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Article

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University as stimulus to promote intention to separate food waste: a study on the Chinese female residential students

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ABSTRACT

Overwhelming food waste impacted society and the environment. One of the initiatives to mitigate this problem is to separate the food waste and utilise it for alternative purposes. However, few studies have examined universities' role in separating female residential students' food waste, even though universities contribute to food waste generation. Therefore, this study investigates the university's role on this matter. Through purposive sampling, 339 responses from female residential students were gathered and analysed using the Partial-Least-Square-Structure Equation Modelling (PLS-SEM) and Importance-Performance Map Analysis (IPMA) techniques. The results revealed that the university environment (UE) and university policy regulation (UPR) influenced female residential students' attitudes (ATT) toward food waste separation. In contrast, UPR and ATT significantly influenced the students' food waste separation intention (FWSI). The mediation analysis also showed the significance of the UE and UPR, which could indirectly affect the students' FWSI through ATT. Furthermore, the Importance-Performance Map Analysis (IPMA) showed that the improvement effort should be more focused on ATT as the current performance is low. Thus, the importance of the university-related factors was provided in this study. The finding is expected to bring theoretical and practical advantages.

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SUBJECTS

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Introduction

Universities appear to be small cities with large campuses and students of various cultural backgrounds (Aikowe & Mazancová, 2021). Universities also act as agents of change in society (Tangwanichagapong et al., 2017), as they equip students with the necessary knowledge and skills. Universities offer some official education structures, yet they also consist of extracurricular activities that would prepare the students with soft skills like leadership, communication skills, creative thinking, and the like. Besides providing educational support, the university's campus usually has the necessary facilities to support the student's daily life. Therefore, this showed that the university played a vital role in shaping the students' behaviour. This supposition aligns with the institutional theory (North, 1991), where individuals must accommodate the institutional forces in regulating their behaviour (Roxas & Marte, 2022). Therefore, it is expected that the university plays a crucial role in influencing the students' behaviour.

Residential students stay in the hostel and usually spend most of their time studying or living on campus, leading to a sense of belonging by considering the residential hostel as their second home. As such, a large amount of the waste, including food waste, is expected to be generated in the residential hostel and normally not well-managed. For instance, approximately 17,000 tonnes of food waste were recorded daily, and 24% were considered edible (Themalaysianreserve.com, 2021). Hashim et al. (2021) further acknowledges that 80% of this food waste is disposed at the landfill despite a high potential to

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be composted. Therefore, proper food waste management practices are necessary as excessive waste and improper management could lead to social and environmental concerns such as public health issues, air and water pollution, and the like (Mui et al., 2022). Furthermore, proper food waste management aligns with the Sustainable Development Goals (SDGs) 11 and 12, which focus on establishing Sustainable Cities and Communities and promoting Responsible Consumption and Production. Ardra and Barua (2022) supported that the food waste generated at the production and consumption stages prohibits the achievement of SDG 12. Universities, as a place for teaching, research, and development of future generations, serve to move towards the SDGs (Heleta & Bagus, 2021). Hence, the roles of universities in promoting food waste separation shall not be overlooked.

Empirically, numerous waste-related studies have been investigated in different contexts and provided a better understanding of the research matter. For instance, waste reduction intention has been investigated by Lin and Guan (2021) and Matharu et al. (2022). Besides, Ao et al. (2022) studied the rural residents' household waste classification, while Luu (2020) examined the hotel employees' food waste reduction behaviour, and Liao et al. (2018) investigated the waste separation intention in the workplace. Furthermore, the restaurant manager's intention to separate food waste has also been examined by Ng and Sia (2023). Unfortunately, the food waste separation intention (FWSI) among female residential students is relatively limited in the literature, even though this group of citizens possesses a unique research context on food waste management. Females were found to have stronger participation in waste source separation (Zhang et al., 2017). This suggests the need for research specifically targeting the female population. Moreover, the evidence on the institutional perspective, particularly the university's role in influencing residential students' food waste separation behaviour, is relatively scarce, as most previous studies focused on different perspectives. For example, most of the previous studies related to food waste separation behavioural intention are focused on personal factors like ATT, subjective norms, awareness of consequences (Ao et al., 2022; Cudjoe et al., 2022; Zhang et al., 2019), as well as the external factors like government, infrastructure or facilities and incentives (Govindan et al., 2022; Zhang et al., 2022). Therefore, from the institutional theory perspective, a study is necessary to investigate the role of the university towards the students' FWSI. To specify, the following research questions aimed to be addressed in this study:

RQ1. Does the university's role (university environment (UE), green university initiatives (GUI), and university policy regulation (UPR)) significantly influence ATT and FWSI?

RQ2. Does ATT significantly influence FWSI?

RQ3. Does ATT significantly mediate the associations of the university's role (UE, GUI, and UPR) and FWSI?

The Stimulus-Organism-Response (SOR) framework has been used in the study as theoretically based and integrated with the institutional theory to address the aforementioned research questions. Particularly, the university's role (UE, GUI, and UPR) that represents the institutional forces are conceptualised as the stimulus to explore their effects on the students' ATT and, eventually, their intention. Besides, the indirect influence of these universities' role on the FWSI was also discovered through the mediator of ATT. Therefore, the study's findings could provide significant insights from both theoretical and practical perspectives. Firstly, theoretical significance relies on the proposed novel model based on the SOR framework and institutional theory, as it could provide a more comprehensive perspective of the residential students' FWSI by considering the university's role as stimuli, followed by the ATT as an organism, and ultimately influence the FWSI, which reacts as a response. The study also offers evidence on the mediation role of ATT between the university's role and FWSI. The incorporation of the SOR framework and institutional theory in researching the university's role can significantly elevate the existing literature on this subject matter, considering its current under-researched state. Besides, the relevant stakeholders, like the university management and government agencies, could utilise the findings for implementing adequate procedures and approaches to cultivate the FWSI among the residential students in establishing a more sustainable environment for benefiting both the campus and the community. These theoretical and practical significances are the compelling motivations that drive current study.

Literature review

Stimulus-organism-response (SOR)

As proposed by Mehrabian and Russell (1974), some external factors could be the stimuli (S) to trigger the individual's cognitive evaluations, which are named organism (O) and eventually form the individual's responses (R), such as decisions, intentions, or behaviour. Perez-Vega et al. (2021) further remarked that SOR is a model that predicts complex human behaviour using the sequential mechanism. Since the inception of the SOR, this theory has been widely used in examining the effect of the external factors that react as stimuli on individuals' cognitive evaluations and responses. For instance, Perez-Vega et al. (2021) proposed a conceptual model for artificial intelligence on online customer engagement behaviour using the SOR framework. Sampat et al. (2022) used SOR with the dual-factor theory to examine the hybrid work model in India. Besides, Duong (2023) also used SOR to evaluate the education-related factors on social entrepreneurial intention and behaviour in Vietnam. Zhu et al. (2023) utilised the SOR model to investigate the effect of artificial intelligence chatbots on purchase intention through online travel agencies. Within the theoretical lens, the SOR framework is an ideal framework for the study as it emphasises the emotion-cognition process to establish the individuals' behavioural intentions with the integration of institutional theory, particularly on the university roles, such as UE, GUI, and UPR, as the stimuli to encourage residential students to perform food waste separation. Besides, the SOR framework is appropriate for studying complex human behaviour (Perez-Vega et al., 2021); thus, it provides a comprehensive perspective to predict the complex connections of an individual and the external factors (university's role) that may influence the cognitive elements and, ultimately, their behaviour. Consistent with Yu et al. (2021), the stimulus constructs could influence individuals' responses through the organism construct, and this signified the appropriateness of the SOR framework to be adopted as the foundation framework of the study. As illustrated in Figure 1, it is anticipated that the three proposed stimuli (UE, GUI, and UPR) would influence the students' cognitive evaluation, represent an ATT, and ultimately influence their FWSI (response).

Hypotheses development

University environment on attitude and intention to separate food waste

UE is a double-edged sword as it could promote or discourage student behaviour (Lüthje & Franke, 2003). With that, the UE could be an external stimulus that influences students' behaviour directly or indirectly. Çera et al. (2021) remarked that the university could provide students with supporting programs such as training and networking, and encourage career aspirations to stimulate their entrepreneurial intentions (Çera et al., 2021). Franke and Lüthje, (2004) also acknowledged the crucial effect of the UE on ATT and entrepreneurial intention.

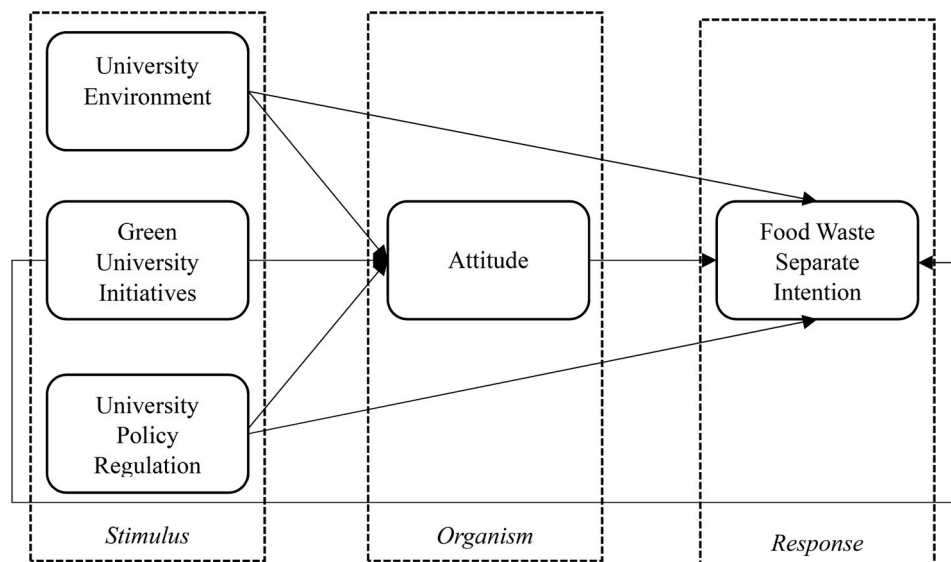


Figure 1. Proposed research framework.

With the better environment of the university, a positive student ATT could be established as the residential students may perceive food waste separation as a favourable behaviour to protect the environment. Thus, it is expected that the UE could significantly affect the student's ATT toward food waste. Besides, the students' behavioural intention is also estimated to be influenced by the UE. This is in line with Çera et al. (2021), who remarked that a better university atmosphere could promote the students' engagement in a particular behaviour, such as entrepreneurship. A similar association is postulated in this study, whereas the residential students' FWSI is expected to be influenced by the UE. However, evidence on the role of the UE on FWSI is scarce. This required further study to explore the role of the UE on the residential student's ATT and FWSI. The hypotheses below are formulated.

H₁: ATT is positively influenced by the UE.

H₂: FWSI is positively influenced by the UE.

Green university initiatives on attitude and intention to separate food waste

Green initiatives prevent or reduce negative consequences on society and the environment (Anand & Gaur, 2019). Thus, the GUI could be referred to as the university's effort to mitigate ecological degradation and promote sustainable campus development. Therefore, the university as an educational institution has a significant role in shaping the students' ATT and behaviour. For instance, favourable ATT could be formed through several green initiatives introduced by the university in promoting environmentally friendly behaviour like food waste separation. This is in agreement with the literature which revealed the significant effect of green initiatives on ATT. For example, Wang et al. (2022) showed that GUI is significantly related to ATT. Similarly, the considerable effect of environmental corporate social responsibility initiatives on ATT is also revealed by Vu et al. (2022). Therefore, it is expected that the favourable ATT of the residential students could be established through GUI. Al-Swidi and Saleh (2021) remarked that green initiatives also significantly influence consumer behaviour. Similarly, Sabbir et al. (2023) further suggested the significant role of government initiatives in electronic product exchange intention. Therefore, the substantial effect of GUI on the residential students' FWSI was also hypothesised. Thus, with the university's green initiatives, residential students would be more likely to separate their food waste. Hence, this study proposed the following hypotheses.

H₃: ATT is positively influenced by GUI.

H₄: FWSI is positively influenced by GUI.

University policy regulation on attitude and intention to separate food waste

Policy regulation refers to the perceived availability of policy and regulation by individuals. This study defined the UPR as the availability of the university's food waste separation policy toward university students' behaviour. As a result, the university could effectively influence students' ATT and behavioural intentions (Franke & Lüthje, 2004). Therefore, it is expected that the UPR could significantly affect the student's ATT toward food waste separation. The residential students shall actively engage in separating food waste if this is mandated by the universities. Chen and Lee (2020) supported that the policy regulation significantly impacted the ATT to separate waste at the source. A favourable ATT toward waste separation is likely to be formed through some policy regulation (Chen & Lee, 2020). Moreover, the UPR could directly impact behavioural intention. The influence of the policy-related construct on consumer behaviour is also remarked by Li et al. (2020). For example, Li et al. (2020) revealed that public environmental policy played a significant effect on behavioural intention. In the same vein, government policy plays a significant role in the intention to purchase new energy vehicles in China (Du et al., 2018). Thus, it is predicted that the UPR could substantially influence the residential students' FWSI. This proposition will be examined in this study through the proposed hypotheses below.

H₅: ATT is positively influenced by UPR.

H₆: FWSI is positively influenced by UPR.

Attitude on intention to separate food waste

An ATT refers to the individual's subjective valuation toward a particular behaviour (Chen & Lee, 2020). The anticipated outcome of the assessment is attributed to each person's subjective evaluation, which can either be favourable or unfavourable (Govindan et al., 2022). Therefore, an individual with a positive ATT will reflect their favourable behaviour (Anubha, 2023). This study defined ATT as the level of perception of the residential students toward the food waste separation behaviour. Therefore, if the residential students have a positive and good ATT toward the food waste separation behaviour, they will have a high likelihood of performing it. This has postulated the significant positive influence of the ATT on the FWSI and is supported by the literature. For example, Ng et al. (2021) remarked that consumers are most likely to perform food waste separation if they feel it is useful and environmentally friendly. Similarly, Cudjoe et al. (2022) and Govindan et al. (2022) also found a significant positive influence of the ATT on the waste sorting intention in China. Besides, ATT also significantly influences rural residents' waste classification intention (Ao et al., 2022) and households' intention to reduce food waste (Lin & Guan, 2021). Thus, the following hypothesis is formulated.

H₇: FWSI is positively influenced by ATT.

Attitude as mediator

Additionally, this study further explored the indirect relationships of the three university constructs (UE, GUI, and UPR) on the FWSI via ATT. ATT is the outcome of the subjective valuation of an individual toward a behaviour (Chen & Lee, 2020). Thus, this outcome is anticipated to mediate the association between stimuli and response. The theoretical reason is that these stimuli may directly and/or indirectly influence FWSI through ATT. The mediation function of the ATT has been extensively documented. For example, ATT has mediated the relationship between subjective norms, perceived environmental responsibility, and environmental concern toward green purchase intention (Duong et al., 2022). Similarly, Ng et al. (2021) also found that ATT could mediate the relationship between environmental concerns and FWSI. Besides, Anubha (2023) revealed the significant mediation role of ATT in the relationship between electronic word of mouth and purchase intention on halal cosmetics. Recently, Ling et al. (2024) also reported the significant mediating effect of ATT on the association between environmental responsibility, environmental consciousness, and subjective norms in the context of socially responsible investment intention. Parallel to the literature, this study also proposed to examine the mediation effect of ATT on the association between the three stimuli (UE, GUI, and UPR) and the FWSI, which react as the response. Therefore, the hypotheses below were proposed on this matter.

H₈: ATT significantly mediates the association between the UE and FWSI.

H₉: ATT significantly mediates the association between GUI and FWSI.

H₁₀: ATT significantly mediates the association between UPR and FWSI.

Research methodology

Sample and data collection

The study's primary data have been collected by employing the quantitative approach. The targeted population is female residential students from a vocational and technical university in Guizhou, China. The main reason is that the research focuses on the food waste separation behaviour in the residential hostel and the selected university equipped with in-campus residential halls, which provided a suitable context for the study. Besides, as mentioned by Khan and Trivedi (2015), females are more environmentally friendly and thus willing to contribute to environmental protection. Wut et al. (2021) also remarked that females are more likely to perform some environmentally friendly behaviour than males, and this is supported by Channa et al. (2022), who mentioned that females are more environmentally conscious and thus intrinsically disposed towards green behaviour. Therefore, the female residential students are

appropriate to be selected to investigate the stimulation role of the university on their FWSI. To ensure the participants' eligibility, the purposive sampling technique was adopted to recruit qualified respondents. Three criteria to be fulfilled by the respondents are: (1) registered students at the universities in China, (2) female students, and (3) residential students. The online survey platform of Wenjuan Xing (www.wjx.cn) has been utilized to collect the data. Wenjuan Xing is a platform for collecting data in China with several cost-free advantages and is connected with local messaging platforms like WeChat (Ling et al., 2023). The survey link was shared with the targeted population through several social media platforms, such as Weibo, QQ, WeChat, and the like, from March 2023 until April 2023. This study has successfully gathered 339 usable data, and this number of respondents (339) is considered adequate as it was larger than the suggested minimum sample size of 153 by the power analysis with a medium effect size, 0.95 power level, and seven predictors.

Instruments and measurement scales

In this study, 20 measurement items adopted from the previous studies have been used to develop the questionnaire. For instance, four GUI and UE items were derived from Al-Swidi and Saleh (2021) and Çera et al. (2021), respectively. Besides, three items of UPR were elicited by Chen and Lee (2020). To measure the ATT, four items were borrowed from Govindan et al. (2022), and five items of FWSI were adapted from Ng et al. (2021). The questionnaire was first prepared in English and further translated into Chinese. The respondents are required to assess the level of agreement and disagreement on these items through the seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Data analytic approach

The primary responses were then first assessed for normality using Mardia's coefficient procedure. The result indicated that the dataset of the study is not normally distributed with a kurtosis coefficient of 67.6967, greater than 20 (Byrne, 2013; Kline, 2011). Thus, the PLS-SEM was suitable for analysing this unnormal distributed data (Hair et al., 2019).

Results

The summary of the respondents' profiles is presented in Table 1. Around 30 percent of the respondents were 20, followed by 19-year-olds and 21-year-olds. Finally, 18-year-olds and 22-year-olds consist of 23 and 22 respondents, respectively. At the same time, the remaining nine respondents were aged 23 to 24 years old. Besides, approximately half of the respondents are year two students, 47 percent of respondents are year one students, and the remaining are year 3 and 4 students. This indicated that most respondents are in their first two-year studies.

The relevant constructs in the proposed framework were indirectly measured using multiple items. Thus, the validity and reliability of these items must be evaluated first through the measurement model assessment. The results of these assessments are provided in Table 2. The outer loading of all items was

Table 1. Respondents' profiles.

Profiles	Frequency	Percentage
Age		
18-year-old	23	6.78
19-year-old	99	29.20
20-year-old	103	30.38
21-year-old	83	24.48
22-year-old	22	6.49
23-year-old	4	1.18
24-year-old	5	1.47
Year of study		
Year 1	159	46.90
Year 2	168	49.56
Year 3	11	3.24
Year 4	1	0.29

between 0.8491 and 0.9676, which is greater than the threshold of 0.7080 (Hair et al., 2017). Besides, as Bagozzi et al. (1991) suggested, the average variance extracted (AVE) greater than 0.5000 indicated a satisfactory level of convergent validity. The result of AVE in Table 2 also exhibited that all constructs with AVE values are higher than 0.5000, which further confirmed the convergent validity at both items and constructs levels. In addition, the result of Composite Reliability (CR) ranging from 0.9571 to 0.9769 exceeds the threshold level of 0.7000 (Gefen et al., 2000). This also proved that the internal consistency of the constructs is established in this study. This study further assessed the discriminant validity using the Heterotrait-Monotrait (HTMT) correlation ratio, as provided in Table 3. All HTMT values less than 0.9000 indicated that discriminant validity was also attained (Gold et al., 2001). In addition, the variance inflation factors (VIF) derived from the full collinearity technique showed that the study is absent from the common method bias (CMB) issue as it is less than the threshold value of 5 (Hair et al., 2017). Similarly, Anwar et al. (2021) also suggested that the single source bias does not appear in the dataset as the VIF is less than 5.

The study was then continued to evaluate the structural model of the proposed framework. The assessment results are presented in Tables 4–6 and Figure 2. First, by focusing the R-squared (R^2) in Table 4, it showed that the three constructs (UE, GUI, and UPR) that represent the university role explained around 70 percent of the variance in ATT, while all four predictors (UE, GUI, UPR, and ATT) predicted 70 percent of INT's variances. All predictors moderately affected the variance in ATT and INT (Hair et al., 2017). Similarly, the predictive relevancy (Q^2) for both ATT (0.5786) and INT (0.6180) is greater than zero, and this signified the model's predictive validity of the predictors (Hair et al., 2017). Besides, the effect size (f^2) was also used in this study and revealed that only UPR possesses a small effect ($0.02 > f^2 < 0.15$) on the INT, but a small effect size ($0.02 > f^2 < 0.15$) and medium effect size ($0.15 > f^2 < 0.35$) was reported for UE and UPR on the ATT (Cohen, 1988).

The result of the hypotheses testing was provided in Table 5 and Figure 2 and showed that four hypotheses (H_1 , H_5 , H_6 , and H_7) were supported, while the remaining three hypotheses (H_2 , H_3 , and H_4) were unsupported. First, the UE significantly influences ATT ($\beta=0.3200$, $p<0.05$), and H_1 is supported. However, H_2 is rejected as the UE insignificantly affects separation intention ($p>0.05$). Similarly, GUI is not significant with ATT and intention to separate ($p>0.05$) which signified the rejection of both H_3 and H_4 .

Table 2. Reliability and convergent validity assessment.

Constructs	Items	Loading	AVE	CR	VIF
University environment	UE1	0.9136	0.8723	0.9647	4.8060
	UE2	0.9334			
	UE3	0.9552			
	UE4	0.9331			
Green university initiatives	GUI1	0.8491	0.8243	0.9591	3.8250
	GUI2	0.9061			
	GUI3	0.9122			
	GUI4	0.9463			
	GUI5	0.9231			
University policy regulation	UPR1	0.9567	0.9192	0.9715	4.9600
	UPR2	0.9676			
	UPR3	0.9518			
Attitude	ATT1	0.9299	0.8481	0.9571	4.4340
	ATT2	0.9015			
	ATT3	0.9299			
	ATT4	0.9221			
Intention	INT1	0.9483	0.8942	0.9769	3.3370
	INT2	0.9668			
	INT3	0.9584			
	INT4	0.9151			
	INT5	0.9386			

Table 3. Discriminant validity using HTMT.

	UE	GUI	UPR	ATT	INT
UE					
GUI	0.8765				
UPR	0.8801	0.8528			
ATT	0.8247	0.7609	0.8547		
INT	0.7496	0.6906	0.7831	0.8582	

Table 4. Coefficient of determination (R^2), predictive relevance (Q^2), and effect size (f^2).

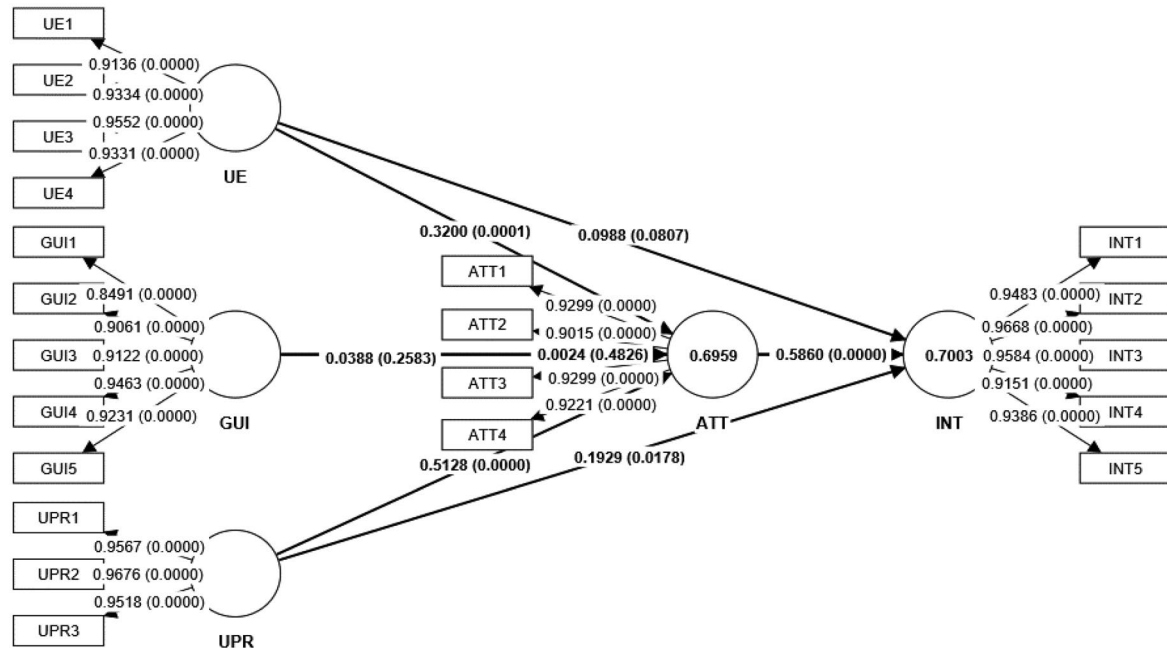
	R^2	Q^2	f^2 (INT)	f^2 (ATT)
INT	0.7003	0.6180		
ATT	0.6959	0.5786		
UE			0.0068	0.0759
GUI			0.0000	0.0013
UPR			0.0257	0.2177

Table 5. Path coefficient and hypotheses testing.

Hypo	Path	Beta	t-value	p-value	BCI-LL	BCI-UL	Decision
H1	UE -> ATT	0.3200	3.7919	0.0001	0.1759	0.4552	Supported
H2	UE -> INT	0.0988	1.4008	0.0807	-0.0219	0.2101	Not Supported
H3	GUI -> ATT	0.0388	0.6487	0.2583	-0.0614	0.1335	Not Supported
H4	GUI -> INT	0.0024	0.0437	0.4826	-0.0864	0.0953	Not Supported
H5	UPR -> ATT	0.5128	6.4681	0.0000	0.3741	0.6349	Supported
H6	UPR -> INT	0.1929	2.1011	0.0178	0.0405	0.3414	Supported
H ₇	ATT -> INT	0.5860	5.9071	0.0000	0.4196	0.7419	Supported

Table 6. Hypotheses testing through mediation analysis.

Hypo	Path	Beta	t-value	p-value	BCI-LL	BCI-UL	Decision
H8	UE -> ATT -> INT	0.1875	3.3166	0.0005	0.1070	0.2974	Supported
H9	GUI -> ATT -> INT	0.0227	0.6309	0.2641	-0.0323	0.0855	Not Supported
H10	UPR -> ATT -> INT	0.3005	4.5722	0.0000	0.2072	0.4260	Supported

**Figure 2.** Research framework with path coefficients and p -values.

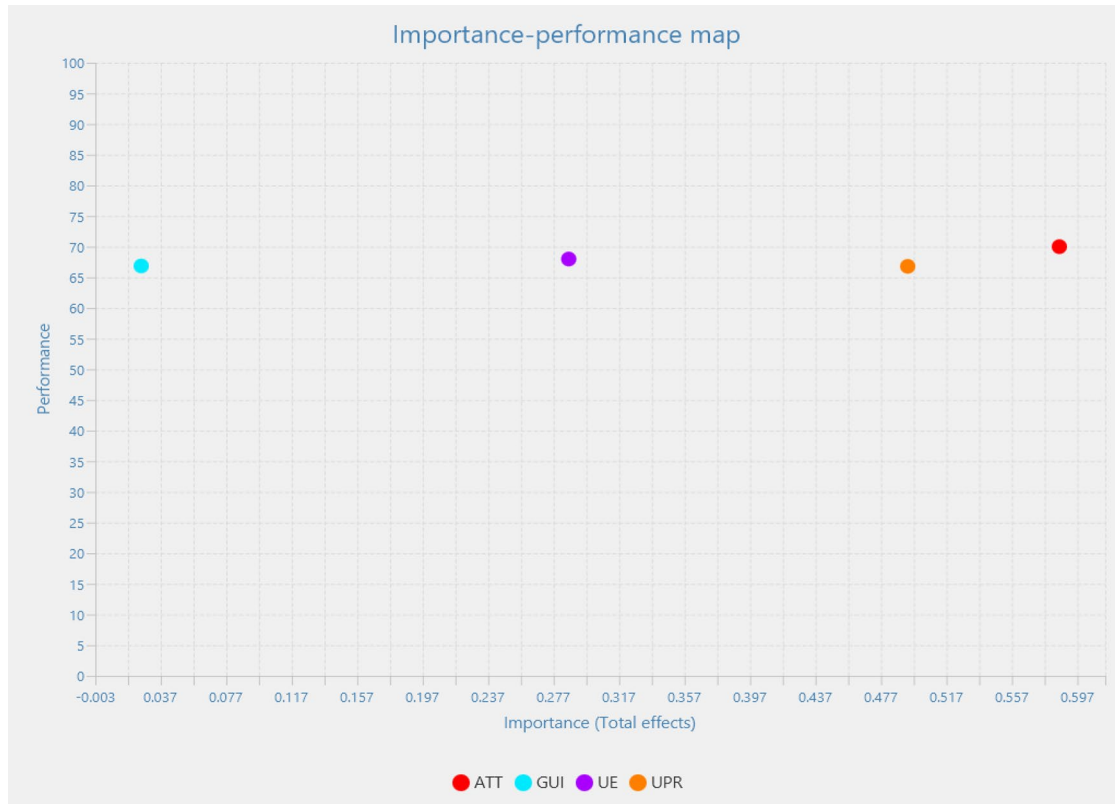
However, the considerable effect of UPR supports both H₅ and H₆, whereas UPR significantly influences ATT ($\beta = 0.5128$, $p < 0.05$) and separation intention ($\beta = 0.1929$, $p < 0.05$). Consistently, H₇ is supported and proved that ATT positively influences FWSI ($\beta = 0.5860$, $p < 0.05$).

The result of the mediation analysis on ATT is provided in Table 6. Two out of three hypotheses (H₈ and H₁₀) were supported, and only H₉ is unsupported ($p > 0.05$). Specifically, the result showed that both the UE ($\beta = 0.1875$, $p < 0.05$) and UPR ($\beta = 0.3005$, $p < 0.05$) could influence the FWSI indirectly through ATT. In contrast, GUI does not affect separation intention, either directly or indirectly.

In addition, the importance-performance map analysis (IPMA) was also performed to identify the most important constructs that needed additional improvement to encourage more residential students to

Table 7. Importance-performance map analysis.

Constructs	Importance	Performance
UE	0.2863	67.9901
GUI	0.0251	66.8590
UPR	0.4934	66.7949
ATT	0.5860	70.0085
Average	0.3477	67.9131

**Figure 3.** Importance-performance map analysis.

separate their food waste. The results of IPMA are shown in Table 7 and Figure 3. Overall, the result showed that two constructs are posited as the crucial construct as the importance value is more than the average importance value (0.3477), namely the UPR (0.4934) and ATT (0.5860). However, the performance value for the UPR (66.7949) is not that satisfactory as it is lower than the average performance value (67.9131). Thus, the IPMA revealed that the improvement effort should be focused on UPR as it is crucial to stimulate the residential students to perform food waste separation. Still, the current performance is relatively low compared to other unimportance constructs like GUI (66.8590) and UE (67.9901).

Discussions

This study investigated the university's role (UE, GUI, and UPR) as stimuli for the FWSI among residential students in China, directly and indirectly. Overall, mixed results were revealed in this study, as the influence of the three stimuli is inconsistent. For instance, the result showed that the UE significantly influenced the ATT without considering separating the food waste. The significant association between the UE and ATT aligns with Franke and Lüthje, (2004), signifying that a better UE further established positive ATT towards food waste separation. At the same time, the insignificant influence of the UE on FWSI is opposed to Çera et al. (2021) and Franke and Lüthje, (2004). In contrast, Çera et al. (2021) concluded that a supportive UE could encourage students' intention; this finding proved that the UE does not affect the Chinese female residential students' FWSI, especially in this study. The incomprehensiveness of the university's supporting efforts could be one of the reasons for this finding. Therefore, this study showed that residential students

tend to have a favourable ATT toward food waste separation if the university provides a better environment to encourage them to do so. However, this environment does not directly increase the students' FWSI.

Surprisingly, GUI is found to have an insignificant relationship with ATT and FWSI. This finding contradicts Al-Swidi and Saleh (2021) and Wang et al. (2022), which found a significant influence of green initiatives on ATT and behavioural intention. Wang et al. (2022) remarked that green initiatives could nurture environmentally friendly behaviour at the institutional level, like universities. Similarly, green initiatives from other institutional agencies like the government indirectly affected individuals' pro-environmental behaviour (Al-Swidi & Saleh, 2021). However, this study offers an opposing viewpoint, as the findings depicted that the university's green initiatives do not influence students' ATT and intentions. The possible reason is that the college may not offer many and/or limited green initiatives to encourage students in food waste separation.

In addition, different findings were found for UPR. In contrast, the significant influence of UPR played a crucial role in the student's ATT and FWSI. The considerable effect of UPR is paralleled by Lin and Guan (2021) and Li et al. (2020), who remarked the significant influence of policy-related factors on environmentally friendly behaviour. Public policy is required to trigger individuals' green behaviour as it could form their ATT toward pro-environmental behaviour (Chen & Lee, 2020). This is supported by the study's finding, which posits that the students' ATT toward food waste separation could be further built through university policy and regulation. At the same time, it could increase the likelihood of the student's behaviour to separate their food waste. One plausible explanation for this finding is residential students are inclined to adhere to the college's rules and regulations, consequently moulding their ATT and intentions.

Moreover, the significant role of the ATT on the FWSI is also noted in this study. As found in numerous studies (Ao et al., 2022; Cudjoe et al., 2022; Lin & Guan, 2021; Ng et al., 2021), the ATT positively affects individual's intention in waste separation. The significant relationship showed that students with a favourable subjective assessment of food waste separation behaviour are likelier to engage in food waste separation. This finding is in line with Govindan et al. (2022), who concluded that individuals who understand the benefits of environmentally friendly behaviour tend to engage in such behaviour.

Furthermore, the mediation analysis further proved that the ATT could significantly mediate the association of UE and UPR on the students' FWSI. The significant mediation effect of ATT is aligned with Anubha (2023), Ling et al. (2024), and Ng et al. (2021), which also found ATT's important mediation role in other contexts. At the same time, the result also found that GUI does not indirectly influence FWSI through ATT. This finding supports the early result on the direct relationship between these three constructs, whereas GUI has no significant influence on ATT and intention. The UE and UPR significantly impact ATT and intentions toward UPR. This finding highlighted that while UPR does not have a direct impact on the FWSI, it has a significant influence in fostering positive ATT towards food waste separation.

Lastly, the IPMA result further showed the performance of each construct on the FWSI relative to their importance level. The finding indicated that UPR is one of the essential constructs for FWSI, but their performance is currently underperformed. Therefore, it is suggested to prioritise UPR rather than other constructs, such as UE and GUI, which are comparatively less critical yet show better performance than UPR.

Theoretical implications

Numerous studies were conducted on food waste, separate intentions in different contexts. However, the evidence of the institutional theory perspective, particularly on the university's role in influencing residential students' FWSI, is limited. On the other hand, the university as an educational institution plays a crucial role in building the students' behaviour. Therefore, it is expected that universities have a significant effect on the student's FWSI. This study employed the SOR framework as the theoretical model to fill the gap. Further, it proposed three constructs that represent the university, namely, UE, GUI, and UPR, which are derived from the institutional theory perspective as the stimuli to influence the students' FWSI directly and indirectly through ATT. As proven in this study, UE and UPR played a vital role in promoting students' intention to separate their food waste, directly or indirectly, and supported the proposition of the institutional theory on affecting individuals' behaviour. These findings contribute

to the literature as new evidence on the FWSI was provided in this study by using a different framework and context.

Practical implications

Practically, the study's findings could benefit the stakeholders in minimising food waste and promoting food waste separation. For instance, the university could refer to this study when designing its policy and regulations to mitigate the consequences of excessive food waste. As proven in this study, the UE and UPR are crucial in establishing favourable ATT toward food waste separation. Therefore, the improvement strategies shall focus on these two constructs. A better study environment and good education structure could equip the students with necessary knowledge and skills to protect the environment through food waste separation. Besides, the university must disseminate the benefits of food waste separation in raising students' interest. The necessary facilities, such as bins and waste collection pools, must facilitate ATT and behaviour. The guidelines on food waste separation must be displayed in the cafeterias, residential colleges, and waste collection stations. All of these efforts are essential to promote the positive and favourable ATT of the students toward the separation of food waste and eventually influence their intention.

In addition, UPR directly impacts the students' intention to separate their food waste. Thus, the relevant food waste separation facilities and guidelines and procedures are particularly important to promoting the FWSI. Besides, the advantages of food waste separation, such as reducing food waste through recycling and protecting society and the environment, must be shared with the students to form their favourable ATT. Therefore, the residential students are expected to have good ATT toward food waste separation behaviour when they acknowledge the importance of separating their food waste and the requirement to protect the environment. Moreover, the UE and UPR indirectly impact the FWSI. This posits that university-related constructs are necessary for residential students to separate their food waste. With that, the university has to provide a sustainable environment with a good quality education structure, including sustainable development, and also deliver important and necessary knowledge to promote sustainable behaviour, such as food waste separation in protecting the environment. Thus, the university can play a more critical role in cultivating food waste separation behaviour among residential students as it is the place to equip the younger generation with the necessary knowledge and skills.

Conclusions, limitations, and suggestions for future research

Numerous studies on individual FWSI have been examined in the literature. However, the evidence derived from the perspective of institutional theory remains constrained in examining the residential students' FWSI. This study utilised the SOR framework to investigate the university's role in students' FWSI. Three constructs derived from institutional theory to represent university roles, namely, UE, GUI, and UPR, have been proposed to influence the students' FWSI (response). At the same time, the ATT is reacted as an organism in this framework. By collecting the primary data from 339 female residential students in China, the results showed that only the UE and UPR significantly influenced ATT. At the same time, the FWSI was impacted considerably by UPR and ATT. In addition, the mediation analysis further proved that the UE and UPR could indirectly influence the intention to separate food waste through ATT. This revealed that not only direct relationships between the university constructs like UE and UPR are important to form students' FWSI, but indirect relationships through ATT are also revealed in this study. This finding is particularly important to promote the FWSI of the residential students as it is crucial to reduce the environmental consequences caused by the overwhelming food waste, which could be reduced through the separation efforts.

Several limitations are encountered in this study. For instance, the study's findings could not be generalised to other settings as the results are only derived from the female residential students in one of the vocational colleges from China. Therefore, further study is encouraged to widen the geographical scope of the study including male residential students and more residential students from different provinces in China to increase the generalisability of the study. Additionally, it would be interesting for future research

to consider different cultural settings of the residential students, such as their majors, nationalities, and even the year of study, as these differences may have a diverse influence on the student's intentions and behaviours. Besides, only three constructs representing the university role are proposed as stimuli, which may limit the model's explainability. Thus, this study suggests to include other constructs for representing different university roles, such as education support, facilities accessibility, and the like. Moreover, further study could consider including other constructs in organisms, like trust or perceived ease of use, to provide more comprehensive findings. Lastly, data collection techniques like interviews and observation could be of future consideration as the students may have a self-reporting bias when providing information through a self-administrated questionnaire.

Data availability statement

The data that support the findings of this study are available from the corresponding author, Pick-Soon Ling, upon reasonable request.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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