

Determinant of Environmental Behavioral in Supporting ITERA UI Greenmetrics Program.

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Abstract: As agents of change, universities have an essential role in spreading the concept of sustainability. Indonesia has UI Greenmetrics as an assessment for Universities to manage the campus environment. There are several challenges in implementing the Green Campus program and Ranking on UI Greenmetric, such as participation by the entire campus community and education of the academic community. In this study, the Theory of Planned Behavior is used to determine the factors that influence the behavior of the academic community at the Institut Teknologi Sumatra. Hypothetically three factors influence the intention, and four factors influence pro-environmental behavior. Results This research is quantitative research with a survey design. The questionnaire was designed based on previous research on pro-environmental behavior and applying the Theory of Planned Behavior (TPB). The sample consisted of 450 people, with a total of 20432. The data were analyzed using PLS Structural Equation Modeling (SEM) software. The results show that PBC is a strong predictor of pro-environmental behavior intention (β : 0.394), and intention is the second most significant predictor of pro-environmental behavior (β = 0.347). Meanwhile, the analysis shows that attitude affects pro-environmental behavior but applies intention as mediation (β = 0.188). While Norm subjective insignificant on intention but positive effect on pro-environmental behavior with low influence.

Keywords: UI Greenmetrics, Pro Environment, Theory of Planned Behaviour, environment management studies, Green Campus, Campus Community, Indonesia

I. INTRODUCTION

Environmental problems are multidimensional problems involving various parties. Over the last few decades, the community entire world has adopted the concept of sustainability to answer the problem the environment at this time, including universities

Universities play an essential role in overcoming global environmental challenges, namely with the concept of sustainable education, which is one of the critical answers to dealing with ecological problems. This is because education, research, and community involvement created by universities can produce sustainable environmental effects. As agents of change, universities have an essential role in spreading the concept of sustainability because they can make students as a climate change agents and future leaders. (Fatmawati & Syahbana, 2015)

UI Greenmetrics is a standard issued by Indonesian universities that evaluates the university's commitment to managing the campus environment. This program is designed

for the evaluation of higher education institutions around the world. In addition, it is also intended for the government, local and international environmental organizations/institutions, and the community to implement the concept of sustainability (UI Greenmetric Team, 2016)

In realizing a Good Green campus and Ranking on UI Greenmetric at the university level, there are several challenges in implementing the Green Campus program, such as participation by the entire campus community and education of the academic community, making programs where all campus residents can actively participate, and commitment from campus management in making policy policies. Affirmations that support pro-environmental behavior are also the key to campus sustainability (Mohd Isa et al., 2021) . Some of the following studies (Riyadi et al., 2018)(Sugiarto & Gabriella, 2020)(Sugandini & Rahajeng Arundati, 2020)(Fachrudin , 2021)) also support that to support the Green Campus, the participation of the entire academic community is required.

Significant predictors of recycling behavior is Environmental attitudes and situational and psychological variables, and to explore the influence of these factors Theory of Planned Behavior (TPB) is the theory to identify the determinants of pro-environmental behavior (Tonglet et al., 2004). Theory of Planned Behavior" (TPB) standard model from Ajzen and Fishbein (1980) compiled a measure of attitudes, subjective norms, and perceived behavioral control to describe the relationship between attitudes and consumer behavior towards pro-environmental behavior (Ekawati, 2020). According to Ajzen and Fishbein (Ajzen, 1991), the determinant of behavior is intention.

The intention is a component in the individual that refers to the desire to perform certain behaviors. behavior that will be carried out by someone in the form of direct action or actual behavior. The theory of planned behavior (TPB) is a theory that can assess a person's behavior based on factors from TPB. When individuals decide to take pro-environmental action, this is a behavior. As in TPB, behavior is influenced by intentions, while intentions are influenced by several factors, namely attitudes towards behavior, subjective norms, and perceived behavioral control.

Therefore, to understand a person's behavior and decision-making motives in supporting the implementation of UI Greenmetrics, this study aims is to identify the determinants

of the environmental behavior of the academic community. And what factors influence the pro-environmental attitude in supporting the UI GreenMetrics program?

This research is conducted at Institut Teknologi Sumatera or known as ITERA which is one of the new state universities in Indonesia, Lampung. ITERA was established in 2014. In developing the institution, ITERA will always improve its human resources, infrastructure, facilities and infrastructure to support its operational activities.

II. LITERATURE REVIEWS

2.1 Theory of Planned Behaviour

TPB (Theory of Planned Behavior) is one theory that is widely used to investigate consumer behavior in purchasing green products. TPB can explain human behavior and psychological determinants Rahab in (Ekawati, 2020). TPB is a refinement of reason action theory. Just like reason action theory, the main focus of planned behavior theory is the individual's intention to perform a particular behavior. Reason action theory states that there are two determinants of intention: personal attitudes and subjective norms (Fishbein and Ajzen, 1975). However, Ajzen argues that reason action theory cannot explain behavior that is not entirely under one's control. Therefore, Ajzen added one factor determining the intention: perceived behavioral control. Perceived behavioral control is an individual's perception of his control concerning certain behaviors. The three factors, attitudes, subjective norms, and perceived behavioral control, can predict individual intentions to perform certain behaviors (Ajzen & Fishbein, 2005)

2.1.1 Attitude

Attitude towards a behavior is influenced by beliefs, feelings, and behavioral tendencies of a person towards the object of attitude. Attitude towards Behavior according to Ajzen is a positive or negative evaluation of some object, person, organization, event, behavior or interest. The theory of planned behavior suggests that an individual's attitude toward a behavior stems from beliefs about the consequences of that behavior, which are called behavioral beliefs. An individual will have the intention to show a behavior, when someone evaluates it positively.

2.1.2 Norm Subjective

Subjective norms come from outside the individual regarding the perceptions of others or references and groups that affect individuals such as parents, friends, bosses, and co-workers. A person believes that another person or particular group accepts or does not accept his behavior. If a person believes that many references agree or want them to show a specific behavior and that there is a motivation to follow a particular behavior, they will feel social pressure to do so (Ajzen & Fishbein, 2005)

2.1.3 Perceived Behaviour Control

Perceived Behavior Control. Perceived Behavior Control explains that behavior is not only controlled by oneself, but

also requires control. Perceived behavioral control is a person's belief in the presence or absence of things that support or prevent him from showing behavior. For example in the form of resources and time. When a person thinks that he or she lacks resources or does not have the time or opportunity to behave, then that person does not have a strong intention to do so. In addition, behavioral control is determined by previous experience and the individual's estimate of how difficult or easy it is to perform the behavior. Controlling this behavior is very important when a person's self-confidence is weak (azwar, 2015)

2.2 UI Greenmetrics

UI GreenMetric was launched in 2010. UI GreenMetric is a standard issued by the University of Indonesia, which is the first university evaluation system in the world, whose primary evaluation basis is the university's commitment to campus environmental management. This program is designed as an entry point for evaluating higher education institutions worldwide. In addition, it is also intended for the government, local and international environmental organizations/institutions, and the community to implement the concept of sustainability. UI GreenMetric, launched in 2010, is a standard issued by the University of Indonesia and is the first university ranking system in the world based on the university's commitment to managing the campus environment as the primary basis for evaluation. This program is designed to serve to evaluate higher education institutions around the world. In addition, applying the concept of sustainable development to the government, local and international environmental organizations/institutions, and the community (Nurbaya in Buana et al., 2018) The criteria contained in the UI assessment Greenmetrics are as follows: (i) Setting and Infrastructure (SI); (ii) Energy and Climate Change (EC); (iii) Waste (WS); (iv) Water; (v) Transportation; and (vi) Education.

III. METHODOLOGY

3.1 Research Model

This research is quantitative research with a survey design. The questionnaire was designed based on previous research related to pro-environmental behavior and the application of Theory of Planned Behaviour (TPB). The endogenous variables in this study are pro-environmental intentions and behaviors, while the exogenous variables are attitudes towards UI Greenmetrics, subjective norms, and perceptions of behavioral control.

3.2 Sampling

The location of this research is at University namely Institut Teknologi Sumatera which is a new state Campus in Lampung Province, Indonesia, and the objects of study are lecturers, education staff, and students. The population in this study was using the Taro Yamane formula with a total result of 450 samples from all ITERA academics of 20432.

3.3 Data Collection

Data analysis used inferential statistical analysis. inferential data analysis used to evaluate the measurements and structural models, the data were analyzed using PLS Structural Equation Modeling (SEM) software. The technique used in this study is to set the outer model or measurement model.

Table 1. Characteristic respondent

Characteristic Respondent	Classification	Total	
		n	%
Age	16-26 y.o	376	84
	26-35 y.o	67	15
	36-46 y.o	7	2
Position	Student	362	12
	Staff	34	8
	lecturer	54	80
Gender	Women	230	51.1
	Men	220	48.9
Knowledge about UI GreenMetrics	Yes	182	40.44
	NO	268	59.56
Participation in joining Courses or Seminar about UI Greenmetrics	Yes	58	12.89
	No	392	87.11

IV. FINDINGS

This study has four independent variables consisting of four latent variables. Among others; are certain attitudes, subjective norms, perceived behavioral control, and behavioral intentions. Six indicator items for the PBC variable, Five indicator items for the SN variable, Six indicator items for the PBC variable, Three indicator items for the behavioral intention variable, and Four variables for the Pro-environmental behaviour indicator. Overall, there are 24 items in the research instrument. Items are designed based on previous research related to pro-environmental behavior and the application of TPB

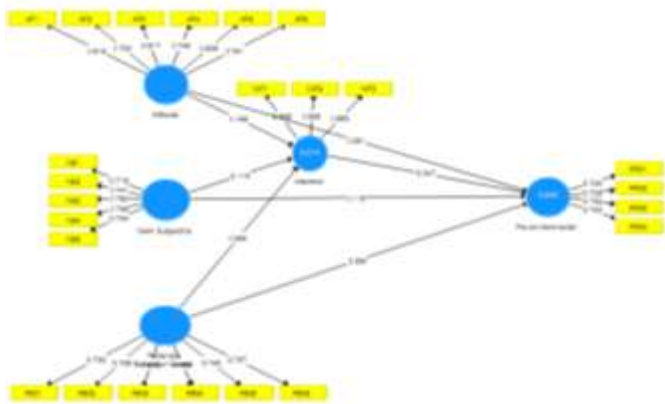


Fig.1 Outer Weights

4.1 Outer Model Evaluation / Measurement model

Measurement model, where the measurement model is revised and confirmed. Measurement model was evaluated by examining the convergent and discriminat validity. Convergent validity is a tool used to determine whether an indicator is valid when used to control a variable. outer loadings values between 0 and 7 are generally considered to have high validity, but some literature uses a tolerance level of only 0.5. Accordingly, outer loadings values above this level are generally accepted as valid indicators. (Tonglet et al., 2004)

Table 2. Measurement Model

Construct	Indicator	Outer Loadings	Average Variance Extracted (AVE)	Composite Reliability	Cronbach's Alpha
Attitude (X ₁)	X _{1.1}	0.616			
	X _{1.2}	0.7			
	X _{1.3}	0.617	0.514	0.862	0.829
Norm Subjective (X ₂)	X _{1.4}	0.745			
	X _{1.5}	0.808			
	X _{1.6}	0.791			
Perceived Behaviour Control (X ₃)	X _{2.1}	0.719			
	X _{2.2}	0.741	0.537	0.853	0.785
	X _{2.3}	0.76			
	X _{2.4}	0.736			
Intention (Y ₁)	X _{2.5}	0.704			
	X _{3.1}	0.733			
	X _{3.2}	0.726			
	X _{3.3}	0.692	0.517	0.865	0.813
Pro Environemntal Behaviour (Z ₁)	X _{3.4}	0.66			
	X _{3.5}	0.74			
	X _{3.6}	0.757			
	Y _{1.1}	0.859			
Pro Environemntal Behaviour (Z ₁)	Y _{1.2}	0.826	0.629	0.834	0.703
	Y _{1.3}	0.683			
	Z _{1.1}	0.723			
	Z _{1.2}	0.708	0.525	0.815	0.7
Pro Environemntal Behaviour (Z ₁)	Z _{1.3}	0.732			
	Z _{1.4}	0.733			

Table II shows that the loading factor of all constructs in the measurement model exceeds 0.5, so the above variables are considered valid. The composite reliability ranged from 0.81 to 0.86, and the AVE ranged from 0.51 to 0.62. Thus, the three criteria for convergent validity are valid. This result indicates that the constructs in the proposed model show adequate internal consistency. Cronbach Alpha for each construct was also calculated, with values ranging from 0.7 to

0.82. This result indicates that each indicator shows high reliability.

4.2 Structural Model

Construction Model evaluated By analyzing the internal model, namely testing the value of R square, the value of R2, which means the little ability of the independent variable to explain the dependent variable is minimal. If the value of R Square is close to one, the variables are independent and provide almost all the necessary information for the dependent variable.

Table 3. R2 Values

R Squares		
	R Squares	R Adjusted
Intention	0,314	0,309
Pro Environmental Behaviour	0,545	0,541

The R-square value of the Intention variable is 0.314, which means that the variability of the construct of intention can be explained only by variations in Attitude, Subjective Norm, and Perceived Behavior Control by 31.4 percent, while other variations explain the remaining 68.60 percent. The R-Square value of pro-environmental behavior of 0.545 means that variations in attitudes, subjective norms, and Perceived Behavior Control by 54.5 percent. In comparison, the remaining 45.5 percent is explained by other variations outside the model studied, as seen in the table above.

4.3 Hypotheses Result by PLS

Table IV. Hypotheses Result

Path Coefficients	Original Sample/ β	Sample Mean	Standar Deviasi	t Statistics (Ts)	t-tabel	Hasil	P Values	Keterangan
					(Tt)			
Attitude -> Pro Environmental behavior	0.051	0.054	0.033	1.480	1,967	Ts<Tt	0.139	Positive Insignificant
Attitude -> Intention	0.188	0.193	0.046	4.214	1,967	Ts>Tt	0	Positif Signifcant
Norm Subjective -> Pro Environmental behavior	0.119	0.122	0.042	2.661	1,967	Ts>Tt	0.000	Positif Signifcant
Norm Subjective -> Intention	0.115	0.119	0.062	1.917	1,967	Ts<Tt	0.056	Positif Insignificant
Perceived Behaviour Control -> Pro Environmental behavior	0.386	0.389	0.052	7.378	1,967	Ts<Tt	0	Positif Signifcant
Perceived Behaviour Control -> Intention	0.394	0.393	0.06	7.046	1,967	Ts>Tt	0	Positif Signifcant
Intention -> Pro Environmental behavior	0.347	0.341	0.045	7.587	1,967	Ts>Tt	0	Positif Signifcant

The results shown in Table IV do not all support the hypothesis. The path coefficient from Attitude to Pro Environmental behavior was insignificant with the predictive relevance measure and was low (β : 0.05, t 1.48, $p > 0.05$). The path coefficient of Attitude to Intention was significant, with a relatively higher effect size level, although still low, and predictive relevance (β 0.188, t 4.21, $p < 0.05$). The subjective Norm of Pro Environmental behavior was significant with small effect size and low predictive relevance (β 0.119, t 2.66, $p < 0.05$). The path coefficient from Subjective Norm to Intention was insignificant with relevance (β 0.115, t 1.91, $p > 0.05$). The path from Perceived Behavior Control to Pro Environmental behavior is significant (β 0.386, t 7.37, $p < 0.05$), the path from Perceived Behavior Control to Intention (β 0.394, t 7.04 $p < 0.05$) is also significant, and the path of Intention to Pro Environmental behavior is significant. (β 0.347, t 7.58 $p < 0.05$).

V. DISCUSSION AND EVALUATION

Pro-environmental behavior is the key to a sustainable campus where the community actively participates

in creating a sustainable environment, especially in the campus environment. According to Scannell in Sugiarto (Sugiarto & Gabriella, 2020), pro-environmental behavior is an action taken to minimize environmental damage or improve environmental conditions.

The Theory of Planned Behavior in Ajzen 1991 is the correct theory for determining the crucial factors of pro-environmental behavior in the academic community. The relationship between attitudes, subjective norms, behavioral control, and intentions determines the behavior that someone will carry out. Because when an individual decides to take pro-environmental action, which is a behavior, it is influenced by intentions, while intentions are influenced by several factors, namely attitudes towards behavior, subjective norms, and perceived behavioral control.

This study provides in-depth information to campus/university management regarding what factors encourage individuals to behave pro-environmentally in supporting the UI Green metrics Program at ITERA and as input to universities to make policies that can accommodate

sustainable campuses and improvements to facilities and infrastructure.

The results of the study show that Attitude and Perceived Behavior Control have a positive influence on Intentions same as previous research by (Ekawati, 2020)(Azro'i, 2015)(Wan et al., 2012)(Mahmud & Osman, 2010), while Norm Subjective, Perceived Behavior Control, and Intentions have a positive influence on pro-environmental behavior (Suryandari et al., 2016),(Tonglet et al., 2004).

Meanwhile Attitude towards Behaviour has insignificant effect neither does Norm Subjective to Intention. It seems that what was stated by Wicker 1969(Mahyarni, 2013) regarding the relationship between attitudes and behavior is that individuals are usually quite rational and use the available information systematically, and individuals will consider the consequences of their actions before someone decides to display behavior or not. A person's behavior depends on the desire to behave so that the Attitude in the individual does not have a positive effect on the behavior shown without first being preceded by the intention or desire to behave.

The Attitude itself is determined by belief, namely a person's subjective assessment of the surrounding environment. Belief can be related to the behavior that will be shown based on the self-evaluation of the data obtained that the behavior can provide benefits for the perpetrator. Therefore, Attitude toward pro-environmental behavior does not have a positive effect because it must be mediated by intention.

This is in line with the statement in the book (Sugandini & Rahajeng Arundati, 2020), where there is a statement of cognitive dissonance, namely a situation that refers to mental conflict, which occurs when a person's beliefs, attitudes, and behavior are not in harmony. For example, a smoker continues to smoke even though he knows that cigarettes are harmful to his health. In this case, carrying out pro-environmental activities is not proportional to attitudes and beliefs because a person realizes that there is a feeling of discomfort in him due to the inconsistency that occurs, so then make these changes. These uncomfortable feelings can take the form of anxiety, shame, or feelings of guilt and regret. These feelings can also affect behavior, thoughts, decisions, and attitudes.

To explain the insignificant effect between Subjective Norm to Intention. This is in line with the study by (Siti Khotimah, 2019) that Norm subjective is not always significant with intentions. Even though someone has a good attitude towards the environment, encouragement or motivation from close friends or someone who is considered important does not affect the intention of pro-environmental behavior, as well as what Tonglet and Davis research (Mahmud & Osman, 2010) that the Subjective Norm is the weakest factor in the TPB variable. Even in Boldero's research (Boldero, 1995), it is not significant at all.

VI. CONCLUSION

The purpose of this study was to identify the determinants of the environmental behavior of the academic community. And what factors influence pro-environmental attitudes in supporting the UI Green Metric program using the Theory of Prediction Behavior. The result of this study is the strongest predictors of pro-environmental behavior in the ITERA community are Perceived Behavior Control (PBC) and Attitude. PBC is the second strongest predictor of intention to do pro-environmental behavior, while attitude is also the largest predictor after PBC, while subjective norm has no significant effect on the intention to be pro-environmental behavior

This finding implies that the main challenge and consideration for Campus policymakers is to increase knowledge and understanding of pro-environmental behavior and environmental impacts on the academic community. This will improve individual PBC. Things that can be done such as providing support and facilities such as; Intracurricular activities such as sustainable development courses are required by every faculty. Sustainable Development courses include knowledge of Sustainable Development Goals/SDG. In addition, campuses also need to conduct socialization about UI Green metric, workshops, periodic seminars, and appeals in the form of installing banners and posters. Increase the budget to realize environmentally friendly campus infrastructure and form SMEs or programs that need to be run and initiated by the campus and integrated between departments, especially regarding waste management such as the 3R (reuse, reduce and recycle) program to reduce waste in the campus environment.

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APPENDIX

Table V. Questionnaire items

Construct	Variable
Attitude	
X1	I am responsible for preserving the environment by taking electricity-saving measures
X2	I believe recycling waste is a helpful activity
X3	Saving water is a useful and responsible action
X4	Using public transportation is a responsible action
X5	Environmental education is essential and can solve environmental problems
X6	I believe that pro-environmental behavior will reduce environmental pollution.
Norm Subjective	
X2.1	I always see water-saving stickers on campus
X2.2	My close friend invites me to use public transportation
X2.3	Easy to find and use the shuttle bus on campus
X2.4	My close friend invites me to do pro-environmental behavior
X2.5	There is an environmental and sustainable club or community within the ITERA Campus
Perceived Behaviour Control	
X3.1	I have many opportunities to recycle
X3.2	I know where to take my household trash for recycling
X3.3	I always choose to walk rather than ride a private motorized vehicle
X3.4	I studied more than one subject related to education
X3.5	I participate in environmental conservation activities
X3.6	I'm taking a course on environment and sustainability
Intention	
Y1.1	I choose eco-friendly items.
Y1.2	When buying a product, I assess the type of packaging and choose the one that can be recycled
Y1.3	I am willing to reduce the consumption of food and drink packaged in plastic if it can help protect the environment.
Pro Lingkungan	
Z1.1	I choose to take public transportation/walk even though the campus is far from home
Z1.2	I reuse used goods (glass bottles, plastic, jars, cans, and plastic bags)
Z1.3	I collect waste paper for reuse
Z1.4	I read books, publications, and other materials on environmental issues
Source: Adapted from (Sarah Muslihah, 2021), Wan et al (2012), (Rodríguez-Barreiro et al., 2013),(Ounsaneha,2018),Tonglet, Kaiser et al (2007)	