Predicting the Sustainability Integration Effectiveness within the Government-Linked Universities in Malaysia

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Abstract
Universities are the key players in fulfilling the objectives of sustainability and sustainable development through incorporating green curriculum and environment. Ministry of Education Malaysia had allocated RM60.2 billion (2019) for sustainability integration in the education agenda. Thus, the universities in Malaysia should approach sustainability challenges beyond ''education-as-usual'' attitude. The objective of study is to examine the perceived sustainability integration effectiveness that influence the sustainability behavioural intention among the students and staffs of Malaysia's government-linked universities (GLUs) – Universiti Tenaga Nasional, Universiti Teknologi PETRONAS, Universiti Kuala Lumpur and Universiti Multimedia. 418 students and employees shared their perception on the respective universities sustainability effectiveness and factors that influence their attitude and behavioral intention to either participate or initiate sustainability programs. This study analyzed the sustainability integration effectiveness (SIE), subjective norms (SN) and attitude (ATT) towards the behavioral intention (BI) to participate or initiate sustainability programs. The PLS-SEM confirmed that SIE, SN and AT have significant positive relationships with BI at 0.05 level of confidence. These predictors explain 81.8% of the variance in BI. Meanwhile SIE is also positively related to ATT and explains 38.6% of the variance in ATT. Thus, all four hypotheses are supported. SIE f^2 value of 0.626 has a large effect in the R^2 for BI. The f^2 for SN (0.760) also has a large effect in the R^2 for ATT, whilst f^2 value of SIE (0.077) and Attitude (0.076) have a small effect in the R^2 for Intention. The blindfolding procedure shows that the Q^2 value indicated the model sufficient predictive relevance. GLUs are hybrid universities that combine the culture and processes of public and private universities. Thus, the results could not be generalized within the industry. Further study to gather the inputs from other public and private universities students and employees may depict different outcomes.

Keywords: integration effectiveness, sustainability, Theory of Reasoned Action.

1. INTRODUCTION
The 2030 Agenda for Sustainable Development (The United Nation General Assembly, 2015) indicated that education as its fourth goal for inclusive and equitable quality education, as well as promoting lifelong learning opportunities for all. Higher educational institutions have to be sustainable across the board (Sanchev-Carrillo et al., 2021). HEI has to develop the competencies (such as systems-thinking, anticipatory, normative, strategic skills and interpersonal) to change society and equip individuals more engaged with their environment (Wiek et al., 2014). Competencies assessment checks whether learning outcomes and HEI commitments in implementing sustainability (Cebrian et al., 2016; Lozano et al., 2017). Unfortunately, the universal framework on sustainability integration in education is lacking (Karatzoglou, 2013). Sanchev-Carrillo et al., (2021) highlighted on the way HEI embrace sustainability, using pedagogy to elevate level of sustainability competencies and the society perception towards HEI. This study investigates the perception of universities' students and staffs relationship towards sustainability integration effectiveness of the respective university where they study or work.

Sustainability and sustainable development within the universities have been addressed extensively. Education is the major force in fostering sustainability and "sustainability mindset". Sustainability mindset from the perspective of technical knowledge, ecosystem and society could emphasizes on management ethics, entrepreneurship, environmental studies, cognitive systems and self-awareness and able to break away from "traditional management disciplinary silos" (Zaleniene and Pereira, 2021; Kassel et al., 2016). Many universities incorporate environmental education into their curricula to ensure the current generation preserve the world for the next one. To change the society to be environmental aware is through educational approach. This is a crucial and influential methodology to achieve sustainable development (Doost, Sanusi, Fariddudin and Jegatesan, 2011; Fielding and Head, 2012; Foo, 2013; Hanifah et al., 2014). Thus, the educators are the drivers towards sustainable education because they are effective change agents (Gough, 2005; Habibah and Punitha, 2012; Liu, 2009). The students have to explore and analyze the environmental issues so that they appreciate and preserve environment. Thus, this study looks at the effectiveness of sustainability integration within the selected universities curricular perceived by the students and staffs that lead them to partake in sustainability programs as initiators or participants.

The key player to fulfill sustainability and sustainable development objectives is the universities (Fonseca et al., 2018). The study of sustainability integration within many universities focused on incorporating embracing green curriculum and more focused towards the environment (Menon & Suresh, 2020; Chhokar, 2010; Sammalisto and Lindhqvist, 2008). The extent of incorporating environmental education into the university' curricula vary into three main dimensions (Pavlova, 2013) such as ecological, social and environment. Although all the three dimensions are incorporated, it is still called as environmental education (Björnberg et al., 2015). Rampasso et al. (2018) added economic and equity dimensions in their study. Educational programs aim to enhance the students' competencies on the interconnectedness between humans and nature. This is conflicting and requires trade-offs between the social, economic and environmental dimensions integral to sustainable development (Remington-Doucette et al., 2013). There are matrices and models developed to assist the sustainability adoption process (Rusinko, 2010; Savelyeva and McKenna, 2011) and the threshold for curriculum design were outlined (Fiselier et al., 2018). Zaleniene and Pereira (2021) postulated that incorporation of sustainability improves universities image, reputation and studies quality. Sadly, only high-ranking universities develop sustainability for their students and establish a culture of sustainability (Salvioni et al., 2017).

Since GLUs are universities that operates as both public and private institutions, they would represent the higher learning institutions in Malaysia. GLUs support sustainability by creating and allocate resources to plan impactful sustainability initiatives, thus integrate sustainability within its curricular has been carried out (The Star, 2021). This study investigates the perception of the GLUs' students and staffs on the sustainability integration effective as well examine their behavioural intention to partake in sustainability programs as initiator or participants.

II. LITERATURE REVIEW

Appiah (2020) indicated that educating and preparing the younger generations to overcome future sustainability challenges and crucial. The main reason is higher education has the ability to cultivate innovative capacity. This will elevates behavior intentions to be environmental champions and participate in solving environmental problems. Kanchanapibul, Lacka, Wang, and Chan (2014) found that younger-generation consumers with more environmental knowledge had stronger behavioral intentions to purchase green products. Cheng and Wu (2015) postulated that environmental knowledge has a significant positive effect on behavioral intentions. Icek Ajzen (1991) indicated that stronger behavioral intention lead to the likelihood of its behavioral performance. Maichum et al. (2017) confirmed behavioral intention has a positive influence on consumers' actual behavior.

Integration of sustainability curricular could be incorporated within management, engineering and other disciplines (Menon and Suresh, 2020). The management curriculum need the produce entrepreneurs who are environmentally and socially literate instead of focusing on profit and wealth

maximization (Amatucci et al., 2013). Corporate governance, corporate social responsibility (CSR), business ethics, social business and sustainability as popular subjects taught in business schools (Naeem and Neal, 2012; Wu et al., 2015). The number of universities integrating sustainability curriculum into their curricula has increased significantly (Hill and Wang, 2018; Thürer et al., 2018; Ciancio, 2018; Beasley and Rosseel, 2016).

According to Tasdemir and Gazo (2020) and Tejedor et al. (2018) the academia proficiency level to delivering effective curricula in addressing sustainability issues at a global scale is still not at desired levels. The academia most difficult task to eliminate the unsustainable mindset of the students, who are the future leaders. Transformative pedagogical approach (including collaboration and competition) could improve critical thinking (Tasdemir and Gazo, 2020; Liu et al., 2017; Thomas, 2009).

This study investigates the perception of the students and staffs on the GLUs' sustainability integration effectiveness (SIE), attitude (ATT) and their behavioural intention (BI) towards initiating or participating in sustainability programs. Hence, Theory of Reasoned Action was used because of its ability to explain and predicts human behavior that focuses on the controlled aspects of decision-making and goal-directed behaviors (Sok et al., 2020; Ajzen and Fishbein 1975; 1980). This study use SIE items to look at its influence towards ATT and determine whether ATT mediates the relationship between SIE and BI.

Furthermore, several studies have shown that individuals' attitudes are significantly impacted by subjective norms (Jang and Cho, 2022; Shin & Hancer, 2016; Kim et al., 2013). According to Jang and Cho (2022) the existing TRA model unable to to verify the relationship between SN and ATT. Thus, this study also verifies the relationship of ATT and SN and how these variables influence BI. SN refers to individual's perceptions of what others think they should do or whether others would approve or disapprove of their behavior. TRA postulated that behaviors are volitional control and will be initiated once an intention is formed (Sok et al., 2020; Ajzen and Fishbein 1975; 1980). Thus, investigating the AT and SN of the GLUs' staffs and students would disclose their behavioral intention to in initiate or participate in sustainability programs.

Attitude is the extent to which an individual has a good or bad evaluation of the behavior (Irianto, 2015). According to the Theory of Reasoned Action, it is imperative to know how individuals feel about buying or using an object (Ajzen, 1991). Attitude is a crucial predictor behavioral intention and have been confirmed by many studies (Thøgersen, Zhou and Huang, 2016; Chen, Lobo and Rajendran, 2014; Al-Swidi et al., 2014). Recent studies (Klemichen, Peters and Stark, 2022; Jang and Cho, 2022; Dilotsotlhe and Mkhize, 2021; Sok et al., 2020) postulated that attitude is more predictive of behavioral intention than other factor.

According Fishbein and Ajzen (1975), subjective norms reflects the social pressures that an individual experience whether to perform or not to perform a specific behavior. Subjective norms influence the expectations of reference group and motivation on how an individual acts – the act is done as long as it is favorable to their reference group. The key driver to comply with social pressures could be from reference groups, personal exposure, and interpersonal influence. Individual may want to to enhance their image within the reference group. According to Alsaad (2021), subjective norms influence the intention to purchase ethical products.

III. METHODOLOGY

The study is adapting Theory of Reasoned Action (Azjen, 1975 & 2010), thus Subjective Norms and Attitude are included in the framework. The novelty of this study is the incorporation Sustainability Integration Effectiveness. Figure 1 depicts the research framework and the hypotheses.
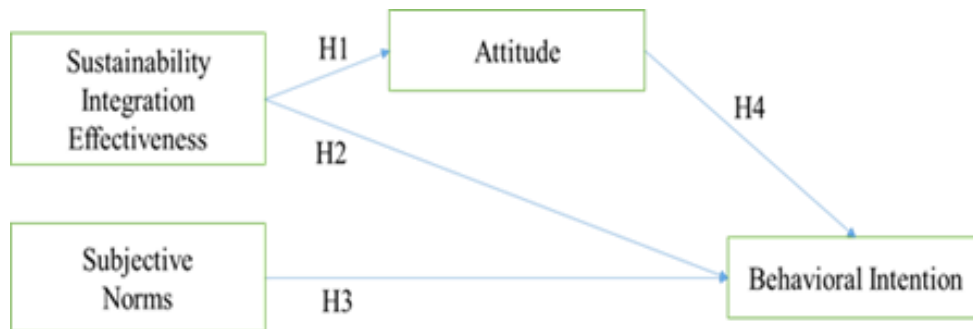
Figure 1 – Research Framework

The respondents of this study are the staffs and students of four Malaysia government-linked universities, namely Universiti Tenaga Nasional (UNITEN), Multimedia University (MMU), Universiti Teknologi Petronas (UTP) and University of Kuala Lumpur (UniKL). The GLUs are chosen since they have unique academic culture and processes that incorporate public university policy and academic procedures with the nature of private university's profit centre objective. GLUs were founded in 2016 and strives to be a globally recognised alliance of industry-driven universities. GLUs also operate alongside government and policymakers to optimize and create best learning environment and outcomes for students – local or international (The Star, 2021).

The data was analysed using PLS-SEM in two phases – first to determine the distribution of the demographic characteristics of the research sample and then to validate the measurement and structure model. The convenience sampling method was chosen due to the constraint by the Covid-19 pandemic. An online questionnaire was develop using Google Form and sent to the selected respondents via email, Facebook, Instagram, Telegram and WhatsApp applications. 418 returned questionnaires were the completed and analysed.

IV. FINDINGS & DISCUSSION

The data collection was conducted among the staffs and students of UNITEN, MMU, UTP and UniKL. From Table 1, 43.3% of the respondents were from UNITEN, followed by UTP and UniKL at 22.2% and 21.1% respectively. MMU was participated by only 13.4%. Majority of the respondents (85%) are aged below 40 years old (below 25 years old were 58.9% and between 25 to 40 years old were 26.1%). 53.8% are female and 46.2% are male. Most of them are with bachelor degree (47.4%) and certificate/diploma (23.9%). 48.6% are students from various field and level, whilst 49.5% are employed.

Table 1: Demographic Profile

AGE	f	%
Below 25 years old	246	58.9
25 to 40 years old	109	26.1
41 to 55 years old	42	10.0
Above 55 years old	21	5.0
GENDER	f	%
Male	193	46.2
Female	225	53.8
EDUCATION	f	%
Certificate/Diploma	100	23.9
Bachelor Degree	198	47.4
Master Degree	62	14.8
Doctorate	42	10.0
Others	16	3.8
OCCUPATION	f	%
Academics	78	18.7
Management	43	10.3
Admin & Support	86	20.5
Student	203	48.6
Others	8	1.9

The results from Table 2 demonstrated internal consistency reliability since with all constructs have Composite Reliability values above 0.721. Likewise, most loadings are above the threshold of higher than 0.708. This means the indicator reliability is accomplished. According to Hair et al., (2019) the AVE value of above 0.50 this indicates that the items are able to explain more than 50% of the construct. Thus, the convergent validity and reliability were established.

Table 2: Construct Reliability and Validity

Constructs	Cronbach's Alpha	rho_A	CR	AVE
Attitude	0.896	0.897	0.935	0.829
Behavioral Intention	0.869	0.878	0.920	0.793
Integration Effectiveness	0.913	0.916	0.929	0.592
Subjective Norms	0.895	0.895	0.950	0.905

Discriminant validity occurs when the square root of AVE is larger than the highest correlation (Fornell & Larker, 1981). The outcome shows that the square roots AVE (highlighted) are greater than the correlation between the constructs. This established the discriminant validity. The HTMT criterion of 0.85 (Kline, 2011) is fulfilled and the confidence level does not show any value of 1 among the constructs. These ascertained the discriminant validity. (Ramayah et al., 2018; Henseler et al., 2015). The outcome of the study shows that the reliability and validity assessment of the reflective constructs indicate internal consistency reliability, adequate indicator reliability, established convergent validity and confirmed the discriminant validity for all constructs.

The structural model was assessed through five analyses – collinearity issue, path coefficients, coefficient of determination, effect size and predictive relevance. The variance inflation factor (VIF) outcomes for all constructs are all below 5, thus vertical and lateral collinearities do not exist (Hair et al., 2020; Ramayah et al., 2018). From Table 3, the R^2 analysis shows that IE, SN and AT are strong indicators for BI. The predictors explain 81.8% of variance in BI. The hypotheses are

supported because there is no "0" straddled in between the confidence intervals bias results. The results also show that SIE (β = 0.621, p< 0.01), SN (β = 0.620, p< 0.01) and Attitude (β = 0.219, p< 0.01) are positively related to Intention, which explain 81.8% of the variance in Behavioral Intention. Meanwhile SIE is also positively related to Attitude, which explains 38.6% of the variance in Attitude. These results support H1, H2, H3 and H4.

Table 3: Summary of Hypothesis Testing

Hypo thesis	Relationships	Std. Beta	Std. Dev.	t-value	R^2	f^2	Q^2
H1	Sustainability Integration Effectiveness $\rightarrow$ Attitude	0.621	0.624	3.990	0.386	0.628	0.315
H2	Sustainability Integration Effectiveness $\rightarrow$ Intention	0.151	0.153	17.519	0.818	0.077	0.636
H3	Subjective Norms $\rightarrow$ Intention	0.626	0.623	7.617		0.760	
H4	Attitude $\rightarrow$ Intention	0.219	0.221	12.498		0.076	

According to Cohen (1988), the f^2 value of SIE (0.626) has a large effect in the R^2 for BI. Similarly, the f^2 for SN (0.760) has a large effect in the R^2 for Attitude. Whilst f2 value of SIE (0.077) and Attitude (0.076) have a small effect in the R^2 for Intention. The blindfolding procedure examines the predictive relevance of the model and the Q^2 value shows that the model has sufficient predictive relevance – Attitude 0.315 and Intention 0.636 – higher that "0" (Hair et al., 2019).

V. CONCLUSION

The findings of this study indicated that Sustainability Integration Effectiveness has a positive and significance relationship with Attitude as well as with sustainability Behavioural Intention. This means that the universities' staffs and students perceived sustainability integration within their universities are effectiveness and its influence their attitude towards their intention to initiate or participate or both, sustainability programs. The positive relationship with behavioral intention indicates that they would be more receptive and participative towards sustainability programs within the university or community. This outcomes are supported by several studies (such as Jang and Cho, 2022; Maichum et al., 2017; Shin & Hancer, 2016; Kim et al., 2013). Subjective Norms and Attitude also have positive and significant relationships with behavioral intention. These outcomes are concurrent with several other studies and solidified its importance within TRA model

This study also verified the relationship of ATT and SN and how these variables influence BI, which is supported by some other studies (such as Sok et al., 2020; Ajzen and Fishbein 1975; 1980). This means that AT and SN of the GLUs' staffs and students influence their behavioral intention to in initiate or participate in sustainability programs. The universities have to gear the attitude of their staffs towards positive sustainability integration within the learning process. The academics support and staffs commitment towards sustainability would enhance the students' motivation and positive attitude towards sustainable development (Kalsoom and Khanam, 2017; Esa, 2010).

The sustainability programs that the universities have outlined and planned need to be relevant and of interest among these groups. These would influence their attitude positively and initiate the sustainability participation as well as initiation of sustainability programs among them. Thus, universities need to set sustainability integration a priority through academic processes, social relevance, graduates, management-and financial resources and capability (Noushen et al, 2020; Nawaz and Koç, 2018). Since Industry 4.0 is revolutionizing the way organizations manufacture, improve and distribute their products by integrating new technologies – Internet of Things (IoT), cloud computing and analytics, and AI. Universities must leverage their strengths to take advantage of its possibilities, while overcoming the vulnerabilities and risks.

This study was conducted among the staffs and students of the government-linked universities in Malaysia. These universities are a hybrid between public and private universities in term of academic objectives, processes and culture. Thus, the findings may not be generalized. Further studies are needed to expand the research to a bigger and varied population. The chosen variables are based on the relevancy of the study. Other variables should be introduce into the model and could reflect a different results.

Acknowledgement

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