

A Whole-of-University Approach towards Sustainability in a Research Institute: A Force-Field Analysis

Siti Nur Diyana Mahmud^{a*}, Nurfaradilla Mohd Nasri^b, Sharifah Intan Sharina Syed Abdullah^c, ^{a,b}Faculty of Education, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia, ^cSchool of Education, Universiti Putra Malaysia, Serdang, 43400 Seri Kembangan, Selangor, Malaysia. Email: ^{a*}diyana@ukm.edu.my

The objective of this paper is to examine the driving and restraining factors to the implementation of a whole-of-university approach towards sustainability in a Malaysian research university. This study was framed in a qualitative paradigm of inquiry that utilised a case study design. The data were derived from semi-structured interviews with 10 experts in sustainability research and teaching in the Malaysian case university. The findings demonstrated that the driving factors for the whole-of-university approach towards sustainability were, i) financial support and ii) lecturers' autonomy. Meanwhile, the resistance to institutional change towards the whole-of-university approach were, the i) lack of accreditation pressure for linking learning to research and campus operation, ii) few co-ordination bodies to support sustainability activities, and iii) non-contextualised learning. The restraining forces outweighed the driving forces. Therefore, the systemic transformation for sustainability is difficult to be enacted in this university context.

Key words: *Education for Sustainable Development, higher education, Sustainable Higher Education, barriers to change, change drivers, organisational change.*

Introduction

Sustainable development is one of the biggest challenges to higher education in the twenty-first century. Many believe that higher education is one of the keys to a sustainable future because it bears responsibility for educating future leaders and change agents (Wu & Shen, 2016). Despite these lofty aspirations of sustainability in higher education, the impact of sustainability in Higher Education Institutions is not systemic and is limited to certain

components in the university. Furthermore, HEIs are failing to lead students to address sustainability problems in a holistic and systemic way (Filho, 2015). This is because most of the HEIs are tackling sustainability issues in a silo (Birx, 2019; Li, et al., 2019; Pompeii, et al., 2019). Education for Sustainability (EfS) in HEIs is limited to specific courses, and is often unconnected to research. Furthermore, EfS is unlikely to be connected to sustainable campus operations. HEIs can optimise their roles as agents of change with regard to sustainability by adopting the whole-of-university approach to sustainability. The whole-of-university approach explicitly links research, educational, operational, and outreach activities and engages students in each. Nevertheless, many HEIs are struggling with holistic transformation towards sustainability (Ferrer-Balas, et al., 2004; Hopkinson, 2010). Transforming HEI practices and praxis towards sustainability is a challenge, and actual results are still far from the desired image of higher education for sustainable development (SD) (The Observatory, 2006; Holmberg and Samuelsson, 2006). Many researchers have looked into the drivers and barriers towards sustainability in higher education, however, there was a gap found in the literature explaining the driving and restraining factors for the whole-of-university approach towards systemic sustainability in HEIs. Especially in research universities, where there is a strong focus on research, it is interesting to investigate how the whole-of-university approach that links research, education, and campus operation is enacted. Thus, the objective of this study has been to examine the driving and restraining factors to the implementation of the whole-of-university approach towards sustainability in one research university in Malaysia. The uniqueness of this university is that, it is the first research university in Malaysia that has an active institution to fulfil the aspirations of the university, as envisioned by the United Nation's Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, i.e. to conceptualise the aim of sustainable development through research and capacity development (Saadatian, 2009). The findings in this study provide insight into understanding the siloed approach of sustainability enactment in HEIs.

Whole-of-University Approach towards Sustainability

HEIs can optimise their roles as agents of change for a sustainable future by adopting the whole-of-university approach to sustainability (McMillin & Dyball, 2009). This approach explicitly links the research, educational, and operational activities of an institution and, more importantly, engages students in each, rather than confining their education solely to the classroom. Nevertheless, EfS is not usually linked to research, and both education and research are separate from campus operations (Birx, 2019; Li, et al., 2019; Pompeii, et al., 2019). This fragmentation squanders an opportunity to leverage improved outcomes from the time and resources invested in sustainability initiatives.

Given the complex nature of sustainability issues, it is imperative that EfS pursues an integrative approach to modelling sustainability in the core functions and systems of the university. Universities as a whole are just beginning to attempt to model what a sustainable system might look like. By explicitly linking the core functions of the institution, the whole-of-university approach to sustainability demonstrates to students a real-world application of the sometimes vague concept of sustainability (Faham, Rezvanfar, Movahed Mohammadi, & Rajabi Nohooji, 2017).

A systems' approach recognises that a university operates with the complexity of a mini-city, and all its interdependent parts must be considered if it is to develop in a sustainable manner. Such a unified and complementary whole-of-university approach is an aspirational target for most institutions, and this model provides a framework for implementing sustainability into the organisation.

Education for Sustainability at a Malaysian Case University

Whilst sustainability has become a 'buzzword' in global and Malaysian HEIs, there are no comprehensive studies that explore the drivers and barriers of the whole-of university approach towards systemic sustainability transformation of HEIs. Previous studies of sustainability in Malaysian HEIs focused on separated dimensions of sustainability (e.g., Darus, et al., 2009; Derahim, Hashim, Ali, & Norfadillah Derahim, Halimaton Saadiah Hashim, 2011; M. Z. Abd-Razak, Uberta, & Handryant, 2012; Omar, et al., 2009; and O Saadatian, Salleh, Tahir, Haw, & Sopian, 2011) rather than on multiple and integrated dimensions, such in the whole-of-university approach.

In the Malaysian case university, sustainability initiatives officially started in 2007. To implement sustainability initiatives in the Malaysian Case University, three main research groups were established under Sustainable Campus Research Cluster, which are the:

- 1) **Sustainable Community Research Group.** Areas of research are in: governance, curriculum, human well-being, ICT, and communication.
- 2) **Sustainable Ecosystem Management Research Group.** Areas of research are in: energy management, water management, waste management and zero waste campus, forest management.
- 3) **Sustainable Physical Development Research Group.** Areas of research are in: implementation of Master Plan and Campus Planning, sustainable campus design building, sustainable campus smart transportation system, infrastructure design, sustainable landscape design, sustainable construction materials application in construction systems, management and maintenance building systems, infrastructure, and sustainable landscape.

Data from three established high-ranking public research universities in Malaysia indicated that university sustainability programmes focus mainly on physical campus greening, green procurement, and research on green technology (Omar, et al., 2009). This mirrors the findings from England where the strategic review of EfS by the Higher Education Funding Council for England (2008) identified that HEIs focused on campus greening rather than the substantive reform of pedagogy and curriculum. According to Sydow (2012), sustainability in higher education typically refers to greening the campus and attempts to reduce the university's ecological footprint. A study by Elfithri et al. (2017) on a decade of sustainable campus programmes in the Malaysian case university found that the programmes were not properly planned or coordinated. Many programmes were condensed into a short period of time. Elfithri et al. (2017) also found that there were unequal activities amongst the sustainable research groups with only one of the three groups (i.e., Sustainable Ecosystem Management Research Group) still being active. The Sustainable Ecosystem Management Research Group focusses on conservation and management of water, energy, and waste resources. Unfortunately, EfS is not a priority for even this active research group so the achievement of the sustainable development goals (UNESCO, 2017) seems even more remote. Despite 10 years of sustainability initiatives in the Malaysian case university, Derahim et al. (2011) and Er Ah Choi et al. (2017) identified the critical gaps and weaknesses that remained in the knowledge and awareness of the students and staff which pose major challenges to the Malaysian case university.

Methodology

This study utilised a qualitative approach and a case study design. The data used for this study were from semi-structured interviews with 10 experts (lecturers) in the sustainability field at the case university. The main purpose of conducting an interview is to obtain some special kind of information, namely what is “in and on someone else’s mind” (Patton, 2015, p. 426). By adopting a semi-structured approach, there was space for the interviewer or interviewee to diverge in order to pursue an idea or response in more detail (Creswell, 2012). The participants’ selection in this study was based on specific criteria, i) the lecturer was actively conducting research related to sustainability and ii) the lecturer was teaching a sustainability related course. The details of the participants have been displayed in Table 1. However, pseudonyms were used to protect the confidentiality of the participants.

Table 1: Participants details

Lecturer participants	Position	Discipline
Lecturer 1	Associate Professor	Environmental Philosophy
Lecturer 2	Associate Professor	Environmental Education
Lecturer 3	Senior Lecturer	Applied Biology
Lecturer 4	Professor	Applied Biology
Lecturer 5	Senior Lecturer	Engineering
Lecturer 6	Senior Lecturer	Environmental Management
Lecturer 7	Senior Lecturer	Geography
Lecturer 8	Professor	Engineering
Lecturer 9	Senior Lecturer	Environmental Education
Lecturer 10	Senior Lecturer	Environmental Management

A series of semi-structured interviews was conducted with each of the 10 lecturers, individually. Each interview consisted of several key questions designed to investigate the drivers and barriers of the whole-of-university approach towards sustainability. On average, the interviews were conducted for 90 minutes. All semi-structured interviews were digitally recorded and transcribed, after which each transcript was returned to the relevant lecturer participant by email and he or she was asked to check its accuracy.

The qualitative approach in the study was based on Schutz's (1967) theory of social phenomenology which is a descriptive and interpretive theory of social action that explores the subjective experiences within the daily life of an individual. Schutz (1967) formulated a method for studying social action involving two senses of interpretive understanding. The first order is the process by which people make sense of or interpret the phenomena of the everyday world. The second order of understanding involves generating ideal types by which to interpret and describe the phenomenon under investigation. In the study, the method of analysis used the data-driven inductive approach of Boyatzis (1998) to reach the appropriate level of interpretive understanding. In light of this, the data analysis process in this study involved four phases: i) becoming familiarised with the data, ii) assigning codes to the data, iii) theme identification, and iv) force-field analysis.

Phase One

Phase One started with becoming familiarised with the data. The researchers listened to the recordings of the interviews several times, and transcribed them in English into Microsoft Word documents. Finally, the interview transcripts were re-read whilst listening to the interview recording to allow for a detailed examination of what was said and to stimulate ideas about the analysis (Hunter, Lusardi, Zucker, Jacelon, & Chandler, 2002).

Phase Two

During Phase Two, the researchers employed an inductive and data-driven approach to develop the codes. Clear operational definitions were necessary so that they could be applied consistently over time. The researchers developed a codebook that consisted of a set of codes and definitions, and used it as a guide to code the interviews. The researchers employed the Computer Assisted Qualitative Data Analysis Software (CAQDAS) Atlas.ti 8 to code the data.

Phase Three

In this phase, the theme identification process was conducted. This phase of searching for themes involved reviewing the coded data to identify areas of similarity and overlap amongst the codes. The basic process of generating the themes in this study involved collapsing or clustering the codes that seemed to share some unifying features so that they reflected and described a coherent and meaningful pattern in the data.

Phase Four

A force-field analysis was utilised during phase four of the data analysis process. The force-field analysis provides a framework for looking at the factors (forces) that influence a situation, originating from social situations. This form of analysis looks at the forces that are either driving movement towards a goal (helping forces) or blocking movement towards a goal (hindering forces). The principle was developed by Kurt Lewin (1951). All the forces in support of the change are then listed in a column to the left (driving the change forwards), whereas all forces working against the change are listed in a column to the right (holding it back). The driving and restraining forces should be sorted around common themes and then be scored according to their 'weight'. In this study, the 'weight' scores were based on the frequency of the factors mentioned by the participants during the interviews. The weights were further added to these driving and restraining forces to portray the relative importance of each force. The driving forces needed to outweigh the restraining forces to enable a whole-of-university approach transformation towards sustainability.

Findings and Discussion

In this section, the findings and discussion of the driving and restraining factors of the whole-of-university approach towards sustainability will be discussed.

As displayed in Figure 1, the drivers of the-of-whole university approach towards systemic sustainability in the Case University were categorised into two themes: i) financial support and ii) autonomy to the lecturers. Meanwhile, the restraining factors were: i) lack of

accreditation pressure for linking learning to research and campus operation, ii) few coordination bodies to support sustainability activities, and iii) non-contextualised learning. The total number of restraining factors exceeded the number of driving factors.

Driving Factors of the Whole-Of University Approach towards Sustainability

This study identified financial support and autonomy to the lecturers as the driving factors of the whole-of-university approach. Financial support as a driver was argued by all the lecturers (10) being interviewed. One of the participants stated that “*Financial support for sustainability research and learning is very important*” (Lecturer 1). Furthermore, another participant (Lecturer 5) argued that “*In order to link the learning to research, first we need to conduct the research. To conduct the research, we need financial support*”. Financial support as the driver of the whole-of-university approach towards sustainability is in line with the study by Aleixo, Leal, and Azeiteiro (2018); and, the systematic review of sustainability enactment in HEIs by Wu and Shen (2016) who identified that, strong financial support is required for implementing EfS on a systemic level. Nevertheless, Lecturer 4 didn’t perceive financial support as the most important driving factor, she stated that “*Financial support is important, but it is not the most important driver to holistically transform our university towards sustainability*”. In general, all the participants argued the financial support as being one of the driving factors for the whole-of-university approach. However, the relative importance of financial support for systemic transformation towards sustainability in HEIs was perceived in various ways by the participants.

Besides financial support, a driving factor for the whole-of-university approach towards sustainability can be in the form of giving autonomy to lecturers to develop their own expertise. Four participants (Lecturer 2, Lecturer 6, Lecturer 8, and Lecturer 9) perceived the university policy that gives autonomy and opportunity to the lecturer to develop his or her own expertise as a driver for the whole-of-university approach towards sustainability. Lecturer 2 stated, “*What drives me to teach sustainability is because I have autonomy. I developed the course, and I teach and evaluate the course. It is not difficult to connect my lesson with my research*” (Lecturer 2).

The lecturers claimed that autonomy being given by the university as a driving factor is consistent with Holmberg and Samuelsson’s (2006) position. They argued that academics’ autonomy and freedom in universities had a profound role to play in EfS. Furthermore, one participant (Lecturer 8) highlighted the case for university’s status as a research university as a significant factor that encouraged academic autonomy and connected their lessons and campus operation with the research activities. She stated:

In a research university, we emphasis the research activity. Therefore, our lesson should be connected to research. The sustainability campus operation also needs to be based on the research that we conducted. And in a research university the management gives you freedom and support to do that. (Lecturer 8)

The case university is one of the research universities in Malaysia, and this university has a fair amount of autonomy (Choy & Lau, 2013).

Both of the driving factors for the whole-of-university approach perceived by the participants was concerned with the university's role in providing financial support and giving autonomy to the lecturers. The participants did not mention the driving factors that were related to the individual roles in the university. This is because to systemically transform the university towards sustainability, the institution as a whole bears a greater role (Heck, 2005; Zakerian, Sadoughi, Nabavi, & Mahdi, 2017).

Restraining Factors of the Whole-of-University Approach towards Sustainability

The restraining factors of the whole-of-university approach towards sustainability were: i) no accreditation pressure for linking learning to research and campus operation; ii) no co-ordination bodies for sustainability activities; and, iii) non-contextualised learning.

The most often mentioned restraining factor by the participants was that there was no accreditation pressure for linking learning to research and campus operation. A great majority of the research participants mentioned no accreditation pressure as a restraining factor. During the interviews, Lecturer 3, Lecturer 6, and Lecturer 7 linked the lack of sustainability awareness amongst the important stakeholders in curriculum development to a condition where there was no accreditation pressure for linking sustainability learning to research & campus operation. Lecturer 6 stated:

The barrier is that some of the important people in the university are not aware of the importance of sustainability integration in teaching. Therefore, sustainability integration in teaching has not been given emphasis by the stakeholders. It depends on the individual lecturer to integrate sustainability in his/her teaching. Because there is no requirement to do so. (Lecturer 6)

Lecturer 6's concern over the difficulty in incorporating sustainability in the HEI curricula is supported by Dawe et al.'s (2005) study, which recognised the limited staff awareness that discourages cultural change towards sustainability as one of the major barriers to the successful embedding of Efs into many of the subject disciplines in HEIs. Furthermore,

Lecturer 7 raised the issue of a lack of sustainability awareness amongst the senior management in HEIs:

I think the top management needs to have an awareness about sustainability issues, because sometimes they are more focused on administrative work and can't see the connection to sustainability problems. When there is no pressure from the top management, not many people are concerned with integrating sustainability issues in their teaching. (Lecturer 7)

Lecturer 7's suggestion of the necessity for the top management to have sustainability awareness is based on the premise that, sustainability awareness is a key element in furthering more sustainable practices in HEIs. Before addressing the practices, there must be a basic belief that there are or could be sustainability problems (Shadymanova, Wahlen, & Van Der Horst, 2014). Lecturer 7's claims about a lack of sustainability awareness amongst the university management are consistent with a study by Velazquez et al. (2005) which demonstrated that people in charge of sustainability in HEIs often complain about the university's management being unaware of or having no interest in sustainability. This will delay the systemic transformation in HEIs towards sustainability, and delay the incorporation of sustainability in the HEI curricula (Dawe et al., 2005).

Lecturer 5 related the no accreditation pressure factor with the cultural element. She noted:

You know the culture here. It is hard to find volunteers to do sustainability work. Everything needs to be enforced through a top down management instruction. Since there is no pressure from the top management, only lecturers who are truly passionate will be involved in sustainability teaching and research. (Lecturer 5)

In highly collective societies, a reward obtained at the end of a programme is highly appreciated (Hofstede, 1987). Thus, it is understandable that Lecturer 5 observed that her colleagues were reluctant to participate in sustainability activities if there was no pressure from the top management.

The next restraining factor was related to no coordination bodies in the case university to coordinate all the sustainability activities. Six of the participants (Lecturer 1, Lecturer 5, Lecturer 6, Lecturer 8, Lecturer 9, and Lecturer 10) mentioned that the sustainability programmes were not properly planned or co-ordinated where many were condensed into a short period of time. Lecturer 8 stated: *"Sometimes there are too many sustainability events within a short period of time. And there will be no event at all during the rest of the semester. The events need to be consistently organised during the whole semester"* (Lecturer 8). Furthermore, Lecturer 10 also mentioned, *"I observed that, many similar overlapping*

sustainability events were happening in the campus. Looked like there was no coordination” (Lecturer 10).

Having no co-ordination bodies to co-ordinate sustainability activities in the university was not unique to this case university. Studies by Krizek, Newport, White and Townsend (2012) and Salvioni, Franzoni and Cassano (2017) reported that the university experienced serious challenges for co-ordination and integration of the sustainability programmes.

Half of the participants (Lecturer 2, Lecturer 4, Lecturer 5, Lecturer 9, and Lecturer 10) argued that one of the restraining factors to the whole-of-university approach towards sustainability was non-contextualised learning. In this study, the participants explained that non-contextualised learning is when learning is unconnected to the real world. For example, Lecturer 5 stated, *“Sometimes the lecturer does not give a real-world example to the students in the classroom. A real-world example can be from the research or maybe using the campus area as an example”* (Lecturer 5).

In addition, the participants agreed that the non-contextualised learning occurred because the lecturer did not have good pedagogical skills to contextualise the learning. Lecturer 9 stated:

The educator should have good pedagogical skills and be able to contextualise the learning. The barrier for an effective sustainability learning is that, not all the university lecturers have good pedagogical skills to contextualise the learning to make it more meaningful to the students. (Lecturer 4)

Lecturer 9’s claim is in line with global concerns on the challenges of sustainability education in higher education. Seatter and Ceulemans (2017) argued that, the barrier to systemic sustainability education in HEIs is when the lecturers approach a sustainability curriculum with a non-substantive pedagogy and do not have connection with real-world sustainability problems.

The restraining factors mentioned by the participants involved the institution level and the individual level. The institution level restraining factors were no accreditation pressure for linking learning to research & campus operation and no coordination bodies for sustainability activities. Meanwhile, the individual level restraining factor was non-contextual learning.

Conclusion

This study has provided insight into understanding the siloed approach of sustainability in higher education. The findings from this study identified that more restraining factors towards the whole-university approach were involved at the institutional level compared to the individual level. On the other hand, all the driving factors for the whole-of-university



approach perceived by the participants were involved at the institutional level. Therefore, this suggests that for the HEI systemic transformation towards sustainability, the actions and decisions enactment at the institutional level is required. Future research should examine the operation, praxis, and governance at the HEIs that drive and deter the whole-of-university approach towards sustainability.

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APPENDIX

Figure 1. Force-field analysis of the driving and restraining factors of the whole-of-university approach towards sustainability

