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Food Waste Separation Intention: Perspective of University Students Using S-O-R Framework

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Abstract

Sustainable behaviour plays an essential role in achieving campus sustainability. A significant concern within university campuses revolves around the excessive food waste, which leads to various environment and social problems. Although food waste separation has been extensively studied in the literature, the evidence from the stimulus-organism-response (S-O-R) perspective and on the university's students remain scarce. Therefore, this study aims to examine the factors that significantly affect university students to separate their food waste using the framework of S-O-R. A total of 214 valid responses were gathered from the university students using purposive sampling, and these responses were further analysed using the partial least squared-structural equation modelling (PLS-SEM). The findings showed that students' attitudes towards food waste separation were significantly influenced by their awareness of consequences, environmental knowledge, and university support. At the same time, the ascription of responsibility was found to have a negligible impact on attitudes. Besides, the study also found that attitudes significantly affect students' intention to separate their food waste. This study provides valuable information that can benefit both literature and stakeholders in this field. Both theoretical and practical implications have been provided and discussed in this study.

Keywords: Food Waste Separation Intention, University Students, Stimulus-Organism-Response, University Support, Awareness of Consequences

Introduction

The improper consumption and management of waste have led to environmental challenges that demand urgent action to curb their impact on society and the environment. Food waste is among the top component of the waste produced (Othman, Ahmad, Suif, Jelani, Munikanan, & Farid, 2021), with an estimated 91kg of household food waste would produce per capita annually (Food Waste Index Report, 2021). In addition, Malaysia is estimated to generate about 17,000 tonnes of food waste daily; thus, urgent action is needed to control the food waste (themalaysianreserve.com, 2021). Hashim, Kadir, Ibrahim, Halim, Sarani, Hassan, Hamid, Hashar, and Hissham (2021) remarked that 80% of the food waste is currently being disposed of in landfills, despite its potential for composting. The improper management of food waste led to several issues, such as loss of natural resources, insufficient landfill locations, public health

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problems, air and water pollution and others (Mui, Wong, Tsang, Chiu, & Lai, 2022). Therefore, proper food waste management is required to mitigate these issues, and it has the potential to bring several environmental, social and economic benefits. Moreover, food waste management also corresponds to the Sustainable Development Goals (SDGs), especially SDG 11, which aims to establish sustainable cities and communities. Food waste separation was considered one of the most effective approaches to manage excessive food waste as the separated food waste can be composted or recycled, eventually establishing a more inclusive and sustainable environment.

A similar situation is also observed at the university campus. According to National Resources Defense Council (2019), 22 million pounds of food are wasted at college campuses in the United States. Similarly, Ali, Hamdan, Talmizi, Mohamad, Leng, and Teck (2022) reported that the daily food waste generation at the dining halls in the sampled university is around 0.02kg to 0.07kg per capita. Universities are considered as quasi-cities (Aikowe & Mazancova, 2021), consisting of students from different backgrounds with daily routines in a large campus area. Besides, universities are usually equipped with necessary infrastructures and facilities, such as cafeterias or restaurants, grocery stores or convenience stores, laundries, sports and recreational halls, or even some bank branches and postal services, catering to the students' daily living requirements. In addition, universities are also society change agents (Tangwanichagapong, Nitivattananon, Mohanty, & Visvanathan, 2017), as their primary role is to educate the students with the necessary knowledge and skills to fulfil the industry's demand. However, sustainable consumption behaviour may be excluded from the formal curricular standard, leading to a lack of environmental protection awareness among students. Subsequently, the students may not take the initiatives to engage in some sustainable practices such as food waste separation. Given the huge amount of food waste has been generated at the university's campus, the impact of this issue cannot be underestimated. It could have huge consequences on society and environment. Recognising the importance of food waste within the university campus, this study was designed to specifically target university students in order to gain a better understanding of the determinant constructs that influence their food waste separation intention (FWSI).

Numerous studies have investigated the determinant factors of waste reduction or separation intention and behaviour in different contexts. For example, Cudjoe, Nketiah, Obuobi, Adjei, Zhu, and Adu-Gyamfi (2022) employed the theory of reasoned action to investigate the factors of residents' waste sorting intention in China. Additionally, Ao, Zhu, Wang, Zhang, and Chang (2022) investigated the factors influencing household waste classification behaviour among rural residents in China, using the Theory of Planned Behaviour (TPB). The TPB model also examined the factors that significantly affecting household waste separation behaviour in Russia and Finland (Zaikova, Deviatkin, Havukainen, Horttanainen, Astrup, Saunila, & Happonen, 2022). In addition, Govindan, Zhuang, and Chen (2022) also employed TPB as an underlying model to study the residents' waste sorting behaviour in China. TPB has again been adopted to study the intention to separate food waste in Malaysia in a study conducted by Ng, Ho, and Sia (2021). Likewise, Chengqin, Zailani, Rahman, Aziz, Bhuiyan, and Gazi (2024) used TPB to evaluate the factors of household behavioural intention towards reducing, reusing and recycling food waste management. Additionally, an integrated model combining TPB and the norm activation model were also proposed to investigate the factors that impact household waste sorting behaviour (Zhang, Lai, Wang, & Wang, 2019). In a recent study by Ng and Sia (2023), the FWSI of the restaurant's managers has been examined using the institutional theory. These previous

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studies have provided valuable insights into sustainable waste-related behavioural intention from different perspectives, offering benefits to both theoretical frameworks and practical applications. Nevertheless, the factors affecting university students' FWSI from the Stimulus-Organism-Response (S-O-R) lens are deficient in the literature. Therefore, further research is required to fill this gap and enrich the literature in this area.

As discussed above, the study's main objective is to examine the constructs that significantly influence university students to separate their food waste using the S-O-R framework. Four constructs have been proposed in this study as stimuli: awareness of consequences (AC), ascription of responsibility (AR), environmental knowledge (EK), and university support (US). At the same time, students' attitudes (ATT) on food waste separation are proposed as an organism that may affect the students' FWSI. Several important implications are provided in this study, and it benefits the literature and stakeholders. For instance, the new evidence on the FWSI of the study could further enrich the literature as the evidence was provided from different perspectives (S-O-R) and settings (university students). Moreover, the stakeholders could refer to the study in formulating practical strategies to promote food waste separation behaviour and further move forward to achieve a sustainable campus.

Literature Review and Hypotheses Development

Stimulus-Organism-Response (S-O-R)

SOR is a framework introduced by Mehrabian and Russell (1974) and suggested that the responses (R) of an individual are influenced by the organism (O), and some external factors would be the stimuli (S) that affect their organism (O). Theoretically, stimulus represents some external factors that affect the internal states of organisms (Tan, 2023) and eventually determine their responses. The SOR would be the appropriate framework to explain complicated human behaviour as the framework consists of a sequential mechanism (Perez-Vega, Kaartemo, Lages, Razavi, & Mannisto, 2021), from Stimulus to Organism and Response. Therefore, numerous studies have adopted this framework due to its advantages in predicting human behaviour. For instance, Wong, Ling, and Ling (2023) proposed a conceptual framework for assessing student loyalty in higher education using the SOR framework. Chang, Yen, Chou, and Lo (2023) also adopted the SOR framework to investigate the factors of live-streaming purchase intention. Similarly, Tan (2023) also utilised the framework of SOR to examine the green hotel patronage intention. The SOR framework has also been used to study customer engagement behaviour in the retail sector (Sicilia & Palazon, 2023). This empirical evidence signified the suitability of the SOR in explaining human behaviour in different research contexts. With that, this study also adopts SOR as its theoretical foundation. Consistent with the theoretical perspective and empirical evidence, the four proposed external stimuli, namely AC, AR, EK, and US could have a significant effect on the proposed internal organism (ATT). Additionally, ATT also played a significant role in determining consumers' behavioural intention, such as students' FSWI, in this study context. Therefore, with the great theoretical framework offered by SOR, it is suitable to study the intention of students to separate food waste.

Effect of Awareness of Consequences on Attitudes

AC refers to an individual's comprehension of the prospective results of the waste separation (Chen & Lee, 2020). If individuals have a better understanding of their behaviour's consequences, they will have more awareness and consciousness toward the

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behaviour. For instance, in this study, university students are perceived to exhibit high awareness and consciousness of their behaviour, such as food waste separation behaviour, when they gain a deeper understanding of the consequences of this behaviour on society and the environment. Thus, the AC is projected to significantly impact students' ATT toward food waste separation. This postulation is proven in literature where individuals' ATT toward pro-environmental behaviour could be significantly affected by their AC. Zhang et al. (2019) discovered the positive impact between the AC and personal ATT towards waste recycling behaviour. This aligns with the findings conducted by Chen and Lee (2020), who discovered a significant impact of the AC on household ATT toward waste separation intention. Similarly, Nguyen (2022) also remarked on the positive effect of the AC on the ATT toward bringing one's own shopping bags. Therefore, the hypothesis below is proposed:

H1: AC is positive and significantly affects ATT.

Effect of Ascription of Responsibility on Attitudes

AR is defined as the feeling of responsibility for ecological problems and issues (Steg & de Groot, 2010). Individuals will tend to protect the environment if they feel responsible for environmental degradation (Mohmed@Wasli, Ling, Kiew, & Ling, 2022). With that, it is assumed that the individual's responsibility is one of the determinant factors of pro-environmental behaviour. Individuals' positive ATT are often influenced by their sense of responsibility. When individuals perceive a sense of responsibility for environmental issues, they are more likely to develop favourable ATT toward related behaviours. The same supposition is proposed in this study, whereby the students are expected to have favourable ATT toward the food waste separation if they feel responsible for environmental issues. Some of the prior studies support this proposition. For example, Zhang *et al.* (2019) revealed the significant role of the AR on the resident's ATT toward waste recycling. Likewise, the significant positive effect of the AR on the ATT toward green hotels was also found in the context of green hotel visiting intention in Pakistan (Raza & Farrukh, 2023). Hence, the following hypothesis is suggested:

H2: AR is positive and significantly affects ATT.

Effect of Environmental Knowledge on Attitudes

EK refers to the level of familiarity of an individual with environmental problems and issues (Emekci, 2019). EK is crucial in explaining the student's environmentally friendly behaviour, as the students are more likely to engage themselves in pro-environmentally behaviour if they gain a better understanding about environmental issues (Ling, Chin, Yi, & Wong, 2023). Students are expected to have a certain level of knowledge on environmental problems to form a positive and good ATT on the food waste separation, as they must know the reason behind engaging in the behaviour. Therefore, it is anticipated that the level of knowledge on environmental issues would significantly influence students' ATT towards food waste separation. The significant influence of EK on ATT has been documented in the previous literature. For instance, Liao and Li (2019) found that EK significantly impacts the ATT towards solid waste separation on campus. Shimul and Cheah (2023) also revealed the significant impact of EK on consumers' ATT regarding eco-friendly packaging products. Parallel significant effect of EK and consumers' ATT has also been observed in the study on green plastic products

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(Suhartanto, Mohd Suki, Najib, Suhaeni, & Kania, 2023). Thus, the hypothesis below is formulated:

H3: EK is positive and significantly affects ATT.

Effect of University Support on Attitudes

Meeralam and Adeinat (2022) defined US as the level of perception where the university provides students with the required knowledge, skills, and inspiration. In other words, support from the university could be defined as the assistance and initiatives provided by the university management to encourage students' behaviour. These supports may include regulations, policies, facilities, and educational supports. The influence of UD on students' behaviour has been documented in the literature. For example, Qazi, Qureshi, Raza, Khan, and Qureshi (2021) found that university green entrepreneurial support significantly affects students' green entrepreneurial intention. The university's supporting efforts and initiatives are expected to cultivate students' positive and favourable ATT toward food waste separation. It is hypothesised that if the university provides more efforts and initiatives to support the food waste separation behaviour, it will help facilitate the behaviour and thus establish a positive ATT toward the food waste separation behaviour. This hypothesis aligns with some empirical studies that revealed the significant influence of the supportive effort from institutional agencies like universities and government in promoting favourable ATT toward a behaviour. For instance, Waris, Barkat, Ahmed, and Hameed (2022) found that university entrepreneurial support is crucial in forming favourable ATT toward sustainable entrepreneurship. Besides, Lee and Jais (2022) further acknowledged the significant influence of government support on ATT toward the use of e-wallets. Similarly, similar impacts of government support on the ATT toward Islamic banking are also revealed in the literature (Charag, Fazili, & Bashir, 2020). Therefore, the following hypothesis was proposed by borrowing a similar concept from other research contexts.

H4: US is positive and significantly affects ATT.

Effect of Attitudes on Separation Intention

ATT refer to an individual's feelings toward a particular behaviour (Ajzen, 1991) and the feeling may be good or bad. The positive ATT tend to encourage the individual to perform it, while the bad ATT are more likely to inhibit their engagement. With that, ATT are a primary predictor of an individual's behavioural intention. For example, individuals are more likely to perform food waste separation if they perceive it as helpful and environmentally friendly behaviour (Ng et al., 2021). Similarly, Cudjoe et al. (2022) also remarked that favourable ATT toward waste sorting would encourage their behavioural intention. Govindan et al. (2022) expressed a similar viewpoint by mentioning that individuals are more likely to participate in food waste sorting if they know the benefits of the behaviour on the environment. Therefore, a positive and favourable ATT is hypothesised to promote the intention to separate food waste, paralleled with the findings in the literature (Cudjoe et al., 2022; Govindan et al., 2022; Chengqin et al., 2024). Specifically, Ng et al. (2021) showed significantly positive effect of the ATT towards the FWSI in Malaysia. Zaikova et al. (2022) also observed a significant positive influence of the ATT on the waste source-separation intention in Russia and Finland. For that reason, the hypothesis below is suggested:

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H5: ATT is positive and significantly affects INT.

The proposed research framework in Figure 1 was developed based on the discussion above, whereby AC, AR, EK, and US are the stimulus that will affect ATT (as an organism), and the Response is FWSI.

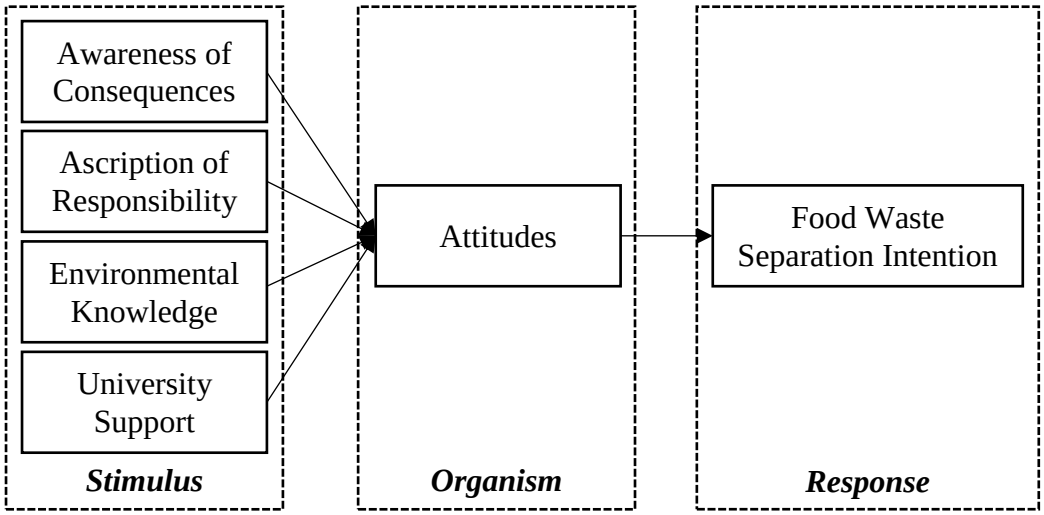

Figure 1: Proposed Research Framework
Source: Own developed

Methodology

The study used a quantitative method to achieve its research objective. A purposive sampling technique is employed to select the university students as the study's respondents. Purposive sampling is used in the study as the respondents must fulfil the criteria (e.g., they must be Malaysian university students) to be eligible for the study. Therefore, the participants must fill in their students' email to verify their eligibility. Purposive sampling is the most suitable sampling technique if the respondents must fulfil certain selection criteria to be qualified for a study. The primary responses from the targeted population were collected through Google Forms from April until May 2023. A total of 214 university students took part in this study, surpassing the minimum sample size requirement of 138, calculated using power analysis with an effect size of 0.15, 95% power level, and five predictors.

The questionnaire is first developed by adapting measurement items from previous studies for each construct. For example, three items of AC and AR were borrowed from Wang, Wang, Zhao, and Yang (2019). Furthermore, four EK items and five US items were adapted from Nekmahmud, Ramkissoon, and Fekete-Farkas (2022) and Ling et al. (2023), respectively. Four items were used to measure ATT, and it was elicited by Govindan *et al.* (2022). Lastly, FWSI was measured using the five items from Ng et al. (2021). With that, 24 items were included in the study questionnaire, and four questions were for the respondent's background. The questionnaire was prepared in English and Malay to avoid confusion. Respondents were required to use a seven-point Likert scale to assess their level of agreement on these measurement items, ranging from strongly disagree (1) to strongly agree (7).

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The partial least squared structural equation modelling (PLS-SEM) in SmartPLS version 4.0.9.2 was utilised to analyse the collected data. The main reason for using PLS-SEM in SmartPLS rather than other analytic approaches is due to the non-normality of the data. The Mardia multivariate normality test found that the data is not normally distributed, as the kurtosis coefficient (79.1292) is greater than 20. Thus PLS-SEM was deemed the most suitable approach (Hair, Risher, Sarstedt, & Ringle, 2019).

Analysis of Results

Table 1 provides an overview of the demographic profiles of the study's respondents. The data shows that males (52%) are slightly more than females (48%). Besides, majority students fall within the 21 to 23 years old range, with the next largest group being aged between 18 to 20 years old. In terms of the level of study, around 77% of respondents are enrolled in Bachelor's degree programs, and the remaining 23% are foundation students. The Table also showed that half of the respondents are newbies as they enter the university for their first-year studies.

Table 1: Demographic Profiles of Respondents

Profiles	Frequency	Percentage
Gender		
Male	111	51.87
Female	103	48.13
Age Ranges		
18 – 20-Year-Old	73	34.11
21 – 23-Year-Old	129	60.28
24-Year-Old and Above	12	5.61
Level of Study		
Foundation	49	22.90
Bachelor Degree	165	77.10
Year of Study		
Year 1	106	49.53
Year 2	76	35.51
Year 3	18	8.41
Year 4	14	6.54

Source: Author (2024)

Common method bias (CMB) is considered one of the main issues for multivariate analysis. Therefore, this study further assesses the possibility of the CMB issue using full collinearity and Harman's single-factor approach. Kock (2015) introduced the full-collinearity method and suggested that the CMB is absent in the study when all constructs' variance inflation factors (VIFs) are less than 3.30. As provided in Table 2, the VIF values for all constructs are not greater than 3.30, and thus, it proved that CMB is not an issue in this study. In addition, Harman's single-factor test also supports this conclusion, whereas all items only predicted 44.42% of the first factor, which is less than the threshold value of 50% (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

The measurement model must be assessed first before examining the proposed hypotheses. The results of the measurement model assessment are provided in Table 2. Firstly, the convergent validity is established in both items and constructs levels as the outer loading values for all items is exceed 0.5000 (Bagozzi, Yi, & Philipps, 1991), and average variance extracted (AVE) values also greater than the threshold of 0.5000

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(Bagozzi & Yi, 1988). Besides, the composite reliability (CR) values higher than 0.7000 further confirmed the high internal consistency of the study (Gefen, Straub, & Boudreau, 2000). Furthermore, the study's discriminant validity was assessed using the heterotrait-monotrait (HTMT) correlation ratio, as presented in Table 3. The result of HTMT proved that the discriminant validity was also established in the study, as all the values were lower than the stringent threshold of 0.85 (Kline, 2011). With that, further analyses on the structural model assessment could be carried out as the data was sufficiently reliable and valid.

Table 2: Results of Measurement Model Assessment

Constructs	Items	Loadings	AVE	CR	VIF
Awareness of Consequences	AC1	0.8683	0.7629	0.9061	2.5180
	AC2	0.8847			
	AC3	0.8672			
Ascription of Responsibility	AR1	0.8781	0.7823	0.9151	2.4470
	AR2	0.8884			
	AR3	0.8870			
Environmental Knowledge	EK1	0.5713	0.5270	0.8114	2.6100
	EK2	0.5862			
	EK3	0.8336			
	EK4	0.8620			
University Support	US1	0.7835	0.6276	0.8937	2.6350
	US2	0.8310			
	US3	0.8151			
	US4	0.8029			
	US5	0.7241			
Attitudes	ATT1	0.8538	0.7047	0.9050	2.8100
	ATT2	0.7960			
	ATT3	0.8841			
	ATT4	0.8213			
Intention to Separate Food Waste	INT1	0.8660	0.7061	0.9231	2.2320
	INT2	0.8308			
	INT3	0.8493			
	INT4	0.8179			
	INT5	0.8368			

Source: Author (2024)

Table 3: Result of Heterotrait-Monotrait (HTMT) Ratio of Correlation

	AC	AR	EK	US	ATT	FWSI
AC						
AR	0.7649					
EK	0.8275	0.8361				
US	0.6905	0.7337	0.7601			
ATT	0.8148	0.6841	0.7786	0.7800		
FWSI	0.6206	0.6548	0.5836	0.7754	0.7245	

Source: Author (2024)

The study continued with the structural model assessment to test the proposed hypotheses of the study. The result of the path coefficient and hypotheses testing was provided in Table 4 and showed that out of five hypotheses, four hypotheses were supported. The result showed that AC ($\beta = 0.3417$, $p < 0.05$), EK ($\beta = 0.2336$, $p < 0.05$), and US ($\beta = 0.3393$, $p < 0.05$) have a significantly positive influence on the ATT, and thus, H1, H3, and H4 were supported. However, H2 failed to support as AR ($\beta = - 0.0083$, $p > 0.05$) is insignificantly influenced by ATT. Besides, the result also revealed that

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FWSI is positively and significantly affected by ATT ($\beta = 0.6399$, $p < 0.05$), supporting H5.

Additionally, the study's coefficient of determination (R^2) showed that the four constructs of stimulus (AC, AR, EK, and US) could explain 62.03% of the variation in ATT. At the same time, ATT predicted 40.94% of the FWSI's variances. Besides, the predictive relevance (Q^2) value for ATT (0.4251) and FWSI (0.2803) further indicated that the exogenous constructs have a predictive ability to explain the endogenous construct, as the Q^2 value exceeds zero (Hair, Hult, Ringle, & Sarstedt, 2017). Moreover, with reference to the guideline of Cohen (1988), AC and EK have a small effect size on ATT ($0.02 > f^2 < 0.15$), but US has a medium effect on ATT ($0.15 > f^2 < 0.35$). In contrast, ATT possesses a large effect size on FWSI ($f^2 > 0.35$).

Table 4: Results of Hypotheses Testing by Using PLS-SEM

Hypo.	Path	Coeff.	t-value	p-value	BCI-LL	BCI-UL	f2	Result
H1	AC -> ATT	0.3417	4.7852	0.0000	0.2300	0.4598	0.1393	Support
H2	AR -> ATT	-0.0083	0.1047	0.4583	-0.1352	0.1273	0.0001	Not Support
H3	EK -> ATT	0.2336	3.2254	0.0006	0.1123	0.3526	0.0588	Support
H4	US -> ATT	0.3393	5.5032	0.0000	0.2362	0.4368	0.1570	Support
H5	ATT -> FWSI	0.6399	9.6544	0.0000	0.5088	0.7325	0.6933	Support

Source: Author (2024)

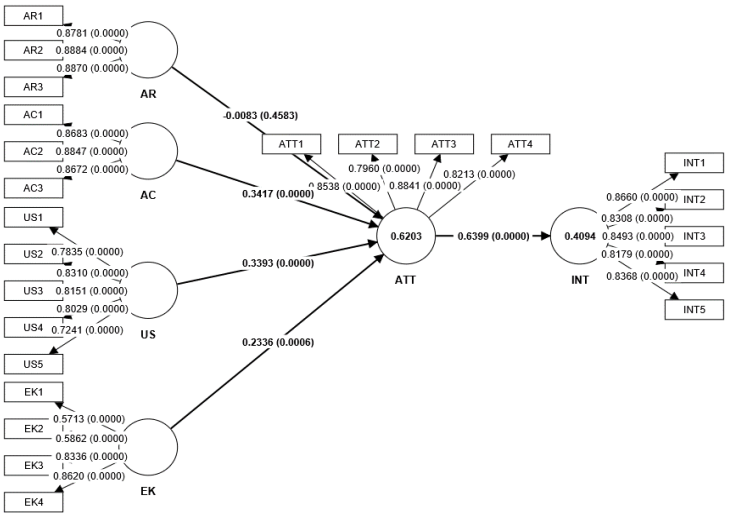

Figure 2: Results of Hypotheses Testing by Using PLS-SEM
Source: Own developed

Discussion

Using the SOR framework, this study aims to investigate the constructs that significantly influence students' FWSI. The study first revealed that AC significantly influenced students' ATT on food waste separation. This significant relationship aligns previous studies conducted by Zhang et al. (2019), Chen and Lee (2020), and Nguyen (2022) studies. It shows that the students tend to have a favourable ATT towards food waste separation if they are aware and know about the consequences of excessive food waste on environmental quality. However, AR is found to be insignificant to ATT, and this contrasts with some of the empirical evidence (Zhang et al., 2019; Raza & Farrukh, 2023) that found a significant effect of AR on ATT. The insignificant result signified

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that students' perceived responsibility may not be the primary factor driving the formation of favourable ATT among students on the food waste separation.

Consistent with studies conducted by Liao and Li (2019), Shimul and Cheah (2023), and Suhartanto et al. (2023), this study also identified a significant impact of EK on ATT. It indicated that the students' ATT on food waste separation will be enhanced if they have more knowledge or are well-informed on environmental issues. In addition, the significant role of US on the student's ATT is also further proved in this study. This finding is consistent with research conducted by Waris et al. (2022), who also reported a significant effect of US on students' ATT in different contexts. Lastly, the study found that ATT significantly influences students' FWSI to separate the food waste, paralleled with prior studies (Ng et al., 2021; Cudjoe et al., 2022; Zaikova et al., 2022). With that, students are more likely to engage in food waste separation if they have a positive and favourable ATT toward the food waste separation.

Implications

Several implications were derived from the results of the study. For instance, this study contributed theoretically to the literature by using the SOR framework to investigate students' FWSI. As discussed above, most empirical studies adopted the TPB model as the foundation of their study in examining the FWSI for different groups of populations. However, studies that use SOR framework to investigate the role of four proposed stimuli (AC, AR, EK, and US) is somehow limited. The study considerably enriched the literature in this area by proving that SOR could be used to examine the FWSI, and AC, EK, and US behave as crucial stimuli that affect the ATT, which reacts as an organism, and lastly influenced the students' FWSI. Moreover, among the four proposed stimuli, AC and AR represent personal altruistic behaviour, while EK is related to the student's level of knowledge on environmental issues. Furthermore, the context of the study focuses on university students; therefore, US is also included as one of the stimuli. The result further verified the essential impact of different stimuli, as the students' FWSI is affected by personal behaviour and other factors like knowledge level and support from others. Thus, future studies should consider the vital role of other factors in determining the constructs that may significantly influence FWSI and behaviour.

The findings also provide critical practical implications for stakeholders to further enhance students' FWSI in establishing a sustainable campus. This is aligned with SDG 11, which aims to establish sustainable cities and communities. The University campus is also a community that consists of a large number of students from different backgrounds and is also equipped with several necessary infrastructures and facilities. Therefore, through the study, the stakeholders were able to understand the critical factors that determined the students' FWSI; it could help the university management to achieve the objective of establishing a sustainable campus and even assisting the local government in building more sustainable cities and communities. For example, ATT is essential in promoting students' intention to separate their food waste. Therefore, stakeholders, such as the local government and university management, have a vital role in cultivating a positive and favourable ATT among students towards the food waste separation. Students are more likely to engage in food waste separation hold a positive ATT towards this behaviour.

As proved in this study, students' ATT could be significantly enhanced by three constructs, namely AC, EK, and US. Stakeholders are encouraged to prioritise these three constructs as the stimuli significantly stimulated students' ATT on food waste

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separation. The stakeholders should display and inform the students about the consequences of improper food waste management, such as air and water pollution, resource wastage, excessive food waste in landfills, and the need to raise awareness of the negative consequences on the environmental quality. Additionally, environmentally friendly related programs and activities should be frequently organised on campus to educate students and equip them with the necessary knowledge and information about environmental protection. Lastly, the supporting efforts from the university should not be ignored as the study revealed their importance in creating a good and favourable ATT on the food waste separation. Thus, university management should provide some necessary support, such as issuing food waste separation guidelines to the students on the steps to separate their food waste, providing sufficient separation facilities to facilitate their behaviour and organise some relevant activities and programs to raise students' awareness on the environmental protection. These initiatives and efforts are believed to further stimulate the favourable ATT among students and eventually increase their intention to separate food waste.

Conclusions and Recommendations for Future Study

Food waste separation is one of the efforts to reduce the negative consequences of excessive food waste on environmental quality. University students who spend a lot of time on the university campus are perceived as one of the dominant consumers as they tend to purchase more food than they need. Consequently, it is necessary to investigate the constructs that may drive their intention to separate the food waste, as it is one of the initiatives to achieve campus sustainability. Due to the limited evidence of the SOR in this matter, this study adopts the framework of SOR by proposing AC, AR, EK, and US as the stimulus that may affect the ATT and ultimately impact their intention to separate food waste. Using purposive sampling, 214 valid responses were collected from the existing university students and were subjected to hypothesis testing using PLS-SEM in SmartPLS. The result of the study showed that only AC, EK, and US significantly stimulate students' ATT on food waste separation, while ER has no significant effect on ATT. Besides, the students' intention to engage in food waste separation is significantly influenced by their favourable ATT. These findings provide essential implications for academic research and stakeholders to promote the students' FWSI and build a more sustainable campus.

Due to the limitations of this study, it is recommended that future research may revise the framework by including more constructs as stimulus and organism, as this study only proposed four constructs of stimulus and one construct as an organism. Other constructs like the availability of the facilities, easiness of engagement, and influence from friends and family may be essential stimuli for students to engage in food waste separation. Moreover, some constructs may be included as mediators or moderators to examine students' FWSI as the decision-making usually involves complicated and well-thought processes. In addition, further study may extend the context of the study to different targeted populations, such as working adults and older generations, to obtain a compressive finding regarding the constructs that influenced the FWSI of different consumer groups. Comparison between different consumer groups could be considered, and different consumer groups may have different perspectives on the topic. These suggestions would be expected to produce more comprehensive and solid findings on the research topic and contribute theoretically and practically to the research.

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APPENDIX

Awareness of Consequences – Wang et al. (2019)

- Managing food waste without separation can cause severe environmental pollution problems.
- Managing food waste without separation can cause ecological damage.
- Managing food waste without separation can lead to resource waste.

Ascription of Responsibility – Wang et al. (2019)

- I feel jointly responsible for separating food waste in my daily life.
- I feel jointly responsible for the negative consequences of not separating food waste.
- I feel jointly responsible for the environmental pollution and ecological damage problems caused by not separating food waste.

Environmental Knowledge – Nekmahmud et al. (2022)

- I know more about food waste separation than the average person.
- I am very knowledgeable about environmental issues.
- Separating food waste is one of the most effective ways to reduce pollution.
- Separating food waste is a substantial approach to minimizing the waste of natural resources.

University Support – Ling et al. (2023)

- The university is actively promoting food waste separation by issuing guidelines and policies.
- For me, the university's support for food waste separation is important.
- The university encourages food waste separation.
- The university has good rules and regulations in place to encourage food waste separation.
- For me, the university’s promotion of food waste separation is important.

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Attitudes – Govindan et al. (2022)

- In my opinion, separating food waste is a good activity.
- For me, food waste separation at a residential hostel would be an interesting task.
- I think food waste separation is beneficial to the environment.
- Food waste separation is admirable behaviour.

Food waste separation Intention – Ng et al. (2020)

- I intend to separate my food waste at the residential hostel regularly if there are food waste collection measures.
- I intend to separate my food waste at the residential hostel if I am satisfied with the food waste collection measures taken by the university.
- I intend to separate my food waste at the residential hostel if I am convinced of the benefits of food waste separation.
- I intend to separate my food waste at the residential hostel if the university enforces public participation in food waste separation.
- I intend to separate my food waste at the residential hostel if the university provides satisfactory services for the separated food waste collection.