

# Examining Students' Intentions to Use Energy-Efficient Products: An Application of Theory of Planned Behaviour

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**ABSTRACT:** *Energy-efficient products can reduce the threat of global climate. This research aims to examine students' intentions to use energy-efficient products by using theory of planned behaviour as the guiding principle. Data were analysed using descriptive analysis via the Statistical Package for Social Sciences (SPSS). The results of descriptive analysis revealed that of the twenty-six items assessed, two statements which represented the environmental awareness factor were the top important aspects highlighted by the respondents in respect to positive perception towards energy-efficient products. They reported that "the main cause of the climate change is a lack of environmental risk perceptions". This is followed by statement "current environmental situations are very serious for our future". Moreover, belief factor is also strongly upholding by the participants in this research. They asserted that reliability is important when considering energy-efficient products. Indeed, they strongly believe that environment is important when considering energy-efficient products. The findings advanced body of knowledge on student intentions to use energy-efficient products, which is not much enclosed in the literature in Malaysian context. Direction for future research is also furnished.*

**Keywords :** *Attitude, Energy-Efficient Products, Environmental Awareness, Green Product, Theory of Planned Behaviour.*

## 1. INTRODUCTION

Energy-efficient products can reduce the threat of global climate. Green labels products, including energy-efficient products referred to "new or renovated structures designed, constructed, operated, and demolished in an environmentally friendly and energy-efficient manner" [1]. A green energy label of products heavily focuses on reduce, reuse, and recycle, as well as energy and efficiency [2]. Figure 1 illustrates the energy-efficient products for consumers' product evaluations during green purchase consumption decision making. Green practices through purchasing energy-efficient products would strengthen company image, entice customer interest towards greener lifestyle, and upsurge satisfaction [3]. Accordingly, this research aims to examine students' intentions to use energy-efficient products by using

theory of planned behaviour as the guiding principle.



Figure 1: Energy-Efficient Products

The ensuing section discussed literature review followed by methodology employed in this research study. Data analysis is followed suit. The discussion of findings and conclusion are furnished in the final section.

## 2. LITERATURE REVIEW

Attitudes is defined as “the degree of people awareness of performing electricity-saving behavior, which largely depends on the evaluation of preference to electricity savings and the information the individual holds towards such a behavior” [4]. In addition, attitude refers to a “tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour” [5]. This attitude is sets of beliefs and affect toward certain item or an action which may turn into intention to perform the action [6]. Past scholars found that environmentally friendly attitude concerning green consumerism influenced consumers’ intention to purchase green [7-9].

Environmental concern is referred as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and or indicate the willingness to contribute personally to their solution” [10]. This research associated environmental awareness with environmental concern. Environmental awareness affects consumers' purchasing behaviour in respect of green products in the sense that the higher the concerns for the quality of the environment, the more likely consumers will actively make green products purchases [11]. Similar discoveries were found in preceding studies e.g. [12-13]. Scholars like Suki and Suki [14] and Yadav and Pathak [15] avowed that the relationships between environmentally relevant utilitarian product attributes and purchase intentions is significant.

By having better understanding regarding the substantial benefits of energy resource issues, inclination to make price premium payment for renewable energy is higher [16]. The green energy labeling aids consumers in product evaluation in terms of the genuity of the electricity products [17]. Subjective norms are defined as “the perceived social pressure to perform or not to perform the behavior” [18]. In other words, subjective norms are the individual perception or “opinion about what important others believe the individual should do” [19]. Environmental knowledge is defined as an “individual's factual knowledge about the environment and specified environmental knowledge and awareness as the prerequisite for the formation of

environmental attitude” [20]. Aspects of knowledge, belief, confidence, environmental awareness, subjective norm, eagerness, attitude, would affect consumer behavioral intention.

### 3. METHODOLOGY

Three-hundreds respondents in a public higher learning institution in northern state of Malaysia were approached to complete a self-administered questionnaire. Data was collected via convenience sampling technique in January 2020. This sample size topped 100 the threshold set by Hair et al. [21], inferring an adequate size. The socio-demographics characteristics of the respondents is presented in Table 1. Of the total respondents, 41% was males, and 59% was female. They were mainly aged 22 years old and below (80%), whereas the balance (20%) aged between 23 and 24 years old.

Table 1: Socio-demographics Characteristics of the Respondents

Characteristics	Frequency	Percentage (%)
<i>Gender</i>		
Male	123	41.0
Female	177	59.0
<i>Age (years old)</i>		
19 - 20	68	22.7
21 - 22	173	57.7
23 - 24	59	19.6
<i>Frequency of buying energy-efficient products</i>		
Once in a week	81	27.0
2-3 times in a week	139	46.3
4 - 5 times in a week	47	15.7
More than 5 times in a week	33	11.0
<i>Money spent on energy-efficient products in a week</i>		
≤ RM100	74	24.7
RM101-RM150	111	37.0
RM151-RM200	63	21.0
≥ RM201	52	17.3

Figure 2 demonstrated the descriptive of frequency of buying energy-efficient products. Close to half of the respondents (46%) have purchased energy-efficient products two to three times in a week, 27% have purchased it once in a week, 16% have made purchases between four to five times in a week, and 11% have purchased it more than five times in a week.

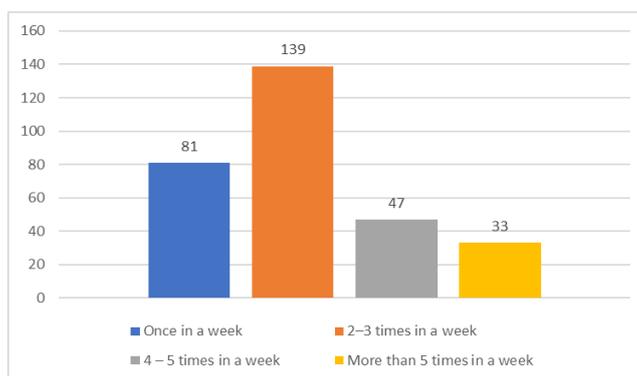


Figure 2: Descriptive of Frequency of Buying Energy-Efficient Products

When asking about money spent on energy-efficient products in a week, 37% of the respondents have spent between RM101 and RM150 (see Figure 3). A-quarter of the respondents (25%) have spent less than RM100 on energy-efficient products in a week. Twenty-one percent of the respondents have spent between RM151 and RM201. However,

small portion have spent more than RM 201 on energy-efficient products in a week.

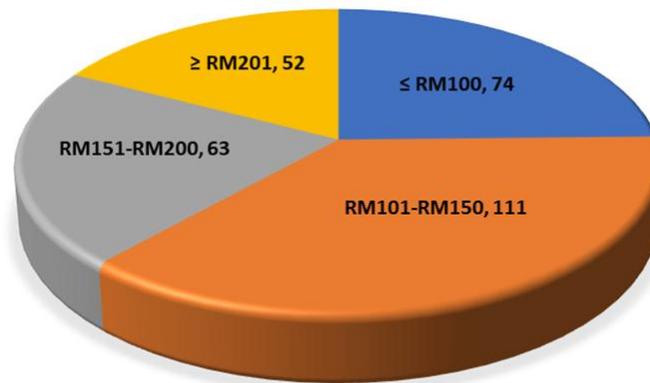


Figure 3: Descriptive of Money Spent on Energy-Efficient Products in a Week

In the first section of a two-section questionnaire, socio-demographic characteristics the respondents are presented like gender, age, frequency of buying energy-efficient products and money spent on energy-efficient products in a week. The second section requires respondents to furnish input regarding their perception on knowledge, confidence, environmental awareness, subjective norm, eagerness, attitude, and behavioral intention. Precisely, knowledge contained four items, belief encompassed three items, and confidence composed three items. In addition, environmental awareness entailed three items, whereas subjective norm contained four items. Furthermore, eagerness involved three items, and attitude encompassed four items. Behavioral intention consisted two items. This measurement of instruments was designed in a 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). A descriptive analysis was performed for data analysis via the Statistical Package for Social Sciences (SPSS) computer programme version 21.

#### 4. DATA ANALYSIS

The descriptive statistics of twenty-six items related to consumer perception towards energy-efficient products is presented in Table 2. This covers aspects of knowledge (4 items), belief (3 items), confidence (3 items), environmental awareness (3 items), subjective norm (4 items), eagerness (3 items), attitude (4 items), and behavioral intention (2 items).

Table 2: Perception towards Energy-Efficient Products

Items	Means	Standard Deviation
<b>Knowledge</b>		
"I'm very familiar with energy-efficient products."	3.687	1.042
"I believe that I'm knowledgeable about energy-efficient products."	3.733	0.976
"Energy-efficient appliance is more appropriate for the environment than conventional cost saving appliances."	3.930	0.800
"Energy-efficient appliances is produced by the environmentally friendly process."	3.990	0.734
<b>Belief</b>		
"I believe that being environmentally conscious when buying does not directly benefit the environment."	3.637	0.913
"I believe that environment is important when considering energy-efficient products."	4.067	2.372
"Reliability is important when considering energy-efficient products."	4.087	0.786
<b>Confidence</b>		
"I believe in the quality guarantee of energy-efficient products."	3.857	0.867
"I trust my own judgment when deciding which appliances to consider."	3.787	0.851
"I am very confident about which appliances are worth considering for the environment."	3.860	0.830
<b>Environmental Awareness</b>		
"The main cause of the climate change is a lack of environmental risk perceptions."	4.163	0.844
"Current environmental situations are very serious for our future."	4.130	0.985
"Without innovation, conventional production is a serious environmental problem."	4.007	0.858
<b>Subjective Norm</b>		
"Everyone has a responsibility to contribute to environmental preservation by purchasing energy-saving products."	3.890	0.817
"I feel morally obligated to refrain from buying the conventional cost-saving products."	3.703	0.926
"I get a bad conscience if I choose conventional instead of energy-saving products."	3.900	0.879
"I accept and carry out the environmental activity even though it is different from me."	3.865	0.765
<b>Eagerness</b>		
"I like helping the current climate change."	3.987	3.066
"I like engaging in the environmental campaign."	3.790	1.937
"I can be very enthusiastic if my action helps the planet."	3.943	0.759
<b>Attitude</b>		
"It is not important to me whether the product is energy-saving or not."	2.807	1.220
"Environmental protection is important to me when making purchases."	3.863	0.796
"If I can choose between energy-saving and conventional product, I prefer energy-saving one."	3.967	0.766
"I have a favorable attitude toward purchasing and energy-saving product."	4.057	0.785
<b>Behavioural Intention</b>		
"The probability that I will buy the energy-saving product is very high."	3.765	1.973
"I will buy an energy-efficient product in a more effective way."	3.987	0.850

Precisely, the leading statement in knowledge factor, namely "Energy-efficient appliances is produced by the environmentally friendly process" had mean value 3.990. This is followed by statement "Energy-efficient appliance is more appropriate for the environment than conventional cost saving appliances" with mean value of 3.930. Additionally, statement "I believe that I'm knowledgeable about energy-efficient products" (M=3.733), and "I'm very familiar with energy-efficient products" (M=3.687) trailed next that represented knowledge factor.

Table 2 specifics that of the three-items in belief factor, respondents heavily noted that "Reliability is important when considering energy-efficient products" (M=4.087). Indeed, they also reported that "environment is important when considering energy-efficient products" (M=4.067), and "believe that being environmentally conscious when buying does not directly benefit the environment" (M=3.637). In confidence factor, an acknowledgement that the participant is very "confident about which appliances are worth considering for the environment" had mean value of 3.860. They also reported that they "believe in the quality

guarantee of energy-efficient products” (M=3.857). Indeed, they also “trust their own judgment when deciding which appliances to consider” (M=3.787).

In regards to environmental awareness, respondents highlighted “the main cause of the climate change is a lack of environmental risk perceptions” (M=4.163), and “current environmental situations are very serious for future” (M=4.130). Furthermore, they also stressed that “without innovation, conventional production is a serious environmental problem” (M=4.007). When checking the aspect of subjective norm, the mean values ranging between 3.703 and 3.900. Statement “I get a bad conscience if I choose conventional instead of energy-saving products” topped the list with mean value of 3.900, followed by “Everyone has a responsibility to contribute to environmental preservation by purchasing energy-saving products” with mean value of 3.890. Respondents also reported that they “accept and carry out the environmental activity” (M=3.865), and “feel morally obligated to refrain from buying the conventional cost-saving products” (M=3.703). The eagerness factor had mean value ranging from 3.790 to 3.987. The respondents put forward that they “like helping the current climate change” (M=3.987). Moreover, they “can be very enthusiastic if their action helps the planet” (M=3.943), and they also “like engaging in the environmental campaign” (M=3.790).

Further inspection on the descriptive analysis of attitude factor indicated that respondents “have a favorable attitude toward purchasing and energy-saving product” (M=4.057). The participant declared that they would prefer energy-saving product if they need to choose between energy-saving and conventional product (M=3.967). Additionally, they reported that environmental protection is important to them when making purchases (M=3.863). However, statement “It is not important to me whether the product is energy-saving or not” had smallest mean value in attitude factor (M=2.807). The ensuing factor, behavioral intention entailed two items of which respondents heavily acknowledged that they “will buy an energy-efficient product in a more effective way”. This statement had highest mean value (M=3.987). What’s more, the probability that they “will buy the energy-saving product is very high” (M=3.765).

## 5. DISCUSSION

This research examined students’ intentions to use energy-efficient products by using theory of planned behaviour as the guiding principle. The results of descriptive analysis revealed that of the twenty-six items assessed, two statements which represented the environmental awareness factor were the top important aspects highlighted by the respondents in respect to positive perception towards energy-efficient products. They reported that “the main cause of the climate change is a lack of environmental risk perceptions”. This is followed by statement “current environmental situations are very serious for our future”.

Moreover, belief factor is also strongly upholding by the participants in this research. They asserted that reliability is important when considering energy-efficient products. Indeed, they strongly believe that environment is important when considering energy-efficient products. The discoveries by Suki and Suki [11] acknowledged that “environmental protection is the responsibility of all members of society”. Similar discoveries were reported in Suki [13], and Suki and Suki [14]. Besides that, statement “I have a favorable attitude toward purchasing and energy-saving product” derived from attitude factor was also emphasized by the respondents with regards to their intentions to use energy-efficient products.

## 6. CONCLUSION

The green products offer substantial benefits to the more environmentally concern consumers [11]. According to González-Rodríguez et al. [22], consumers have strong inclination to recommend, revisit, and spend more money for environmentally friendly products and services. Henceforth, it is vital for marketers and managers to communicate this benefit to “target group, since consumers’ beliefs regarding the good ecological performance of the brand lead to positive attitude towards that brand” [23].

Future research is recommended to expand sample size in order to improve the generalizability of the present findings. Examination of moderating role of gender and religion are also recommended as it would advance body of knowledge regarding different perspective of male and female consumer and Muslim and non-Muslim consumer context [24-26]. Moreover, further research on the application of computer technologies and systematic literature would also advance body of knowledge [27-28].

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