

Determinants of academicians recycling behaviour

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ABSTRACT

The main purpose of this study was to identify the determinants of recycling behaviour among academicians by utilizing the theory of planned behaviour (TPB). It also examined the mediating role of attitude in the relationship between environmental beliefs and recycling behaviour. An online survey was conducted among lecturers in a public university in Malaysia and 101 valid responses were received. Data was analysed using Partial Least Squares Structural Equation Modelling. Out of the six proposed hypotheses, five were supported. Among the important and interesting findings were: (1) perceived behavioural control has an insignificant effect on recycling behaviour and (2) attitude plays a mediating role in the relationship between environmental belief and recycling behaviour. This study contributes to both theory and practice; it extends the TPB and also provides insightful information for university administrators and policy makers that help them plan effective strategies to enhance recycling behaviour among academicians and other stakeholders in the future.

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1. Introduction

Higher education institutions (HEIs) are considered to function like a small city (Tangwanichagapong et al., 2017; Zen et al., 2016; Alshuwaikhat & Abubakar, 2008) and they tend to be leaders or trendsetters for society (Tangwanichagapong et al., 2017; Hooi, Hassan & Mat, 2012) due to the size, diverse population, and wide range of activities that take place in the HEI environment (Baharum et al., 2016; Zhang et al., 2011; Alshuwaikhat and Abubakar, 2008). As time passes, the overall population of an HEI increases, which results in a parallel increase in the amount of waste generated (Baharum et al., 2016). By way of example, a previous study conducted at Universiti Teknologi Malaysia found that one person generates 0.85 kg of waste per day. Moreover, a large amount of waste is generated on campus during major events such as convocations that can result in up to 2 kg of waste per person (Zen et al., 2016). Due to the growing focus on sustainability, the minimization of waste is becoming a primary concern for university administrators when seeking to implement green initiatives on campus (Tangwanichagapong et al., 2017; Zen et al., 2016; Zhang et al., 2011). Waste management or reducing waste on campus is one of the crucial strategies that is deployed to create ‘green’ and sustainable HEIs (Wan, Shen, & Choi, 2017; Smyth, Fredeen, & Booth, 2010). A case study conducted by Zhang et al. (2011) at the University of Southampton in the United Kingdom highlighted that HEIs contribute significantly to the development of sustainable waste management procedures and practices. Meanwhile, other research emphasizes that managing sustainable development on campus through waste management involves good governance practices to encourage and develop a sustainable university environment (Tangwanichagapong et al., 2017; Zen et al., 2016).

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However, the lack of engagement among university stakeholders, especially academicians, with sustainability issues and ignorance about the need to follow sustainable practices on campus is hampering the full “greening” of universities. Some research studies have stated that academicians’ beliefs and attitudes are barriers for engaging in sustainable activities because sustainability is often seen as an annoyance that interferes with ‘real work’ (Christie et al., 2015; Too & Bajracharya, 2015). Moreover, a previous study conducted at Universiti Pendidikan Sultan Idris (UPSI) in Malaysia found that academicians are highly aware of sustainable development in campus, but this does not impel them to behave positively in terms of applying UPSI’s sustainability principles in their day-to-day activities (Kalsum & Isa, 2016).

Most HEIs initiate waste management practices in the initial stage of seek to achieve sustainability on campus (Zhang et al., 2011; Mason, Oberender, & Brooking, 2004). The most common waste management practice in HEIs is the practice of the 3Rs (Reduce, Reuse, Recycle), which is a well-known recycling terminology. Nevertheless, according to Thomas and Sharp (2013), recycling is not a normal behaviour for everyone and there are many people who do not recycle. However, if recycling becomes a normative practice in society generally, this will lead to a better understanding of the gap between practising or not practising recycling and the factors that influence recycling/not recycling behaviour.

In Malaysia, recycling programmes have been instituted since 1993, but over two decades later the rate of recycling is only 5% and just 30% of domestic waste can be recycled (Mamun et al., 2019; Jereme, Siwar & Alam 2015; Ramayah, Lee & Mohamad, 2010). Moreover, it has been estimated the amount of solid waste produced in the country will reach 31,000 tons by 2020, which implies that will become even more difficult for the government to achieve its targeted recycling rate and the landfills will become even threatened to reach sustainable (Mamun et al., 2019; Ramayah, Lee, & Lim, 2012). Furthermore, Moh and Abd Manaf (2014) point out that no particular measures have been adopted to minimize waste and improve recycling.

According to Wan, Cheung and Shen (2012), successful recycling programmes need the involvement of both technology and people as this combination leads to the development and maintenance of pro-environmental behaviour. Some previous studies have sought to identify the factors that influence recycling behaviour by applying the theory of planned behaviour (TPB) to the problem (Barr, 2007; Park & Ha, 2012; Wan et al., 2012; Mtutu & Thondhlana, 2016). A number of these studies have included additional factors in their models in order to improve the applicability and scope of the theory in relation to this phenomenon (Mamun et al., 2019; Ramayah et al., 2012; Wan et al., 2012). Therefore, in order to contribute to this research area, this study aimed to achieve the following three objectives:

- To examine the relationship between environmental beliefs and attitude;
- To assess the relationship among environmental beliefs, attitude, subjective norms, perceived behavioural control and recycling behaviour; and
- To determine the mediating role of attitude in the relationship between environmental beliefs and recycling behaviour.

2. Literature Review and Hypothesis Development

Theory of Planned Behaviour

This study utilized the TPB (Ajzen, 1991) in examining academicians’ behaviour towards recycling. According to the classic TPB model (refer to Fig. 1), an individual’s behaviour is determined by their intention. Three constructs determine the behavioural intention of an individual: (1) attitude, which is an evaluation about performing a specific behaviour, (2) subjective norms, which represent the individual’s view as to whether the people closest to them in their lives would want them to conduct the behaviour and (3) perceived behavioural control (PBC), which refers to the extent to which the individual believes that the behaviour in question is under their volitional control. All three of these factors influence behavioural intention, which then acts as a mediator in determining the individual’s behaviour in a certain situation (Ajzen, 1991; Ramayah et al., 2012; Chen & Tung, 2014; Maichum et al., 2016; Taufique & Vaithianathan, 2018).

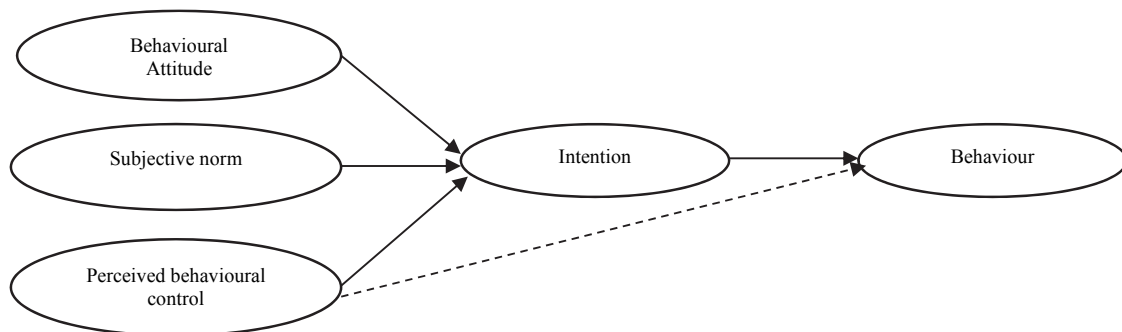


Fig. 1. Theory of planned behaviour (adapted from Ajzen, 1991)

However, there is a gap between behavioural intention and actual behaviour, which has been termed the ‘intention–behaviour gap’ (Tang, Chen, & Luo, 2011; Tudor, Barr, & Gilg, 2007). In order to better understand why this gap exists, studies have investigated the direct effects of attitude, subjective norms and PBC. Some studies have stated that PBC can directly affect behaviour (Ramayah et al., 2012; Davis, O’callaghan, & Knox, 2009), while others have found that subjective norms are an important factor in influencing recycling behaviour (Mamun et al., 2019; Ramayah et al., 2012; Sidique et al., 2010a). In addition, other studies have shown that the three main factors of TPB (attitude, subjective norms and PBC) can have a direct effect on behaviour without behavioural intention acting as a mediator between them (Liobikiene, Mandravickaite, & Bernatoniene, 2016; Ramayah et al., 2012; Taufique and Vaithianathan, 2018).

Usefully, TPB also allows the integration of additional variables and changes to the model (Ajzen, 1991; Ari & Yilmaz, 2016). For example, some studies have used environmental awareness as an additional factor in the TPB model in order to try to determine the factors that influence recycling behaviour (Ramayah et al., 2012; Mamun et al., 2019). Hence, the literature indicates that not only attitudes, subjective norms, and PBC, but also an additional variable – environmental awareness (or beliefs) – may all have an important role to play in terms of predicting recycling behaviour. Each of these variables of the research model (refer to Fig. 2) is discussed in more detail below.

2.1 Environmental Beliefs and Attitudes towards Recycling Behaviour

According to Ajzen (1991), attitude can be defined as an element of a person’s belief about and evaluation of a behaviour. Meanwhile, a person’s belief has also been described as the knowledge and perceptions about certain behaviours of that person (Wan et al., 2012). According to Xiao and Buhrmann (2019), general beliefs and attitudes do not have a direct impact on behaviour unless they are specifically about the environment. A few studies have been conducted on the relationships between attitude, beliefs and behaviour in the environmental field (Kaiser et al., 1996; Hernández, 2012; Thapa 2010; Xiao and Buhrmann, 2019). However, there are limitations to study the relationship between environmental beliefs and attitudes in general and with actual behaviour (Ambusaidi et al., 2012; Fishbein & Ajzen, 1975).

According to Thapa (2010), a person’s attitude is the most significant factor that predicts their behaviour and also been found that an attitude towards an issue is the most important factor in determining the specific behaviour towards that issue. In addition, it has been stated that having a positive attitude means having a positive belief in or about something; for instance, believing that recycling can reduce waste, pollution and conserve natural resources leads a positive attitude towards recycling behaviour (Ramayah et al., 2012). In short, when a person’s attitude towards an environmental issue is strong, it may completely mediate the effects of their environmental beliefs on their behaviour. This is because the relationship between attitude and behaviour is strong enough to balance the direct effect of beliefs on behaviour (Kalsum & Isa, 2016; Maki & Raimi, 2017; Mamun et al., 2019; Ramayah et al., 2010; Wan et al., 2012). According to Ramayah (2012), several pieces of literature in social psychology concentrate on the relation between environmental beliefs and behaviour. However, the evidence is contradictory and over time attitudes may have changed.

Hence, in light of the above discussion, we proposed the following hypotheses:

- H1:** There is a positive relationship between environmental beliefs and attitude.
- H2:** There is a positive relationship between attitude and recycling behaviour.
- H3:** There is a positive relationship between environmental beliefs and recycling behaviour.
- H4:** Attitude mediates the relationship between environmental beliefs and recycling behaviour.

2.2 Subjective Norms and Recycling Behaviour

Based on Ajzen (1991), subjective norms replicate the perceived social pressure of other individuals or groups upon an individual to perform or not perform a certain behaviour. This pressure may come from family members, peers, the neighbourhood or anyone close to the individual person who might have a positive effect on, in the context of this study, recycling behaviours (Wan et al., 2012). Previous studies have stated that subjective norms are an important factor in influencing recycling behaviour (Ghani et al., 2013; Mamun et al., 2019; Ramayah et al., 2012; Sidique et al., 2010b; Thomas & Sharp, 2013). In addition, Taufique and Vaithianathan (2018) found that subjective norms have a direct positive impact on behaviour, but there is an insignificant relationship in respect of the indirect effect of subjective norms on behaviour via behavioural intention and in respect of the direct effect on intention. Therefore, the following hypothesis was hypothesized:

- H5:** There is a positive relationship between subjective norms and recycling behaviour.

2.3 Perceived Behavioural Control and Recycling Behaviour

Perceived behavioural control relates to the difficulty or easiness of performing a certain behaviour and it often reflects past experiences (Ajzen, 1991). According to the TPB theory, PBC has a strong influence on behavioural intention or directly on

behaviour (Ajzen, 1991; Mamun et al., 2019; Tam et al., 2018). A person's behaviour is not just reliant on their will, but also on other factors such as PBC (Ari & Yilmaz, 2016). In the context of this topic of interest to this study, PBC consists of a set of perceived control variables such as ease and opportunity; facilitating factors such as knowledge on how, what, and where to recycle; and provision of recycling resources (Wan et al., 2012). On the other hand, Davies et al. (2002) claim that the control variables that promote or prevent recycling behaviour should be regarded through operationalized PBC. Therefore, in light of the above, the final hypothesis was formulated:

H6: There is a positive relationship between perceived behavioural control and recycling behaviour.

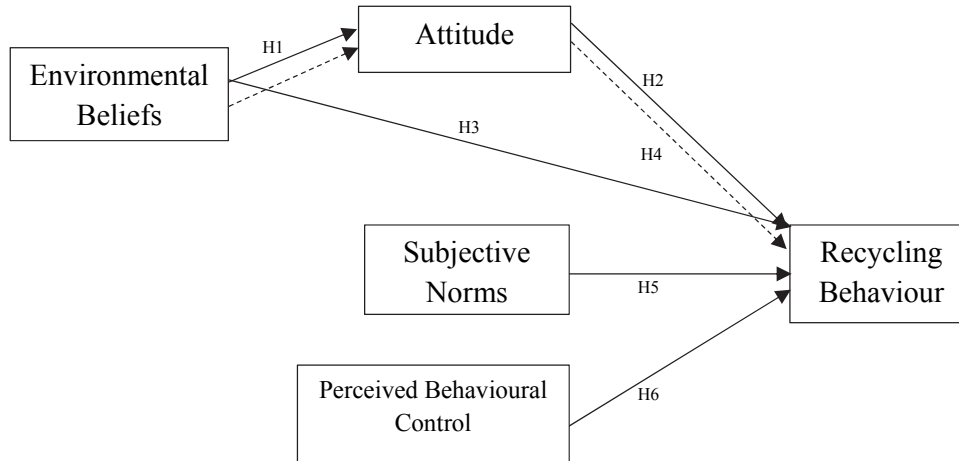


Fig. 2. Research model

3. Methodology

This paper presents the results of a study that was performed to collect data by means of an online survey conducted among academicians at one of the green campuses in Malaysia, namely, University Malaysia Terengganu (UMT). The sample size of the study determined according to the number of predictors of the construct based on Green (1991). Hence the minimum sample size for 5 predictors with medium effect size (0.15) is 91 and the total valid response received is 101. A survey questionnaire using a five-point Likert-type scale of agreement (from 1 “strongly disagree” to 5 “strongly agree”) was employed to gather the data. The instrument contained 21 items adapted from the literature that related to the five constructs of the research model. Out of these 21 items, three items were for attitude, seven were for environmental beliefs, three were about subjective norms, four were on PBC, and another four were about recycling behaviour. Table 1 below shows the items after deleted due to low factor loadings which has total of 17 items. The questionnaire also included questions to obtain the demographic characteristics of the respondents, including gender, age, marital status, nationality, ethnicity and years in academic field.

Table 1

Measurements Items

Construct	Items and Code	Adapted from
Attitude (ATT)	I think practicing sustainable waste management is a good idea. (ATT2) I think practicing sustainable waste management is positive. (ATT3)	(Maichum et al., 2016)
Environmental Beliefs (BL)	Continued use of chemical in campus will damage the environment. (BL3) Shortages of some important resources will occur soon in the near future. (BL4) Global warming is becoming a problem. (BL5) Ozone depletion is an environmental problem. (BL6) The availability of clean water will become a problem in the future. (BL7)	(Kilbourne and Pickett, 2008)
Subjective Norm (SN)	My family think that I should practice sustainable waste management. (SN1) My colleagues think that I should practice sustainable waste management at campus. (SN2) Most people who are important to me think that I should participate in sustainable waste management activities at campus. (SN3)	(Maichum et al., 2016)
Perceived Behavioural Control (PBC)	The decision to engage myself in campus sustainability is completely up to me. (PBC1) For me, to practice waste management at my workplace would be an easy task. (PBC2) I have complete control in deciding whether or not to practice sustainable waste management. (PBC3) If wanted to, I could manage sustainable waste management at campus. (PBC4)	(Karim Ghani et al., 2013)
Recycling Behaviour (RC)	I recycle paper. (RC1) I recycle glass. (RC2) I recycle plastic containers. (RC3)	(Coelho et al., 2017)

The data was tested to assess the reliability and validity of the instrument by using SPSS version 25 and SmartPLS 3.2.8 software. First, SPSS version 25 was used to analyse the respondents' demographic data and to conduct a data normality test. Then SmartPLS 3.2.8 was used to analyse the measurement and structural models. The reason for using PLS-SEM in this study was to examine the proposed theoretical constructs because it is generally agreed that it is better suited for theory development and exploring the relationships between latent variables (Tan et al., 2017; Hair et al., 2014; Wan et al., 2012).

4. Results and Findings

4.1 Demographic Profile

As can be seen in Table 2, 61 respondents (60.4%) were female and the remainder (40, 39.6%) were male. As regards age, the largest proportion (32) of the respondents (31.7%) were aged 35 to 39 years old, followed by 27 from 40–44 years old age range and only one is oldest respondent aged 60 and above. As indicated in Table 2, just over half of the respondents were PhD holders (53, 52.5%) and the vast majority of the respondents were Malaysian (94, 93.1%). Furthermore, the largest group of respondents (27, 26.7%) had 11 to 15 years of experience in their academic field and five (5%) academicians had less than 1 year, while an equal proportion of respondents (23, 22.8%) had 1–5 years, 6–10 years and above 15 years of experience in their respective fields. Finally, the majority of the respondents (87, 86.1%) belonged to the Malay ethnic group.

Table 2
Demographic Profile of Respondents (n = 101)

Description	Frequency	%	Description	Frequency	%
<i>Gender</i>			<i>Nationality</i>		
Male	40	39.6	Malaysian	94	93.1
Female	61	60.4	Non-Malaysian	7	6.9
<i>Age</i>			<i>Years in Academic Field</i>		
25–29	6	5.9	Less than 1 year	5	5.0
30–34	13	12.9	1–5 years	23	22.8
35–39	32	31.7	6–10 years	23	22.8
40–44	27	26.7	>11 years	50	49.5
50–54	5	5.0			
55–59	3	3.0			
60 and above	1	1.0			
<i>Highest Qualification</i>			<i>Ethnicity</i>		
Bachelor's	1	1.0	Malay	87	86.1
Master's	10	9.9	Indian	4	4.0
PhD	53	52.5	Chinese	2	2.0
Others	37	36.6	Others	8	7.9

4.2 Analysis of Measurement Model

The measurement model analysis by PLS-SEM involved assessing reliability (internal consistency) and validity (convergent and discriminant validity). The measurement model criteria were as follows: all the factor loadings were required to be more than 0.7 (Tan et al., 2017; Hair et al., 2017). However according to Hair et al. (2016) the loadings that are more than 0.6 is also acceptable. On the other hand, the composite reliability (CR) value needed to be 0.7 or greater; and the average variance extracted (AVE) had to be in as a minimum as 0.5 (Hair et al., 2017; 2014). Meanwhile, for validity testing, the convergent validity replicates whether a specific item estimates a latent variable that it is expected to measure (Tan et al., 2017; Urbach & Ahlemann, 2010), while the AVE assesses the measure of change that build catches from its markers contrasted and the sum because of estimation mistake (Tan et al., 2017; Fornell & Larcker, 1981).

Table 3 and Fig. 3 display the results of the reliability and validity assessment of the measurement model. As a result of these assessments, four items were deleted. One from the attitude, two from environmental beliefs and one from recycling behaviour constructs due to low factor loadings. The remaining items were retained as the factor loading values were ranged from 0.607 to 0.959 which is acceptable (Hair et al., 2016). As the CR values were ranging from 0.887 to 0.955 which is above 0.7, these values indicated that the measurement model was reliable (Fornell & Larcker, 1981).

Table 3
Validity and Reliability Results for the Measurement Model

Construct	Adapted from	Item Code	Cronbach's Alpha	Factor Loading	CR	AVE
Attitude (ATT)	(Maichum et al., 2016)	ATT 2	0.907	0.954	0.955	0.915
		ATT 3		0.959		
Environmental Beliefs (BL)	(Kilbourne and Pickett, 2008)	BL 3	0.853	0.732	0.895	0.632
		BL 4		0.801		
		BL 5		0.813		
		BL 6		0.755		
		BL 7		0.866		
Subjective Norm (SN)	(Maichum et al., 2016)	SN 1	0.871	0.936	0.920	0.794
		SN 2		0.838		
		SN 3		0.896		
Perceived Behavioural Control (PBC)	(Karim Ghani et al., 2013)	PBC 1	0.823	0.607	0.887	0.667
		PBC 2		0.883		
		PBC 3		0.898		
		PBC 4		0.843		
Recycling Behaviour (RC)	(Coelho et al., 2017)	RC 1	0.869	0.879	0.919	0.792
		RC 2		0.898		
		RC 3		0.894		

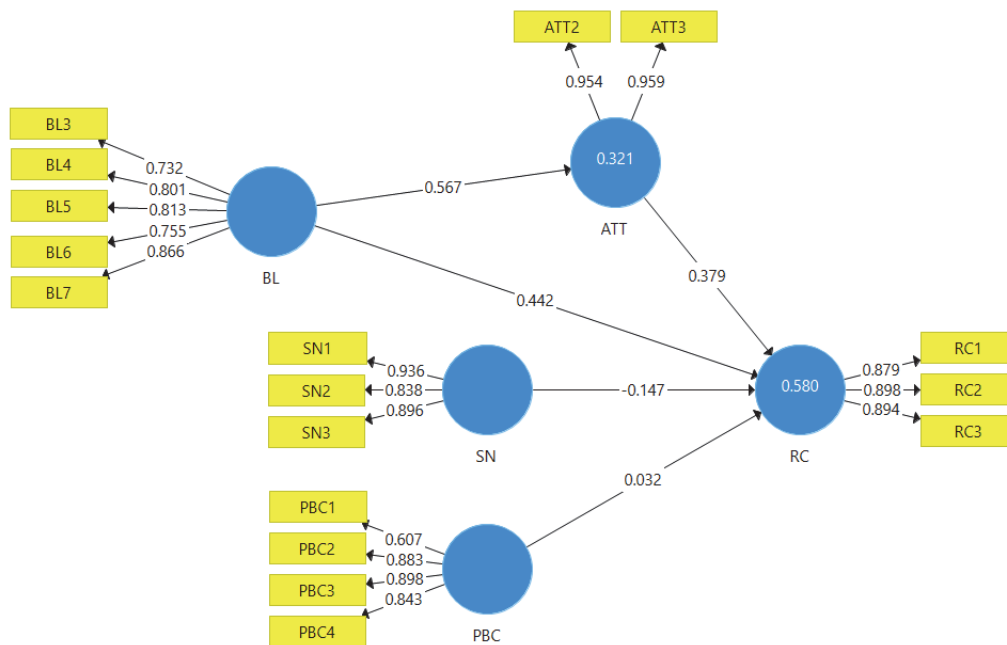


Fig. 3. Path analysis results for measurement model

In addition, the convergent and discriminant validity of the measurement model was assessed. As per Table 3, the convergent validity of the items accepted with AVE values greater than the suggested level of 0.5, which is extending from 0.632 to 0.915 (Hair et al., 2017). Discriminant validity is confirmed when the item loads more highly on its own construct rather than on other constructs. Hence, discriminant validity was assessed through differentiating the square root of the AVE value of each construct with all the other constructs in order to be larger than the correlations between two factors (Fornell & Larcker, 1981; Barclay et al., 1995). Table 3 shows that the correlation score of each construct is greater when it correlates itself compared to the rest constructs, which indicated that all the constructs had acceptable discriminant validity. Therefore, the measurement model was considered to be reliable and valid.

Table 4
Discriminant Validity (HTMT)

Construct	ATT	BL	PBC	RC	SN
Attitude (ATT)					
Environmental Beliefs (BL)	0.645				
Perceived Behavioural Control (PBC)	0.589	0.507			
Recycling Behaviour (RC)	0.732	0.772	0.454		
Subjective Norm (SN)	0.057	0.130	0.208	0.178	

4.3 Analysis of Structural Model

The structural model evaluated the causal relations among the constructs in the model by analysing the path coefficients, *t*-statistics, *p*-value and variance. Path significances were estimated via the bootstrapping method using 101 cases and 5000 resamples at the 5% significance level. The predictive power of the proposed model was determined via hypothesis testing. A summary of the results of this analysis is presented in Table 5.

Based on Fig. 3, the R^2 value of recycling behaviour (0.580) showed that the amount of variance in recycling could be defined by environmental beliefs, attitude, subjective norms and PBC. Furthermore, the R^2 value of attitude (0.321) exposed the amount of variance in attitude described by environmental beliefs. According to Cohen's (1988) rule of thumb, 0.26, 0.13 and 0.02 describes the levels of predictive accuracy which are substantial, moderate and weak respectively. Therefore, the R^2 values of the study are substantial or acceptable since it was higher than 0.26.

Table 5

Summary of Results for Structural Model

Path	B	Std. error	t	P	f ²	Q ²	Decision
ATT → RC	0.567	0.081	7.041	0.000	0.473	0.275	H1 Supported
BL → RC	0.379	0.126	3.020	0.001	0.195	0.423	H2 Supported
BL → ATT → RC	0.442	0.122	3.629	0.000	0.305		H3 Supported
BL → ATT → RC	0.215	0.082	2.609	0.005			H4 Supported
SN → RC	-0.147	0.070	2.115	0.017	0.049		H5 Supported
PBC → RC	0.032	0.092	0.351	0.363	0.002		H6 Not Supported

Notes: BL = Environmental Beliefs, ATT = Attitude, SN = Subjective Norms, PBC = Perceived Behavioural Control, RC = Recycling Behaviour.

According to Cohen's effect size values of 0.02, 0.15, and 0.35 suggest low, medium, and high effects, respectively (Cohen, 1988). Table 4, it can be seen that the path between environmental beliefs and attitude showed a positive relationship with a high effect size ($\beta = 0.567$, $t = 7.041$, $P < 0.01$, $f^2 = 0.473$), which supported H1. In addition, H2 was supported by the medium effect size of the path coefficient from attitude to recycling behaviour ($\beta = 0.379$, $t = 3.020$, $P < 0.01$, $f^2 = 0.195$), and H3 was also supported by the path coefficient from environmental beliefs to recycling behaviour which is positive and significant with a medium effect size ($\beta = 0.442$, $t = 3.629$, $P < 0.01$, $f^2 = 0.305$). Meanwhile, H5 was supported by the path coefficient from subjective norms to recycling behaviour which is positive and significant with a low effect size ($\beta = -0.147$, $t = 2.115$, $P < 0.05$, $f^2 = 0.049$). However, H6 was not supported as the path coefficient between PBC and recycling behaviour showed no significant impact with no effect size ($\beta = 0.032$, $t = 0.351$, $p > 0.05$, $f^2 = 0.002$). As for the mediating effect of attitude, the model showed that the indirect effect of environmental beliefs on recycling behaviour was statistically significant ($\beta = 0.215$, $t = 2.609$, $p < 0.05$), which indicated that H4 was statistically supported. The Q^2 values in this paper is higher than 0 which shows the exogenous constructs have predictive relevance on endogenous construct (Hair et al., 2017).

5. Discussion and Implications

The main aims of this study were to investigate academicians' behaviour towards recycling based on the TPB by including environmental beliefs as a potential influencing factor in the TPB model and to determine whether attitude played a mediating role in the relationship between environmental beliefs and recycling behaviour. Throughout the study, the researcher found that the TPB provided a useful basis for understanding and explaining recycling behaviour. The results showed that recycling behaviour was influenced by attitude and subjective norms. In addition, they showed that attitude mediated the relationship between environmental beliefs and recycling behaviour. These findings support the previous literature that shows that attitude (Mamun et al., 2019; Ramayah et al., 2012; Sidique et al., 2010a,b) and subjective norms (Ramayah et al., 2012) have a positive impact on recycling behaviour.

This study found that environmental beliefs was a strong predictor of recycling behaviour (H3) followed by attitude as medium predictor (H2) and environmental beliefs also had a substantial influence on predicting attitude (H1). Moreover, the mediating role of attitude in the relationship between environmental beliefs and recycling behaviour was supported by the statistical results (H4). This result is one of the main contributions of this study because it indicates that attitude acts as a bridge and is substantially responsible for the effect of environmental beliefs on recycling behaviour among academicians. However, the results showed that the relationship between PBC and recycling behaviour was not significant, which is in contrast to the findings of some previous studies (Ari and Yilmaz, 2016; Mamun et al., 2019). Nevertheless, Ramayah et al. (2012) found that PBC has no significant direct relationship with recycling behaviour unless intention acts as a mediator.

The findings of this study offer some indications for decision makers on how best to design and implement effective recycling initiative at UMT. For example, to enhance the PBC of academicians, management needs to focus on improving understanding of recycling by enhancing awareness and knowledge about sustainability through education. Furthermore, seminars and advertising campaigns on recycling may help to create a positive attitude towards and belief in recycling and sustainable development as, according to Huang (2016), individuals with stronger environmental beliefs mostly procure information through

public relations channels. On the other hand, to make the performance of recycling behaviour more convenient, management needs to provide or arrange more facilities as well as support and encourage academicians to participate in sustainable waste management. This could be achieved by, for instance, setting up drop-off points for waste throughout the campus that are visible to academicians and other stakeholders and/or by appointing responsible persons to collect the waste from the academicians' workplace once or twice a week in order to make recycling more convenient and also to motivate non-recyclers to recycle.

6. Conclusion

Many studies have been conducted on recycling in HEIs using the TPB framework, yet this study has managed to make an important contribution to this framework by incorporating environmental beliefs as a new additional factor into the framework. As mentioned earlier, a limited number of studies have investigated the links between environmental beliefs, attitude and recycling behaviour and this study has shown that there was a positive relationship statistically between environmental beliefs and attitude as well as attitude and recycling behaviour. Moreover, skipping intention from the TPB theory and studied direct relationship between all three TPB variables to recycling behaviour was another speciality of this study. However, it should be noted that the results of this study may not be generalizable to other areas, sample sizes and contexts because it was carried out in only one university in Malaysia and the respondents were all academicians. Therefore, it is recommended that future studies apply this model in different HEIs and also include other stakeholders and obtain a higher sample size.

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