

Modelling Indonesian student pro-environmental behaviour: Empirical study of value believe norm theory

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Abstract. Higher education has an essential role in improving the quality of the environment. In addition to research and scientific aspects, the habituation of environmentally friendly living behaviour must also start from campus. This is related to efforts to realize the goal of SDG 11, which is to make cities and human settlements inclusive, safe, resilient, and sustainable, which starts from habituation in schools. This research will focus on the structural modelling of various determinants in the Value belief norm (VBN) theory that determine environmentally friendly consumption behaviour. Next, this research will empirically test the factors in each determinant prepared to test this theory in economic behaviour. This research involved 277 students at Universitas Negeri Semarang, Indonesia. This research shows that altruism and bio-values exist in conservation activities, and conservation values have a very high role in influencing environmental awareness and environmentally friendly behaviour. Furthermore, environmental awareness continues to be vital to increasing environmentally friendly behaviour.

1 Introduction

People's behaviours in economic endeavours cannot be separated from the environmental impacts that occur [1, 2]. The Environmental Performance Index (EPI) can measure human behaviour in daily life. Indonesia is ranked 164th out of 180 countries with an EPI score of 28.2. This ranking indicates that environmentally friendly behaviour in Indonesia is still shallow compared to other countries [3].

One of the business activities has a negative impact on the environment if it is not managed with environmentally friendly principles [4, 5]. According to [6], the green economy concept is the only solution to realizing economic activities that are in synergy with the environment and can educate the behaviour of economic actors towards being environmentally friendly. Based on the Paris Agreement in 2016, a series of climate change summits, the green economy was agreed to be a transformational change in the world economy [7].

The existence of a green economy currently still needs to be encouraged massively to create an environmentally friendly economy. This principle must be supported by other

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business concepts such as Green Business, Green marketing, Green Consumption, and other concepts that educate economic behaviour to be environmentally friendly [6]. Unfortunately, until 2022, various green economic plans in Indonesia are considered not very progressive in their development.

Environmentally friendly behaviour is the behaviour of someone who pays attention to environmental aspects. According to [8], environmentally friendly behaviour is defined as individual behaviour that is profit-oriented in protecting the environment by minimizing the negative impacts of environmental damage due to consumption and production. [9] added that individuals who are aware that their behaviour has a negative impact on the environment will change their behaviour towards environmentally friendly behaviour.

Efforts to increase environmentally friendly behaviour in consumption are significant, but many factors hamper their implementation. Simple behaviours to reduce the impact of environmental damage, such as saving electricity, reusing waste, reducing the use of plastic, and others, are commonly carried out. However, their existence is difficult to research [10]. Environmentally friendly consumption behaviour is defined as consumer behaviour that seeks to reduce the impact on the environment and consumption patterns that damage the environment [11, 12] emphasized that environmentally friendly consumption behaviour leads to sustainable and responsible consumption patterns after being aware of environmental problems.

Environmentally friendly behaviour is generally driven by individual factors, such as socio-demographics, values, beliefs, and norms [13, 14, 5]. The Value-Belief-Norm (VBN) Theory explains that environmentally friendly consumption behaviour is determined by the values that develop in society and the beliefs and rules that exist within it. This means that the conception of values is fundamental to increasing environmentally friendly consumption styles and even environmentally friendly behaviour.

So far, there have been many studies on environmentally friendly behaviour based on the VBN model, one of which is [16], which investigated the environmentally friendly behaviour of students in secondary schools. Furthermore, research by [17, 18] specifies the behavioural aspects of using emission-free vehicles. More specifically on environmentally friendly consumption, research conducted by [19] focuses on aspects of purchasing environmentally friendly products in society. The absence of research to operationalize value variables in VBN theory needs to be strengthened with various new empirical research.

Theory Value Belief Norm (VBN Theory) is a framework that explains the influence of pro-environmental values on individual behaviour. VBN theory [20] has been tested empirically and focuses on individual values, beliefs, and personal norms as determinants of behaviours [17, 21]. VBN theory combines value theory [22], norm activation theory [23], and the new ecological paradigm (NEP) [24] into a theoretical construct. Stern et al. argue that VBN theory connects it in a causal structure, including values, ecological beliefs based on the new ecological paradigm (NEP), awareness of consequences (AC), the ascription of responsibility (AR), personal norms (PN), and pro-environmental behaviour.

The first part of the VBN theory is values related to pro-environmental behaviours, including biosphere values, altruistic values, and egoistic values [25, 26]. Biosphere values emphasize concern for nature and focus on the consequences of actions taken on the environment. Altruistic values focus on what others feel benefits. Egoistic values emphasize increasing individual resources, such as money or status [27]. In previous research, biosphere and altruistic values were found to positively affect pro-environmental behaviour, while egoistic values had a negative effect [27]. These three values indirectly influence pro-environmental behaviour.

Environmentally Friendly Behaviour in this research is a proxy for overall consumption behaviour that prioritizes environmental sustainability. Environmentally friendly consumption behaviour or green consumption behaviour is a consumer behaviour that seeks

to protect the environment and minimize the negative impact of consumption on the environment [28, 29] believe that environmentally friendly consumption behaviour leads to sustainable consumption patterns and is responsible for environmental problems that occur. Pro-environmental behaviour is generally driven by individual factors, such as socio-demographics, values, beliefs, and norms [13-15]. Therefore, the Value-Belief-Norm (VBN) Theory can be used to study pro-environmental behaviour.

2 Methods

This research tries to develop a conceptual model of environmentally friendly consumption behaviour among students at Universitas Negeri Semarang (UNNES). The model building in this research refers to the Value Believe Norm (VBN) theory developed by Stern et al. [20], the development of this conceptual model was then tested using SEM-PLS-based structural modelling.

The population in this research is Universitas Negeri Semarang students, with portraits of students who have taken university courses in Conservation. The sample size refers to the table developed by [30], which uses a sample with a minimum of 5 times the number of items compiled in the research. Furthermore, this research will also use several key informants to confirm the results and develop a model that has been tested empirically.

This research used a quantitative approach based on structural modelling [31]. The quantitative analysis used by the author is a factor analysis design using confirmatory factor analysis (CFA), Moderating Regression Analysis (MRA), and also testing a Covariance-based model based on Structural Equation Modelling (SEM) using PLS 6. The data collection method used a questionnaire using an agree disagree interval scale with seven scales (1-7).

3 Results and Discussion

3.1 Outer model analysis

Outer model testing needs to be carried out to confirm the composition of the variables that form the latent variables of the construct variables. This is used to determine the variables in the model. It is indeed feasible to test the relationship between variables. Testing of the outer model in this research can be seen by measuring convergent validity, discriminant validity, discriminant reliability, and Cronbach alpha [32]. Figure 1 shows the outer model testing of Student Pro-Environmental Behaviour:

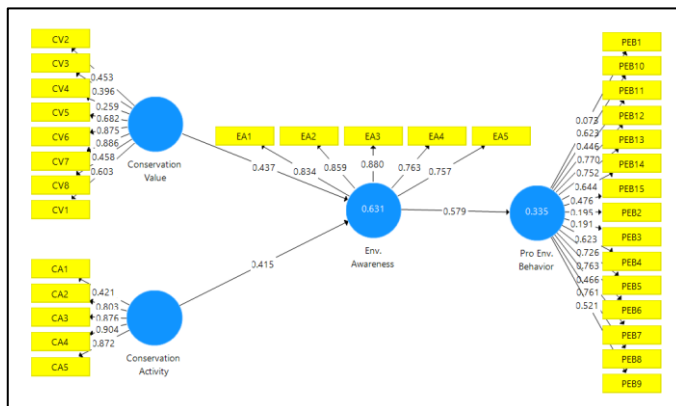


Fig.1. Student Pro-Environmental Behaviour Model

In the display in Figure 1, it can be seen that the loading factor value of each construct variable on the tool variable shows a result of >0.6 ; this shows that the variables in the model are pretty good with the various constructs that make it up [32]. Furthermore, Average Variance Extracted (AVE), Composite reliability, and Cronbach alpha measurements need to be carried out to determine the quality of the model prepared. These measurements can be seen in Table 1.

Table 1: Cronbach's alpha, Composite Reliability, and AVE testing

	Cronbach's Alpha	Rho A	Composite Reliability	Average Variance Extracted (AVE)
Conservation Value	0.893	0.898	0.916	0.610
Conservation Activities	0.829	0.833	0.876	0.541
Environmental Awareness	0.718	0.740	0.827	0.548
Pro Env. Behaviour	0.851	0.853	0.886	0.527

Source: SmartPLS3 Output

Based on Table 1, it can be seen that there are no variables that show unfavorable symptoms in the AVE, Cronbach alpha, and AVE measurements.

Table 2: Discriminant Validity

	Conservation Value	Conservation Activities	Environmental Awareness	Pro Env. Behaviour
Conservation Value	0.781			
Conservation Activities	0.661	0.735		
Environmental Awareness	0.612	0.769	0.740	
Pro Env. Behaviour	0.634	0.651	0.603	0.726

Source: SmartPLS3 output, 2023

In Table 2, it is explained that no cross-loading value exceeds the cross-loading value for each criterion, so it is stated that discriminant validity is met.

3.2 Hypothesis testing

Table 3 shows the relationship between variables in the model and also the level of significance of their influence, while Table 3 is as follows:

Table 3: Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Conservation Value -> Environmental Awareness	0.323	0.328	0.062	5,190	0,000
Conservation Activity -> Environmental Awareness	0.208	0.211	0.058	3,558	0,000
Env Awareness -> Pro-Environmental Behaviour	0.308	0.306	0.075	4,106	0,000

Source: SmartPLS Output 3, 2023

Measurement of the R Square Coefficient of Determination and the magnitude of the influence between variables can be seen in Table 4.

Table 4. R Square Value

	R Square	Adjusted R Square
Environmental awareness	0.591	0.589
Environmental Behaviour	0.510	0.502

Source: SmartPLS 3.0 output

The results of the inner model test show that altruistic values have a positive and significant effect on social responsibility in students. This is based on the original sample value of 0.381 and a P-value of 0.000, which is smaller than 0.05. Thus, it can be concluded that in the Value-Belief-Norm (VBN) Theory, the value construct influences personal norms. In this research, altruistic values were chosen as a value construct because UNNES, through conservation education, instils caring values in students. Then, the social responsibility variable is operationalized as the norm variable in VBN theory. Therefore, it can be interpreted that students who care about other individuals will feel they have a moral obligation to be responsible for the decisions they make.

The results of the inner model test also show that altruistic values have a positive and significant effect on environmentally friendly consumption behaviour through social responsibility among students. This is based on the original sample value of 0.280 and a P-value of 0.000, which is smaller than 0.05. Thus, it can be concluded that this research is based on the Value-Belief-Norm (VBN) Theory [13]. The results of this research follow previous research conducted by [33, 34, 35, 36] that altruistic values have a positive and significant influence on pro-environmental behaviour through norms. The higher the individual's altruistic value, the higher the individual's feeling of moral obligation. This feeling of moral obligation will encourage a person's environmentally friendly consumption behaviour. Thus, it can be concluded that the more concerned an individual is about the impacts they feel on other people, the more motivated they are to behave in an environmentally friendly manner.

The results of the inner model test show that the biosphere value has a positive and significant effect on social responsibility in the active UNNES undergraduate student class of 2021. This is based on the original sample value of 0.498 and a P-value of 0.000, which is smaller than 0.05. Thus, it can be concluded that in the Value-Belief-Norm (VBN) Theory, the value construct influences personal norms. In this research, biosphere values were chosen as a value construct because UNNES, through conservation education, instills caring values in students. Then, the social responsibility variable is operationalized as the norm variable in VBN theory.

The results of the inner model test show that social responsibility has a positive and significant effect on environmentally friendly consumption behaviour among active UNNES undergraduate students in the class of 2021. This is based on the original sample value of 0.735 and a P-value of 0.000, which is smaller than 0.05. Thus, it can be concluded that this research is per the Value-Belief-Norm (VBN) Theory [13]. Social responsibility as an operationalization of norms in VBN theory successfully predicts students' environmentally friendly consumption behaviour. The results of this research are not in line with previous research conducted by [16], which found that personal norms did not affect environmentally friendly behaviour.

4 Conclusion

Based on VBN theory, predicting pro-environmental behaviour can link three structures: values, beliefs, and norms. In this case, conservation value is proxied as part of altruism, and

several values are modelled and accepted. In the final structural model generated empirically, in the case of environmentally friendly consumption behaviour, altruistic value is measured in the value construct using one factor. The results show that altruistic values indirectly affect environmentally friendly consumption behaviour, but rather through norms. Then, there is a biosphere value variable in other value constructs, measured using two factors. The research results show that biosphere values indirectly influence environmentally friendly consumption behaviour, but rather through norms. The social responsibility variable operationalizes the norm variable in the VBN theory construct. By using six factors to measure the social responsibility variable, the results obtained show that social responsibility influences environmentally friendly consumption behaviour

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