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Factors Influencing Energy Conservation Application in Green Campus Design Based on Green Behavior

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ABSTRACT

The energy conservation application on campus may reduce energy consumption by using alternative energy sources. Green behavior in energy conservation by students and campus regulation has an important role in developing green campus. The purpose of this research is to analyze factors affecting energy conservation application on green campus design based on green behavior. Green behavior consists of attitudes, responsibilities, control behavior, beliefs, and intentions in energy conservation. This research used a quantitative method and conducted at universities in Medan city, Indonesia. The population of this research was university students with a total sample of 395 respondents. The analysis was carried out with SEM-PLS. Attitudes and beliefs were affecting perceived behavior control. In addition, beliefs are also affecting energy conservation application on green campus. Therefore, the campus policy and management should consider students green behavior in designing energy conservation application for green campus. Green behavior by campus occupants is beneficial to support campus efforts to apply green campus concepts.

Keywords: Attitude, Energy Conservation, Green Behavior, Green Campus Design
JEL Classifications: I23, P18, Q20, Q42

1. INTRODUCTION

The impact of a climate change calls for emergence to initiate green behavior or environmental-friendly behavior. The university contributes to the environmental sustainability process through knowledge, green campus, and also public awareness (Rwelamila and Neha, 2015). The university should be designed according to a green concept to improve students' quality of life (McFarland et al., 2008; Tamiami et al., 2018). University is an ideal place for giving education regarding to the concept of Green Campus (Creighton and Rapoport, 2007).

The researches focusing on the influence of green behavior in a green campus environment especially for the energy conservation are rarely conducted. Research about pro-environment awareness and pro-environment behavior in campus environment based on student and staff perceptions has been done before by Fu et al. (2017). One of the pro-environmental behaviors is energy conservation, such as saving electricity by turning off lights whenever they are not needed (Yusliza et al., 2020).

The strategy towards a green campus which aims to save energy is carried out by students and staffs of the university (Khanh, 2018). Conservation development and application in campus area is needed to achieve sustainable development. Campus has tremendous energy potential which requires energy management and conservation (Han et al., 2015). Yen et al. (2010) suggested five methods to achieve energy conservation, namely developing renewable energy, increasing energy efficiency, managing and monitoring energy use, promoting and integrating energy concepts, and increasing awareness of energy saving and energy use behavior.

One of the principles of the green campus is energy conservation which has the highest percentage of assessments compared to

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other principles based on the level of importance (UIGreenMetric, 2015). The indicators assessed on this principle are based on the efficient energy use, electricity use, and energy conservation.

Energy conservation application focuses on the alternative energy use and the energy saving features (Fachrudin, 2020). Qarnain et al. (2020) emphasized energy conservation factors of residential building based on consumer behavior. Meanwhile, Gandhe and Pandey (2017) explained energy conservation by households in India based on green behavior. Besides, Gandhe and Pandey (2018) also explained that green behavior in energy conservation is very important to promote energy conservation for supporting sustainability efforts. Increasing green behavior has a positive correlation with awareness of ecological and sustainability issues related to the environment (Khare, 2015).

Therefore, based on several previous studies, energy conservation application is one of the important principles that should be fulfilled in green campus design. In the green campus assessment, the principle of energy conservation has the highest score which indicates its importance. The application of energy conservation in green campus design includes the use of alternative energy and energy-saving features.

Former studies conducting by previous researchers around the world agreed to state that behavior consisting of attitude, belief, responsibility, intention, and their effects on pro-environmental behavior including energy saving behavior. However, there is still no research conducted with mainly focus on the influence of green behavior and energy conservation application in green campus designs. Therefore, this present study is aimed to reveal whether the behavior of students can support the energy conservation application in Green Campus design or not. We analyze the possible factors related to green behavior that may affecting energy conservation application in green campus design. Furthermore, the results of this present study can be added as a reference in green campus design especially on the implementation of energy conservation.

2. REVIEW OF LITERATURE

2.1. Green Campus: Energy Conservation, and Green Behavior

Emphasis on green campus promotion can increase comfort and ability to discuss pro-environmental topics and develop pro-environmental activities within the campus area (Fu et al., 2017). Green behavior as pro-environmental behavior in which each individual minimize harms to the environment through reducing energy use, conserving water, reducing waste, and stop buying goods that are harmful to the environment (Steg and Vlek, 2009; Kollmuss and Agyeman, 2002). Energy conservation behavior in buildings is supported by policies from building managers who proactively call on building users to behave energy efficient (Azizi and Wilkinson, 2015). According to Ibtissem (2020), conservation behavior is determined by individual awareness and a motivation is needed to make it happen. Consumers will pay attention to their behavior if they have obtained information about the benefits of energy, for example, about the high cost of energy consumption. Governments and producers must provide information on energy consumption and the issue of greenhouse gas emissions.

2.2. Green Campus

Sustainable development on campus with a green concept prioritizes campus planning and construction. Campus development planning has three aspects to consider, namely accessibility, security, and social agreements. Integrated development planning affects three aspects of sustainability, namely social, economic, and environmental (Abd-Razak et al., 2011). A sustainable university must first form a vision of sustainability, in which a mission of sustainability is conceptualized. Besides, efforts can be made to develop broad sustainability policies, sustainable target and goals line with the sustainability mission (Velazquez et al., 2006).

Green building strategy can be achieved by five stages of Go Green (Armstrong, 2008), including reducing energy consumption and concern for building occupants or users and communication between building owners and occupants or users. This communication is very important in an effort to reduce negative environmental impacts. According to Brown (2006), there are six aspects that make the green design in buildings are important, namely environmental impacts, materials, waste, energy, water, and human health. The green campus design should apply seven principles, namely building, landscape, energy conservation, water conservation, waste management, education, and transportation (Fachrudin, 2020). The green campus assessment conducted by UIGreenMetric (2015) is based on six indicators and each indicator has different scores. Currently, the UIGreenMetric indicator has been used as a reference in measuring the success of green campus application in Indonesia. The six indicators are setting and infrastructure, energy and climate change, waste management, water use, transportation, and education. Energy conservation is an indicator that has the highest rating in UIGreenMetric. In addition, there are also alternative policies for the realization of a sustainable campus by using a sustainable budget for campus environmental management and applying the green building concept. Furthermore, to create a green campus policy, green campus budget is required.

2.3. Energy Conservation Application in Green Campus Design

According to Zhu et al. (2021), the construction of green campuses at universities in China has already implemented the energy conservation. Energy conservation application including the use of photovoltaic from solar panels to generate electricity contributes to energy sustainability (Petratos and Evangelia, 2015).

Energy conservation application requires a behavior and technology approach. Yen et al. (2010) divided the method of energy conservation into two parts, namely structural energy conservation and non-structural energy conservation. Structural energy conservation consists of renewable energy, energy efficiency, and energy usage management and monitoring. Non-structural energy conservation consists of promotion and energy use behavior.

UIGreenMetric's Green Campus is an assessment on energy conservation application related to energy conservation programs,

green development, climate change adaptation, and mitigation programs as well as policies to reduce greenhouse gas emissions (UIGreenMetric, 2015). Some of the sub-indicators that are assessed are the use of energy efficient equipment replacing conventional equipment, implementation of smart building, renewable energy production in campus, electricity usage per year (in kilo watt hours), the ratio of production/per production of renewable energy to total energy use per years, elements of green building implementation as reflected in all construction and renovation policies, greenhouse gas emission reduction programs and total carbon footprint (CO_2 emissions in the last 12 months in metric tons). The application of energy conservation includes energy audits and energy management during planning, operation, and supervision of energy use (Tanod et al., 2015).

The benefits of using solar panels at universities include renewable energy that never runs out, saving electricity in the long term, reducing global warming, being clean and environmental-friendly, also reducing dependence on government-owned power plants. In green campus, solar panels can be alternative energy and energy-saving features in the building that should be considered (Fachrudin, 2020). Waste is not only can be reused in the form of recycling into a goods or compost that can be reused but can also be a source of energy (Monice and Perinov, 2016).

2.4. Green Behavior

Green behavior is supposed to be done as an effort to reduce the negative impact of one's activities on the environment (Stern, 2000). Environmental-friendly behavior is consumer behavior carried out by consumers to support environmental protection (Goncalves et al., 2016). The factors that contribute to increase the green behavior are awareness of ecological and sustainability issues, awareness of environmental issues, and the value of environmental-friendly alternatives (Khare, 2015).

2.5. Green Behavior in Energy Conservation

Energy-saving behavior can be viewed in two ways, namely the usual energy-saving behavior (reducing energy consumption by adjusting daily activities) and energy-saving technology investment (Azizi and Wilkinson, 2015). The highest savings come from changes in behavior that include the use of automatic and energy-efficient devices (Schelly and Cross, 2011).

Green behavior in energy conservation according to Gandhe and Pandey (2017) consists of several measurement variables, namely energy conservation beliefs, subjective norms, energy conservation attitudes, perceived behavioral control and behavioral intentions. While according to Wang et al. (2014), it consists of subjective norms, environmental attitudes, information publicity, lifestyles, and perceived behavioral control significantly affecting residents' energy-saving behavior. Energy conservation behavior is a solution to achieve the energy sustainability in the world (Ting et al., 2011). New energy resources are needed to determine energy use patterns for the benefit of future generations.

The government through the Ministry of Energy and Mineral Resources provides Energy Efficiency and Conservation Clearing House Indonesia (EECCHI) service facilities, namely Energy Saving with Changing Behavior (Ditjen EBTKE, 2014), through the following 6 steps, namely obtaining support and commitment to implementing energy, identifying the situation energy needs that are widely used, planning energy-saving programs, implementing energy-saving programs, evaluating the results of energy-saving programs, and generating an energy-saving culture in organizations, also, protecting the environment is currently a special concern around the world.

3. METHODOLOGY

This research uses quantitative methods. This research was conducted at Medan city, Indonesia. The variables used to measure the effect of green behavior on energy conservation in green campus design in this present study were attitude, belief, perceived behavior control, behavior intention and responsibility. Each variable has several constructs.

The green behavior in energy conservation as independent variables consists of attitude (A) that has 3 constructs, responsibility (R) that has 8 constructs, belief in energy conservation (B) that has 3 constructs, and behavioral intention (BI) that has 6 constructs. Perceived behavior control has been selected as the mediating variable that has 2 constructs. The dependent variable used was energy conservation application (ECA) that has 3 constructs. Questionnaires were prepared according to Likert scale from 1 to 5 (unimportant to extremely important) as can be seen in Table 1.

The population in this research was students universities in Medan city, Indonesia. Students were selected as the population of this present study because students are the largest number of academicians apart from staff and management. Sample are 395 students. Data collection techniques used was through survey techniques with questionnaires. Data analysis was conducted with structural equation modeling-partial least squares (SEM-PLS) using the SmartPLS software. This analysis was chosen because it can work efficiently with small sample sizes and complex models. In addition, the assumption of data distribution in SEM-PLS is relatively looser than in Covariant Based- Structural Equation Modelling (CB-SEM). Estimation by CB-SEM requires a series of assumptions that must be fulfilled such as multivariate data normality, minimum sample size and homoscedasticity.

According to the previous studies, there are important variables of green behavior that has impact to the conservational energy efforts including attitudes, responsibility, believe in energy conservation, behavior intention, and perceived behavior control. Energy conservation application used as an effort to create and develop the green campus design.

3.1. Hypothesis Development

3.1.1. Attitude

Attitude to energy conservation can be measured by being aware of the environment (Zelezny and Schultz, 2000). The environmental care attitude of consumers is influenced by several factors, including education and consumer knowledge about the environment, which is carried out through a simple and healthy lifestyle (Cruz and Prabawani, 2017). Attitude will be measured by the level of likes and dislikes about the behavior (Alias et al., 2013).

Table 1: Variables details used in this present study

Variable	Construct
A	A1 utilization natural lighting
	A2 utilization natural ventilation
	A3 Reducing energy consumption
R	R1 turn off the lights when not in use
	R2 turn off the air conditioner when not in use
	R3 use air conditioning in the room only during class hours
	R4 turn off the fan when not in use
	R5 do not turn on the air conditioner when the weather is not hot
	R6 use the HP Charger as needed
	R7 turn off the monitor screen whenever not in use
	R8 puts the computer into hibernation mode or sleep mode when leaving the computer for a short time
B	B1 efficient use of energy can reduce climate change
	B2 green behavior can create a green campus
	B3 participating in energy saving campaigns can create a green campus
BI	BI1 intention to seek information about green campus or green concept
	BI2 intention to behave green because they have gained knowledge about green campus
	BI3 intention to behave green because have attention to green campus
	BI4 intention to behave green because they have attention to green campus
	BI5 intention to behave green because they are attracted to green campus
	BI6 intention to behave green in everyday life
BC	BC1 energy-saving behavior
	BC2 use electricity as needed
ECA	ECA1 Renewable energy productior
	ECA2 Waste to energy application
	ECA3 energy saving features

A positive attitude towards energy conservation on campus should be started as early as possible. Facility managers including university managers must pay attention to this need to educate and embed a good attitude towards energy saving (Lee and Arumugam, 2016). According to Fu et al. (2017), attitude can create emotions that affect good or bad activities in pro-environmental behavior. Pro-environmental behavior, also known as green behavior or low carbon behavior by students, can influence energy conservation on campus. Several arguments regarding attitude to energy conservation application form the hypothesis 1 (H_1).

H_1. Attitude positively influence energy. conservation application.

3.1.2. Responsibility

Manufacturers have the responsibility for environmental preservation and improvement by producing environmental-friendly products. Consumers have a responsibility to protect the environment by not consuming products that are harmful to the environment (Wu and Chen, 2013). Responsibility for energy conservation shows that there is responsibility for energy use such as turn-off the lighting equipment before leaving a room unoccupied (Gandhe and Pandey, 2018). Positive statements such as turn off the room lights when the room is unoccupied and unplugging the electrical appliance after use to reducing the energy consumption (Ogbuanya and Nungse, 2020). Consumers' awareness of the dangers of excessive energy consumption is related to the belief in personal responsibility so that it is necessary to establish and knowledge of consumers about environmental damage caused by excessive consumption of natural resources (Ibtissem, 2010). People who have responsibility for things related to environmental issues such as energy use will tend to feel compliant to reduce their energy consumption (Yeboah and Kaplowitz, 2016). Several studies about having responsibility to energy conservation application form the hypothesis 2 (H_2).

H_2. Responsibility positively influence energy conservation application.

3.1.3. Belief in energy conservation

Belief contributes to overcome environmental problems, one of which is by conserving energy (Alias et al., 2013). Consumers who have environmental awareness are often called as consumer with a "green orientation" which is predicted to be increased in the future. Consumers who have a high awareness of the environment will tend to choose products that are environmental-friendly even though the price is relatively more expensive (Vlosky et al., 1999; Laroche et al., 2001). Beliefs would predict the effectiveness of descriptive norm information on the energy savings. Beliefs towards energy conservation would predict energy-saving behavior (Jachimowicz et al., 2018). Beliefs may influence pro-environmental behavior, especially in energy conservation (Yusliza et al., 2020). Several arguments about beliefs to energy conservation application form the hypothesis 3 (H_3).

H_3. Beliefs positively influence energy conservation application.

3.1.4. Behavior intention

Student's intent is important to promote pro-environmental behavior, such as energy conservation (Yusliza et al., 2020). Environmental knowledge is related to science and awareness of environmental problems and solutions. The most important dimension of environmental awareness in each individual is environmental knowledge, values, willingness to act, and actual behavior which is influenced by several factors including elements of intent and situation (Zsoka et al., 2013). Willingness can be measured as the intensity value of individual to create a special behavior (Alias et al., 2013). Behavioral intention is almost detached from socio-economic reality but a strong intention is nothing without an action (Gandhe and Pandey, 2018). Belief and interest were strongly related to energy-related behavioral intentions toward energy conservation (Takahashi et al., 2017). Some research regarding behavioral intention to energy conservation application form the hypothesis 4 (H_4).

H_4. Behavior Intent positively influence energy conservation application.

3.1.5. Perceived behavior control

Perceived behavior control influence energy-saving behavior that related to energy conservation effort (Wang et al., 2014; Gandhe and Pandey, 2017). The research about perceived behavior control form the hypothesis 5 (H_5). Perceived behavioral control

explains how energy users perceive their ability to perform energy conservation behaviors that depend not only on their attitudes and social constraints, but also on personal beliefs (Alias et al., 2013. This research form the hypothesis 6 and 7 (H_6 and H_7).

H_5. Perceived behavior control positively influence energy conservation application.
H_6. Attitude positively influence perceived behavior control.
H_7. Belief positively influence perceived behavior control.

4. RESULTS

4.1. Outer Model

The first part of PLS analysis is measurement model that analyze the reliability and validity. The model shows the influence of attitude, responsibility, perceived behavior control, belief and behavior intention to energy conservation in green campus design and influence of attitude and belief to perceived behavior control (Figure 1).

Based on the test of the loading factor validity in Figure 2, it is known that the indicators on R3, R5, R6 and R8 have a loading factor value of <0.7, so that these indicators are eliminated from the analysis process. Then proceed back to the second stage of the loading factor testing process.

Based on the test of the validity of loading factors in Table 2, it is known that all loading values are >0.7, which means that they have met the validity requirements based on the loading value. The loading of each indicator in a construct is greater than other constructs within the same variable tested. It means that the indicators in one construct have a stronger relationship than other constructs. The different of a main loadings and cross loadings are above 0.100. It means that indicators are accepted.

Table 2: Main loading

Indicators	A	B	BC	BI	ECA	R
A1	0.828					
A2	0.778					
A3	0.821					
B1		0.822				
B2		0.861				
B3		0.708				
BC1			0.924			
BC2			0.932			
BI1				0.731		
BI2				0.846		
BI3				0.917		
BI4				0.932		
BI5				0.869		
BI6				0.808		
ECA1					0.885	
ECA2					0.922	
ECA3					0.909	
R1						0.789
R2						0.845
R4						0.829
R7						0.735

Figure 1: Path diagram 1. Validity testing based on loading factors (Stage 1).

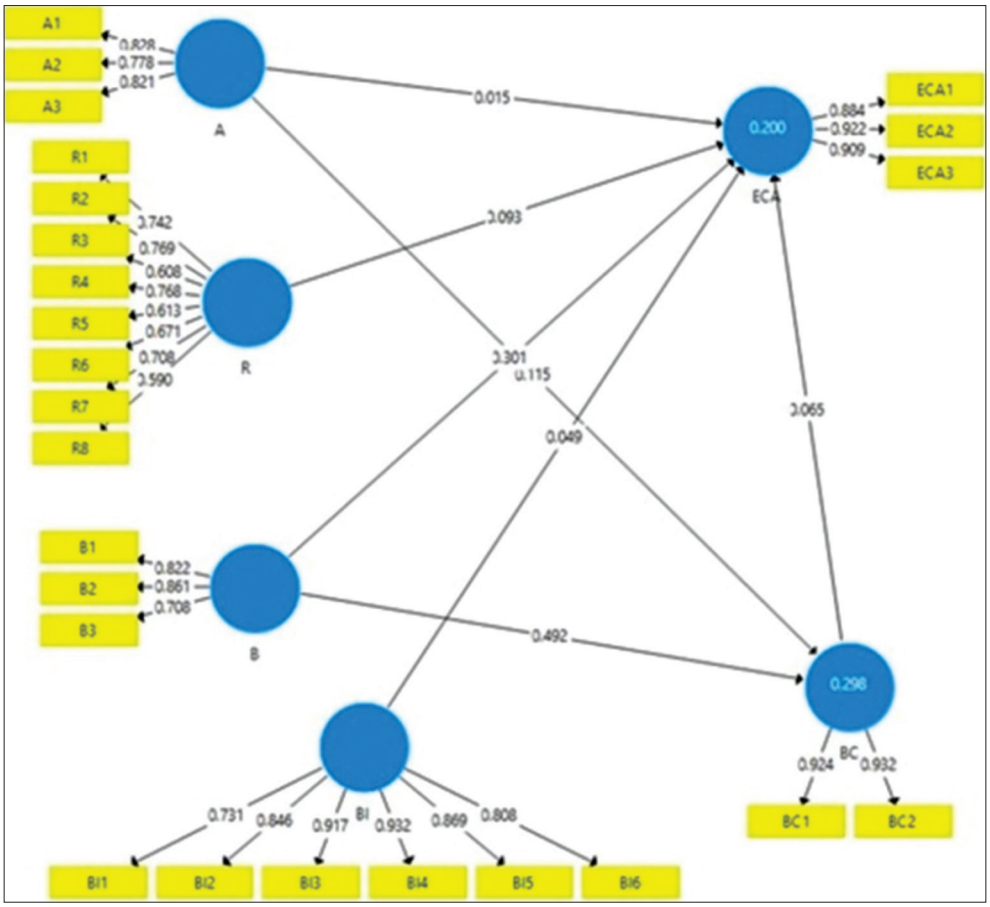
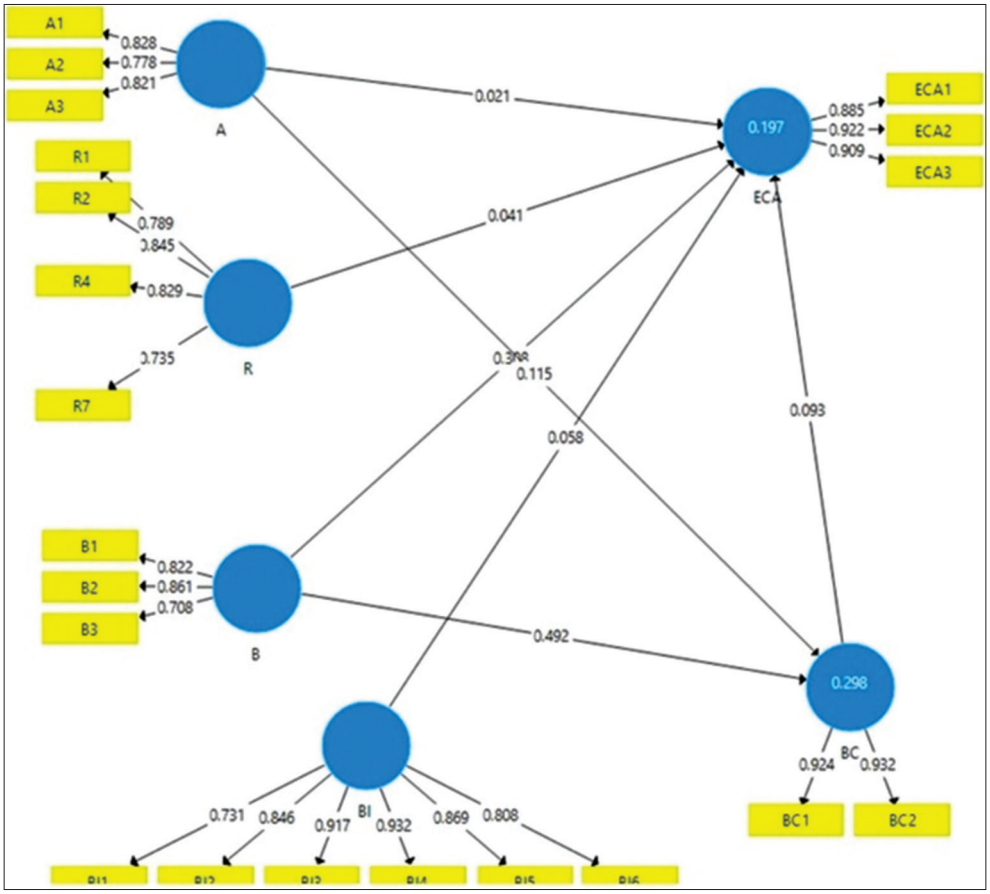


Figure 2: Path diagram 2. Validity testing based on loading factors (Stage 2).



Furthermore, the validity test is carried out based on the average variance extracted (AVE) value. It is known that all AVE values are >0.5, which means that they have met the validity requirements based on AVE. Furthermore, reliability testing is carried out based on the composite reliability (CR) value.

All CA values is >0.7, which means that they met the reliability requirements based on Cronbach's alpha (Table 3). The value of Attitude is 0.655; Belief is 0.640; perceived Behavior Control is 0.861; Behavior Intention is 0.728; Energy Conservation Application is 0.820 and Responsibility is 0.641. In the analysis, the R-square value for perceived Behavior Control is 0.298 and Energy Conservation Application is 0.197. It is known that the coefficient of determination (R-Square) for BC is 0.298, which means that A and B are able to influence BC by 29.8%. It is known that the coefficient of determination (R-Square) for ECA is 0.197, which means that A, R, B, BI, BC are able to influence the ECA by 19.7%.

The Goodness of Fit (GoF) value was obtained at 0.423. The GoF of this result is included as large value (>0.3600). The value obtained in this analysis is >0.36, which means that the independent variable and the dependent variable have a strong relationship. Furthermore, the discriminant validity test was conducted by using the Fornell-Larcker approach. In discriminant validity testing, the value of the square root AVE of a latent variable is compared with the correlation value among latent variables. It is known that the square root value of AVE for each latent variable is greater than the correlation value among latent variables. So that it is concluded that it has met the requirements of discriminant validity (Table 4).

Table 3: Composite reliability

Construct	Average variance extracted	Cronbach's alpha	R^2
A	0.655	0.752	0,000
B	0.640	0.717	0.000
BC	0.861	0.839	0.298
BI	0.728	0.924	0.000
ECA	0.820	0.891	0.197
R	0.641	0.816	0.000

Table 4: Discriminant validity

	A	B	BC	BI	ECA	R
A	0.809					
B	0.378	0.800				
BC	0.301	0.535	0.928			
BI	0.401	0.658	0.518	0.853		
ECA	0.200	0.426	0.321	0.337	0.906	
R	0.270	0.531	0.662	0.476	0.300	0.800

4.2. Inner Model

The next stage is to test the hypothesis. All samples were tested using ×5000 bootstrapping samples to find the rejection of

Table 5: Hypothesis testing

Hypothesis	Relationship	Original Sample (O)	Mean	Standard Deviation (STDEV)	T-value	P-value	Supported
H_1	A ->ECA	0.021	0.023	0.057	0.379	0.705	No
H_2	R ->ECA	0.041	0.052	0.062	0.667	0.505	No
H_3	B ->ECA	0.308	0.298	0.064	4.799**	0.000	Yes
H_4	BI -> ECA	0.058	0.060	0.073	0.793	0.428	No
H_5	BC ->ECA	0.093	0.092	0.062	1.495	0.136	No
H_6	A ->BC	0.115	0.121	0.046	2.482**	0.013	Yes
H_7	B ->BC	0.492	0.484	0.065	7.620**	0.000	Yes

**P<0.01

reflective measurement or bias-corrected confidence interval that is different from zero (Chin and Dibbern, 2010). The Hypothesis testing shows at Table 5. The t-value describe the hypothesis for independent and dependent variables.

H_1 Attitude has a positive effect on energy conservation application on green campus design with a t-value of 0.379 but not significant with a P = 0.705 >0.05.

H_2 Responsibility has a positive effect on energy conservation application on green campus design with a t = 0.667 but not significant with a P = 0.505 >0.05.

H_3 Belief has a positive effect on energy conservation application on green campus design with a t-value of 4.799 and is significant with a P = 0.000 <0.05.

H_4 Behavior Intention has a positive effect on energy conservation application on green campus design t = 0.793 but not significant with P = 0.428 >0.05.

H_5 Perceived Behavior Control has a positive effect on energy conservation application on green campus design with a t = 1.495 but not significant with a P = 0.136 >0.05.

H_6 Attitude has a positive effect on perceived behavior control with a t = of 2.482 and significant with a P = 0.013 <0.05.

H_7 Belief has a positive effect on perceived behavior control with a t = 7.620 and is significant with a P = 0.000 <0.05.

5. DISCUSSION

According to the result, the attitude and belief in energy conservation affecting the perceived behavior control which further improve the energy conservation in the campus. Students who believe in energy conservation will try to save energy, use energy efficiently, and behave green behavioral. Energy conservation efforts in green campus design can be applied with the support and trust of students' behavior. The results of this present study are in accordance with previous research (Alias et al., 2013; Vlosky et al., 1999; Laroche et al., 2001; Jachimowicz et al., 2018; Yusliza et al., 2020).

Energy conservation behavior is a type of human behavior that is displayed physically or verbally in a context related to the environment which also provides conditions for public behavior regarding environmental benefits and public conservation of a resource (Thayayuth and Pimdee, 2018). Psychological factors are considered important as an effort to save energy in green behavior, including moral norms, pro-environmental attitudes, personal responsibility, and beliefs (Olson et al., 2013).

For developing sustainable production and consumption systems that are more environmental-friendly, the environment does not only depend on the use of technology and regular changes in consumer behavior, but also on the willingness of consumers to take part in reducing or changing their consumption behavior to be greener (Akenji, 2014; Peattie, 2010).

Based on Cruz and Prabawani (2017), consumers' tendency to adopt environmental-friendly consumption behaviors is identified through consumer demographics and psychographics (lifestyle). Consumers who have higher education can make it easier to understand complex environmental issues to deeply focus on environmental quality and are more willing to adopt environmental-friendly behavior (Zhao et al., 2014). Consumers with education and knowledge about the environment will impact the buying behavior of environmental-friendly products as a form of consumer contribution to environmental protection. From a psychological perspective, environmental-friendly products that are following consumers' lifestyle are expected to bring benefits to consumers in the form of safety and health and provide protection benefits for the environment.

According to Ibtissem (2010), there is an accumulation of knowledge about the impacts of altruism, egoism, anthropocentrism, and eco-centrism related to energy conservation behavior. The value of selfishness is shown by individuals who are less involved in environmental protection if there is interference with other human-centered values such as quality of life. Altruistic and anthropocentric values are important for promoting these educational institutions' values and conducting campaigns to raise environmental awareness. Consumers' awareness of the dangers of excessive energy use is linked to a belief in personal responsibility.

According to Alias et al. (2013), the best way to conserve energy is to focus on behavioral aspects through improving energy conservation behavior users. Examples of energy-saving behavior include turning off the lights when leaving the room if no one is in, turning off the computer when not in use, using energy-efficient light bulbs and unplugging equipment, or turning it off when not in use. Perceived behavioral control explains how energy users perceive their ability to perform energy conservation behaviors that depend not only on their attitudes and social constraints but also on personal beliefs. Energy conservation behavior is a part

of the solution to achieve energy sustainability and protect the environment. Knowledge influences the awareness and actual behavior of the individual. Student behavior affects energy use, so that good energy conservation behavior is needed.

Environmental-friendly consumption behavior starts from saving energy users such as electricity, water, and fuel, reducing the use of air conditioning, avoiding the use of excess plastic, recycling packaging, plastics, cardboard, and paper, and purchasing environmental-friendly products, especially cosmetic products Cruz and Prabawani, 2017). Recycling behavior affects the purchase of green products (Schlegelmilch et al., 1996).

Based on (Gandhe and Pandey 2017) research on India's energy conservation behavior, awareness, motive of energy conservation, and motive has a relationship to sustainable conservation behavior. Individuals' attitudes and intentions do not directly affect individuals' socio-economic and psycho-social realities in carrying out energy conservation behavior. Actions do not accompany sometimes strong intentions. Cultural factors and socio-economic constraints play an important role because India is a unique country. Behavioral intention is almost independent of socio-economic reality; the low explanation regarding energy conservation behavior that has been given indicates that many things have not been resolved; in addition, gender does not affect the intention to carry out energy conservation behavior.

Energy conservation behavior is very important for large organizations such as universities consisting of students and staffs that consume a lot of energy (Ting et al., 2011). Student behavior makes a major contribution to energy use. However, another result of this study showed that the analysis shows that attitude, perceived behavior control, behavior intention, and responsibility have no effect on campus energy conservation. Students have attitudes, perceived behavior control, intention and responsibility in using energy but they do not significantly affect energy conservation efforts in green campus design. This finding contradicts the previous researches (Zelezny and Schultz, 2000; Ibtissem, 2010; Alias et al., 2013; Zsoka et al., 2013; Wu and Chen, 2013; Wang et al., 2014; Cruz and Prabawani, 2017; Gandhe and Pandey, 2018). Students can participate in the realization of campus energy conservation effort, but there is a need for collaboration with campus management. The policies issued by the campus management and the green behavior of students should support each other.

The progress of a green campus should not stop after improving energy conservation and resource efficiency. However, students, faculty staff, and administrators' joint participation is needed to develop further the green design concept (Fu et al., 2017). In the green campus development process, administrators have an important role as policymakers. Tra Vinh University has implemented a strategy that regulates three main activities that have significant results, including green projects for sustainable development in order to increase awareness of green ideas among students and staffs; reduce water consumption and save energy by using automatic systems such as automatic taps and solar energy systems for heating water in housing; and take precautions against factors implementing measures that cause environmental damage such as dust and smoke, normal solid waste substances, hazardous solid waste substances, wastewater, and noise (Khanh, 2018).

Universities can integrate environmental sustainability through education, research, operations, and university administration (Jabbour, 2010). The green campus is a university policy as an effort to follow the concept of sustainability. The university contributes to the environmental conservation process through knowledge, green campuses, and public awareness (Rwelamila and Neha, 2015). Green campus initiatives include the management of the green building, energy, air, food, transportation, waste, and sustainable landscaping (Calder and Dautremont-Smith, 2009). The university's progress in becoming a green campus is due to various challenges and obstacles so that facilities are needed to overcome them (Owens and Halfacre-Hitchcock, 2006).

In addition, giving an insight of environmental knowledge as the science of applying environmental-friendly products should be conducted for all university staff and students (Polonsky, 2011; Lim et al., 2014). The information about environmental knowledge among consumers will help evaluate green consumer behavior to provide advice on action strategies (Cheah and Phau, 2011). Universities should focus on education directed at students and faculty staff in green campus planning without neglecting all aspects of the sustainability plan, such as energy use (Parker, 2007).

6. CONCLUSIONS

Green behavior by campus occupants is beneficial to support campus efforts to apply green campus concepts. The results are used to formulate the factors affecting energy conservation in green campus design based on green behavior. Furthermore, the results of this study can be the basis for the preparation of an energy conservation policy on campus. The variable that affects energy conservation on the campus is belief. Meanwhile, attitude and belief influence perceived behavior control, but perceived behavior control does not affect campus energy conservation. Energy conservation application is important for the realization of green campus design. Green behavior should implement in the campus environment. In order to create a green campus, there must be support from campus residents, namely students, lecturers, and staff. This research was conducted by asking for input from students with the highest number as the campus residents. Further research will be carried by increasing the number of respondents, especially the students and academicians and other campus residents.

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