



The Determinant Factors of Students' Green Behavior: Lesson from Indonesia

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Abstract

This study aims to examine the determinants factors affecting students' green behavior, particularly in plastic waste problems. The subjects of this study were Jambi University students with a sample of 1001 respondents. Data collection instruments were compiled by the researcher and tested for validity and reliability. Data collection was carried out using online questionnaire in collaboration with the information technology and communication development institute of the University of Jambi. The collected data is analyzed quantitatively using regression analysis by employing SPSS (version 25). The findings of the study showed that student awareness in environmental issues is the main variable influencing student behavior, followed by students' understanding of environment variables and ecological-economic literacy variables. Meanwhile, the student lifestyle variable does not affect the behavior of students in the plastic waste problem.

Abstrak

Penelitian ini bertujuan untuk menguji faktor literasi ekonomi ekologi, pemahaman tentang lingkungan, gaya hidup, dan kesadaran mahasiswa terhadap perilaku hijau mahasiswa terutama tentang permasalahan sampah. Subjek penelitian ini adalah mahasiswa Universitas Jambi dengan sampel berjumlah 1001 responden. Instrumen pengumpul data disusun oleh peneliti dan dilakukan pengujian validitas dan reliabilitasnya. Pengumpulan data dilakukan secara daring dan bekerjasama dengan Lembaga Pengembangan Teknologi Informasi dan Komunikasi Universitas Jambi. Data yang terkumpul dianalisis secara kuantitatif dengan analisis regresi menggunakan program SPSS. Hasil penelitian menunjukkan bahwa kesadaran mahasiswa dalam masalah lingkungan menjadi variabel utama yang mempengaruhi perilaku mahasiswa, diikuti pemahaman mahasiswa terhadap lingkungan, dan variabel literasi ekonomi ekologi. Sedangkan variabel gaya hidup mahasiswa tidak berpengaruh terhadap perilaku mahasiswa dalam masalah sampah plastik.

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INTRODUCTION

Dealing with environmental issues, particularly on plastic waste, has been a global challenge. In the context of Indonesia, the government and community have started to overcome this problem by providing campaigns and policies to reduce the plastic waste (Wulandari & Narmaditya, 2017; Khoiruman & Haryanto, 2017). The fundamental rationale is that plastic waste is a material that takes a long time to decompose, so it will continue to exist and accumulate over a long period. The United Nations Environment Program (UNEP) remarked that more than 400 million tons of plastic were approved in 2019. From these, approximately 36 percent is transported to disposable packaging bags that often encounter every day. Additionally, carelessly disposed of plastic waste can obstruct drainage channels, which cause flooding, disrupt groundwater absorption, and disturb the beauty.

In addition to the government and community action, the study on plastic waste has gained attention among scholars (Willis et al., 2018; Chaerul et al., 2017). In general, scholars have focused on the handling of plastic waste to be converted into energy, especially liquid fuels. In fact, environmental problems cannot be overcome by improving the relationship between humans and the environment, but also by making improvements to the values, norms, and ethics of life that are included in the concept of eco-literacy (Desfandi et al., 2017). For this reason, this study captures from a different perspective, which is from the educational context, ecological economic literacy, behavior, and individual awareness on the environmental issue.

An understanding of the basic knowledge of ecological economics is essential for an individual. Since the effort to maximize the existing resources, sometimes people ignore other impacts such as environmental (Drews et al., 2018). For example, a massive development of manufactures or housing complexes will sacrifice green space. Ecological economics captures a broad perspective than conventional economics and recognizes more things that affect human well-being, not only goods and services but also health, education, friends and family, and their contribution to the environment, both biological and physical systems (Kallis, 2020). For this reason, sustainable development is the key success for the harmony in this fourth industrial era.

Understanding of environmental problems can be acquired from formal and informal education. In acquaintance with environmental awareness, understanding is crucial that has a positive behavioral linkage to the potential damage to the ecological environment as a result of plastic waste. Santoso and Meyrasyawati (2015) stated that cultural understanding can be used to prevent negative behavior. This means that the more people understand the environmental problems will lead to better behavior. Understanding has three main components, namely, cognitive, affective, and psychomotor. Chow et al. (2017) mentioned that to reduce plastic waste, the popularity of plastic waste management among the people must be increased by changing knowledge, attitudes, and behavior towards the management of plastic waste.

The lifestyle changes have impacted individual behavior. In a normal condition, lifestyles change slowly in line with environmental changes (Suratno, Denmar & Arief, 2020), but globalization affects these changes rapidly (Zhang et al., 2009). A person's lifestyle will show the pattern of their life, which is reflected by his/her activity, interest, and opinions (Anggraini & Santhoso, 2017). At the same time, Yuniarti (2015) revealed that the lifestyle adopted by a person would influence the needs, desires, and behavior, in this case, their awareness of the problem of plastic waste. Indeed, Hariyono (2015) that lifestyle has a positive relationship with behavior.

Lifestyle can have a positive or negative effect on one's awareness of the environment. Positive influences, as shown through caring for others and the future together, while negative influences are depicted from the attitude of the ignorant and unresponsive to the social environment in which they live. Individual awareness of a sustainable environment supports an indispensable quality of life. Awareness is the awakening of the soul to the environment that will encourage the creation of the behavior of each individual. Awareness of a healthy, clean, and sustainable environment will encourage wise and responsible use of the environment for its sustainability. Indeed, Paramita and Yasa (2015) stated that environmental awareness influences behavior in preserving the environment.

Neoloka (2008) pointed out that environmental awareness as an effort that involves citizens in growing and fostering awareness to preserve the environment and live peacefully in a sustainable environment. The basis of environmental awareness will affect the visible behavior and attitudes of a person associated with it. Similarly, Riyadi and Hasanah (2015); Gea (2002) remarked that someone who has high self-awareness will be followed with responsibility, able to understand, and able to carry out positive behavior according to the values they hold. Conversely, those who have low self-awareness will be followed by low responsibility, understanding, and behavior. The basis of environmental awareness is environmental ethics that place humans as conquerors and regulators of nature (Neoloka, 2008). Albayrak et al. (2013) measured environmental awareness using three dimensions, namely: egoistic, altruistic, and bioperic awareness, which were also adopted in this study.

Since the escalating studies on plastic waste, however, scholars have focused on the handling of plastic waste to be converted into energy and another valued product. For instance, Sari (2017) converts plastic waste into fuel oil, while Wedayani (2018) turned plastic waste into the Kuta Bali beach area into fuel oil. Additionally, Wulandari et al. (2017); Septiani et al. (2019) have focused on the waste management system through the waste bank. However, little attention among scholars is concerned with the perspectives of social, economic, and education. Fraj and Martinez (2006) found that environmental patterns and self-fulfillment values were the factors that determined the ecological economic segment. Xu, Yao, and Sun (2019) concluded that the technological environment and social environment positively influence the three perceived interactivity dimensions, each including control of action, connectedness, and responsiveness.

The contribution of this study is twofold. First, it provides an insight into the literature by examining the study from the perspectives of ecological economic literacy, lifestyle, awareness, and green behavior. Second, the focus in Indonesia is arguably due to the fact that Indonesia presents the second-highest waste. Therefore, the findings of this study can be considered as an effort to reduce the environmental issue from educational sides.

METHOD

Research Design

This study applied a quantitative method to understand the relationship between variables comprehensively. The object of this study is Jambi University students' behavior about the problem of plastic waste consisting of about 1001 respondents from several faculties. The participants voluntarily filled out the online questionnaires. This study's subjects included economic ecology literacy, environmental understanding, lifestyle, and student awareness, and green behavior, particularly on plastic waste problems.

Instruments and Data Collection

There are four independent variables, namely: ecological-economic literacy (X1), environmental understanding (X2), lifestyle (X3), and Environmental Awareness (X4), while the dependent variable is students' green behavior particularly on the problem of plastic waste (Y). First, the students' green behavior reflects a response that minimizes harm to the environment, which showed by plastic waste problems. The ecological economic literacy variable is proxied by a students' understanding of resource scarcity as a means of satisfying needs, motivation to carry out activities to meet economic needs, and principles in resource management to meet the needs still pay attention to environmental sustainability issues. The ecological understanding variable covers students' cognition, attitude, and psychomotor in understanding environmental problems. Besides, lifestyle means students' daily behavior, which includes: what activities are carried out, interest or interest in the issue of plastic waste, and their opinions about plastic waste. The instrument model used is familiar with the AIO (activity, interest, opinion) psychographic, widely applied by other researchers.

Table 1. The coefficient reliability using Cronbach's Alpha

Variables	Cronbach's Alpha
Ecological-economic literacy (X ₁)	0.903
Environmental understanding (X ₂)	0.902
Life style (X ₃)	0.820
Environmental awareness (X ₄)	0.899
Green behavior (Y)	0.901

The content validity is based on theory, while the construct is carried out in discussions with colleagues who are experts in their fields. Meanwhile, the instrument reliability testing was carried out using Cronbach's Alpha minimum criteria of 0.6, according to Hair et al. (2017), meaning that if the instrument of a variable must have the lowest coefficient of 0.6 and the higher it will be trusted (see table 1). The results of the instrument reliability test analysis shown in table 1, showed that the lowest score is 0.820, and the highest is 0.903. Therefore, the instrument is reliable and can be used for further analysis. Furthermore, this study is analyzed using regression tests by employing SPSS version 25.

RESULTS AND DISCUSSION

The hypothesis testing

The following analysis aims to answer the five proposed hypotheses. First, the requirements test, which includes the normality of data using the Kolmogorov-Smirnov test. From the study, it can be seen that the K-S coefficient is 0.898 and Asymp. sig. (2-tailed) of $0.067 > 0.05$, then the data is normally distributed (see table 2).

Table 2. One Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		1001
Normal Parameters ^{a,b}	Mean	.0000006
	Std. Deviation	.05461182
	Most Extreme Differences	
	Absolute	.098
	Positive	.079
	Negative	-.081
Test Statistic		.898
Asymp. Sig. (2-tailed)		.067 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Furthermore, to produce a prediction that can be trusted, the data between independent variables should not correlate. The criteria used to decide whether the Durbin-Watson (DW) coefficient is 1.937, whether or not there is multicollinearity, does not use the guidelines $du < DW$ debts $< 4 - du$. Data about du is obtained from the DW table with a 5 percent with $n = 1000$. The limit of the existing n table is at most 200. Therefore, the n 200 boundary number used is equal to $du = 1.7127$ and $4 - du = 2.2873$. Based on these data, then: $1.7127 < 1.9370 < 2.2873$, thus data between variables is free, meaning that there is no autocorrelation, which presented in table 3.

Table 3. The Durbin-Watson Test

Model Summary^b											
Mo del	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson	
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.908 ^a	.825	.824	.911	.825	1170.349	4	996	.000	1.937	

a. Predictors: (Constant), awareness, lifestyle, ecological-economic literacy, environmental understanding

b. Dependent Variable: Y

The next step is to test the research hypothesis. To estimate the hypothesis testing, there is no partial analysis of each independent variable on the dependent variable. It is conducted together using a simple linear regression shown by the standard beta coefficient. The regression analysis results of the independent variables on the dependent variable are presented in table 4, table 5, and table 6.

Table 4. Summary Model Effects

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.908 ^a	.825	.824	.911

a. Predictors: (Constant), awareness, lifestyle, ecological-economic literacy, environmental understanding

b. Dependent Variable: Y

Based on the data in table 4, it is known that the independent variables: ecological-economic literacy, environmental knowledge, lifestyle, and environmental awareness have a significant effect on students' green behavior dependent variables as indicated by the R coefficient of 0.908 and the coefficient of R squared of 0.825. This means that the four independent variables simultaneously influence students' behavior in the waste problem by 82.50 percent. After further analysis with the ANOVA test, the coefficient of F is 1170.349, with a significance of 0.000, which means that the influence of the four independent variables on the dependent variable is significant. Thus, the fifth hypothesis is proven, that all independent variables together have a significant positive effect on student behavior in waste problems (see table 5)

Table 5. The Anova Test

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3889.097	4	972.274	1170.349	.000 ^b
	Residual	827.433	996	.831		
	Total	4716.529	1000			

a. Dependent Variable: Y

b. Predictors: (Constant), awareness, lifestyle, ecological-economic literacy, environmental understanding

The significant influence of the independent variable on the dependent variable individually each dependent variable on the independent variable is realized in the regression equation as follows (the detail is provided in table 6).

$$Y = 0.17 + 0.063 X_1 + 0.089 X_2 + 0.023 X_3 + 0.780 X_4 + e$$

Testing the effect of ecological-economic literacy on student behavior shows that the effect of variable ecological-economic literacy has a significant effect on the variable behavior of students in plastic waste problems with a coefficient of 0.063 X_1 meaning that if there is a change in the increase or decrease in X_1 by one unit, it will cause changes in the increase or decrease student behavior by 0.063 units. These effects after further testing with the t-test obtained a coefficient of t of 2.897 with a significance level of 0.004. Thus, the H_1 hypothesis is proven.

Table 6. Regression Coefficient

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	.017	.259		.066	.948
	Econology literacy	.029	.010	.063	2.897	.004
	Env. Understanding	.045	.012	.089	3.781	.000
	Lifestyle	.008	.005	.023	1.611	.108
	Awareness	.195	.006	.780	33.589	.000

a. Dependent Variable: Y

Testing students' understanding of the environment influences student behavior is indicated by a beta coefficient of 0.089 and a coefficient of 3.781 with a significance level of 0.000. This implies that the variable of student understanding has a positive and significant effect on student behavior in the problem of plastic waste. The coefficient is meaningful if there is a change in the variable of students' understanding of environmental problems, which is pleasing with one unit of plastic waste. The change will affect the variable of student behavior in environmental problems by 0.089 units. The influence of lifestyle variables on student behavior, is indicated by a beta coefficient of 0.023.

After further testing, with the t-test, a significance coefficient of 0.108 was obtained. This study assigns alpha at 5 percent. Thus, the t coefficient of 10.8 percent is higher than the alpha of 5 percent. The hypothesis must be rejected at 5 percent alpha behavior. The fourth hypothesis testing shows a significant influence on student awareness in the environment on student behavior. The analysis results obtained a beta coefficient of 0.78 X_4 and a coefficient of t of 33.589 with a significance level of 0.000. This shows that the X_4 variable has a significant positive effect on Y.

Discussion

This study explores the relationship between variables as determinants of students' green behavior, especially in the problem of plastic waste. Based on the analysis results obtained, influence of student awareness variables become the most important variable in determining students' green behavior. Furthermore, the variable understanding of the environment and ecological-economic literacy becomes the second and third-ranking variables. However, lifestyle variables are stated not to have a significant effect on the green behavior of students. The existence of self-awareness is a general description of awareness (Riyadi & Hasanah, 2015).

This study's results are in line with Paramita and Yasa (2015) that awareness of the environment and preserving the environment positively affect individual behavior. Indeed, Arttacharia (2012) remarked that there is a demand for a green economy where the community avoids products that endanger the health of themselves and others, requiring an environment that is clean and free of damage. In line with Neoloka (2008), the environmental awareness is an effort that involves citizens in fostering and fostering awareness to preserve the environment and live

peacefully in a sustainable environment. The basis of environmental awareness affects the visible behavior and attitudes of a person associated with it. Additionally, Riyadi and Hasanah (2015); Gea (2002) that someone who has high self-awareness will be followed by responsibility, ability to understand, and ability to carry out positive behavior according to the values they hold. Conversely, those who have low self-awareness will be accompanied by low responsibility, understanding, and behavior. Environmental awareness is based on environmental ethics that place humans as conquerors and regulators of nature (Neoloka, 2008; Albayrak et al. (2013).

The finding of this study showed that students' understanding of plastic waste's clean life had an impact on students' green behavior. This study confirms that Fraj and Martinez (2006) find that environmental patterns and self-fulfillment values determine market segments of the ecological economy. Whereas Septiani et al. (2019) The handling of plastic rubbish still has to deal with aspects of community culture that cannot yet be switched from plastic, in addition to the awareness that must be fostered. Student understanding variables about the problem of plastic waste in cognitive aspects, affective aspects, and psychomotor aspects form a crystallized understanding of a person. Santaigo (2014) revealed that understanding aims to eradicate corruption by strengthening constructive and effective social control, so students' understanding of plastic waste being as a strategy in affirming student behavior in dealing with the problem of plastic waste.

This proves that education and knowledge eradicate bad behavior through culture growers (Wardani, 2015). If it is associated with the awareness behavior of plastic waste management, understanding is possible that there is a positive behavioral linkage to the potential. Similarly, Santoso and Meyrasyawati (2015) opinion that cultural education can play a role to prevent negative behavior. This means that the more educated someone means, the more understanding it will be the wiser in behaving. Chow et al. (2017) stated that the popularity of plastic waste management among the people must be increased by changing knowledge, attitudes, and behavior towards the management of plastic waste.

The ecological-economic literacy variable influences the green behavior of students. Ecological- economics is a discipline field between economics and the environment which aims to expand economic theory by expanding the environment, human values, and human health and human well-being (Anastisios, 2008). People who have an ecological-economic literacy are people who understand economic problems from an economic perspective but are very concerned with the environment and natural ecosystems as places for the development of human life (Van den Bergh, 2001). In line with Faber's (2008) statement, the ecological economy focuses on the problems of nature, justice, and time. Meanwhile, Victor (2008); Soderbaum (2012) argue that economic problems not only discuss normative economics but also consider time and intergenerational justice issues. Ecological economics shares some of its perspectives with feminist economics, including a focus on the values of sustainability, nature, justice, and care.

However, lifestyle does not affect the green behavior of students in the plastic waste problem. Lifestyle is related to the way humans do, possess, and use and display behavior (Backhaus et al., 2011) related to specific problems, in this case, plastic waste. At a normal level, lifestyles change slowly, but globalization affects these changes rapidly, especially in the middle class due to media and information being open (Zhang et al., 2009). A person's lifestyle will show the pattern of his life reflected by his activities, interests, and opinions or opinions in interacting with his surroundings (Anggraini & Santhoso, 2017). This study's results are in line with the results of Yuniarti (2015) research that the lifestyle adopted by a person will influence the needs, desires, and behavior, in this case, the problem of plastic waste. However, this finding contradicts Hariyono (2015) which mentioned that lifestyle has a positive relationship with behavior.

CONCLUSIONS AND SUGGESTION

This study aims at examining the determinant factors affecting students' green behavior. Based on the results of data analysis and discussions that have been carried out, it can be concluded that students' green behavior is influenced by ecological-economic literacy, the understanding of Jambi University students about the environmentally sustainable environment, and student awareness about the environment. However, this research does not prove that lifestyle can influence student behavior. Simultaneously, ecology economic literacy, student knowledge, lifestyle, and student awareness have a significant positive effect on students' green behavior.

This study suggests that further research needs to be done on student behavior on waste issues with different research subjects so that it can be used as a strong basis in setting relevant policies. In addition, further testing is needed about the student's lifestyle and its effect on students' green behavior, especially in the case of plastic waste.

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