

SUSTAINABLE BEHAVIOUR IN HIGHER EDUCATION: ANTECEDENTS AND CONSEQUENCES

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Abstract: There is a need to integrate education into sustainable development in higher education. The practice of sustainability in higher education is to disseminate sustainable development knowledge. Furthermore, sustainable universities should not merely focus on greening their curriculum and management practices, but also ways to promote social and economic sustainability. This study aimed to test a model of the antecedents and consequences of sustainable behaviour in higher education. A total of 403 students participated in the survey and were selected using purposive sampling. The questionnaires were analysed using Partial Least Squares Path Modeling (PLS-PM) and XLSTAT2020 as the statistical analysis software. The findings revealed that personality influenced sustainable behaviour, attitude did not have a significant effect on sustainable behaviour, and sustainable behaviour had a significant relationship with happiness and life satisfaction. This research contributed to sustainability efforts through studies of sustainable behaviour, particularly the understanding on why students involved in sustainable behaviour. One of the findings did not support the hypothesis, yet it may still be useful and broadened the findings of the research. Further research is needed for the non-significant hypothesis.

Keywords: Sustainability, sustainable behaviour, individual difference, well-being.

Introduction

The concept of sustainability is often considered as an environmental concept, but it has a broader scope, which includes education as well. The consensus is that education is the means to attain sustainable development. Sustainability education or Education for Sustainable Development (ESD) is a learning approach that incorporates social, economic, and environmental dimensions as the pathway to sustainability.

Regarding sustainability, higher education has put significant efforts to address it in campus operations. Sustainable university refers to environmental, economic and social concerns that universities should have in their activities (Amaral *et al.*, 2015). In fact, higher education takes a critical role in creating a sustainable future. Higher education may serve as a sustainable model and the practice of sustainability can be carried out through teaching and curriculum, research and scholarship, campus operations,

management and community, and financial management (Alshuwaikhat *et al.*, 2016).

University students, as the young generation, play a substantial role in addressing sustainability. The promotion of ESD in higher education is considered crucial to build a sustainable future and to place the younger generation at the centre of development (UNESCO, 2009). Strong student participation, engagement, and involvement can strengthen and contribute to sustainability efforts at the campus. Yet, Abubakar *et al.* (2016) found that student may show their awareness and concerns about campus sustainability, but they lack the interest and willingness to be involved in sustainability practice. Recycling, energy efficiency, water preservation, or the use of environmentally friendly devices and products are some of students' sustainability practices that promote sustainable behaviour.

Studying students' sustainable behaviour is important because it concentrates on behaviour

that reduces negative environmental impact. Bechtel and Corral-Verdugo (2010) suggested the studying of the consequences of sustainable behaviour as human behaviour is determined by its antecedents and repercussions. Individual difference can be used to understand human behaviour. It is the personal attributes that vary one person to another (Griffin, 2013), including several factors, such as personality traits and attitudes (Mullins, 2016). Juárez-Nájera (2010) found that personality factors as the base of sustainable behaviour, and environmental attitude as a predictor of ecological behaviour (Kaiser *et al.*, 1999). When people are aware of the positive consequences of practising sustainable behaviour, they are eager to participate. Previous studies indicated that participating in environmental behaviour contributes to a person's well-being. Life satisfaction is positively and significantly associated with diverse types of pro-environmental behaviour and people who engage in sustainable behaviour are found to feel happier than those who do not (Welsch & Kühling, 2009; Choi, 2016).

The present study examined individual differences as the antecedents and human well-being as the consequences of having sustainable behaviour. It is designed to examine further the influence of personality and attitude on sustainable behaviour and sustainable behaviour on both happiness and life satisfaction.

Sustainable Behaviour

The relationship between human and the natural environment has long been the subject of research. Human behaviour has always been concerned with environmental problems (Vlek & Steg, 2007). It leads to the emergence of sustainable behaviour (SB), an individual behaviour that aims to protect both the natural and the human/social environments (Tapia-Fonllem *et al.*, 2013). In a similar definition, Bonnes & Bonaiuto (2002) argued that SB requires people to engage in actions aimed at caring for others and to protect their biophysical environment. Previous studies have investigated factors that exert influence on sustainable

behaviour, such as the socio-psychological model, time perspective, character strengths, incentives, and competition (Juárez-Nájera *et al.*, 2010 ; Arnocky *et al.*, 2014; Corral-Verdugo *et al.*, 2015; Huber *et al.*, 2017; Van Horen *et al.*, 2018).

Personality and Sustainable Behaviour

Personality has long been studied to help predict certain behaviours. Personality is thought to influence behaviour through the types of traits and is reflected in behavioural patterns. Approaches to studying personality have developed with the trait approach, which is relatively stable, consistent, and endures internal characteristics. The Big Five personality traits are considered as the most basic dimensions of the structure of personality and consist of agreeableness, conscientiousness, openness to new experiences, extraversion and neuroticism. Agreeableness contrasts a prosocial and communal orientation towards others with antagonism; conscientiousness describes socially prescribed impulse control that facilitates task- and goal-directed behaviour, such as thinking before acting, delaying gratification, following norms and rules, and planning, organising, and prioritising tasks; openness to experience describes the breadth, depth, originality, and complexity of an individual's mental and experiential life; extraversion implies an energetic approach toward the social and material world; and, neuroticism contrasts emotional stability and even-temperedness with negative emotionality (John & Srivastava, 1999). Previous studies have pointed out the importance of studying personality in predicting sustainable behaviour. Kvasova (2015) found that agreeableness, conscientiousness, extraversion, and neuroticism are positively associated with pro-environmental behaviour with no significant relationship between openness and ecological action. Poškus (2018) found that extraversion, openness, conscientiousness, and agreeableness are positively related to pro-environmental behaviour, while neuroticism is negatively related to pro-environmental behaviour.

Hypothesis 1: Personality influences sustainable behaviour

Attitude and Sustainable Behaviour

Research on attitudes has been widely studied, especially in social science. Attitude is a strong determinant of behaviour (Polonsky *et al.*, 2012). In the environmental domain, attitude is described as the cognitive and affective evaluation of the object environmental protection (Bamberg, 2003). Individual environmental concern is also known as environmental attitude (EA) and is considered a strong predictor of ecological behaviour (Kaiser *et al.*, 1999). A positive attitude will make an individual support, understand, and carry out sustainable behaviour. In fact, positive attitudes towards the environment lead to pro-environmental behaviour (Bamberg & Möser, 2007). Thus, sustainable behaviour is more likely to happen if a person has a positive attitude towards sustainability and believes that the behaviour is easy to perform. In contrast to Mainieri *et al.* (1997) and Ahmad *et al.* (2015), other studies found positive correlation between environmental attitudes and environmental behaviour (Kotchen & Reiling, 2000; Mostafa, 2007).

Hypothesis 2: Attitude influences sustainable behaviour

Sustainable Behaviour and Happiness

The awareness of environmental protection has a major role in how the natural environment works in human happiness. In contrast to Ferrer-i-Carbonell and Gowdy (2007) and Di Tella and MacCulloch (2008), who found that environmental degradation has a negative impact on happiness, Tiwari and Mutascu (2015) reported no significant impact of environmental degradation and GDP on happiness. By practising sustainable behaviour, individuals can minimise the level of environmental degradation, thus, improve the level of happiness. Some studies have provided supportive evidence for a link

between sustainable behaviour and happiness. Gardner and Prugh (2008) found that practising sustainable behaviour results in happiness and life satisfaction. Corral-Verdugo *et al.* (2011) and Choi (2016) found that sustainable behaviour significantly influences happiness.

Hypothesis 3: Sustainable behaviour influences happiness

Sustainable Behaviour and Life Satisfaction

Engaging with the natural environment is one path to contribute significantly to life satisfaction. Environmental problems reduce life satisfaction (Ferrer-i-Carbonell & Gowdy, 2007). Furthermore, environmental concern is a prime mechanism for life satisfaction (Wang & Kang, 2019). Man-made pollution, loss of biodiversity, and depletion of natural resources are some causes of environmental problems, especially their impacts on human well-being. Ferreira *et al.* (2013) found a negative impact of air pollution on life satisfaction. Thus, having sustainable behaviour would reduce the level of environmental degradation and improve life satisfaction. Previous findings examined the relationship between sustainable behaviour and life satisfaction. Brown and Kasser (2005) found that life satisfaction was related to smaller ecological footprints. Welsch and Kühling (2010) found a positive and significant association between life satisfaction and pro-environmental behaviour.

Hypothesis 4: Sustainable behaviour influences life satisfaction

Materials and Methods

A survey was carried out at the University of Indonesia (UI) and Bogor Agricultural Institute (IPB). These universities were chosen because they are ranked as the first and the second on the national level (Indonesian rankings) of UI GreenMetric World University Rankings in 2019. A total of 410 questionnaires were distributed and 403 questionnaires were completed, resulting in a 98.3% response rate.

The sample size was calculated using the Slovin's formula with a 95 % level of confidence to produce the required sample and the purposive sampling method was employed. The number of the population is 68,938 students for both universities and produced a minimum sample of 398 students. The sample size was made up of 267 respondents from the University of Indonesia and 136 respondents from Bogor Agricultural Institute. The purposive sampling method was chosen because the students who participated in this questionnaire were only second-year to final-year students. It was based on the judgment that those students have more learning experiences about sustainability at the university. The number of questionnaires distributed was more than the sample minimum to avoid a low response rate as it is vulnerable to sampling bias. Therefore, the sample of 403 respondents exceeded the minimum sample requirement (398 respondents).

The measurements of all items were done through a 7-point Likert-type scale (1 = strongly disagree to 7 = strongly agree). Personality was adapted from Kvasova (2015) and measured through 17 items. The measurement of attitude toward sustainability was adopted from Kagawa (2007) and included items such as "I think it is a waste of time and effort" and "I think it is a good thing". Sustainable Behaviour (SB) was adapted from Tapia-Fonllem *et al.* (2013) and was measured through 23 items. The happiness scale was adopted from Lyubomirsky and Lepper (1999) and included items such as "In general, I consider myself happy", "Compared to most of my peers, I consider myself happy", and "I enjoy life, regardless of what's going on". The measurement of life satisfaction was adopted from Diener *et al.* (1985) and included items such as "In most ways, my life is close to my ideal" and "I am satisfied with my life".

The questionnaires were analysed using Partial Least Squares Path Modeling (PLS-PM) and XLSTAT2020 as the statistical analysis software. PLS-PM is the Partial Least Squares approach to Structural Equation Modeling (SEM). The validity and reliability of the

questionnaire were assessed from convergent validity, discriminant validity, and composite reliability. Convergent validity was measured by outer loading value of greater than 0.70. However, indicators with an outer loading value of between 0.50 and 0.60 were considered sufficient; discriminant validity was measured by Average Variance Extracted (AVE) value of greater than 0.50; composite reliability was measured by Cronbach's Alpha value of greater than 0.70 (Hair *et al.*, 2017) and Dillon Goldstein's rho / D.G rho (PCA) value of greater than 0.60 (Bagozzi & Yi, 1988).

Results and Discussion

The background characteristics of respondents included gender and age. The students comprised 238 female students (59.1%) and 165 male students (40.9%). Of the 403 respondents, 86 students (21.3%) and 317 students (78.7%) were under the age of 20 years, and between 20 to 25 years, respectively.

The present study proposed a conceptual framework of how personality and attitude affect the practice of sustainable behaviour and the consequence of that practice on happiness and life satisfaction. Figure 1 depicts the conceptual framework, which illustrates the relationships between the variables in the present study.

The measurement model was evaluated for convergent validity and discriminant validity, as well as composite reliability. The composite reliability was assessed by calculating the Cronbach's Alpha and the Dillon Goldstein rho (D.G rho). The first assessment was convergent validity, in which a second reestimation was performed by removing items with outer loading values of below 0.50. Discriminant validity was assessed by Average Variance Extracted (AVE) value of greater than 0.50. The next assessment was composite reliability, in which the acceptable values were at least greater than 0.6. Tables 1 to 3 showed that all constructs in the model complied with the validity and discriminant validity criterion.

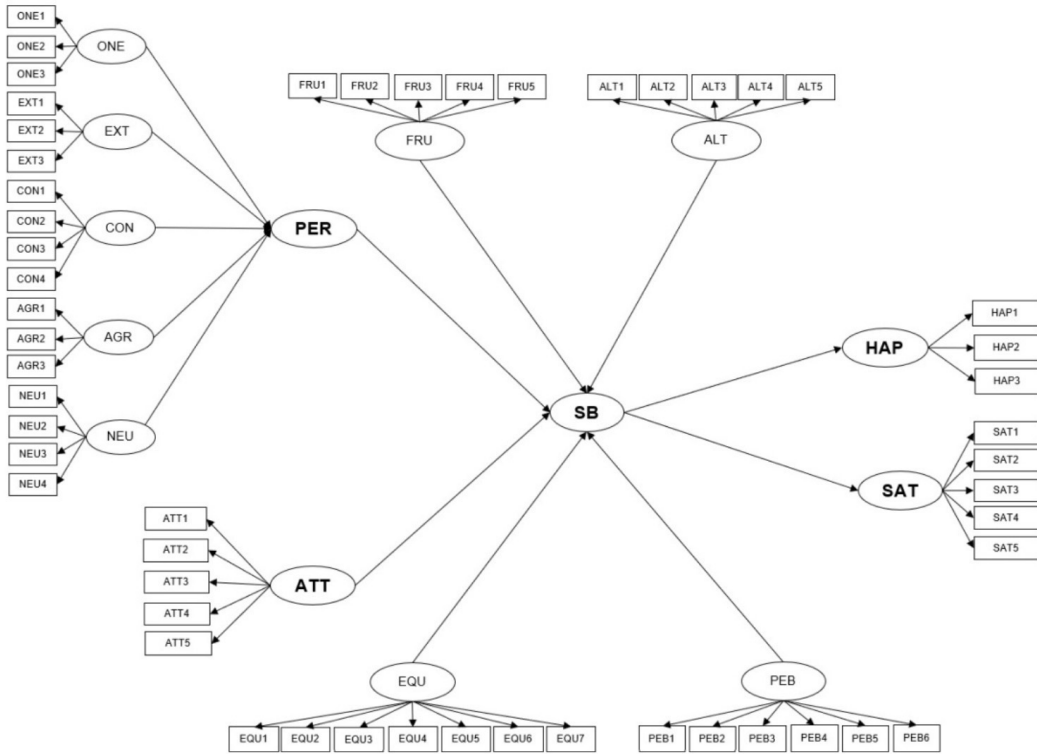


Figure 1: Research framework

Table 1: The assessment of convergent validity

Factor Loadings											
	EXT	CON	AGR	NEU	ATT	FRU	ALT	EQU	PEB	SAT	HAP
ONE1	0,236	0,096	0,162	0,161	0,187	0,122	0,135	0,195	0,184	0,072	0,090
ONE2	0,328	0,127	0,247	0,201	0,361	0,241	0,289	0,298	0,346	0,098	0,081
ONE3	0,253	0,131	0,186	0,257	0,265	0,181	0,119	0,169	0,167	0,086	0,020
EXT1	0,922	0,152	0,243	0,232	0,220	0,149	0,267	0,186	0,164	0,240	0,150
EXT2	0,944	0,157	0,285	0,266	0,195	0,136	0,281	0,170	0,187	0,268	0,175
EXT3	0,886	0,128	0,217	0,228	0,157	0,086	0,100	0,107	0,107	0,258	0,146
CON1	0,228	0,778	0,272	0,228	0,136	0,194	0,210	0,124	0,167	0,378	0,198
CON2	0,113	0,786	0,163	0,263	0,142	0,197	0,180	0,200	0,228	0,310	0,160
CON3	0,124	0,819	0,299	0,151	0,149	0,150	0,288	0,247	0,218	0,315	0,101
CON4	-0,013	0,668	0,269	0,190	0,227	0,280	0,294	0,243	0,251	0,162	0,032
AGR1	0,195	0,345	0,804	0,123	0,387	0,288	0,418	0,447	0,417	0,209	0,173
AGR2	0,281	0,297	0,882	0,272	0,268	0,257	0,392	0,298	0,318	0,315	0,203
AGR3	0,204	0,179	0,844	0,185	0,222	0,203	0,317	0,265	0,278	0,141	0,121
NEU1	0,215	0,235	0,221	0,797	0,133	0,216	0,251	0,066	0,261	0,259	0,258
NEU2	0,106	0,086	0,135	0,665	0,194	0,097	0,157	0,116	0,091	0,184	0,309
NEU3	0,209	0,262	0,211	0,852	0,189	0,278	0,249	0,062	0,265	0,420	0,373
NEU4	0,287	0,255	0,172	0,871	0,183	0,182	0,178	0,038	0,188	0,435	0,430
ATT1	0,139	0,198	0,330	0,198	0,831	0,362	0,354	0,252	0,335	0,138	0,115
ATT2	0,130	0,234	0,279	0,200	0,861	0,343	0,347	0,264	0,355	0,155	0,079
ATT3	0,172	0,176	0,274	0,161	0,856	0,283	0,337	0,260	0,327	0,139	0,060
ATT4	0,222	0,163	0,289	0,115	0,868	0,276	0,281	0,274	0,313	0,153	0,095
ATT5	0,210	0,117	0,283	0,213	0,803	0,296	0,326	0,320	0,404	0,192	0,164

FRU1	0,056	0,157	0,158	0,185	0,282	0,588	0,146	0,170	0,257	0,064	0,118
FRU4	0,075	0,181	0,233	0,107	0,330	0,763	0,414	0,131	0,452	0,079	0,076
FRU5	0,155	0,229	0,236	0,263	0,197	0,786	0,352	0,155	0,347	0,176	0,217
ALT1	0,168	0,265	0,336	0,112	0,334	0,416	0,785	0,279	0,435	0,180	0,223
ALT2	0,216	0,286	0,394	0,238	0,295	0,385	0,865	0,229	0,546	0,230	0,224
ALT3	0,220	0,271	0,399	0,282	0,292	0,395	0,835	0,241	0,492	0,211	0,224
ALT4	0,201	0,205	0,343	0,236	0,284	0,343	0,825	0,175	0,480	0,261	0,205
ALT5	0,175	0,252	0,355	0,206	0,408	0,296	0,786	0,339	0,381	0,156	0,182
EQU1	0,112	0,116	0,199	0,099	0,207	0,071	0,146	0,538	0,183	0,103	0,022
EQU4	0,139	0,215	0,289	0,075	0,238	0,195	0,283	0,809	0,321	0,139	0,081
EQU5	0,141	0,184	0,275	0,102	0,168	0,114	0,171	0,512	0,104	0,210	0,061
EQU6	0,097	0,161	0,317	-0,014	0,288	0,150	0,237	0,781	0,272	0,051	0,011
EQU7	0,117	0,220	0,302	0,057	0,231	0,151	0,200	0,770	0,288	0,109	0,047
PEB1	0,122	0,214	0,348	0,219	0,342	0,450	0,504	0,288	0,836	0,296	0,225
PEB2	0,207	0,266	0,396	0,278	0,352	0,376	0,538	0,305	0,857	0,336	0,246
PEB3	0,102	0,163	0,251	0,185	0,319	0,319	0,444	0,229	0,772	0,238	0,135
PEB4	0,080	0,204	0,241	0,060	0,347	0,291	0,266	0,404	0,564	0,091	0,059
PEB5	0,092	0,223	0,292	0,139	0,276	0,442	0,362	0,253	0,743	0,170	0,101
PEB6	0,150	0,210	0,293	0,278	0,292	0,434	0,475	0,185	0,801	0,353	0,254
SAT1	0,304	0,357	0,214	0,319	0,192	0,123	0,204	0,105	0,267	0,822	0,454
SAT2	0,229	0,305	0,229	0,330	0,188	0,146	0,186	0,111	0,295	0,850	0,489
SAT3	0,214	0,319	0,236	0,383	0,136	0,143	0,226	0,164	0,239	0,840	0,602
SAT4	0,211	0,291	0,217	0,342	0,142	0,085	0,256	0,180	0,332	0,802	0,508
SAT5	0,094	0,295	0,158	0,287	0,029	0,105	0,080	0,055	0,119	0,617	0,403
HAP1	0,170	0,163	0,191	0,423	0,156	0,172	0,238	0,040	0,236	0,611	0,928
HAP2	0,176	0,184	0,120	0,390	0,034	0,112	0,166	0,037	0,160	0,575	0,878
HAP3	0,123	0,116	0,208	0,343	0,126	0,203	0,273	0,090	0,212	0,496	0,884

Note. ONE = openness to new experience; EXT = extraversion; CON = conscientiousness; AGR = agreeableness; NEU = neuroticism; ATT = attitude; FRU = frugal; ALT = altruistic; EQU = equitable; PEB = pro-ecological behaviour; HAP = happiness; SAT = satisfaction with life

Table 2: The assessment of discriminant validity

AVE	ONE	EXT	CON	AGR	NEU	ATT	PB	FRU	ALT	EQU	PEB	SAT	HAP	(AVE)
ONE	1	0,111	0,021	0,059	0,064	0,113	0,109	0,050	0,051	0,073	0,083	0,011	0,006	0,679
EXT	0,111	1	0,025	0,074	0,070	0,043	0,059	0,018	0,058	0,029	0,028	0,077	0,029	0,842
CON	0,021	0,025	1	0,107	0,075	0,043	0,135	0,069	0,098	0,067	0,077	0,153	0,028	0,585
AGR	0,059	0,074	0,107	1	0,054	0,119	0,268	0,088	0,200	0,158	0,160	0,073	0,040	0,712
NEU	0,064	0,070	0,075	0,054	1	0,046	0,088	0,062	0,069	0,007	0,068	0,175	0,183	0,641
ATT	0,113	0,043	0,043	0,119	0,046	1	0,248	0,138	0,153	0,108	0,173	0,035	0,016	0,713
FRU	0,050	0,018	0,069	0,088	0,062	0,138	0,409	1	0,201	0,042	0,254	0,023	0,035	0,515
ALT	0,051	0,058	0,098	0,200	0,069	0,153	0,704	0,201	1	0,094	0,327	0,064	0,067	0,672
EQU	0,073	0,029	0,067	0,158	0,007	0,108	0,310	0,042	0,094	1	0,125	0,027	0,004	0,582
PEB	0,083	0,028	0,077	0,160	0,068	0,173	0,765	0,254	0,327	0,125	1	0,111	0,053	0,590
SAT	0,011	0,077	0,153	0,073	0,175	0,035	0,108	0,023	0,064	0,027	0,111	1	0,386	0,625
HAP	0,006	0,029	0,028	0,040	0,183	0,016	0,071	0,035	0,067	0,004	0,053	0,386	1	0,805
(AVE)	0,679	0,842	0,585	0,712	0,641	0,713	0,339	0,515	0,672	0,582	0,590	0,625	0,805	0

Table 3: The assessment of composite reliability

	Cronbach Alpha	D.G. rho (PCA)
ONE	0.765	0.864
EXT	0.906	0.941
CON	0.762	0.849
AGR	0.798	0.882
NEU	0.811	0.877
ATT	0.899	0.926
FRU	0.536	0.764
ALT	0.878	0.911
EQU	0.722	0.819
PEB	0.857	0.895
SAT	0.850	0.894
HAP	0.880	0.926

Figure 2 depicts a model of interrelations between personality, attitude, sustainable behaviour, happiness and life satisfaction. The measurement model of the structural equation analysis produced significant factor loadings between every factor and their corresponding indicators ($p < 0.05$). The personality (structural

coefficient = 0.556; $p < 0.05$) and attitude (structural coefficient = 0.497; $p < 0.05$) influenced sustainable behaviour. In turn, happiness (structural coefficient = 0.267; $p < 0.05$) and life satisfaction (structural coefficient = 0.330; $p < 0.05$) were affected by sustainable behaviour. Goodness of Fit (GoF) and relative

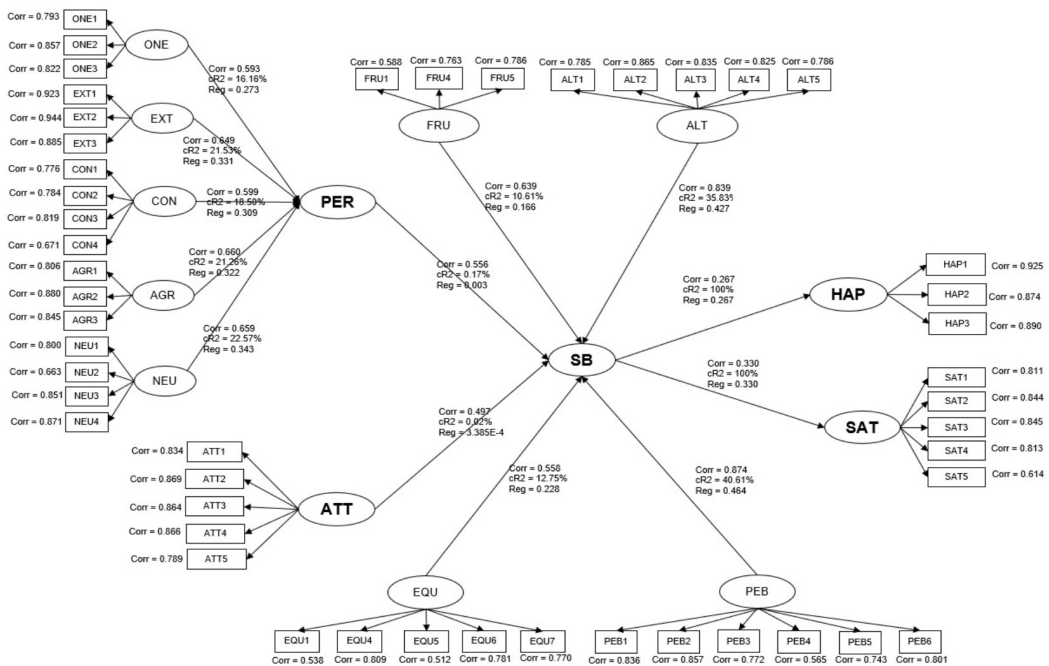


Figure 2: Results of the path analysis

Note. PER = personality; ONE = openness to new experience; EXT = extraversion; CON = conscientiousness; AGR = agreeableness; NEU = neuroticism; ATT = attitude; SB = sustainable behaviour; FRU = frugal; ALT = altruistic; EQU = equitable; PEB = pro-ecological behaviour; HAP = happiness; SAT = satisfaction with life

GoF (GoF_{rel}) of the model were 0.561 and 0.884, respectively. The relative GoF_{rel} is high and reflects a good fit of the model to the data.

The relationship among variables contained in t-statistic is significant in 5% tests (see Table 4). The hypothesis testing results where personality exert a significant influence on sustainable behaviour, attitude has no statistical significance on sustainable behaviour, and sustainable behaviour has significant influence on both happiness and life satisfaction.

Path coefficient for personality is seen in Table 5. Neuroticism (NEU) has a greater weighting (0.343), followed by extraversion (0.331), agreeableness (0.322), conscientiousness (0.309), and openness to experience (0.273).

Among theories of personality, the trait approach to personality focuses on individual differences. Specifically within the field of the environment, personality can influence the likelihood of engagement in environmental practices (Costa & McCrae, 2012). Furthermore, people with different personality traits respond differently towards some environmentally friendly actions (Fraj & Martinez, 2006). This study demonstrated that students' personality influenced sustainable behaviour. The stronger

the personality related to the environment, the more the students are involved in sustainability behaviour practices. A good personality will cause students to be responsible for conserving natural resources and practising sustainable behaviour. All personality traits achieved statistical significance. Neuroticism had the highest associations among the personality traits and openness had the lowest associations (Table 5). Neuroticism is the trait disposition to experience negative effects, including emotional instability. Rationally, emotional instability can prevent an individual from behaving sustainably. Even so, it is not always the case for neuroticism. The emotional reaction of neurotic people is stronger when they experience environmental degradation directly (Newhouse, 1990). Hence, it can encourage or motivate students because practising sustainable behaviour will help them reduce or avert negative emotions. In addition, neurotic students who have been stressed with the environmental degradation could result in sustainable behaviour, even for specific behaviour such as purchasing and using eco-friendly products. Previous research has demonstrated the relationship between neuroticism and environmental behaviour (Milfont & Sibley, 2012; Kvasova, 2015).

Table 4: Path coefficient, standard error, and t-statistic

Hypothesis	Relationship	Path Coefficient	Standard Error	T-statistic	P Value
1	PER -> SB	0.003	0.001	4.050	0.000
2	ATT -> SB	0.000	0.001	0.451	0.652
3	SB -> HAPP	0.267	0.048	5.552	0.000
4	SB -> SAT	0.330	0.047	7.004	0.000

Table 5: Path coefficient for personality

Path coefficients (PERSONALITY / 1):

Latent Variable	Value	Standard Error	t	Pr > t	Critical Ratio (CR)
ONE	0,273	0,001	458,718	0,000	13,733
EXT	0,331	0,001	552,436	0,000	17,849
CON	0,309	0,001	521,794	0,000	16,335
AGR	0,322	0,001	534,693	0,000	17,209
NEU	0,343	0,001	577,505	0,000	15,821

A positive attitude towards nature involves attempts to improve the environment while a negative attitude involves no effort to protect and conserve the environment and even perform an action to harm the environment. The present study demonstrated no significant relationship between attitude and sustainable behaviour. Students' attitude is not enough to drive them to behave sustainably. In practice, a positive attitude towards environment generally will involve sustainable behaviours. Students may express positive attitudes about the environment, but it may not be always reflected in their actions. The present findings were consistent with Fu *et al.* (2018), but contradicted with Altinigne and Bilgin (2015). Inconsistency may emerge when students who consider themselves as someone who care for the environment but do not behave accordingly. The inconsistency between student attitudes and their actual sustainable behaviour is known as the attitude-behaviour gap. This gap indicates the failure of an individual to translate environmental attitude into pro-environmental behaviour. Bamberg and Möser (2007) demonstrated the attitude-behaviour gap towards pro-environmental behaviour.

The concept of human well-being is to link human life and the natural environment. Several studies have linked human activities and environmental degradation that threatens human well-being. Happiness and life satisfaction are separate constructs. Happiness relates more to affect or feelings and life satisfaction relates more to the cognitive assessment of life as a whole (Erdogan *et al.*, 2012). Studies have demonstrated that happiness and satisfaction with life are psychological consequences of sustainability. While most of happiness is related to material consumption, the non-material is related to enjoying the nature. Students who spend more recreational time in nature, attributed a mind to nature, high connectedness to nature and have a greater appreciation of the natural environment exhibit more sustainable behaviours. By behaving in sustainable ways, students can minimise the damage to the environment and the practice produces happiness. This findings were consistent

with other studies that sustainable behaviour influences happiness (Corral-Verdugo *et al.*, 2011; Tapia-Fonllem *et al.*, 2013; Choi, 2016).

Poor environmental quality may contribute to a decrease in life satisfaction. The links between environmental conditions and life satisfaction have often been studied (Rajani *et al.*, 2019). This study found that sustainable behaviours (pro-ecological, altruistic, frugal and equitable) influence life satisfaction. In regards to frugal action, De Young (1986) found that recycling and reusing materials relate to satisfaction from frugality. Welsch and Kühling (2010) found a significant positive relationship between recycling and life satisfaction. Corral-Verdugo *et al.* (2016) found that sustainable behaviour exhibited by frugal and equitable actions is significantly related to positive intrinsic consequences, namely satisfaction. The present findings added evidence to the literature suggesting that sustainable behaviour contributes to life satisfaction (Welsch & Kühling, 2010; Schmitt *et al.*, 2018). The sustainable practices contribute positively to natural life and the life of students themselves, even for simple eco-friendly practices, such as turning off the air conditioner when leaving the room or sorting plastic waste.

In general, students who behave sustainably will support initiatives and ideas of sustainability by involving themselves personally and committing to sustainability practices. Engagement and commitment form the basis for change at a broader level, namely society. When sustainable behaviour is accepted in an individual, family, and community, the practice of sustainable behaviour will be more easily formed. Familiarising the self with the consequences of behaviour towards nature, other people, now and in the future, and repeating behavioural actions into habits, sustainable behaviour can become a moral standard.

Conclusion

The present study analysed how sustainable behaviour of university students is structured. Students' active participation and involvement in

sustainability practice can influence the success of sustainable behaviour. Although individual differences (attitudes and personality) can drive people to engage in sustainable behaviours and improve human well-being (happiness and satisfaction to life) from that action, there are still other barriers to environmental action. Nevertheless, examining antecedents and consequences may give insights into how they shape sustainable behaviour. In contrast to personality that has a significant influence on sustainable behaviour, attitude has no significant influence on sustainable behaviour. When students feel that attitude towards sustainability do not have a high importance in their life, then this attitude is not important to them and does not have a strong influence on the behaviour. Therefore, attitudes can have a strong impact on behaviour only when students feel the importance of having a sustainability attitude.

The present study also focused on the associations of the two key subjective dimensions of well-being, life satisfaction and happiness among students. The more often students engage in sustainable behaviour, the happier they become, and induce a higher life satisfaction. Future research is required to (1) investigate further non-significant hypothesis; and (2) investigate the intricate relationship between neuroticism and sustainable behaviour because neurotic people tend to experience negative emotions that can hinder behaviour, and (3) extend the sample size to other campus stakeholders (faculty members and administrators/staff) to determine if there is differentiation of results from the sample students.

This research contributed to sustainable behaviour studies in understanding why students are involved sustainable behaviour. Universities should promote, educate, adopt, and practice the concept of sustainability (sustainable behaviour) through the design of sustainability based on teaching and curriculum, campus operations, as well as assist the government in the role of facilitator and mediator in the transition of sustainable community life. Furthermore, the

university must prevent the emergence of anti-environmental behaviour by implementing environmentally oriented policies/sanctions.

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