or effect variable (bound variable)
- X : Predictor variable or factor (free variable)
- a : Constants
- b : Regression coefficient (slope), the amount of response generated by the predictor

Meanwhile, in collecting data, this research uses several methods, namely the questionnaire method, interviews and documentation methods. With a sample of 41 students who are part of the population of class X social studies students for the 2021/2022 academic year.

III. RESULT AND DISCUSSION

The presentation of the data presented below is sourced from the results of the questionnaire given to students. The sample in this study is the entire population of class X social studies students for the 2021/2022 academic year. In this study, respondents totaled 41 students.

There are two variables in this study, namely the free variable (X) and the bound variable (Y). Learning Geography as a free variable (X) and environmental concerns of class X social studies students as

a bound variable (Y). Geography learning is reviewed from questionnaires, interviews and documentation, while student environmental concerns are reviewed from questionnaires or questionnaires.

The presentation of Geography learning data (X) and environmental care attitudes (Y) given to students is as follows:

Table 1. X and Y Variable Test Results

Not	Subject	X	Y	Not	Subject	X	Y
1	S1	78.95	85	22	S22	45.39	29.17
2	S2	54.61	33.33	23	S23	71.71	50
3	S3	61.84	54.17	24	S24	75	100
4	S4	56.58	52.5	25	S25	91.45	81.67
5	S5	70.39	29.17	26	S26	76.97	70.83
6	S6	51.32	29.17	27	S27	79.61	83.33
7	S7	65.13	66.67	28	S28	87.5	90
8	S8	71.71	48.33	29	S29	80.26	58.33
9	S9	56.58	41.67	30	S30	66.45	62.5
10	S10	69.08	29.17	31	S31	94.74	83.33
11	S11	76.32	18.33	32	S32	71.05	68.33
12	S12	75.66	25	33	S33	75.66	52.5
13	S13	50.66	41.67	34	S34	69.08	100
14	S14	65.13	100	35	S35	69.08	95.83
15	S15	75.66	100	36	S36	71.71	58.33
16	S16	61.84	56.67	37	S37	74.34	58.33
17	S17	78.29	67.5	38	S38	78.95	52.5
18	S18	75	70.83	39	S39	84.21	65
19	S19	69.74	37.5	40	S40	67.11	62.5
20	S20	84.21	81.67	41	S41	46.71	29.17
21	S21	55.92	40				

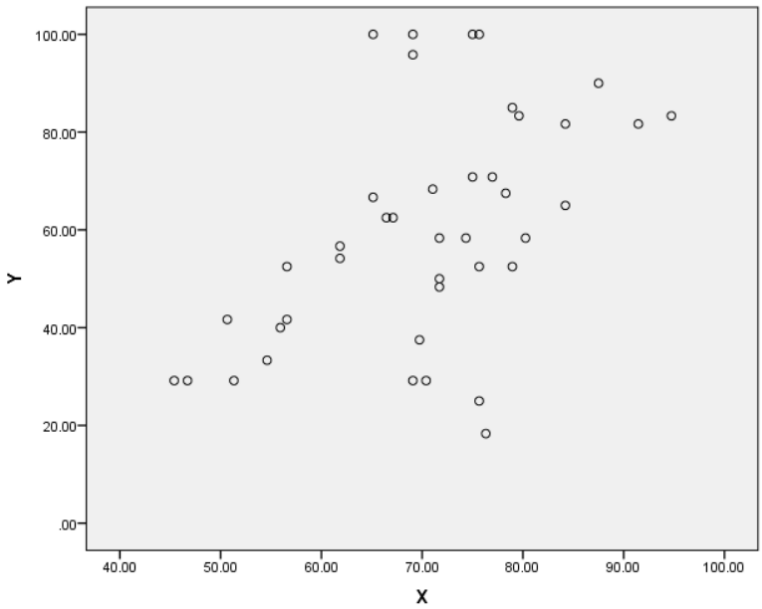

Fig 1. X and Y Variable Test Results

1. Validity and Reliability of the Instrument

   This validity test uses the *product moment* correlation formula.

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}} \quad [13]$$

Table 2 Validity of instruments

No problem	Correlation coefficient (rxy)	rtabel	Decision	No problem	Correlation coefficient (rxy)	rtabel	Decision
1	0.737	0.308	Legitimate	22	0.676	0.308	Legitimate
2	0.688	0.308	Legitimate	23	0.794	0.308	Legitimate
3	0.544	0.308	Legitimate	24	0.765	0.308	Legitimate
4	0.372	0.308	Legitimate	25	0.681	0.308	Legitimate
5	0.78	0.308	Legitimate	26	0.798	0.308	Legitimate
6	0.441	0.308	Legitimate	27	0.789	0.308	Legitimate
7	0.584	0.308	Legitimate	28	0.1	0.308	Invalid
8	0.696	0.308	Legitimate	29	0.685	0.308	Legitimate
9	0.568	0.308	Legitimate	30	0.702	0.308	Legitimate
10	0.76	0.308	Legitimate	31	0.111	0.308	Invalid
11	0.27	0.308	Invalid	32	0.31	0.308	Legitimate
12	0.72	0.308	Legitimate	33	0.779	0.308	Legitimate
13	0.517	0.308	Legitimate	34	0.713	0.308	Legitimate
14	0.657	0.308	Legitimate	35	0.722	0.308	Legitimate
15	0.829	0.308	Legitimate	36	0.571	0.308	Legitimate
16	0.544	0.308	Legitimate	37	0.746	0.308	Legitimate
17	0.533	0.308	Legitimate	38	0.654	0.308	Legitimate
18	0.619	0.308	Legitimate	39	0.754	0.308	Legitimate
19	0.562	0.308	Legitimate	40	0.406	0.308	Legitimate
20	0.64	0.308	Legitimate	41	0.644	0.308	Legitimate
21	0.3	0.308	Invalid	42	0.587	0.308	Legitimate

Based on the table above, it can be concluded that the question items from numbers 1 to 42 have several invalid question items, namely questions number 11, 21, 28 and 31 because $r_{counts} \leq r_{table}$. These four questions will not be used for data collection in the form of student learning geography learning questionnaires. So that the number of question items that will be used for collecting student learning geography learning data is 38 questions.

a. Instrument reliability

The instrument is said to be *reliable* if the magnitude of the reliability index obtained is $r_{11} \geq 0.70$. With the number of questions as many as 38 items that have been tested for validity, an r value of $_{11}$ is 0.962. The value of r_{11} is greater than 0.70 so that the instrument is reliable or feasible to use for data collection tools.

2. Prerequisite Analysis

a. Normality test

In this study, for the normality test, the *Liliefors* method was used with a significant level of 0.05. Based on calculations assisted by Ms. Excel, the result was obtained, namely L0 of 0.076 while L_{table} i.e. 0.138 to L0 < L_{table}. The test decision of the results is L0 ∉ DK so that H_0 is accepted which means the sample comes from a normally distributed population.

b. Linearity test

The linearity test uses a significance of 0.05. The calculation of the linearity test was assisted by Ms. Excel and obtained the value F counts at 0.675. Whereas with DF1 = 1 and DF2 = 39 obtained F_{table} by

4,091. So that F calculates < F_{table} then H_0 accepted and H_1 rejected, meaning that there is a linear relationship between the learning variables of geography and the attitude of caring for the environment.

c. Heteroskedasticity test

The heteroskedasticity test was assisted by Ms. Excel and obtained a *P-value* or *Sig (Significance F)* of 0.515. So that *Sig* > 0.05 then H_0 is accepted and H_1 is rejected, meaning that there is no problem of heteroskedasticity.

3. Simple Linear Regression Analysis

A simple linear regression analysis is used to find out the values of the constants a and b in the regression equation Y = a + bX + e. From the calculation results obtained a of -13.912 and b of 1.051 so that it can be written in the following equation:

$$Y = -13.912 + 1.052\,X$$

This means that if X=0 then Y= -13,912, if X increases by one unit (X=1) then Y will also increase by 1,051.

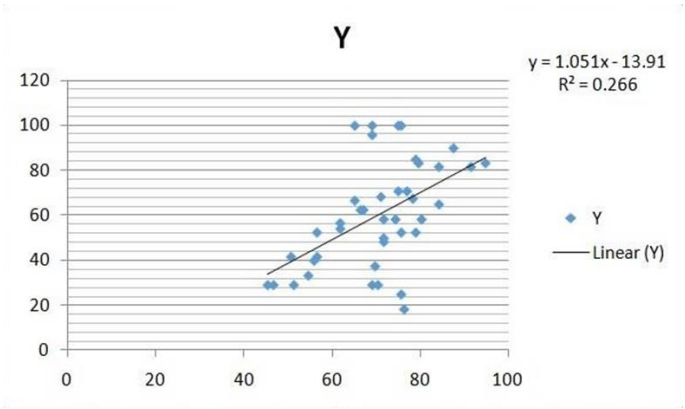

Fig 2. Simple Linear Regression Equation Graph

The above graph is searched using ms. Excel menu inserts scattered →.

4. Correlation Analysis

a. Correlation coefficient test

The relationship of free variables with bound variables uses a simple correlation formula or product moment correlation.

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}} \quad [13]$$

The calculation of the value of r_{xy} obtained the value of the correlation coefficient between X and Y which is 0.516 which belongs to the category of rather low.

b. Coefficient of determination test

The coefficient of determination is used to find out how much the relationship between the free variable and the bound variable is. With the formula R = (r^2) × 100% , obtained the value of the coefficient of determination (*R- Squared*) of 0.2667 or 26.67% which means that X can explain Y by 26.67% ; the rest is influenced by other factors.

5. Variable Significance Test

The variable significance test is calculated with the t-test so that it can be found t-count. If $t_{counts} < t_{table}$, then H_0 is accepted and H_1 is rejected which means that geography learning has no significant effect on the attitude of environmental care. The calculation was assisted by *Ms. Excel* and obtained $a_{calculated}$ t value of 3.766 while with a significant degree of 0.05; and DF=39 obtained value t_{table} is 2.023 so $t_{counts} > t_{table}$. Because $t_{count} > t_{table}$, H_0 is rejected and H_1 is accepted, which means that geography learning has a significant effect on the attitude of environmental care.

Prerequisite analysis in this study is the normality test, linearity test and heteroskedasticity test. The normality test uses environmental care attitude (Y) data and the results of the analysis show that the data is normally distributed. The linearity test and heteroskedasticity test use learning data on learning geography

in the form of scores from questionnaires (X) and data on environmental care attitudes (Y). The results of the analysis on the linearity test showed that free variables and bound variables have a linear relationship. Meanwhile, the heteroskedasticity test showed no heteroskedasticity problems. All three prerequisite analyses are met so that they can proceed to correlation analysis, simple linear regression analysis and variable significance tests.

Correlation analysis shows that the value of the correlation coefficient between X and Y is 0.516 which belongs to the rather low category. The value of the coefficient of determination (*R-Squared*) is 0.2667 or 26.67% which means that X can explain Y by 26.67%; the rest is influenced by other factors. Furthermore, the moderate coefficient of determination (26.67%) indicates that environmental care attitudes are influenced by multiple internal and external factors. Previous research confirms that environmental awareness, social norms, and personal values significantly contribute to pro-environmental behavior [14] [15]. Meanwhile, the research hypothesis was tested with a t-test and used to test the significance of the variable so that $a_{calculated}$ t value = 3.766 was obtained greater than the table t = 2.023 so that it could be concluded that there was a significant relationship between variable X (geography learning) and variable Y (attitude to care for the environment).

In addition, geography learning affects the attitude of caring for the environment significantly can be shown by the regression equation Y = -13.912 + 1.051 X. Judging at the regression coefficient the equation is positively valued at 1.051 which means that if X (learning increases geography) by one unit it will increase the value of Y (attitude to care for the environment) by 1,501. So that the more X grades (geography learning) there will be more Y values (environmental care attitudes).

The findings of this study indicate that Geography learning has a significant influence on students' environmental care attitudes. This result is consistent with recent studies showing that environmental education plays an important role in improving pro-environmental behavior and environmental awareness among students [16] [17] (Zhao Y. et al., 2024; Qi S. et al., 2025). Environmental education not only enhances knowledge but also shapes attitudes and responsibility, which are key mediators in influencing behavior.

In addition, learning approaches that involve active participation and real-world environmental engagement are more effective in shaping environmental attitudes compared to conventional instruction [18]. Studies show that students' participation in environmental education programs significantly improves pro-environmental behavior [19] [20].

IV. CONCLUSION

From the results of the study, it proves that increasing the quality of geography learning will have a positive influence on environmental care attitudes. So if the school wants students to have a better attitude of caring for the environment, it must improve the quality of geography learning.

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REFERENCES

[1] H. Yunansah and Y. T. Herlambang, "Pendidikan Berbasis Ekopedagogik dalam Menumbuhkan Kesadaran Ekologis dan Mengembangkan Karakter Siswa Sekolah Dasar," EduHumaniora: ***Jurnal Pendidikan Dasar Kampus Cibiru,*** vol. 9, no. 1, p. 27, 2017, doi: 10.17509/eh.v9i1.6153.

[2] S. A. Abdul-Wahab, "Level of Environmental Awareness Towards Depletion of the Ozone Layer Among Distributors and Consumers in the Solvent Sector: A Case Study from Oman," ***Climatic Change***, vol. 103, no. 3, pp. 503–517, 2010, doi: 10.1007/s10584-009-9777-x.

[3] S. H. Chun, H. J. Hwang, and Y. H. Byun, "Environmental Awareness in Green Supply Chain and Green Business Practices: Application to Small and Medium-Sized Enterprises," Lecture Notes in Electrical Engineering, vol. 203, pp. 429–435, 2012, doi: 10.1007/978-94-007-5699-1_42.

[4] P. Lago and T. Jansen, "Creating Environmental Awareness in Service-Oriented Software Engineering," Lecture Notes in Computer Science, vol. 6568, pp. 181–186, 2011, doi: 10.1007/978-3-642-19394-1_19.

[5] I. B. Gurbuz, E. Nesirov, and G. Ozkan, "Investigating Environmental Awareness of Citizens of Azerbaijan: A Survey on Ecological Footprint," Environment, Development and Sustainability, vol. 23, no. 7, pp. 10378–10396, 2021, doi: 10.1007/s10668-020-01061-w.

[6] S. Otto and P. Pensini, "Nature-Based Environmental Education of Children: Environmental Knowledge and Connectedness to Nature," ***Journal of Environmental Psychology***, vol. 52, pp. 88–94, 2017, doi: 10.1016/j.jenvp.2017.06.009.

[7] Á. Zsóka, Z. Szerényi, A. Széchy, and T. Kocsis, "Greening Due to Environmental Education? Environmental Knowledge, Attitudes, Consumer Behavior and Everyday Pro-Environmental Activities of Hungarian High School and University Students," ***Journal of Cleaner Production,*** vol. 48, pp. 126–138, 2013, doi: 10.1016/j.jclepro.2012.11.030.

[8] A. Kollmuss and J. Agyeman, "Mind the Gap: Why Do People Act Environmentally and What Are the Barriers to Pro-Environmental Behavior?" Ecological Economics, vol. 39, no. 3, pp. 239–260, 2002, doi: 10.1016/S0921-8009(02)00079-1.

[9] T. Handayani, Z. M. S., and C. B. Yudha, "Pendidikan Karakter Peduli Lingkungan Melalui Program Adiwiyata Berbasis Ekopedagogik," EduHumaniora: ***Jurnal Pendidikan Dasar Kampus Cibiru***, vol. 13, no. 1, pp. 36–42, 2021, doi: 10.17509/eh.v13i1.25735.

[10] A. Sugiarto and D. A. Gabriella, "Kesadaran dan Perilaku Ramah Lingkungan Mahasiswa di Kampus," Jurnal Ilmu Sosial dan Humaniora, vol. 9, no. 2, p. 260, 2020, doi: 10.23887/jish-undiksha.v9i2.21061.

[11] M. Gadotti, "Reorienting Education Practices Towards Sustainability," ***Journal of Education for Sustainable Development,*** vol. 4, no. 2, pp. 203–211, 2010.

[12] A. M. Husein, F. R. Lubis, and M. K. Harahap, "Analisis Prediktif untuk Keputusan Bisnis: Peramalan Penjualan," Data Sciences Indonesia, vol. 1, no. 1, pp. 32–40, 2021.

[13] S. Arikunto, Prosedur Penelitian: Suatu Pendekatan Praktik. Jakarta: PT Rineka Cipta, 2013.

[14] N. Plohl, "The Role of Environmental Awareness and Self-Efficacy in Pro-Environmental Behavior," Environmental Challenges, vol. 15, 2026.

[15] Fitria et al., "Predicting Students' Pro-Environmental Behavior Based on Antecedent Factors," Biosfer: ***Jurnal Pendidikan Biologi,*** 2024.

[16] Y. Zhao et al., "Enhancing Pro-Environmental Behavior Through Nature-Contact Environmental Education," Frontiers in Environmental Science, vol. 12, 2024, doi: 10.3389/fenvs.2024.1491780.

[17] S. Qi et al., "Promoting Pro-Environmental Behavior Among University Students Through Sustainability Education and Institutional Support," ***Sustainability,*** vol. 17, no. 22, p. 10069, 2025, doi: 10.3390/su172210069.

[18] A. E. J. Wals, "Learning our way to sustainability in a complex world," Environmental Education Research, vol. 27, no. 5, pp. 1–14, 2021, doi: 10.1080/13504622.2021.1915169.

[19] J. A. Handayani and Widodo, "The Impact of Student Participation in Environmental Education Programs on Pro-Environmental Behavior," Jurnal Cakrawala Pendidikan, vol. 10, no. 2, 2024.

[20] N. M. Ardoin, A. W. Bowers, and E. Gaillard, "Environmental Education Outcomes for Conservation: A Systematic Review," ***Biological Conservation***, vol. 241, p. 108224, 2020, doi: 10.1016/j.biocon.2019.108224.