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DETERMINANTS OF ENERGY EFFICIENT APPLIANCES AMONG MALAYSIAN HOUSEHOLDS: ROLES OF THEORY OF PLANNED BEHAVIOR, SOCIAL INTERACTION AND APPLIANCE QUALITY

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ABSTRACT

The purpose of this study is to investigate the determinants of purchasing intention of energy efficient appliances among Malaysian households. Consumer behavior, particularly when purchasing non-environmentally friendly products, contributes significantly towards environmental problems and climate change. This study adopts the theory of planned behavior as the basis and integrates it with two external domains, namely social interaction and the quality of energy efficient appliances. A total of 318 respondents participated and were analyzed via partial least squares structural equation modeling (PLS-SEM). Findings show that perceived behavioral control and subjective norms exert a significant and positive effect on consumers' intention to purchase energy efficient appliances, while attitude has no significant influence. Meanwhile, social interaction and quality were found to be critical determinants of intention to purchase energy efficient appliances. Implications in the context of sustainable purchasing behavior and recommendations to increase consumers' purchases of energy efficient appliances or green appliances are discussed.

Contribution/Originality: This paper supports the study of energy saving behavior within the context of purchasing energy efficient appliances. While plenty of studies have been done on habitual energy saving behavior, studies on purchasing energy efficient appliance are still in their infancy.

1. INTRODUCTION

Human activity is the main cause of environmental degradation and climate change, which are largely contributed to by consumer behavior (Apipuchayakul & Vassanadumrongdee, 2020; Blasch, Filippini, & Kumar, 2019; Wang, Sun, Wang, & Zhang, 2019). Among this behavior is the consumers' purchases of non-energy efficient appliances, either for households or workplaces. Energy efficient appliances consume less electricity compared with inefficient appliances (Agyarko, Opoku, & Van Buskirk, 2020). Recent research finding shows that many factors influence the consumers' purchase behavior (Dieleman et al., 2018; Mizobuchi & Takeuchi, 2016). For example, the intention to purchase may result from suggestions by others through search engines, interacting with social media messages, or product reviews. In addition, these suggestions will serve as updated information for manufacturers as it allows them

to develop strategies for marketing their energy efficient appliances (De Silva, Wang, & Kuah, 2020; Huh, Jo, Shin, & Yoo, 2019).

In addition to benefitting the manufacturers, investigating consumers' intention to purchase green appliances will also help relevant authorities to mitigate problems of energy consumption with regard to domestic energy efficient appliances. Before taking any action to regulate or induce the awareness on the Malaysian energy efficient appliance market and inspire consumers to purchase green appliances, it is important to discuss what factors drive Malaysian consumers to purchase energy efficient appliances. Yet, limited research has been performed that focuses on these appliances, so this study aims to bridge this gap. Research on the determinants of consumers' intention to purchase energy efficient appliances in Malaysia was first carried out in 2005 by Mahlia, with more recent research conducted by Tong, Islam, Low, Choo, & Abdullah (2019).

The theory of planned behavior (TPB) was selected as the basic theoretical model in this study. The TPB, introduced by Ajzen (1991), is an impactful theory that explains individuals' behavior (Ajzen, 1991; Wang, Guo, Wang, Zhang, & Wang, 2018; Yadav & Pathak, 2017). Given the specific research context and background, other variables have been integrated within the TPB model to better explain individual behavior (Kaffashi & Shamsudin, 2019; Song, Zhao, & Zhang, 2019; Verma & Chandra, 2018; Yadav & Pathak, 2017). Current research that shows consumers' concerns regarding product quality, and past experiences of family and friends with purchasing energy efficient appliances, were added into the TPB model to develop a comprehensive theoretical model to understand consumers' intention to purchase energy efficient appliances (Ballarotto, Volpi, Marzilli, & Tambelli, 2018; Dieu-Hang, Grafton, Martínez-Espiñeira, & Garcia-Valiñas, 2017; Issock, Mpinganjira, & Roberts-Lombard, 2018; Soh, Chew, Koay, & Ang, 2018).

2. LITERATURE REVIEW

2.1. Theory of Planned Behavior

Purchasing is a behavior that corresponds to inner thoughts and conflicts and gaining as much product knowledge as possible. Internal and external factors that represent perceived behavioral control (PBC), attitudes and subjective norms (SN) in the theory of planned behavior have shown that the intention connects the possible factors that will lead to purchasing behavior (Gunarathne, Kaluarachchilage, & Rajasooriya, 2020; Hu, Fang, & Yu, 2020; Nie, Vasseur, Fan, & Xu, 2019). The TPB theory emphasizes the importance of these three main determinants (perceived behavioral control, attitudes and subjective norms) (Ajzen, 1985; Ajzen & Driver, 1991, 1992) in predicting the intentions and future behavior of humans as these determinants exhibit measurable and perceived characteristics (Mahardika, Thomas, Ewing, & Japutra, 2020a; Sentosa & Mat, 2012). This study aims to expand the idea of proofing the selective factors which possibility increase purchasing behavior and increase the level of intention to purchase energy efficient appliances.

This study focuses on consumers' electrical energy consumption from energy efficiency appliances. The complexities of consumer lifestyles and lack of knowledge regarding the environmental impact from the residential aspect will unconsciously affect the environment. Recent research on the TPB explores the consumer purchasing behavior of energy efficient appliances with different methodological and applied fields such as psychology and applied psychology (Ma, Andrews-Speed, & Zhang, 2013), the value-belief-norm (Parikh & Parikh, 2016), the psychology and industrial behavior concept (Huh et al., 2019), and social group norms (Kwon, Kim, Baek, & Kim, 2020; Mizobuchi & Takeuchi, 2016).

Many studies have been done on consumerism, and the TPB is considered as one of the most robust ways to explain the intention of individual behavior. In the current research context, consumers with positive attitudes towards purchasing energy efficient appliances believe that friends and relatives expect them to purchase the same, and they also have sufficient knowledge, time and money to purchase (Mahardika, Thomas, Ewing, & Japutra, 2020b). A higher subjective norm may indicate a higher likelihood of engaging in such activity. Perceived behavioral control

refers to "the controllability of conducting a certain behavior" (Apipuchayakul & Vassanadumrongdee, 2020; Gunarathne et al., 2020; Hu et al., 2020; Mahardika et al., 2020b).

2.2. Hypothesis Development

To understand consumers' intentions to purchase energy efficient appliances, this study posits that the TPB can be strengthened by incorporating social interaction and appliance quality into the model to improve the understanding of individual behavior. The five hypotheses are presented in the following subsections.

2.2.1. Attitude towards Energy Efficient Appliances

Attitude explains why certain people tend to use their inner perspectives to drive intention (Hung, Chang, & Shaw, 2019) and implies a person's inner argumentation (Verma & Chandra, 2018). Attitude derived from belief is also influenced by past experiences. Beliefs of an individual guide their future behavior and the processes defining attitude can be explained by the belief concept. In the context of consumers' purchasing behavior of energy efficient appliances, the goal of intention to purchase likely relies on past experience which is correlated to beliefs regarding the positive outcome of purchasing the appliances and one's degree of inclination to comply with those beliefs (Masud et al., 2016; Ting, Chuah, Cheah, Memon, & Yacob, 2015; Xu, Hua, Wang, & Xu, 2020).

Attitude is essential to fully understanding the role human behavior plays in energy consumption, as well as to further realize future intention of purchasing behavior of energy efficient appliances for the home. Energy consumption varies from one household to another and is based on the lifestyle of those in the household. The trend of younger people in purchasing the household appliances can be seen through their purchase of product durability (Zhang, Bai, & Mills, 2020). There are many different reasons for purchasing appliances, such as air-conditioning for cooling and television for entertainment. More specific studies on consumer behavior modification are needed to educate consumers to develop behavior that takes environmental issues into account. Hence, it is necessary to increase awareness of these issues among consumers when purchasing energy efficient appliances (Belaïd & Joumni, 2020; Domínguez-Amarillo, Fernández-Agüera, Peacock, & Acosta, 2020; Gunarathne et al., 2020; Sharpe et al., 2019). Thus, the proposed hypothesis is presented as:

H1: Attitude positively affects purchase intention of energy efficient appliances.

2.2.2. Perceived Behavioral Control (PBC)

PBC is a crucial factor of behavioral intention and energy saving behavior, and recent studies support the role of PBC, especially when purchasing domestic appliances (Mustafa, Husain, Aziz, Othman, & Malek, 2014). The awareness of purchasing energy efficient appliances has been increasing among the Malaysian population (Rahman et al., 2017), yet based on a study by Zailan et al. (2020), the use of energy efficient appliances in Malaysia is still at an unsatisfactory level. Consumers are more likely be attracted to cheaper products because the energy efficient household appliances are branded and expensive.

Consumers are usually able to differentiate appliances based on the product information regarding electrical usage (Claudy, Michelsen, & O'Driscoll, 2011). The same applies to the intention to purchase; consumers distinguish between household appliances and purchase the best appliances based on energy saving labels, instructions, or policies set by the government. As a result of perceived behavior control, household lifestyles gradually change. People are more willing to purchase efficient appliances as they become familiar with the importance of saving energy and environmental issues (Sarkis, 2017).

In predicting the intention to purchase energy efficient appliances, perceived behavior control and other relevant variables will be explored. This study examines factors influencing Malaysian consumer preferences regarding energy efficient appliances, especially for regularly used household appliances. The main contribution of perceived behavior control is that it defines individual perception and ease in performing the expected behavior. When purchasing energy

efficient household appliances, PBC influences intention by educating consumers about green/environmental issues regardless of financial benefit. Hence, the hypothesis is presented as:

H2: Perceived behavioral control has a positive influence on consumers' intention to purchase energy efficient appliances.

2.2.3. Subjective Norms

Subjective norms refer to the belief that an important person or group of people will approve and support a particular behavior (Li, Li, Jin, & Wang, 2019; Taufique & Vaithianathan, 2018). Subjective norms are determined by perceived social pressure from others to behave in a certain manner (Huang & Ge, 2019; Sentosa & Mat, 2012) and the motivation to comply with others' expectations (Paul, Modi, & Patel, 2016). Social pressure rises from both cultural differences and actions needed to reduce the effects of climate change. Recent research on non-distinct cultures, such as Sweden and Norway, show significantly positive customer intentions towards purchasing energy efficient appliances such as blenders, mixers and heaters during winter as these two countries share the same climate (Nguyen, 2018). In addition, studies from China and Finland also suggest that advice from family members and friends enhance the purchasing of energy efficient appliances (Tan, Ooi, & Goh, 2017). The opinions of family members and friends are considered as the most significant subjective norm in one's decision making (Nguyen, Skitmore, Gray, Zhang, & Olanipekun, 2017; Rajaee, Hoseini, & Malekmohammadi, 2019). Thus, the proposed hypothesis is presented as:

H3: Subjective norms have a positive influence on consumers' intention to purchase energy efficient appliances.

2.2.4. Social Interaction

Social interaction is an exchange between two or more individuals. A fundamental feature of social life is social interaction, or the ways in which people act with other people and react to how other people are acting (Ru, Wang, & Yan, 2018; Wang et al., 2018). Comparison studies between Malaysian and European cultures have shown that social interaction has no influence on customers' intention to purchase energy efficient household appliances (Mustafa et al., 2014; Sniehotta, 2009; Tan et al., 2017). Research has shown that the intention to purchase efficient appliances overlaps with consumers' daily needs as it will directly affect consumers regarding product price and purchasing power (Ru et al., 2018; Wang et al., 2019). Consumers who intend to purchase energy efficient appliances can be influenced by reviews, recommendation and suggestions from others through social media and search engines. Social interaction when reviewing appliances is more likely to increase the purchase intention towards energy efficient appliance. Hence, some organizations or unions will publish a list of recommendations, which will help consumers in their decision making process when purchasing energy efficient appliances (Dieu-Hang et al., 2017; Pamulapati, Mallipeddi, & Lee, 2020; Ru et al., 2018). Hence, the hypothesis is presented as:

H4: Social interaction positively influences consumers' intention to purchase energy efficient appliances.

2.2.5. Appliance Quality

Household electrical appliances, such as washing machines, microwaves, refrigerators and freezers, contribute to domestic energy consumption (Belaïd & Joumni, 2020; Huse, Lucinda, & Cardoso, 2020; Kwon et al., 2020; Zhang, Xiao, & Zhou, 2020). Appliance quality is usually based on its durability, the energy it consumes and improved technology. Preferences for household appliances differ by region and country (Brucal & Roberts, 2019). For instance, consumers in the Asia-Pacific region and Europe are distinct in the sense that the former relies heavily on cost, while the later focuses more on quality (Boyano, Espinosa, & Villanueva, 2020; Nguyen et al., 2017). Meanwhile, energy efficient household appliances are in demands in Western Europe (i.e., washing machines, refrigerator, freezer and cloth dryer). It is because certain countries have energy restriction policy like Canada and the United Kingdom (Cagno & Trianni, 2014; Rashid, 2009; Ritter, Borchardt, Vaccaro, Pereira, & Almeida, 2015). Energy efficient appliances use improved technology that is better for the environment and have lower electrical consumption and higher safety

measures for use in households (Safarzadeh, Rasti-Barzoki, Hejazi, & Piran, 2020). To compare product quality between appliances, consumers may shop around for items to find the best product. Thus, the proposed hypothesis is presented as:

H5: Product quality has a positive influence on consumers' intention to purchase energy efficient appliances.

Figure 1 presents the research model adopted in this study.

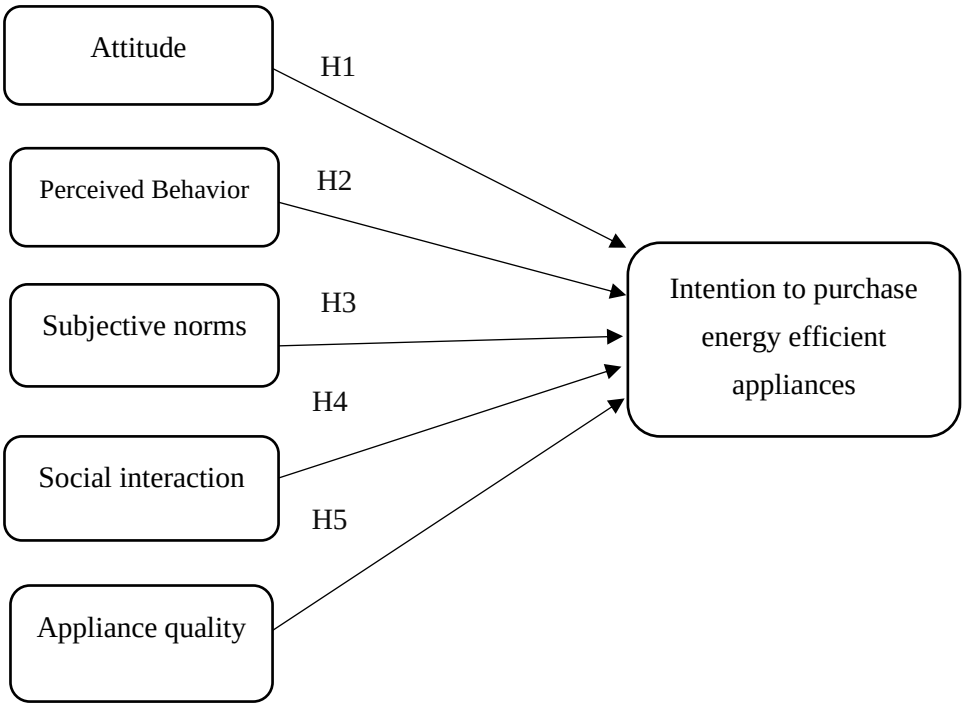

Figure 1. Research model.

3. METHODOLOGY

3.1. Data collection

Data was collected via an online questionnaire. The respondents are Malaysian household residents who have purchasing power and are potential buyers of energy efficient appliances, and they were selected using the quota sampling technique. The sample was divided into five clusters—northern, east coast, central, southern and east Malaysia. The selected participants were split evenly among each of the five clusters and ranged from 20 to 60 years of age. The questionnaire was circulated based on the quota. Out of the 347 questionnaires returned, 318 were used after data screening.

Table 1 presents the respondents' demographic information. It shows that 76.0% of the participants were female, with majority of them being between 30 and 40 years old (84.0%). The majority of participants have a monthly income of less than RM 3000 (77.0%) and almost half of the respondents reside in terraced houses.

3.2. Measures

The measurement scales of this study were adapted from various validated items in prior studies (Issock et al., 2018; Wang et al., 2019; Zhang et al., 2020). All items in this study were rated on a seven-point Likert scale ranging from "strongly disagree" to "strongly agree." Table 2 presents the list of constructs administered in this study with the number of items and adoption references.

Table 1. Demographic profiles of participants.

	Number	Percentage (%)
Gender		
Male	76	24
Female	242	76
Age		
21–25	26	8
26–30	104	33
31–35	116	36
36–40	53	17
41–45	11	3.5
46–50	5	1.5
51–55	2	0.7
Above 56	1	0.3
Type of Residence		
Flat/apartment	52	16.6
Terrace House	104	47.5
Bungalow House	116	22.5
Semi Detached House	53	13.4
Monthly Electricity Bills		
RM 0–50	33	10.4
RM 51–100	91	28.7
RM 101–150	87	27
RM 151–200	52	16.7
RM 201–250	18	5.6
RM 251–300	6	1.9
RM 301–350	11	3.5
RM 351–400	7	2.2
Above RM 401	13	4
Household Income		
Below RM 1000	21	6.8
RM 1001–RM 2000	106	33
RM 2001–RM 3000	119	37.5
RM 3001–RM 4000	34	10.7
RM 4001–RM 5000	12	3.7
RM 5001–RM 6000	8	2.5
RM 6001–RM 7000	5	1.6
RM 7001–RM 8000	5	1.6
RM 8001–RM 9000	3	0.9
RM 9001–RM 10000	4	1.4
Above RM 10001	1	0.3

Table 2. Constructs used in the questionnaire.

Construct	Items	Adapted from
Intention to purchase energy efficient appliances	5	Issock et al. (2018)
Perceived behavioral control	5	Hung et al. (2019)
Attitude	5	Wang et al. (2019)
Subjective norms	4	Taufique & Vaithianathan (2018)
Social interaction	3	Wang, Wang, & Guo (2017)
Appliance quality	4	Issock et al. (2018)

3.3. Common Method Bias

Since the questions were answered by the same sample, there is a possibility of common method bias. Table 3 shows the full collinearity test. According to Kock (2015), a variance inflation factor (VIF) value below 5.0 indicates that there is no common method bias issue. The VIF of the constructs in this study shows that the values are lower than the recommended threshold of 5.0, denoting no issue of common method bias in the dataset.

Table 3. Full collinearity test.

Construct	ITPB	ATT	PBC	SN	SI	PQ
VIF	4.183	3.479	3.114	3.301	2.361	2.226

Note: ITPB = intention, PBC = perceived behavioral control, ATT = attitude, PQ = appliance quality, SI = social interaction, SN = subjective norms.

4. DATA ANALYSIS AND RESULTS

The data analysis is based on the two stage PLS-SEM using SmartPLS 3. The first stage evaluates the measurement model by investigating the reliability and discriminant validity of constructs. The second level assesses the structural model by testing the proposed hypotheses through variables' path coefficients and statistical significance. The PLS-SEM approach is useful in this study due to its ability to work with complex models with many indicator variables, exogenous and endogenous constructs, and non-normal data distributions (Astrachan, Patel, & Wanzenried, 2014; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Also, the PLS-SEM can assist researchers who conduct exploratory research in developing theory with its ability to estimate the model that commonly displays a high degree of statistical power compared to the CB-SEM method (Hair, Ringle, & Sarstedt, 2011; Henseler, Ringle, & Sarstedt, 2015; Law & Fong, 2020). Thus, PLS-SEM can determine the most successful variable in understanding consumer intent in this study.

4.1. Measurement Model

The measurement model is the first stage in the PLS-SEM method that specifies the constructs' internal consistency reliability, convergent validity, and discriminant validity. The reliability of the constructs was measured through Cronbach's alpha and composite reliability. A considerable threshold for the reliability should be more than 0.60 for exploratory research (Hair, Risher, Sarstedt, & Ringle, 2019).

Table 4. Reliability and validity analysis.

Construct	Item	Mean	Loadings	Cronbach's alpha	CR	AVE
Purchase Intention Behavior (ITPB)	ITPB1	3.32	0.921	0.952	0.963	0.84
	ITPB2	3.54	0.904			
	ITPB3	3.43	0.931			
	ITPB5	3.32	0.902			
Perceived Behavioral Control (PBC)	PBC1	3.29	0.895	0.944	0.957	0.818
	PBC2	3.65	0.927			
	PBC3	3.30	0.906			
	PBC4	3.76	0.911			
	PBC5	3.55	0.882			
Attitude (ATT)	ATT1	3.80	0.895	0.962	0.953	0.887
	ATT2	3.63	0.927			
	ATT3	3.33	0.906			
	ATT4	3.41	0.911			
	ATT5	3.50	0.882			
Appliance Quality (PQ)	PQ1	3.82	0.826	0.923	0.945	0.813
	PQ2	3.63	0.937			
	PQ3	3.39	0.914			
	PQ4	3.31	0.924			
Social Interaction (SI)	SI2	3.58	0.948	0.884	0.945	0.896
	SI3	3.27	0.945			
Subjective Norms (SN)	SN1	3.74	0.912	0.936	0.954	0.84
	SN2	3.81	0.916			
	SN3	3.51	0.909			
	SN4	3.49	0.928			

Table 4 shows that the range of Cronbach's alpha is 0.884–0.962, denoting strong internal consistency reliability. Convergent validity was assessed through the indicator loadings and average variance extracted (AVE). The current

study established convergent validity as the indicator loadings that passed the threshold value of 0.60 with AVE value of more than 0.50, ranging from 0.813–0.896 (Hair, Hult, Ringle, & Sarstedt, 2016). The measurement is acceptable if the AVE for each construct is greater than 0.50. Two items were deleted for having low loadings, ITPB4 (0.408) and SI1 (0.310). The results of the indicator loadings, average variance extracted (AVE) and composite reliability (CR) measures of all items are presented in Table 4.

Discriminant validity was analyzed via the heterotrait-monotrait (HTMT) ratio of correlation. The HTMT is acknowledged to be superior to the traditional Fornell and Larcker criterion (Henseler et al., 2015). Franke & Sarstedt (2019) mentioned that a lower threshold value, such as 0.85 or 0.9, could establish the discriminant validity that reliably distinguishes between those pairs of latent variables depending on the study context. In Table 5, all the values of the constructs are below 0.9, which reflects satisfactory discriminant validity.

Table 5. Heterotrait-monotrait (HTMT) ratio of correlations.

	ATT	ITPB		PQ	SI	SN
ATT						
ITPB	0.796					
PBC	0.89	0.839				
PQ	0.873	0.866	0.682			
SI	0.791	0.797	0.623	0.69		
SN	0.824	0.828	0.629	0.666	0.552	

Note: ITPB = intention, PBC = perceived behavioral control, ATT = attitude, PQ = appliance quality, SI = social interaction, SN = subjective norms.

4.2. Structural Model and Hypothesis Testing Analysis

This study used the bootstrapping method (5000 resample) to test the model with different research hypotheses. To assess the structural model, the path coefficient of exogenous to endogenous variables, the t-values, and squared multiple correlation (R^2) values of explained variance on the endogenous variable were evaluated. The path coefficient value ranges from -1 to +1, where a path coefficient estimated close to +1 shows a strong positive relationship while -1 shows a strong negative relationship with an annotation of path coefficients (β).

Based on five predictors of ITPB, the coefficient of determination, R^2 was 0.440, and statistically significant evidence was found in support of H2 (PBC → ITPB, $\beta = 0.695$, $p < 0.01$). Support is also shown for H3 (SN → ITPB, $\beta = 0.584$, $p < 0.01$) and H4 (SI → ITPB, $\beta = 0.710$, $p < 0.01$). For the additional variable in the TPB, social interaction (H4) and appliance quality positively influence the intention of purchasing energy efficient appliances, thus supporting H5 (PQ → ITPB, $\beta = 0.552$, $p < 0.01$), However, H1 (ATT → ITPB) is not supported since the t-value is below 1.645 and straddles the zero value in the confidence interval. Table 6 shows the outcomes of the hypothesis testing.

Table 6. Hypothesis testing results.

Hypothesis	Relation	Path coefficient (β)	T-value	P-value	5.00% LL	95.00% UL	Result
H1	ATT → ITPB	0.158	1.287	0.062	0	0.175	Not Supported
H2	PBC → ITPB	0.695	1.839	0.005	0.065	0.263	Supported
H3	SN→ITPB	0.584	1.903	0.26	-0.105	0.05	Supported
H4	SI→ITPB	0.710	0.54	0.001	0.069	0.193	Supported
H5	PQ→ITPB	0.552	1.653	0.055	-0.001	0.15	Supported

5. DISCUSSION

This study determined the factors that influence consumers' purchase of energy efficient appliances in Malaysian households. According to the findings, perceived behavioral control and subjective norms have a positive and significant impact on consumers' intentions to purchase energy efficient appliances, although attitude had no impact. These results may differ from previous research due to the sample size ratio between monthly income and age. People

in the 25–35 year age group may have the intention to purchase due to better incomes that exceed the average salary of RM 2k per month Hence, they will be more assertive in making decisions, unconsciously directed by their own perceived feelings (Huebner, Shipworth, Hamilton, Chalabi, & Oreszczyn, 2016). In reality, certain factors of energy efficient appliances, such as quality, are the most important antecedents of consumers purchase intention.

This research has a wide range of explanations on how certain factors can influence the intention to purchase among Malaysians, especially regarding social interaction and the quality of energy efficient appliances. In daily life communication within a community or residency, subjective norms and appliance quality may contribute to the intention of purchasing energy efficient appliances. This type of residency is usually consistent with monthly bills and the type of energy efficient appliances used. Thus, the best aspect must be suggested and considered. Suggestions included the advantages of using energy efficient appliances, especially regarding quality factors, i.e., durability, cost saving and safety. The best approach to attract consumers is by intervening in their basic psychological needs (as shown in the Maslow hierarchy). In conclusion, this study's findings are in accordance with the previous research conducted on Malaysia (Begum, Sohag, Abdullah, & Jaafar, 2015; Lim & Hossain, 2016; Masud et al., 2016; Mustafa et al., 2014; Sentosa & Mat, 2012; Tan et al., 2017; Ting et al., 2015). The additional variables included in the TPB (quality of appliances and social interaction) were identified among the crucial determinants of energy efficient appliance purchasing behavior.

6. IMPLICATIONS

6.1. Theoretical Implications

This study determines the TPB social factors and the quality of appliances and provides empirical findings of consumer intention in the purchasing of energy efficient appliances with regard to the study of behavior in industrial management. The current study justifies that the theory is still reliable and emphasizes that behavior relies heavily on individual contributions (Belaïd & Joumni, 2020; Huse et al., 2020; Kwon et al., 2020; Zhang et al., 2020). Additionally, the results suggest that adding new variables—quality of appliances and social interaction—contributed to the study context.

6.2. Practical Implications

Communication is important as consumers will actively share information regarding their purchases of energy efficient appliances, especially household appliances. For instance, information regarding appliance quality will spread faster and lead to lower intention to purchase a product if its quality is being negatively conveyed. Practically, this study will help marketers in promoting purchase intention by introducing programs/commercials built with the latest technologies to attract younger people who have higher purchase intention for energy efficient appliances. Consumers will be benefit from this research as it will help them to understand the advantages of energy efficient appliances used. This study will also promote the importance of communication between individuals, which largely contributes to the intention of purchasing energy efficient appliances in a Malaysian context (Tan et al., 2017). This study also shows the advantages of energy efficient appliances based on quality factors (i.e., durability, cost saving and safety). The direct influence and psychological aspects also affect the intention to purchase.

This issue must be addressed by the government to ensure better action regarding promoting the benefits of energy efficient appliances among the public. Although the government started actively promoting energy efficient appliances through the SAVE 2.0 program and continues the program with SAVE 3.0 by offering a voucher for RM 400 to each household, more must be done to create awareness of environmental issues among Malaysians. This action by the government can be further emphasized to reach the whole population of Malaysia if there is more research done to explore the determinant factors regarding the intention to purchase energy efficient appliances. Malaysian purchasers are believed to be more concerned with their families and personal health, and they do not feel

obligated to help improve environmental quality. Still, the quality of appliances is considered to be one of the most critical predictors of consumers' purchases of energy efficient appliances (Hung et al., 2019; Li et al., 2019).

7. CONCLUSION

The study explores the TPB integrated with social interaction and appliance quality on consumers' intention to purchase energy efficient appliances. Even though the TPB is considered to be outdated in behavioral studies, the current study justifies that the theory is still relevant. Also, there is a lack of studies that discuss the perspectives of purchasing behavior based on energy efficient appliances. This study strengthens the relationship between intention to purchase with purchase behavior. Every consumer's purchase behavior was directly observed based on several factors which explain the process of purchasing based on the three main factors (internal beliefs, products, and information from external sources).

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