Sustainable campus and academic staffs awareness and behaviour in Malaysia's institutions of higher learning: A case study of UPSI

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Abstract

The concept of sustainable development has gained global attention since its introduction through the Bruntland Report 'Our Common Future' during the United Nations Conference on Environment and Development in 1987. In line with the recommendations of the government to encourage the development of sustainable campuses in Malaysia, Universiti Pendidikan Sultan Idris (UPSI) has initiated several steps towards to realize this goal. However, the effective implementation of a sustainable campus must begin with the awareness and support from the campus community itself. This study examined the level of awareness among UPSI academic staffs with regard to the principles of a sustainable campus. It analysed the relationship between the knowledge, attitude and behaviour of the academic staffs with the level of their awareness of the sustainable campus principles . Primary data were obtained through a questionnaire survey of randomly sampled186 academic staffs. Results of the correlation tests showed a high awareness level (mean value of 4.36) of the UPSI academic staffs with regard to the principles of a sustainable campus. However, there was a weak correlation between their awareness level and their behaviour (r = 0.464). This led to the conclusion that the UPSI academic staffs' high awareness of the desirability of a sustainable campus did not prompt them to act positively towards the implementation of the sustainability principles at UPSI.

Keywords: attitude, awareness, behaviour, sustainability knowledge, sustainable campus, sustainability principles

Introduction

The concept of 'sustainable development' has gained global attention since its introduction through the Bruntland Report titled 'Our Common Future' during the United Nations Conference on Environment and Development in 1987. Malaysia, like the other countries, jointly supported and engaged in efforts to achieve sustainable development. Since the university is seen as an institution with the potential for triggering the sustainability of a country, it was natural for this institution to be involved in efforts to achieve that goal. University has unique features that enable it to assist a country in solving many challenges within the context of sustainable development implementation (Norfadillah et al., 2012; Fonseca et al., 2011; Bilodeau et al., 2014). However, the implementation of sustainable development must begin with an awareness of the need to implement the sustainability principles and practices, particularly among the stakeholders. Universities play a role in sustainable development through the processes of management, planning, development, education, research, operations, community service, purchases, transportation, design, and the construction of new buildings, renovations and retrofits. Therefore, the awareness, knowledge and implementation of the principles of sustainability in these institutions cannot be ignored.

A university, either directly or indirectly, performs various operations and activities that have the potential to impact the environment either positively or negatively. This is because a campus is inhabited

by a large population and covers a wide area. Calder and Clugston (2003) explained that the operations of a sustainable campus will be the basis for reducing the ecological footprint of an institution. According to Velazquez et al. (2006), a sustainable campus is a higher education institution that wholly or partly emphasizes and is engaged in and promotes, either regionally or globally, environmentally friendly attitudes and behaviour, such as minimizing the negative effects on the environment, the economy, the society and health through the use of resources to fulfil the functions of teaching, research, outreach, partnerships and supervision, to help the society to make the transition towards a sustainable lifestyle. Zen (2011) reinforced the opinion of Velazquez et al. (2006) by clarifying that a sustainable campus means a campus that, if or when it is carrying out the functions and activities as a university, continuously strives to minimize the negative impact of the activities on the environment, the economy, the society and health created through the use of resources in carrying out these activities. He also stressed that the implementation of a sustainable campus should consist of three main components, namely i) increasing economic efficiency, ii) protecting and preserving the ecological system, and iii) emphasizing the welfare of the campus community.

Universiti Pendidikan Sultan Idris (UPSI) is a leading education university in Malaysia which serves to educate and train teachers and teacher candidates in the field of national education. As the only public university that is oriented towards the teachers' education as its key area, UPSI was considered to be the most significant case study for this research. The implementation of sustainability in UPSI is viewed as an important strategy for equipping potential teachers with the sustainability awareness and develop their ability to inculcate these principles in the younger generation, beginning from the earliest levels at schools.

In this study, the level of awareness with regards to the sustainable campus principles among UPSI academic staffs was measured by the items of 'knowledge', 'attitude' and 'behaviour' towards implementing the principles at UPSI. In particular, relationship between the level of knowledge, attitude and behaviour of the academic staffs were examined as a basis for establishing a method for the implementation of sustainable campus principles at UPSI in the future.

Literature review

Sustainable Campus Principles

Cortese (2003) proposed a sustainable campus model, known as 'Higher Education Modelling Sustainability as a Fully Integrated System', that places the emphasis from an educational standpoint. The model stresses that centres of higher learning should act as mentors and provide knowledge and information not just to students, but also to the surrounding community to come together to act towards achieving sustainability. Cortese (2003) asserted that integration and cooperation between teaching, research, operations and relationships between the campus community and the surrounding community under one unified campus system are very necessary for achieving sustainability of a campus. This covers the daily operations of the campus, including the operational aspects of the campus buildings that take into account sustainability aspects such as promotion of soft landscaped areas, the use of building operating systems that are energy efficient, and the efficient use of water and other resources.

Apart from the model proposed by Cortese (2003), it was recommended that development of a sustainable campus should consider the implementation of sustainability principles in the physical and environmental aspects of the campuses such as with traffic, land use, infrastructure and so on (Burton, 2000), as well as sustainability from the socio-economic angle on campuses such as the curriculum, research, scholarships and the like (Libunao & Peter, 2013). According to Dyball and McMillan (2009), most of the existing campuses tend to address sustainability issues separately. The implementation of sustainable education is often isolated from the research component of sustainability. Similarly, the operation components and campus sustainability programs are often implemented with their own mission

and methods without integration with the other components of a sustainable campus (Dyball & McMillin, 2009). On the basis and the belief that an integrated and comprehensive system is required for the establishment of a sustainable campus, Dyball & McMillin (2009) formulated a sustainable campus model based on comprehensive principles of sustainability. They stressed that this approach is able to optimize the role of universities as agents of change towards sustainability. Through this approach, the principles of sustainability should not only be disclosed in certain academic subjects alone, but students also need to be involved in sustainability research activities and operations on campus.

In addition, the Sustainability Tracking, Assessment and Rating System (STARS) is a framework for recognizing and measuring the relative progress towards sustainability at institutions of higher learning. STARS was designed: i) to promote and provide guidance to all sectors of higher education for the practice of sustainability in terms of education, research, operations and administration, ii) to enable institutions to make comparisons from time to time by creating a standard measurement for sustainability in higher education institutions, iii) to create incentives for continuous improvement towards sustainability, iv) to facilitate cooperation and the sharing of information on sustainability practices and performance in higher education institutions, v) to identify the sustainability performance of all institutions, including leaders, and vi) to build a stronger sustainable society on campus (AASHE, 2009). STARS outlined three main categories for the principles of a sustainable campus namely, education and research, operations and planning, and administration and engagement. The STARS framework shows that the concept of sustainability can be applied in education and research through the co-curriculum, curriculum and research. The application of sustainability in education and research is important for awareness and to create a campus community that can develop national sustainability. The operational aspects of campus sustainability are also emphasized in order to plan and execute the work or responsibility in sustaining a campus building. Among the categories involved in the operation and planning of sustainability are buildings, climate, nutritional services, energy, land, purchases, transportation, solid waste and water. Meanwhile, the aspects of planning, administration and engagement include coordination and planning, diversity and outreach, human resources, investment and involvement. All of these credits will be evaluated by STARS in order to know the level of sustainability achieved by a campus (AASHE, 2009).

The Talloires Declaration, which was passed in 1990 at an international conference in Talloires, France, was the catalyst for the development of a sustainable campus, including in Malaysia. An integrated collaborative approach between parties from different disciplines was emphasized for the development of a sustainable campus. According to this declaration, academics and university administrators as well as environmental practitioners in the industrial field need to come together to achieve synergy in developing curricula, research initiatives, operations and service activities as well as outreaches either at community, national or international levels to support sustainable development. In addition, a sustainable campus should strengthen cooperation and partnership with the administration and education of primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment and sustainable development. A sustainable campus is expected to be able to provide extensive services, including outreaches at national and international levels. Collaboration with such external organizations is very necessary to encourage and promote the efforts of universities throughout the world toward a sustainable future.

Based on the literature review that was conducted, it can be stated that there have been positive developments in efforts towards achieving sustainable development or sustainable campuses in particular. However, aspects of planning and physical development and sustainable buildings are not clearly described in the existing models that have been discussed. The model by Cortese (2003) touched on the aspects of education, research and university operations as well as outreaches to external communities, whereas the model introduced by Dyball and McMillin (2009) focused more on aspects of the curriculum, research and campus operations in moving towards sustainability. The Ten-Point Action Plan in the Tallories Declaration is seen as defining a sustainable campus in greater detail compared with other models, and touches on matters such as collaboration with external parties in order to achieve the

sustainable development of the campus. It is noted that the planning and development of buildings and the physical environment of a sustainable campus must also be highlighted in the development of a sustainable campus (Alshuwaikhat & Abu Bakar, 2008). This is because non-sustainable buildings and environment will be detrimental to the environment, society and economy of consumers and the surrounding communities (Isa et al., 2015; Isa et al., 2014).

This study concluded that there are five core areas should be taken into account during the development of a sustainable campus, they are i) curriculum, ii) research, iii) operations, iv) services and outreaches to external communities, and v) the buildings and physical environment (see Figure 1). Sustainability integration in each of the area is very important for a higher education institution to achieve the status of a sustainable campus.

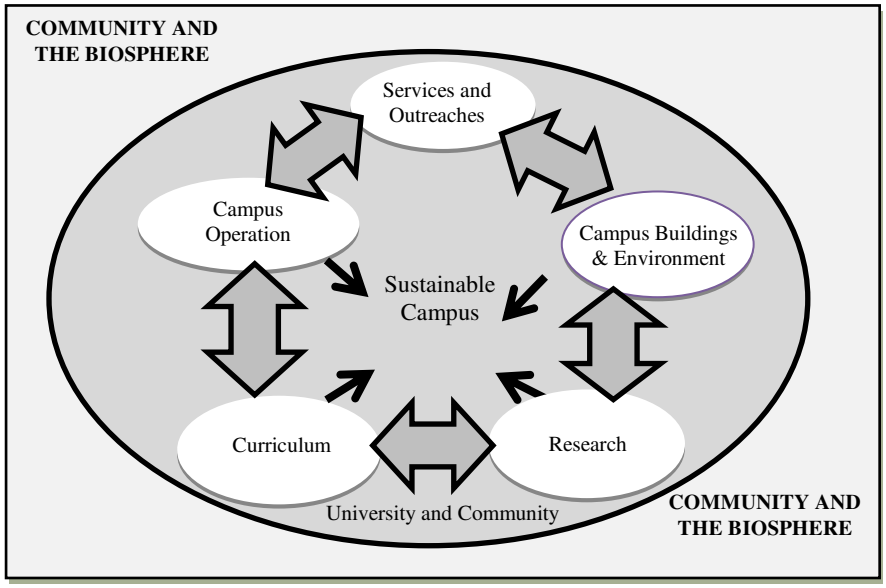

Figure 1. *The sustainability principles of a sustainable campus*

Awareness of a Sustainable Campus Principles

According to Aisyah and Zainora (2012), environmental awareness is one of the fundamental components for enhancing sustainability in every country. Awareness enables individuals to deepen their understanding of sustainability (Mazlan et al., 2015; Birdsall, 2013). Emanuel and Adams (2011) stressed that understanding and perception of students towards sustainability will define the pattern of their involvement towards practicing sustainability in their daily life. Environmental awareness is indispensable for achieving environmental sustainability (Madsen, 1996). It is a term that is used to describe environmental knowledge based on facts, affective attitudes and behaviours towards environmental issues and values related to the environment (Arcury & Johnson, 1987). All levels of society need to have the basics of environmental awareness and sustainability. Leaders of organizations, including those in the field of environmental education, should not only have the knowledge of environmental issues, but must also be aware of the ways to solve problems within the issues (Madsen, 1996).

The earliest model used to measure and explain about environmental and sustainability awareness was the one proposed by Ramsey and Rickson in 1976, on pro-environmental behaviour. This model was then popularly known as the KAP model, which refers to the knowledge, attitude and practice/behaviour (Mahmud & Siarap, 2013). This model prioritized knowledge as a variable to attitude and behaviour (Flamm, 2006). Based on the KAP model, an increase in people knowledge will lead to a change in their

attitude. A change in attitude will then bring about their change of practices or behaviour. Knowledge was claimed as the basis for determining attitude, intention and behaviour. Knowledge can be enhanced through exposure to new information through talks, classes, media, lectures and other activities of a scholarly nature.

The validity of KAP model for behavioural change, however, has been criticized in several of previous studies such as studies by Dwyer, Porter, Cobern and Leeming (1993), and Sivek and Hungerford (1989). These researchers discovered that the shaping of attitudes and behaviour towards the environment protection is more complex than what was traditionally thought. According to them, the acquisition of knowledge need not necessarily change attitudes, and changes in attitudes also need not necessarily change behaviour.

Other theories on environmental and sustainability awareness are including the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Predictors of Environmental Behaviour (PEB) model. The Theory of Reasoned Action (TRA) was developed by Fishbein and Ajzen in 1975. Davey (2012) explained that this theory is based on the concept of a person's behaviour (behavioural intention) as a function of attitude towards the results of actions (attitude), and by the choices around them (subjective norms). The behaviour of an individual is determined by the person's purpose in doing something and is also closely related to the attitude and subjective norms of the individual. This theory also explains that the purpose should be driven by a good attitude to encourage a noble, good and positive behaviour. Therefore, a person's purpose or intention of a person is very important in influencing behaviour.

The Theory of Planned Behaviour (TPB) was then developed by Ajzen and Fishbein in 1980 as an extension of the Theory of Reasoned Action (TRA) (Ajzen, 1991). This model deals more with the human being. It stresses that a person's decisions are guided by a rational assessment of the consequences of a particular behaviour. According to this theory, attitude does not directly determine behaviour but it does so indirectly through the intention to do so. This theory is also often used by many researchers to refer to the behaviour and tendencies of a person with regard to a particular matter. It explains that the proposed behaviour is affected by the attitude, subjective norms and perceived behavioural controls. These three main factors are inter-related and are used to predict and explain the proposed behaviour of an individual.

Whereas, the Predictors of Environmental Behaviour (PEB) model was formed by Hines, Hungerford and Tomera in 1986 by means of a meta-analysis of 128 responsible environmental behaviour researches. Based on this analysis, six variables were identified, namely knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment and a sense of individual responsibility. This theory was developed based on the Theory of Planned Behaviour devised by Ajzen and Fishbein (Kollmuss & Agyeman, 2002). Based on this model, individuals who desire to take action will be more involved in actions related to the environment than individuals who have no such desire. Before a person desires to act with regard to a particular environmental problem, the individual must be aware of the existence of the problem. Hence, knowledge of the issue is seen as a prerequisite to action. A person must have knowledge of existing behaviours in order to be more effective in a given situation. According to Davey (2012), there are many situational factors or conditions that influence responsible environmental behaviour. The situational factors in this model refer to the barriers, social pressures and the opportunities to choose different actions that can hamper or increase a person's desire to act. This model is able to predict the behaviour of a person to be more responsible for the environment.

For the purpose of this study, three main domains which refer to the KAP model were adopted to measure the level of awareness, namely the knowledge, attitude and behaviour of UPSI academic staffs towards the principles of a sustainable campus on the assumption that every awareness will begin from knowledge, and then will go on to the attitude and behaviour. It also refers to the argument of Sahin et al. (2012) that knowledge of environmental issues affects an individual's attitude towards the environment. Attitude will then lead to behaviour, and behaviour will drive individuals to deepen their knowledge about a sustainable campus.

Methodology

This study used a quantitative method, a total of 186 UPSI academic staffs were selected to contribute for questionnaire survey. The stratified random sampling technique was used based on the Krejcie and Morgan Table (1970) for the determination of the sample size of the respondents. The respondents were selected from nine different faculties, as shown in Table 1.

Table 1. Number of respondents

Faculty	Population	Sample
Education and Human Development	44	23
Sports Science and Coaching	14	7
Science and Mathematics	54	29
Music and Performing Arts	73	39
Human Sciences	58	31
Language and Communication	59	31
Management and Economics	22	12
Art, Computing and Creative Industries	24	13
Technical and Vocational Education	3	1
Total	351	186

For the purpose of this study, three main domains were used to measure the level of awareness, i.e. the 'knowledge' domain with regard to 5 main items (curriculum, research, campus operations, services and outreach, and building and physical environment) and 68 sub-items comprised of the principles of a sustainable campus, the 'attitude' domain with regard to 59 sub-items and the 'behaviour' domain, consisting of 28 sub-items with regard to the practices of sustainable campus principles among UPSI academic staffs, on the assumption that every awareness will begin from knowledge and proceed to attitude and behaviour. The method of analysis used to assess the level of awareness of the academic staffs involved calculating the mean of the answers given by the respondents. Spearman's correlation analysis was also used to analyse the relationship between awareness and knowledge; awareness and attitude; and awareness and behaviour; as well as between the knowledge, attitude and behaviour of the respondents, respectively.

Findings and discussion

The results showed that a total of 88 male academic staffs (47.3%) and 98 female academic staffs (52.7%) participated in this study. Majority of the respondents, i.e. 67 respondents (36%) aged between 30-39 years, followed by 59 respondents (31.7%) aged between 50-59 years, and 7 respondents (3.8%) aged between 60-69 years. Most of the respondents are doctoral degree holders, i.e. 146 respondents (78.5%), followed by 40 master's degree holders (21.5%).

The results revealed that the overall level of sustainable campus awareness among the academic staffs was high with a mean value of 3.84. Meanwhile, the level of their knowledge with regard to the principles of a sustainable campus from the curriculum aspect was also high with a mean value of 4.17, research aspect had a mean value of 4.02 (high), the daily operation aspect had a mean value of 4.37 (high), outreach and services aspect had a mean value of 4.25 (high), and the building and physical environment had a mean value of 4.38 (high). The highest level of knowledge among the UPSI academic staffs regarding the principles of a sustainable campus was concerning the aspects of sustainable buildings and its physical environment, whereas the lowest mean value was in relation to the principles of sustainability integration in the research activities of the university. Overall, the level of knowledge of the UPSI

academic staffs with regard to the principles of a sustainable campus was high, with an overall mean of 4.36 (refer Table 2).

Table 2. Level of knowledge of academic staffs with regard to the principles of a sustainable campus

Respondents	Items/Principles	Mean	Interpretation of Mean
Academic Staffs	Curriculum	4.17	
	Research	4.02	
	Campus operations	4.37	High
	Outreach and services	4.25	
	Building and physical environment	**4.38**	
	Overall mean	4.36	High
n=186	Sub-items=68		
Scoring Guide:	0.00-2.49 = low	2.50-3.49 = moderate	3.50-5.00 = high

From the angle of attitude, the results of the mean analysis showed that the attitude of the academic staffs towards implementing the principles of a sustainable campus at UPSI was high with an overall mean value of 4.24. These positive attitudes were reflected mainly from the sustainability principle of building and physical campus environment, followed by the principle of campus operations (Table 3).

Table 3.Attitude of academic staffs towards implementing the principles of a sustainable campus at UPSI

Category	Items/Principles	Mean Score	Interpretation of Mean
Academic	Curriculum	4.17	
Staffs	Research	4.02	
	Campus Operations	4.37	High
	Outreach and Services	4.25	
	Building and Physical Environment	**4.38**	
	Overall mean	4.24	High
n=186	Sub-items=59		
Scoring Guide:	0.00-2.49 = low	2.50-3.49 = moderate	3.50-5.00 = high

In addition, the results showed that the overall mean for the behaviour of UPSI academic staffs towards implementing the principles of a sustainable campus at UPSI was at a moderate level (2.56). Their behaviour towards practising sustainability in the university curriculum and research were registered at a low level with the mean value of 2.46 and 1.92 respectively. Meanwhile, the behaviour of the academic staffs towards implementing the principles of sustainability from the aspects of campus operations, outreach and services, and building and physical environment of the campus were at a moderate level with mean values of 2.83, 2.64, and 2.93, respectively (Table 4).

Table 4. Behaviour of academic staffs towards implementing the principles of a sustainable campus at UPSI

Category	Items/Principles	Mean Score	Interpretation of Mean
Academic	Curriculum	2.46	Low
Staffs	Research	1.92	
	Campus Operations	2.83	
	Outreach and Services	2.64	Moderate
	Building and Physical Environment	**2.93**	
	Overall mean	2.56	Moderate
n=186	Sub-items=28		
Scoring Guide:	0.00-2.49 = low	2.50-3.49 = moderate	3.50-5.00 = high

The correlation analysis revealed that there was a significant and strong relationship between the level of awareness of the academic staffs and their knowledge and attitude, with r = 0.877, p = 0.000 and r = 0.938, p = 0.000, respectively, while there was a moderate relationship between the level of their awareness and the level of their behaviour, with r = 0.631, p = 0.000. The results also showed that there was a strong and significant relationship between the knowledge and attitude of the academic staffs, with r = 0.808, p = 0.000. However, there was a weak relationship between their attitude and behaviour with r = 0.464, p = 0.000. There was also a very weak relationship between their behaviour and knowledge, with r = 0.300, p = 0.000. The study showed that knowledge and attitude have greatly affected the awareness of UPSI academic staffs towards implementing the principles of sustainability in their campus. Nevertheless, their awareness, knowledge and attitude did not clearly affect the behaviour of them to act positively towards implementing the principles at UPSI.

This finding somewhat rejects the KAP theory and supports the PEB model, which is when the aspects of knowledge and attitude regarding the sustainability are high, it may influence the behaviour towards sustainability. However, situational factors such as demands, pressures and enforcement also affect the behaviour towards sustainability. The results of this study reflect that the behaviour of UPSI academic staffs towards implementing the principles of a sustainable campus particularly in the university curriculum and research activities needs to be strengthened through several situational factors such as enforcement through regulations and certain rewards. This argument is also consistent with the TPB theory, which assumes that a person will be motivated to do something to avoid punishment or to get a reward. The lack of effort of the university to shape and enforce behaviour towards the implementation of the principles is among the factors causing the poor behaviour of academic staffs towards practising sustainability in UPSI.

At the end of the surveys, the respondents were asked to suggest ways to improve the awareness and pro-sustainable behaviours among the academic staffs of UPSI. Overall, the suggestions that have been highlighted by the respondents are include; providing a comprehensive sustainable campus program (14%) and campaign (42%); intensify the administration and monitoring of the sustainability aspects in the campus (31%), enforcement of law (7%) and implementation of a top down approach in practising the principles of a sustainable campus in UPSI (6%). Thus, implementation of the program, campaign, enforcement and the other efforts which aims to foster positive behaviour among academic staffs towards practising the principles of a sustainable campus must be intensified to ensure that their role is optimized to lead UPSI towards sustainability. The main finding of this study is graphically presented in Figure 2 below.

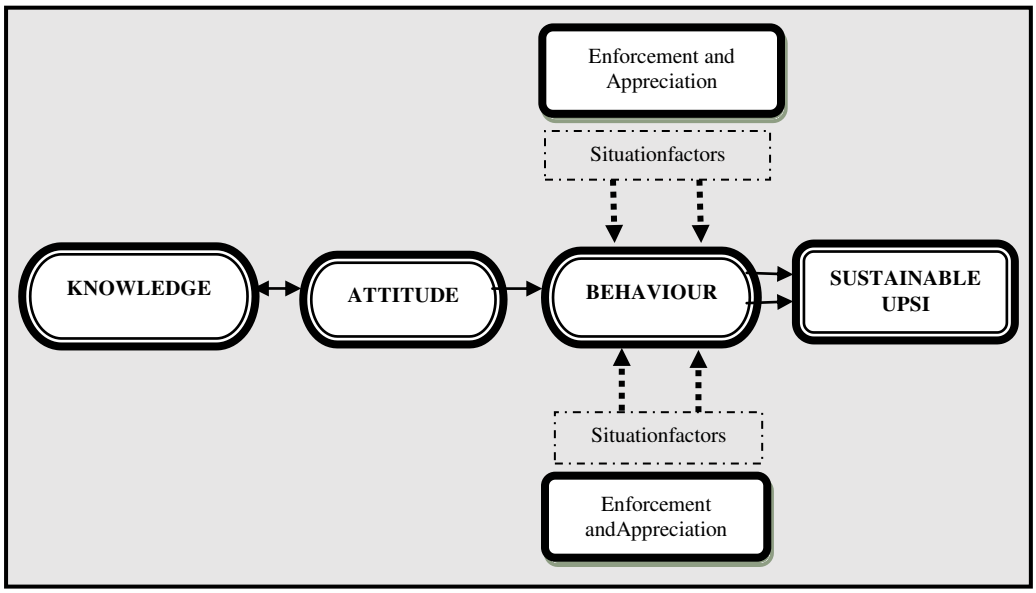

Figure 2. *A framework towards sustainable UPSI*

Conclusion

University is a unique institution when it comes to addressing the challenges of sustainable development by considering the sustainability principles into the curriculum, research, daily campus operations, service activities and community outreaches as well as the planning and construction of buildings and the physical environment of the campus. Academic staffs are among the end users of the campus and they are involved in various activities that can affect the sustainability of the campus. The initial step for developing a sustainable campus is to create the awareness. Although the results of this study showed that the level of awareness among UPSI academic staffs was high, it did not entirely influence the level of their behaviour towards implementing sustainability practices on campus. This study concluded that in the context of UPSI academic staffs, the high level of knowledge and a positive attitude towards implementing the principles of sustainability on campus will not necessarily guarantee a high level of behaviour among them. Situational factors, such as enforcement and rewards, are the other factors that might be required for them to be seriously involved in practising the principles on campus. However, it cannot be denied that a person who has knowledge about a particular behaviour will be more effective in a given situation.

UPSI covers a wide area that involves a large population and complex activities that could potentially impact the environment. Hence, sustainable practices are vital for maintaining a harmonious economic and social campus environment and its universal characteristics. Various efforts are needed to shape the behaviour of academic staffs in order to enhance sustainability practices in the campus. Among the efforts that could be implemented by UPSI would be through the enforcement of integrating sustainability principles into the curriculum system, research, daily operations, and the campus planning and development. UPSI should implement a comprehensive plan in stages so that everybody is involved in the efforts towards achieving sustainable UPSI.

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