The Effect of Campaign Message on Environmental Awareness: Project-Based Learning Mediation Model among Students of Universitas Negeri Semarang

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Abstract

This study aims to determine the role of project-based learning in mediating campaign messages and environmental awareness among students of Universitas Negeri Semarang. This research is a study with a quantitative research approach with a causal correlational design. The population of this study was 131 students, using the Krejcie & Morgan table, with samples of 103 respondents. Data collection was carried out through a questionnaire. The validity test conducted in the study used the loading factor, average variance extracted (AVE), and cross-loading. Reliability The questionnaire is assessed using Cronbach's Alpha, and all composite reliability values for each construct are greater than 0.7. Survey data is entered into SmartPLS version 3.2.9 to be analyzed. Direct effect analysis with a path coefficient helps test the hypothesis of direct effects between variables at a significance level 0.05. A significant direct relationship exists between project-based learning and environmental awareness among students of 0.508 (P-value 0,000). Indirect effect analysis helps test the hypothesis of indirect effects between variables mediated by a variable. Project-based learning significantly mediates between campaign message and environmental awareness of 0.376 (P-value 0,000). This research concludes that project-based learning directly and indirectly influences increasing environmental awareness. Project-based learning significantly mediates the relationship between campaign message and environmental awareness among students at Unnes. Project-based learning plays a vital role in raising environmental awareness. Suggestions for this research, educators need to include project-based learning in a more varied semester learning plan, and according to the latest issues, so that it can ignite and have an impact on increasing environmental awareness among students at Unnes.

Keywords

campaign message; environmental awareness; project-based learning

INTRODUCTION

Issues of an increasingly worse environment are global challenges closely related to the objectives of Sustainable Development Goals (SDGs), which are increasingly urgent to overcome (Malihah, 2022). According to Ferawati (2018), sustainable development is principled to "meet the needs of now without sacrificing the fulfillment of the needs of future generations". This challenge needs to be handled by the community, especially among the younger generation as agents of change and future leaders for the creation of life (Ramdani et al., 2024).

Environmental literacy is the understanding and ability of individuals to recognize, understand, and act on environmental issues, including concepts, behavior, problems, attitudes, beliefs, cognitive abilities, and skills (Purwati et al., 2023). Various problems, such as climate change, clean water crisis, waste and pollution, demanded increased environmental awareness for the wider community (M. Rahmawati, 2025). In the digital era that continues to develop, there are various ways to convey the values and urgency of environmental awareness to the community, namely developing environmental literacy (Pangsuma & Surtikanti, 2024). A study's results stated "There is a good level of knowledge and perception among students of the Alexandria Province in the province of Alexandria regarding several global environmental problems and newly emerged" (Ali El-Sayed Abd El-Hamid Omran et al., 2025). Based on the results, it is clear that environmental campaigns contribute to student environmental literacy. However, the effectiveness of the campaign message is influenced by how the consistency of messages, credibility of information sources, strategic social media repair, and messages are understood by the audience, especially students as groups that have great potential in influencing the community (Hajar & Syaesti, 2024). Another opinion that supports that "source credibility, rather than being viewed as a variable, should be construed as a domain of research concerned with the impact of sources on communicative outcomes, encompassing shifts in attitudes and, more recently, the processing of misinformation" (Dominic et al., 2025).

Modern education approaches such as Project-Based Learning (PJBL), which place students at the center of the learning process, have become one of the models that can bridge the theory of class and practice in the field (Putri et al., 2024). The project-based learning paradigm is based on collaborative learning theory, emphasizing student involvement and problem-solving participation (Muhammad Ilham S. & Amri Amal, 2023). Interactive learning with the PjBL learning model effectively fosters environmental awareness more deeply and continuously (Purwati et al., 2023). A study states that students are involved as active contributors in learning and assessment (De Vita et al., 2025) students are not only the object of recipient of information, but also active subjects involved in the process of exploration, analysis, and delivery of solutions to environmental issues to the community through various creative and innovative ways. Implementing the PjBL learning model can increase student creativity in specific subjects (Wicaksana & Sanjaya, 2021).

Campaign messages positively influence environmentally friendly attitudes (Salsabila & Nugrahani, 2024). Graphic poster design plays an important role in communicating the message of environmental sustainability, affecting public perception, and forming environmentally friendly behavior (Bassey, 2025). Previous research states that campaign messages influence environmental awareness. Project-based learning builds student emotional and cognitive involvement in environmental issues through direct interaction with nature and project-based tasks (Abner, 2025). "Integrating Steam-PJBL With Design Thinking Can Positively Impact Students' Environmental Literacy and Their Engagement in Chemistry" (Y. Rahmawati et al., 2025). Both studies explain that project-based learning affects environmental awareness. However, some existing studies still separate the analysis between the campaign message and PjBL against environmental awareness.

On the other hand, PjBL can potentially be a mediator in strengthening the impact of the campaign message on increasing environmental awareness among students. The results of studies conducted by (Zhang & Wang, 2025) show how the message campaign message (ideological and social) can be integrated into project -based learning in english classes to increase awareness and learning outcomes. The novelty in this study is the integration between variable campaign messages, project-based learning, and environmental awareness because not many studies have integrated these three variables in a comprehensive conceptual framework.

This study aims to analyze the role of project-based learning as a mediation variable between campaign message and environmental awareness among students. This research is expected to theoretically contribute to developing environmental learning models and practical contributions to designing more effective environmental campaigns in higher education institutions. Through this understanding, it is hoped that the academic generation will not only be aware of the importance of the environment but also be able to initiate concrete changes through concrete action-based projects.

METHODS

The method in this study is quantitative research. The quantitative approach measures and analyzes the relationship between the variable campaign messages, environmental awareness, and project-based learning as a mediation variable. This method allows researchers to obtain numerical data that can be analyzed statistically to identify significant patterns or relationships.

The population of this study was 113 students. Using the Krejcie & Morgan table, a sample of 103 respondents taking Conservation Education courses was obtained. The research data was obtained through a Google Form-assisted questionnaire during April 2025. The questionnaire was adapted from the instrument that had been tested for validity and reliability. The data collected will be analyzed using statistical analysis techniques by the research objectives.

The data obtained were analyzed using the SEM-PLS technique through SmartPLS software version 3.2.9 to test the relationship of independent variables with the dependent variable (environmental awareness) and the presence of mediation variables (project-based learning). Using this technique, we can find out the direct influence of the campaign message on environmental awareness. In addition, we can find out the role of project-based learning in the mediation of the campaign message and environmental awareness among students of Universitas Negeri Semarang.

The analysis of the coefficient of determination (R-Squared) is used to determine the magnitude of the effect of the independent variable on the dependent variable. F2 Effect Size (F-Square) is a measure used to assess the relative impact of a variable on the affected variables. Direct effect analysis helps test the hypothesis of the direct effect of a variable on the affected variables. Indirect Effect analysis is helpful for testing the indirect effects of an indirect effect of a variable that affects the affected variables that are mediated by an intervening variable. Article text article text article text article text article text here article text here article text here article text here. Article text article text article text article text article text here.

RESULTS AND DISCUSSION

RESPONDENT DATA
Based on gender, the respondent data is as follows:

Table 1. Respondent Gender Data

No.	Gender	f	Percentage (%)
1.	Male	71	68,9 %
2.	Female	32	31,1 %
	Total	**103**	**100 %**

Table 1 shows that there were 71 male respondents, or 68,9%, while there were 32 female respondents, or 31,1%. Thus, the total sample in this study was 103 students who had taken conservation education at UNNES.

VALIDITY TEST
The validity test carried out in this research used the Loading Factor, Average Variance Extracted (AVE), and Cross Loading. After carrying out calculations using SmartPLS 3.2.9, the following results were obtained:
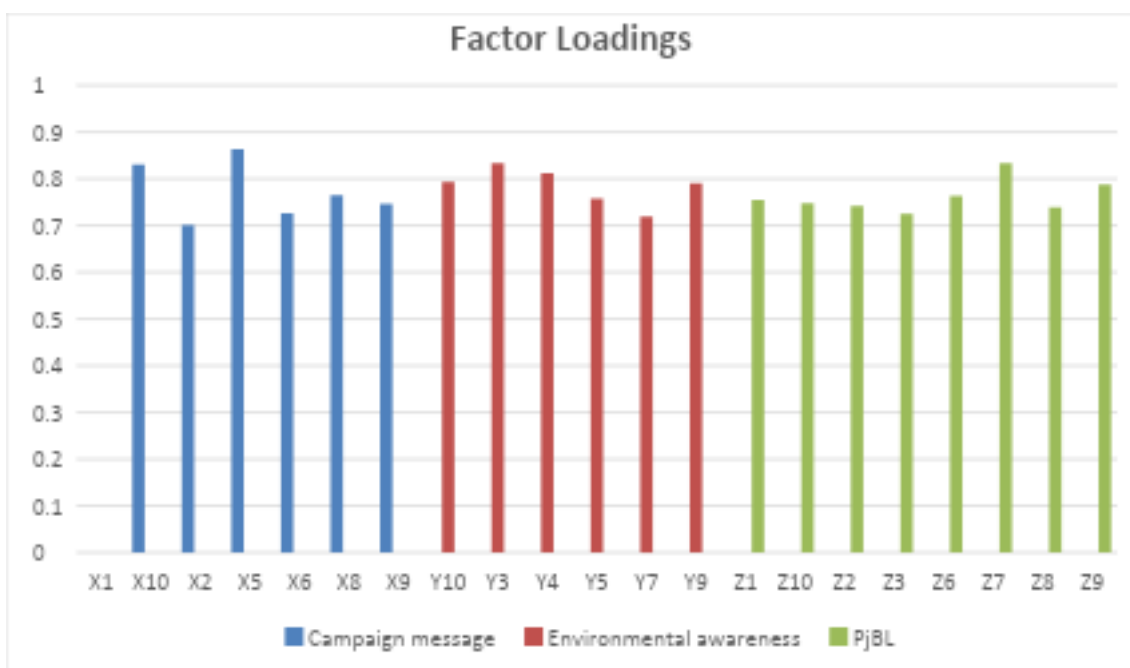
Figure 1. Factor Loadings for All Items

First, the validity criteria with the loading factor results above, it can be seen that all questionnaire items have a value of more than 0.7, which means all the indicators are valid. The next stage is the validity test using the Average Variance Extracted (AVE) value. After carrying out the calculations, the following results were obtained:

Table 2. Average Variance Extracted (AVE)

Variable	Average Variance Extracted (AVE)
Campaign message	0.600
Environmental awareness	0.616
PjBL	0.581

Based on the results shown in the table above, all variables have an AVE value above 0.5, meaning that digital business education, entrepreneurial intention, and self-efficacy are valid. Thus, all variables can be used to test hypotheses using inferential statistics.

Hypothesis testing uses inferential statistics, including Discriminant Validity and Cross-Loading. A measurement model has good discriminant validity if the correlation between a construct and its indicators is more significant than that of other constructs. The following results were obtained after the data was processed as follows:
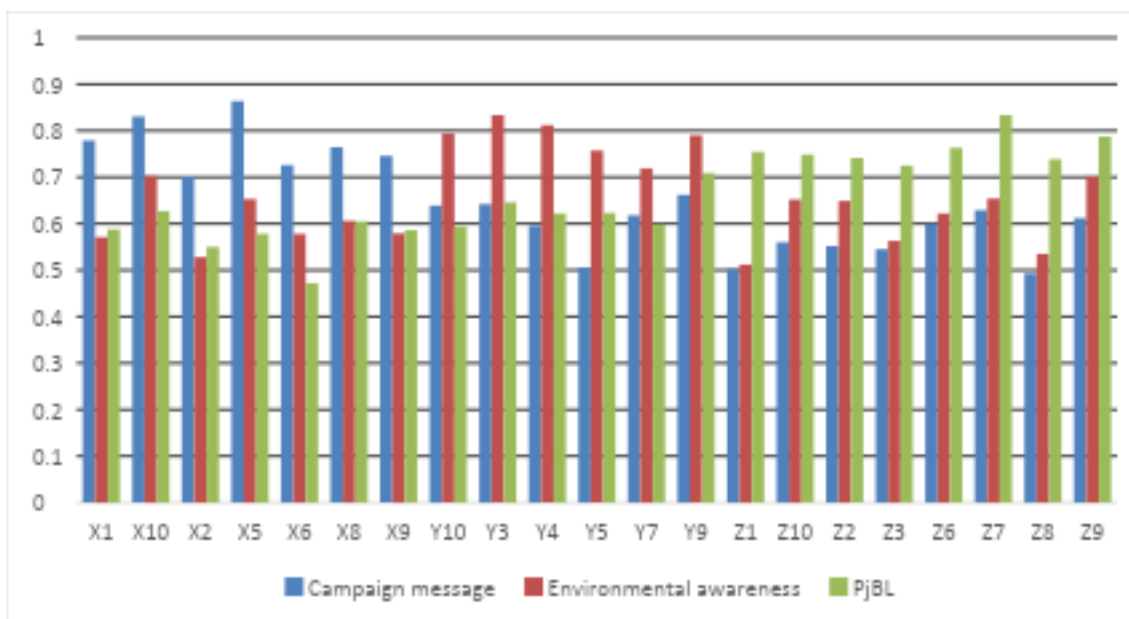
Figure 2. Cross-loadings

The cross-loading results in Figure 2 above show that the correlation coefficient between the construct and its indicators is greater than the correlation coefficient between the construct and other constructs. Thus, all constructs or latent variables already have high discriminant validity.

RELIABILITY TEST

In this research, reliability testing was carried out using composite reliability and cronbach's alpha. The following are the results of the composite reliability and cronbach's alpha calculations:

Table 3. Composite Reliability and Cronbach's Alpha

Variabel	Cronbach's Alpha	rho_A	Composite Reliability
Campaign message	0.888	0.892	0.913
Environmental awareness	0.875	0.877	0.906
PjBL	0.897	0.900	0.917

The composite reliability results shown in the table above show that all composite reliability values for each construct are above 0.7, which means all constructs are reliable. It can be seen that Cronbach's alpha value for all constructs is more significant than 0.7, which means all constructs are reliable.

STRUCTURAL MODEL

R-SQUARE

The coefficient of determination is used to determine the magnitude of the effect of the independent variable on the dependent variable. The coefficient of determination can be shown in the following table.

Table 4. Coefficient of Determination (R-Square)

	R Square	R Square Adjusted
Environmental awareness	0.726	0.721
PjBL	0.549	0.544

Based on the table above, it can be seen that the value of R Square for environmental awareness is 0.726. This means that the ability to influence the campaign message as an independent variable through project-based learning in explaining the environmental awareness amounts to 72.6% (strong). The R Square for project-based learning value is 0.549. This means that the ability to influence the campaign message as the independent variable in explaining the project-based learning variable as an intervening variable of 54.9% (medium). Conversely, other factors outside the study show other values.

F-SQUARE

F^2 effect size (F-Square) is a measure used to assess the relative impact of a variable on the affected variables. F-Square values can be shown in the following table.

Table 5. F-Square

	Campaign message	Environmental awareness	PjBL
Campaign message		0.270	1.216
Environmental awareness			
PjBL		0.424	

Based on the table above, it can be concluded as follows:
1. The effect of campaign message (X) on project-based learning (Z) of 1,216 is a large category.
2. The effect of campaign message (X) on environmental awareness (Y) of 0.270 is included in the medium category.
3. The effect of project-based learning (Z) on environmental awareness (Y) of 0.424 is included in the large category.
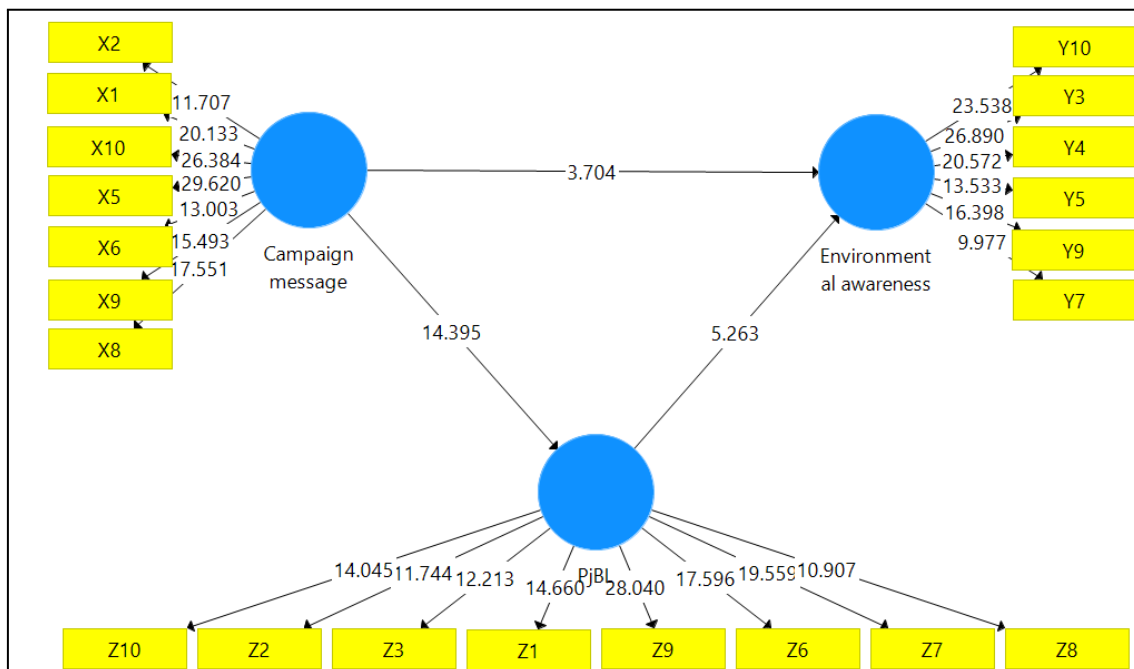
STRUCTURAL MODEL TEST

Figure 3. Structural Model Test

DIRECT EFFECT

Direct effect analysis is helpful for testing the hypothesis of the direct effect of a variable on the affected variables.

Table 6. Mean, STDEV, T-Statistics, and P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Campaign message -> Environmental awareness	0.405	0.382	0.109	3.704	0.000
Campaign message -> PjBL	0.741	0.741	0.051	14.395	0.000
PjBL -> Environmental awareness	0.508	0.527	0.096	5.263	0.000

Based on the table above, the following is a discussion of the hypothesis tested:

1. The first hypothesis, the effect of campaign messages (X) on environmental awareness (Y) is 0.405 (positive) that is, if the campaign message (X) increases, the environmental awareness (Y) also increases in the same direction with the p-value value of 0,000 <0.05 (significant). There is a significant direct effect between the message campaign and environmental awareness.
2. The second hypothesis, the effect of campaign message (X) on project-based learning (Z) is 0.741 (positive) that is, if the campaign message (X) increases, the project-based learning (Z) also increases in the same direction with the p-value value of 0,000 <0.05 (significant). There is a significant direct effect of the campaign message on project-based learning.
3. The third hypothesis, the effect of project-based learning (Z) on environmental awareness (Y) is 0.508 (positive) ie if the effect of project-based learning (Z) increases, the environmental awareness (Y) also increases in the direction there is a significant direct effect between project-based learning on environmental awareness.

INDIRECT EFFECT

Indirect Effect analysis helps test the indirect effects of a variable that affects the affected variables that are mediated by an intervening variable.

Table 7. Mean, STDEV, T-Statistics, and P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Campaign message -> PjBL -> Environmental awareness	0.376	0.389	0.071	5.308	0.000

The fourth hypothesis, the effect of campaign messages on environmental awareness through project-based learning, is 0.376 (positive), with a p-value of 0.000 <0.05 (significant), meaning that the project-based learning variable has a role in mediating the effect of campaign messages on environmental awareness.

Based on the results of the analysis, to find out the role of project-based learning in mediation for campaign messages and environmental awareness among students of Universitas Negeri Semarang who are attending conservation education lectures, as follows:

First, project-based learning has a significant direct effect on environmental awareness. The hypothesis test results obtained a path coefficient 0.508 (p-value 0.002). This means that the more project-based student learning, the more the environmental awareness will increase. Conversely, if students apply less project-based learning, the environmental awareness will be lower. This is in line with the opinion (Purwati et al., 2023), which states that interactive learning with the PJBL learning model effectively fosters environmental awareness more deeply and continuously. Other studies have shown that "Integrating Steam-PJBL With Design Thinking Can Positively Impact Students' Environmental Literacy and Their Engagement in Chemistry" (Y. Rahmawati et al., 2025)

Second, there is an indirect effect of the campaign message on environmental awareness with the project-based learning model as a mediation variable. The hypothesis test results obtained a path coefficient of 0.376 (P-value 0,000), meaning that the variable of the project-based learning model has a role in mediating the effect of a campaign message on environmental awareness. This is in line with research (Zhang & Wang, 2025) shows how the message campaign message (ideological and social) can be integrated into project-based learning in english class to increase awareness and learning outcomes. Other studies explain "the implementation of PBL in the educational context allowed students to address real-world challenges with a practice and creative mindset" (Baek, 2025).

This study concluded that the project-based learning model directly and indirectly influences the increase in the student's environmental awareness. Significantly, the project-based learning model mediated the relationship between campaign message and environmental awareness among Unnes students. The project-based learning model plays an important role in promoting environmental awareness; therefore, educators need to include project-based learning in a more varied semester learning plan, according to the latest issues, so that it can ignite and impact increasing environmental awareness among Unnes students.

CONCLUSION

Based on the results and discussion above, it can be concluded that the project-based learning model has a direct and indirect influence on increasing the students' environmental awareness. This is demonstrated by (1) a significant direct relationship between the project-based learning and environmental awareness model among students of 0.508 (P-value 0,000). (2) The project-based learning model significantly mediates between the campaign message and environmental awareness of 0.376 (P-value 0,000). The project-based learning model is important in increasing the students' environmental awareness. Suggestions: This study suggests that educators need to include project-based learning in a more varied semester learning plan, according to the latest issues, so that it can ignite and impact increasing environmental awareness among UNNES students.

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