Sustainable Practices as Predicted by Environmental Awareness and Attitudes among College Students

Edu A. Lavega

edu.lavega@hcdc.edu.ph

Graduate School, Master of Arts in Education major in Teaching Social Studies,
Holy Cross of Davao College, Davao City 8000, Philippines

Abstract

Unsustainable environmental practices persist. This study verifies the relationships among sustainable practices, environmental awareness, and students' attitudes. Predictive design, stratified random sampling, survey technique, and regression analysis were utilized. Data from 300 college students showed that environmental awareness and attitudes significantly predicted sustainable practices, explaining 81.2% of the variance, with environmental attitudes emerging as the stronger predictor. This result supports qualitative perspectives to account for the remaining 18.8% of the variance and identify additional factors influencing sustainable practices.

Keywords: Sustainable practices, environmental awareness, environmental attitudes, college students

1. Introduction

1.1. The Problem and Its Scope

Low and inconsistent sustainable practices among students remained a major concern in environmental and Social Studies education worldwide. Despite the growing emphasis on environmental awareness and positive attitudes in educational programs, student adoption of sustainable practices remains inconsistent across different contexts. Portus et al. (2024) noted that worldwide awareness of environmental issues has risen markedly, but environmental action is still advancing at a sluggish pace. Likewise, Af'aliyah et al. (2024) discovered that a significant number of Social Studies students in Indonesia continued to show indifference towards environmental cleanliness even after receiving environmental education.

In various countries, students exhibited different sustainable behaviors despite rising awareness and attitudes towards the environment. Environmental education enhanced students' attitudes and awareness in Greece; however, these improvements did not always translate into sustainable behavior (Karvounidi et al., 2024). The results of Prasetya et al. (2025) also showed that although Indonesian students strongly endorse values such as "Respect for the Earth" and "Care for Life," only a few students consistently engage in sustainable behavior. As explained by Srivastava et al. (2023), Asian students are highly practical but do not know what sustainability means. On the other hand, according to Boonchutima et al. (2025), many Bhutanese students exhibit sustainable behaviors, but there is a high level of ignorance regarding environmental issues.

In the Philippines, low levels of sustainable practices among students and youth groups have remained a significant concern. A study by Punzalan (2020) found that students in Cavite, Philippines, have high environmental knowledge; however, they lack sustainable habits. According to Reutotar (2023), despite

knowledge of the rules and environmental issues, a considerable number of youth in Zambales still practice unsustainable environmental practices. The results indicated an apparent gap in these three components in the Philippines: ecological perspectives, sustainable practices, and environmental awareness.

The persistence of low and inconsistent sustainable practices among students contributed to worsening environmental concerns, including pollution, improper waste management, increased waste generation, and the depletion of natural resources. These conditions may negatively affect environmental sustainability, community welfare, and public health. Despite these concerns, few studies have examined how environmental awareness and attitudes predict sustainable practices among college students in the context of Social Studies education in New Bataan, Davao de Oro. Furthermore, few studies explored these variables through the lens of Dobson's Environmental Citizenship Theory. Thus, this study was undertaken.

1.2. Significance of the Study

This study examines how environmental awareness and environmental attitudes predict sustainable practices among college students. First, the findings benefited curriculum developers and the Commission on Higher Education (CHED) by providing empirical evidence to guide improvements in Social Studies to better align with SDG 4 - Quality Education, SDG 12 - Responsible Consumption and Production, and SDG 13 - Climate Action. Second, the findings will assist school administrators and faculty in designing more effective sustainability programs and interventions by emphasizing the development of positive environmental attitudes, emotions, and ethical commitment. Third, this study will offer Social Studies teachers practical insight into improving their students' methods and classroom activities, thereby enhancing students' environmental attitudes and instilling true eco-sense among college students.

1.3. Statement of the Problem

This study determined the significance of forecasting sustainable practices using environmental awareness and attitudes as predictors. Specifically, this study aims to provide empirical evidence based on the following research objectives:

1. To determine the levels of environmental awareness in terms of affective, cognitive, conative, and active; environmental attitudes in terms of environmental behavior, emotion, and opinion; and sustainable practices in terms of sustainability knowingness, attitudes, and behaviors;
2. To determine the significance of the correlation between environmental awareness and environmental attitudes and the sustainable practices; and
3. To determine the significance of the predictive model for sustainable practice with environmental awareness and attitudes as predictors.

1.4. Hypotheses

The null hypotheses were tested at the 0.05 level of significance.

H01: The relationship between environmental awareness and environmental attitudes with sustainable practices is not significant.
H02: The model to predict sustainable practices, using environmental awareness and environmental attitudes as predictors, is not significant.

1.5. Theoretical and Conceptual Framework

This study is anchored in Environmental Citizenship Theory, proposed by Andrew Dobson (2003, 2007), which posits that environmental sustainability requires not only behavioral change but also the development of values rooted in justice, responsibility, and ecological citizenship. The theory emphasizes that individuals become environmentally responsible citizens when they develop awareness, ethical attitudes, and commitment toward sustainable actions that benefit both society and the environment.

While environmental attitudes were evaluated in terms of action, emotion, and opinion (Sarkar et al., 2011), environmental awareness was examined along emotional, cognitive, conative, and active dimensions (Rodríguez & Ecos, 2023). These components constitute the fundamental elements of environmental citizenship. Sustainability knowledge, attitudes, and behaviors—which indicate the conversion of environmental information and values into sustainable actions—were used to measure the dependent variable, sustainable practices (Bacci et al., 2024). Therefore, in order to explain how awareness and attitudes may influence ecologically responsible conduct among college students, the study was grounded in environmental citizenship theory.

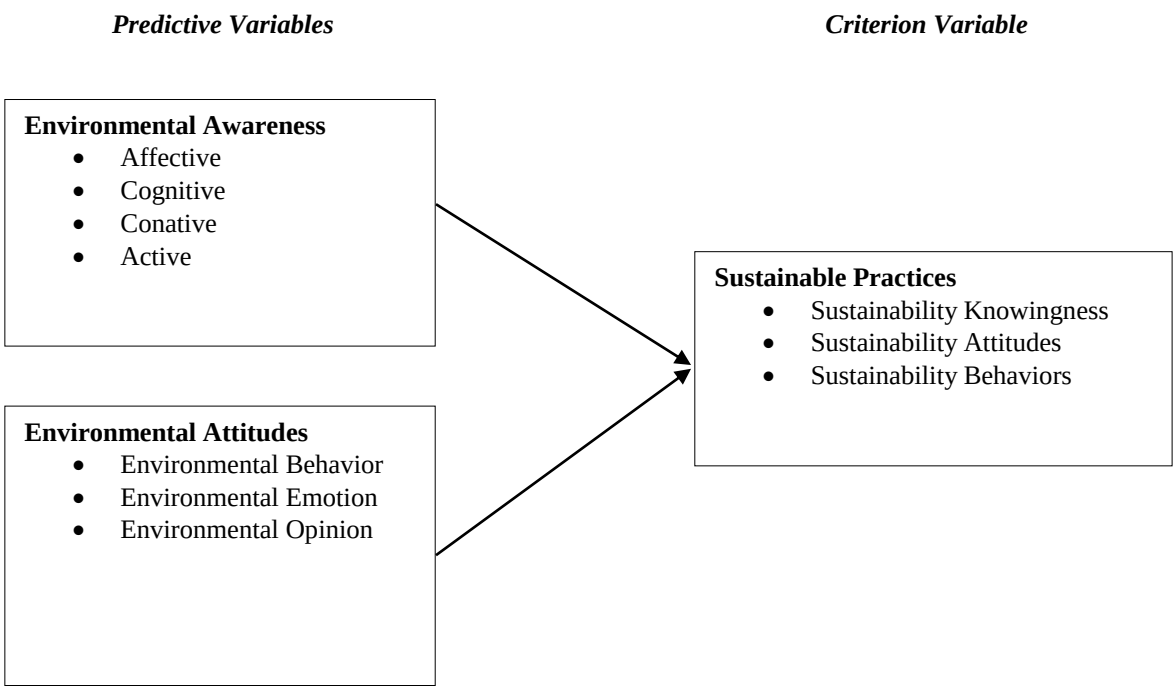

Fig. 1. Conceptual Framework

2. Methodology

This chapter outlined the methods employed in the study, including the research design, locale, sample, sampling technique, data gathering technique, data analysis technique, and ethical considerations.

2.1. Research Design

In this study, a predictive research design was utilized. Predictive design is applied to analyze the extent to which specific predictor variables can predict or affect an outcome variable without altering the predictor variables. Predictive design is widely used in educational studies and the social sciences, as it helps researchers find predictors, identify patterns, and make data-driven decisions using sophisticated analytical tools (Gonzalez-Nucamendi et al., 2023; Van Witteloostuijn et al., 2022). This design was appropriate for the current study, as it sought to investigate the prediction of sustainable practices from environmental awareness and attitudes among college students.

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2.3. Locale of the Study

This study was conducted at a higher education institution in New Bataan, Davao de Oro, Philippines, which offers diverse academic programs, including sustainability-related courses such as Contemporary World. The locale was selected due to the growing importance of sustainability education and the limited local studies examining how environmental awareness and environmental attitudes predict sustainable practices among college students.

2.4. Sample and Sampling Technique

The study's respondents were 300 college students enrolled in the first semester of the 2025–2026 academic year. Based on the official enrollment of 1,014 students, the minimum required sample size was 278 respondents, determined using the Krejcie and Morgan (1970) sample size table, as cited in Johnson and Christensen (2024), at a 95% confidence level and 5% margin of error. To improve representativeness and account for possible incomplete responses, the final sample size was increased to 300 respondents.

This study employed stratified random sampling, in which respondents were selected proportionally by academic program and year level to ensure adequate representation of the population (Sharma et al., 2017). This sampling technique was appropriate because it allowed the researcher to obtain balanced participation from different subgroups within the institution.

2.5. Data Gathering Technique

This study used a survey to collect quantitative data from randomly selected college students enrolled at a higher education institution in New Bataan, Davao de Oro. Survey research is commonly used to collect standardized data from large groups of respondents efficiently and is advantageous for its practicality, wide reach, and suitability for statistical analysis. Before actual data collection, the instrument underwent expert validation and pilot testing to ensure clarity and reliability.

In this study, three adapted and modified questionnaires were used to measure environmental awareness, environmental attitudes, and sustainable practices. The questionnaires underwent content validation by experts in environmental education and Social Studies to ensure contextual suitability and clarity. A pilot test was conducted with 30 respondents, representing 10% of the total sample and not included in the main study. Reliability analysis using Cronbach's alpha showed excellent to good internal consistency: Environmental Awareness (34 items, $\alpha = 0.961$), Environmental Attitude (29 items, $\alpha = 0.965$), and Sustainability Practices (27 items, $\alpha = 0.961$). Formal approval and permission were obtained from the relevant offices before conducting the study.

2.6. Data Analysis Technique

Three statistical techniques were used in analyzing the data. First, descriptive statistics, specifically mean and standard deviation, were used to determine the levels of environmental awareness, environmental attitudes, and sustainable practices. Descriptive statistics summarize and describe the features of a dataset. The mean represents the average value, while the standard deviation measures the dispersion of data around the mean, helping researchers understand data patterns and variability (Blbas, 2024).

Second, Pearson Product-Moment Correlation analysis was used to determine the significant relationships between the predictive and criterion variables. Pearson product-moment correlation, commonly known as Pearson's correlation, is a statistical measure used to assess the strength and direction of the linear relationship between two continuous variables (Karch et al., 2024).

Third, multiple linear regression analysis, using standardized and unstandardized beta coefficients, was employed to determine the predictive influence and contribution of the independent variables on sustainable practices. Multiple linear regression is a statistical method used to examine the relationship between one dependent variable and multiple independent variables, allowing researchers to determine the combined effects of predictors on an outcome variable (Ruan, 2024).

Presented below is the matrix (summary table) listing the statistical tools for each problem statement in this study. The matrix also includes the purpose of using these statistical tools.

Statement of the Problem	**Statistical Tool**	**Purpose/Use**
Levels of the predictor and criterion variables	Descriptive Statistics (Mean, SD)	Describe the levels of environmental awareness, attitudes, and sustainable practices among college students.
Significance of the relationship between the predictor variables	Pearson Product-Moment Correlation	Determine the significance, strength, and direction of

and the criterion variable		relationships among the three variables.
Significance of the predictive model for sustainable practices	Multiple Linear Regression	Assess the extent to which environmental awareness and attitudes jointly predict sustainable practices among college students

In terms of Scale of Beta (β) Coefficient Strength, the following scheme, as proposed by Cohen (1988) and Hair et al. (2019), was used:

β Value Range	**Strength of Model**
±0.00 – ±0.09	Very Weak
±0.10 – ±0.29	Weak
±0.30 – ±0.49	Moderate
±0.50 – ±0.69	Strong
±0.70 and above	Very Strong

Furthermore, the matrix containing the scale, descriptive level, and corresponding interpretation for each variable in this study is presented. This measure is used to describe the levels of environmental awareness, environmental attitudes, and sustainable practices.

Scale	**Level**	**Environmental Awareness**	**Environmental Attitudes**
1.00 – 1.75	very low	Very low awareness	Very poor attitude
1.76 – 2.50	Low	Low awareness	Poor attitude
2.51 – 3.25	High	High awareness	High positive attitude
3.26 – 4.00	very high	Very high awareness	Very high positive attitude
Scale	**Level**	**Sustainable Practices**	
1.00 – 1.75	very low	Very weakly practiced	
1.76 – 2.50	Low	Weakly practiced	
2.51 – 3.25	High	Strongly practiced	
3.26 – 4.00	very high	Very strongly practiced	

The standard deviation value interpretation is as follows:

Range	**Description**	**Interpretation**
SD ⩽ 0.50	High Consistent Responses	Strong and uniform perception
SD ⩽ 0.51 – 1.00	Moderate Consistent Responses	Acceptable consistency
SD = 1.01 – 1.50	Low Consistent Responses	Differing views or experiences
SD > 1.50	Very Low Consistent Responses	High variability and lack of consensus

For the interpretation of the scale of the r-value, the following scheme is used:

r-value (Size of Correlation)	**Interpretation**
0.00 – 0.29	Negligible or little correlation
0.3 – 0.49	Low correlation

0.5 – 0.69	Moderate or marked correlation
0.7 – 0.89	High correlation
0.9 – 1.00	Very high correlation

Pearson's r-values were interpreted using the commonly accepted Guilford Rule of Thumb (1956).

2.7. Ethical Considerations

Ethical considerations were strictly observed throughout the study. Respondents were informed of the study's purpose, procedures, and their rights, including the right to participate voluntarily and to withdraw at any time. Informed consent was obtained prior to data collection. Participants' confidentiality and anonymity were ensured, and all data were securely stored. Ethical clearance was granted by SMILE (Society for Moral Integrity and Legal Ethics), confirming that no risks to participants were identified, and permission to conduct the study was secured from the institution. The researcher also adhered to the Graduate School's ethical guidelines and ensured appropriate safeguards for youth participants, consistent with ethical standards in youth research (Attrash-Najjar, 2025).

3. Results

Included in this chapter are the descriptive, correlation, and regression tabular presentations together with their corresponding analyses and interpretations. This chapter ends with a summary of findings.

3.1. Descriptive Results

Presented in Table 1 are the descriptive statistical results of the study, including the variables involved, namely environmental awareness, environmental attitudes, and sustainable practices, together with their respective indicators. The table also shows the number of samples, standard deviations, mean scores, and corresponding descriptive levels for each variable.

Table 1. Descriptive Statistics (n = 300)

Variables	Number of Samples (n)	SD	Mean	Interpretation
Environmental Awareness	**300**	**0.55**	**3.47**	**Very High**
Affective	300	0.57	3.50	Very High
Cognitive	300	0.57	3.47	Very High
Conative	300	0.61	3.49	Very High
Active	300	0.58	3.42	Very High
Environmental Attitudes	**300**	**0.55**	**3.44**	**Very High**
Environmental Behavior	300	0.59	3.43	Very High
Environmental Opinion	300	0.58	3.49	Very High
Environmental Emotion	300	0.60	3.41	Very High
Sustainable Practices	**300**	**0.55**	**3.46**	**Very High**
Sustainability Knowingness	300	0.57	3.47	Very High

Sustainability Attitudes	300	0.57	3.47	Very High
Sustainability Behaviors	300	0.57	3.43	Very High

Specifically, the table shows that the environmental awareness variable had a mean score of 3.47, indicating very high awareness, as described. All indicators under environmental awareness are also described as very high. The corresponding standard deviation of 0.55 indicates moderately consistent responses, suggesting an acceptable level of consistency among respondents.

Furthermore, the table shows that the environmental attitudes variable had a mean score of 3.44, indicating very high positive attitudes, which is described as very high. All indicators under environmental attitudes were also described as very high. The corresponding standard deviation of 0.55 indicates moderately consistent responses, suggesting an acceptable level of consistency among respondents.

Finally, the table shows that the sustainable practices variable had a mean score of 3.46, indicating that respondents very strongly practiced sustainable practices. All indicators under sustainable practices are also described as very high. The corresponding standard deviation of 0.55 indicates moderately consistent responses, suggesting an acceptable level of consistency among respondents.

The results indicate that all variables are interpreted at a very high level, showing that the respondents demonstrated strong environmental awareness, highly positive environmental attitudes, and very strong sustainable practices. Among the variables, environmental awareness had the highest interpretation, followed closely by sustainable practices, while environmental attitudes had the lowest interpretation. Despite these slight differences, the findings suggest that the respondents consistently demonstrated a high level of understanding, a positive disposition, and active engagement with environmental sustainability.

3.2. Correlation Results

Table 2 presents the results of the correlation analysis between environmental awareness and environmental attitudes (predictor variables) and sustainable practices (criterion variable). The table shows the corresponding R-values, p-values, decisions on the null hypotheses, and interpretations of the relationships.

Table 2. Correlation Analysis Results

Variables	**Sustainable Practices**			
	r-value	**p-value**	**Decision on H0**	**Interpretation**
Environmental Awareness	0.840	0.000	Reject H_0	Positive, Strong, and Significant Relationship
Environmental Attitudes	0.900	0.000	Reject H_0	Positive, Very Strong, and Significant Relationship

Level of Significance 0.05

Decision Rule: Reject H0 if $p < 0.05$

The table specifically shows that the correlation between environmental awareness and sustainable practices variables obtained a p-value of 0.000, which is less than the 0.05 level of significance. Hence, the null hypothesis is rejected. It indicates that the correlation between the two variables is statistically significant. The corresponding r-value of 0.840 indicates a positive, strong, and significant relationship. As environmental awareness increases, sustainable practices increase as well.

Likewise, the table shows the correlation between environmental attitudes and sustainable practices variables obtained a p-value of 0.000, which is less than the 0.05 level of significance. Thus, the null hypothesis was rejected. It indicates that the correlation between environmental attitudes and sustainable practices is statistically significant. The corresponding r-value of 0.00 indicates a positive, very strong, and significant relationship between the two variables. This implies that as environmental attitudes increase, sustainable practices tend to increase as well.

Both relationships were found to be significantly related to sustainable practices, indicating that increases in environmental awareness and attitude variables are associated with corresponding increases in the dependent variable. When compared, environmental attitudes demonstrated a stronger association, although both showed strong correlations.

3.3. Regression Results

Table 3 presents the results of the regression analysis examining environmental awareness and environmental attitudes as predictor variables and sustainable practices as the criterion variable. The table presents the unstandardized estimates, standardized estimates, standard errors, t-values, p-values, decisions on the null hypotheses, and interpretations.

Table 3. Regression Analysis Results

Independent Variables	**Sustainable Practices**						
	Estimate	Standard Estimate	SE	t	p	Decision on H0	Interpretation
Intercept	0.363		0.089	4.08	0.000		
Environmental Awareness	0.401	0.304	0.061	3.70	0.019	Reject H_0	Influence is Significant
Environmental Attitudes	0.794	0.805	0.061	13.02	0 .000	Reject H_0	Influence is Significant

R= 0.901, R2= 0.812, Adjusted R2=0.811, F=643.0, Sig. =0.000;

Level of Significance: 0.05;

Decision Rule: Reject H0 if $p < 0.05$

Predictive Model: SP = 0.401EA + 0.794EAts + 0.363

Table 3 specifically shows that the model predicting sustainable practices using environmental awareness and attitudes as predictors is SP = 0.401EA + 0.794EAts + 0.363. The R^2 value of 0.812 indicates that the model strongly predicts sustainable practices, with environmental awareness and environmental attitudes as predictor variables. Furthermore, the corresponding p-value of 0.000, which is less than the 0.05 level of significance, led to the rejection of the null hypothesis. This indicates that the model's predictive strength is significant.

Moreover, the environmental awareness variable had a standardized estimate of 0.304 (p-value = 0.019), indicating a significant influence on sustainable practices. The environmental attitudes variable, on the other hand, yielded a standardized estimate of 0.805 (p = 0.000), indicating a stronger significant influence on sustainable practices. Finally, this implies that for every unit change in environmental awareness and environmental attitudes, there is a corresponding change in the prediction of sustainable practices.

The findings indicate that environmental awareness and environmental attitudes variables significantly predict sustainable practices, with environmental attitudes emerging as the stronger predictor.

3.4. Summary of Findings

Based on statistical results, it was specifically found that:

1. Environmental awareness and attitudes are significantly correlated with sustainable practices.
2. The predictive model has strong explanatory power for forecasting sustainable practices.

4. Discussions

This chapter provided a comprehensive discussion of the findings from the previous chapter. Likewise, the findings are analyzed and contextualized in relation to existing literature and previous empirical studies.

4.1. Correlation of Environmental Awareness and Environmental Attitudes with Sustainable Practices

The present study revealed a strong positive and statistically significant relationship between environmental awareness and sustainable practices. This indicates that students with higher levels of environmental awareness tend to demonstrate more consistent sustainable behaviors. The current findings support the studies by Attia et al. (2025) and Ahlrahshe (2025), which reported significant positive associations between environmental awareness and sustainability-oriented actions. The current findings also support Escatron et al. (2023), who found a positive relationship between awareness and sustainable practices among students.

On the other hand, environmental attitudes showed a very strong, statistically significant positive relationship with sustainable practices. This suggests that students' environmental emotions, opinions, and behavioral dispositions are more strongly associated with actual sustainable practices than awareness alone. The current findings affirm Limo's (2023) emphasis that strengthened environmental perspectives significantly contribute to greater commitment to sustainable behavior among university students.

Consequently, both environmental awareness and environmental attitudes were significantly correlated with sustainable practices. However, environmental attitudes exhibited a stronger relationship than

environmental awareness. The current findings support Samoraga and Capistrano (2025), who noted that students' sustainability knowledge and positive attitudes jointly enhance their intention to engage in sustainable practices.

In contrast, the current finding differs from that of Ovais et al. (2023), who reported that environmental awareness does not always directly translate into sustainable behavior, as awareness alone may be insufficient to drive actual environmental practices without the influence of behavioral and contextual factors.

4.2. Sustainable Practices as Influenced and Predicted by Environmental Awareness and Environmental Attitudes

The present study revealed that environmental awareness and environmental attitudes significantly predict sustainable practices among college students, with the overall model showing strong predictive power. Environmental attitudes emerged as the stronger predictor, while environmental awareness exerted a moderate influence. The current findings support the study of Saro et al. (2025), who emphasized that positive environmental attitudes strongly influence ecological awareness and environmentally responsible behaviors. Similarly, the current findings align with those of Dönmez and Yardımcı (2024), who found a significant positive relationship between environmental awareness and sustainable behaviors, underscoring the important roles of both cognitive and attitudinal factors in promoting sustainability practices. Collectively, these studies affirm the predictive utility of environmental awareness and environmental attitudes in fostering sustainable practices among students.

In contrast, the current finding contradicts the argument of Mouchrek et al. (2023), reporting that although students demonstrated strong environmental values and awareness, these did not always translate into actual sustainable behaviors due to psychological and behavioral barriers. This contradiction suggests that contextual factors, institutional support, and student engagement influence how awareness and attitudes are translated into sustainable practices among college students.

4.3. Conclusion

Based on the findings, the perceived sustainable practices, using environmental awareness and attitudes as predictors, were significantly forecasted with a strength of 81.2%. These results affirm Environmental Citizenship Theory, stating that responsible environmental behaviors arise not only from knowledge and awareness but more strongly from value-driven ethical commitment and attitudes.

4.4. Recommendations

Based on the conclusions, it is recommended to pursue further quantitative research using additional variables not covered in this study to account for the remaining 18.8% of the variance in sustainable practices. It is also recommended that future researchers and CHED officials conduct qualitative research to explore different themes and sub-themes related to the unaccounted variables and their corresponding indicators, and to identify other potential contributing factors..

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