Interpretations of Sustainability in Higher Education

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Abstract

Sustainability as a development that achieves human needs lasting satisfaction and human life quality improvement, has gained increasing interest among policy makers, planners and academicians all over the world. It has been an important component of the future well-being of humanity and the earth. Universities are one of the key institutions that can contribute to a better understanding of environmental issues. It could play an essential role to create sustainable solutions for the future. A nation that intends to have a high ranking in achieving sustainability, especially in higher education, needs to move forwards to sustainability. This paper by employing literature review method and investigating the initiatives of 24 Universities will analyze the different aspects of sustainability in higher education. The weakness of existing evaluation has been discussed and different proposed model has been investigated. Finally a framework It proposes different important fields of research in details and finally, the paper delineates relationship between different actors like outreach and services, operation, research and scholarship, courses and curricula, mission and structure, researchers and scholarship. The result could be used as a reference for the other researchers and scholars who are going to start working in this topic in their institute or for the universities top managers who want to make their campuses more sustainable.

Key words: Sustainability, Higher education
1-Introduction

Malaysia is a country that has achieved a high ranking in sustainability in the world by getting the second highest seat among Asian countries and was placed at 38 among 146 countries worldwide (Ninth Malaysia plan, 2006). Although decision makers have recognized the needs to develop a more sustainable approach to the higher education, it is still slow in practice in this country. Different aspects of sustainability have been emphasized on national Malaysian plan. For example, chapter 19 sustainable energy, chapter 23 enriching arts and heritage, chapter 22 promoting environmental stewardship and so on. Hence, universities could be a good laboratory to start on different parts of sustainability. Many of these Malaysian universities are also government-linked institutions that despite privatization still functioning as a source of outreach and services to the community and economic sustainability (Rashid, 2007). According to Hansen et al, (2006) university consortium networking has developed a target activity for sustainability capacity building over the last decade, where Malaysia and Thailand is the only Asian participant in this program. However, sustainability in regard of higher education looks to be new in the country. This topic is very important for Malaysian higher education organizations, because Weenen (2000) suggested it as the biggest cosmopolitan challenge to universities in the twenty-first century.

Malaysia as a fast developing country has started to invest on higher education business. It could be a proper destiny for all Asian students who are seeking knowledge and technology in an inexpensive and affordable atmosphere. The questions, which arise, are; 1-what does sustainability in higher education mean? 2- from where one should start? 3- What is the priority between different research issues? 4- What scenario can be proposed for a new higher education?

This paper has reviewed different universities actions toward sustainability in higher education. Those mostly considering; curricula and courses, mission and structure, researches and scholar ships, operations and outreach and services. In this review, the weakness of the existing evaluation has been discussed and different proposed model has
been investigated. Finally, by gathering the information in all of these methods, models, questionnaire formats, articles and thesis a new scenario has been proposed for developing countries higher education organization. This paper attempts to analyze the foundation of different approach to sustainability in higher education. It tries to identify common concept of these different approaches and different methods, which all pursues a common goal. This goal is sustainable educational organization. Then by identification of these bases, it tended categorize the different subjects that have already been considered by different higher organization in the world.

Further more this paper is going to elaborate the different aspects of sustainability in higher education and will give a brief explanation on their assessments. It will argue the dark spots, which exist in these topics to feed the researchers for new glance to topics

2-Sustainability

The popular definition of sustainable development describes sustainable development as “a development that meets the needs of present without compromising the ability of future generations to meet their own needs” (Brundtland Commission, 1987). It means that having a development, which encompasses restoring environmental integrity, improving economic prosperity and promoting social equity. In addition, it needs collective action in a democratic community (Dola, 2006).

One important element in sustainable development is to reach balance between economic, social and environmental goals. Whereas, people participation in planning process is also needed to gain input and support (Roseland, 2007). Sustainable development is primarily aimed at providing a good quality of life for human beings, both now and future (Jones, 2007). Further more according to Osman et al, (2006) this is the issue that even ordinary people are concerning about.

3-Sustainability in higher education

Institution of higher education in this paper is an explicit term that is called for an institution, which authorized for conferring bachelor, Master and PhD degrees. The goal of education is to urge humankind being ethical, responsible, better informed and more
knowledgeable (Weenen, 2000). In addition, the two terms of sustainability and higher education have always had an interactive influence over each other. Higher education organizations like universities have all the expertise necessary to develop the conceptual framework for sustainability. This could help the sustainable trend. Meanwhile universities are the factories, which produce future decision makers in both public and private sectors. On the other hand, if the sustainability could be applied in universities concretively much more benefits will be achieved by the universities themselves.

These institutional organizations like universities or colleges have great impacts on their surrounding via using different resources in their boundaries. They also affect their community through modeling of environmental stewardship. The simplest form of this advantage is in the university operation. Proper management of resources will lead to sustainable energy consumption, sustainable waste management, sustainable water consumption, sustainable transportation and others.

4-Background and history of sustainability in higher education

This issue gained the scientists' interest, institutes and public seriously. It started from Talloires declaration as a first official statement, in France in 1990 and proceeded to Johannesburg summit in 2002. After that, the importance of the central of education in aiding societies to move toward sustainability, worldwide, was emphasized. To support this agenda United Nation Educational, Scientific and Cultural Organization (UNESCO) took the first pace on a worldwide basis to foster this trend. For this purpose, they designed a framework entitled Decade of Education for Sustainable Development, which officially launched in January 2005, and must be completed by December 2014 (Huisingh et al, 2006). Consequently preliminary researches, by UNESCO and numerous other organization and individual educators throughout the world were done. Finally, an approach to education that strengthened the application of social values, particularly integrity and fairness, came out as the most important parameter of this trend (ibid). However, despite the activist call for sustainability in higher education, Shriberg (2002) declares, the result is not satisfactory.
This unsatisfactory processing is referring to universities management and their strategies. This slow progress to all aspects of sustainability is worldwide spread but this inefficient progress in higher education has been assessed and yield more frustrating results (Jenks, 2000). Richards (1999), believes that to create a sustainable universities, university managers should act fundamentally different from old environmental management. It has to include systematic change and incremental improvement. It needs integration of environmental, social and eco efficient goals). This approach should encompass these three target levels: Morality and intergenerational equity, survival of current ecosystem and finally organizational benefits and risks (Shriberg, 2001).

The universities can bear responsibilities for knowledge and awareness enhancement of university’s stakeholders while boosting the current technologies and tools toward sustainability. In Malaysia, like other part of the world and based on a blind survey of the authors, this movement has already started but it remains not fast enough to reach to the climax level. According to Hansen et all, (2006), Sustainability approach in MU-AAU Corporation, a cooperation between Mahidol University in Thailand(MU) and Alborg University in Denmark( AAU) is a prove of starting this approach even in Malaysia. This coalition encompassed University Kebangsaan in Malaysia, Chulalongkorn and MU in Thailand, Berlage institute in Netherlands and AAU in Denmark (Ibid).

5- Aspect of sustainability in higher education

Some higher educations have focused on sustainability in their researches besides the other topics (Bringer, 2006). They intend to explore the route of embedding environmental literacy, as one aspect of sustainability, into every segment of campus operation or curricula. These researches, aim to point on policy, considering environmental issues in the context of economy, equity, health and safety (Weenen, 2000). The direction of these researches related to speculation of different higher education organizations with different cultures, environments, geographical boarders and policies. For instance, Waterloo University focuses on awareness, efficiency, equality, cooperation and natural system (Weenen, 2000). In Fachhochschule Alan in Germany, it is more on usage of paper, heating, lighting, water and procurement (Ibid). Another
example is Amsterdam University, which looks to sustainability through “LIFE” (“L” means limits in resource, “I” means being independent, “F” means fundamental changes and “E” means equity) (ibid).

5-1 Courses and Curricula

One important aspect of sustainability in higher education is curriculum. This issue considers the number of courses, which is being taught in an institute or in a university. For assessment of this issue, the courses syllabuses should be checked and be investigated. It focuses on how many of courses contain sustainability issues. In this instance, a university is chosen and list of different faculties and different group programs is listed. The next step will be analyzing the courses syllabuses and its relationship to sustainability. The courses that have a completely related issue to sustainability will be counted in absolute frequently. The course, which has some things, that covers only some parts of sustainability issues is counted in relative frequency. At the end, the time of teaching of these courses, will be recorded and the combination of these two parameters, frequency and duration of teaching, gives an indictor for curricula sustainability. An example of this kind of research is the one, which Tomas B Ramos and his colleagues fulfilled to investigate the place of EIA in Portugal University. Due to their research, the authorities in Portugal’s higher education expressed that, EIA is a well-established field of knowledge in higher education (Ramos et al, 2007). Since EIA is well known tool for environmental sustainable assessment they were conveying this concept that curricula in Portugal university is sustainable (Ibid).

The same strategy was used in the University of Juvaskyla, Finland. They used the same methodology and compared the salaries of different alumnus with different curricula. They announced that the changing curricula have been extremely imposing to change the alumnus wages (Hanna, 2003). They investigated that alumnus at the era which universities curricula comprised sustainable syllabuses were getting at least 20 % more than their predecessors (Ibid).

Some people believe that changing curricula is a multifunction route toward sustainability. For instance, Calvin Collage in USA implied a program aiming to change
existing curricula to sustainable curricula. The goal of this program was: 1-engaging all university scholars in sustainability issues; 2- Enhancement of collaboration, 3-creativity via curriculum change 4- Engaging students to multidisciplinary course and teach them group work activities (Curry et al., 2007).

In the process of curricula sustainability assessment, mentioned at the beginning of paragraph, this gap remains; what kind of course is completely related to sustainability and which one is semi related. Sustainability is an intuitive concept and it is hard to be defined. Therefore attributing different courses to sustainability is controversial process. Another critical topic is how many percentages of institute curricula should cover the sustainability’s issues to be called it institute with sustainable curricula. Since the people are different in behavior and learning, same curricula have not same effect on their learning. As far as different cultures, religions and ethnics exist in different higher education organization, it might be very difficult to define a universal standard.

5-2 Research and scholarship

Another topic, concerning to the sustainability in higher education, is research and scholarship. In this field, the number of researches that has been fulfilled and number of scholarships in a limited period, for example annual, is taken into account as an indicator for sustainability. Scholarship allocations and researches in different topics and different faculties in an educational institution, university, college, are being considered as an index. In this domain the proportion of particular researches and scholarships, which encompassing sustainability issues to all the number of ongoing research and scholarship is considered as an indicator index. University Erasmus in Netherlands has done much in this regard, by analyzing the positive affects of allocation of scholarship in sustainability issues, they found out this allocations have direct effects on enhancement of sustainability in every part pf university (Bass et al., 2000). This university enhanced its research toward more sustainable higher education by contributing more scholarships or opportunities for interdisciplinary researches and work and study programs (Ibid).

The neglected important matter is the type and generic of researches. Two kinds of researches exist, basic research and applicable research. The first one is something
fundamental and affecting the world in a long-term. In contrast, applicable research
responds very fast. Therefore, in assessment, proportion of basic researches and
applicable researches, which is very essential for an institute in short time feed back,
should be considered either.

5-3 University Operation

One of the other topics, which ensues sustainability in higher education, is sustainability
in campus operations. It indicates the different actions, which is fulfilling in the campus
territory, for having a more sustainable institute.

Several scholars in these filed like Ween, (200), Shriberg, (2001), Ramos et al, (207),
Association of University Leaders for a Sustainable Future, Association for the
Advancement of Sustainability in Higher Education, (ULSF), has addressed parts of these
issues. Those are 1-source reduction of toxic material; 2-source reduction of radioactive
wave; 3-sustainable landscape,

biodiversity, lawn minimization, native plants, protecting against invasive plants; 4-
pesticide control and pest management, 5-sustainable dining and organic food, 6-
sustainable transportation, 7-waste reduction scheme, 8-recycling of solid waste
management, 9-sustainable purchasing, 10-sustainable construction and renovation, 11-
sustainable energy or energy conservation, 12-renewable energy (solar energy), 13-
indoor Air quality, 13- CO2 Reduction and reducing air pollution, 14-conservation of
culture and heritage, 15-egonomics, 16-equity and poverty, 17-handicapped people
facilities, 18-occupational health and safety, 19-global climate.

Usually when somebody address this aspects, features like photo voltaic electricity, gray
water treatment system, composting toilet and native landscaping is considered.
Meanwhile ranking of building based on Leadership in Energy and Environment Design,
LEED, certificate comes out. For evaluating this part, more than using the assessment
methods like LEED, employ questionnaires or interview method. Association of
university leaders for a sustainable future ULSF in USA has designed some questionnaires format to assess the level of sustainability in campuses of USA. These questionnaires are almost subjective and depend on the knowledge of respondents. The problem of using these ULSF questionnaires, based on its subjective nature, depends on the level of understanding of respondents on sustainability issues. For underdeveloped countries or some developing countries, it seems to be complicated for all stakeholders to understand properly and answer correctly. Some other scholars have used environmental tools like EIA, which is a challenging process to link environmental issues without comprising economic and social issues to sustainability.

5-4 Outreach and services

The last topic pertinent to sustainability in higher education is outreach and services. Precisely This topic comprise the effects of an higher education to others in term of sustainability by its deed. It addresses the interaction of sustainability issues between an educational organization and its surrounding neighborhood. In the other word, how a university or a collage can increase the awareness of nonacademic people or help them to move faster forward to sustainability goals. It could be partnership between the educational organization and local government, business enterprises and even schools. Furthermore, these institutes through seminars, conferences and exchange programs could get the help of international cooperation. Meanwhile these institutes could help the other members of a surrounding community. For assessing this topic, getting information from universities managers and faculty managers could give some clues but it would not be accurate and not 100% reliable for some political or organizational issues.

5-5 Sustainability in policy; planning and administration

This part contains institutional missions, planning of an organization and its structure. This topic investigates in what extent formal written statements of an educational institute contain suitability issues. It also includes how many of the eight coming elements exist in
a certain educational institute. Those are: 1-sustainability committees, 2-sustainability coordinators, 3-sustainability councils, 3-sustainability task forces, 4-sustainability energy officers, 5-green purchaser officers or committees, 5- regularly sustainability audit, 6- celebration for environmental issues and other environmental orientation, 7- faculty and staff rewards for sustainability activities 8- Department or committee for getting fund for sustainability (ULSF, 1992).

6 Hierarchical of topics importance for further research

Nobody can deny the importance of research for reaching to any goals. Reaching to the goal of sustainability in a higher education organization is not excluded either. For starting any researches in any higher education institute, it is better to know which one is the most important. Although for reaching to a sustainable situation, all of the sustainability research topics should be considered, it looks very idealistic to be performed. Lack of enough budgets, inadequate qualified expertise, and insufficient public support causes prioritization for the researches and initiatives.

In 27-29 October 2005, Higher Education for Sustainability (HES), an organization constituted by 17 countries, organized a workshop in Nova Scotia, to explore the research priorities. In this workshop and conference by using Delphi exercise and using Lickert-Scale, they chose 125 important topics for research pertaining to sustainability in higher education (Wright, 2007). At the end of the conference, 17 different topics among those were chosen, indicated in table one, as the most important domain for research (Ibid).

Table 1 Hierarchical priority list of HES research (Wright, 2007)

<table>
<thead>
<tr>
<th>priority</th>
<th>Kind of research</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Impacts of Teaching and Learning Methods</td>
</tr>
<tr>
<td>2</td>
<td>University and Community Linkages</td>
</tr>
<tr>
<td>3</td>
<td>Mainstreaming Sustainability</td>
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<tr>
<td>3</td>
<td>Institutional Culture and Organizational/Governance Structures</td>
</tr>
<tr>
<td>4</td>
<td>Evaluating Educational Approaches</td>
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<tr>
<td>5</td>
<td>Case Study Analysis</td>
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<tr>
<td>6</td>
<td>Legitimizing HES Research and Practice</td>
</tr>
</tbody>
</table>
7 Different popular model for higher education sustainability assessment

7-1 Campus Sustainability Assessment Framework (CSAF)

Lindsay Cole, (2003) in Royal Roads University in Canada has proposed this model, which has been constituted based on several different indicators. The significance of this model is using the participatory methodology in its process of its creation, which is very new and delicate method. In addition, this model has been vastly being used in different universities, which only in Canada 32 universities have used this model for their assessment. Furthermore, it employed 145 advisors' opinion during its invention. Before going to the model it should be mentioned that the whole of these elements orbiting over two major parameters. These are people and ecosystem. Ecosystem includes 1-air, 2-water, 3- land (well-being, health) 4-material and 5-energy. People comprise 1-knowledge, 2- community, 3-governance, 4-economy and 5-wealth. Assessing the relation between these elements in campus has been called campus sustainability assessment framework (CSAF).
The structure of CSAF is based on 10 main indicators and the 169 sub indicators, which could assess an educational institute. This framework is a tool kit, which has been designed for assessing the universities. It is an academically standardized audit tool for Canadian campuses (Cole, 2003).

Since this tool kit has been designed for Canadian universities, applicability of this tool for other country is doubtful (Beringer, 2006). Even some universities in Canada are not able to find information regarding indicators contained in CSAF (Ibid). Malaysia is also a country with a different climate, different culture, different people and different system. Therefore, it is not excluded from Beringer hypothesis either.

**7-2 Sustainable Classification Model**

Some other scientists look trough the sustainability in higher education from different angel in multidimensional scope. Sustainable Classification Model has looked to this issue through three angles to answer these three questions: 1-Why should be involved? 2- How would be organized? 3- How would be organized (Weenen, 2000)
Figure 2: The Sustainable University Classification model (Weenen, 2000)

This model answered the proposed questions in different axis separately and in different levels. For instance, for the answer of “what can we do” the model has answered in engagement axis. It expresses the primary approach for any organization is physical operation or sustainable campus. The second level is research, which might cover the campus operation. In the third level, this educational organization reformulates management and policy. At the end, university changes its written statements and its policy entitling mission. The two other axes have a similar explanation regarding those two other questions.

In order to reach to a sustainable higher education in Malaysia using the western model blindly would be hazardous. The systematic approach to this goal is cognition of different actors, which is effectual in having a sustainable higher education organization.

8- Authors proposed scenario

In this part, the authors are going to delineate a scenario model for higher education sustainability. The model shows the relationship between different influential actors in a higher organization institute which should be addressed properly in order to increase the overall sustainability of an educational organization.
Although these coming actors has been partly been addressed by different scholars and institutes like, Beringer, (2006), Curry (2007) Cole, (2003), Hanna et al (2003), Houisngh et al, (2006), Ramos et al (2007), Weenen (2000), ULSF, it has not been collected and explained this much explicit that every body can understand. The authors claim that the exclusivity of this scenario is its comprehensiveness and explicitly. Moreover it delineate the relationship between different important actors in the realm of higher education sustainability and its effects on awareness rising and changing consumption pattern.

It expresses, the first step for conceptualization of sustainability in higher education, is setting a sustainability mission and structure. This mentioned element has interactive relation with strategies for fostering sustainability in Higher Education. In the realm of strategy four main parameters of course and curricula, research and scholarship, outreach and services and operation are being considered.

The authors believe that for sustaining a green campus not only the whole showing parameter should be considered properly but also they should be assessed regularly. The assessment results in one hand alters the consumption pattern and increases the public awareness on the other hand giving feed back to decision makers for better mission and consecutively better strategy.
9-Conclusion and discussions:
This paper investigated the interrelation between sustainability and higher education. It was argued that sustainability in higher education has had different meanings and it is not a specific described definition.

Although different higher organizations institutions have represented this concept in their own educational organization in diverse methods, the foundation is the same. This foundation is conceptualizing the philosophy of sustainable development in the important aspects of a higher education institution. As far as this concept has been interpreted in different country differently, the reason should be analyzed in future researches. The difference between their interpretations might refer to different geographical boarders, different cultures, and different level of existing sustainability in different institutes. In this paper by using archival approach, and doing a strong literature review, the important parameters of this realm was collected and proposed as a comprehensive and explicit model. In reviewing this literature, the common foundation of theses different routes ongoing to the same goal was identified. This foundation is conceptualization of sustainability in higher education organization. It encompasses humanity and environment.

The concept of sustainable development in all over the world stands on the two elements; people and ecosystem. Air, water, land, material, energy are derived from former while, knowledge, community, governance, economy and wealth are derived from latter (Cole, 2003). It has been argued although variety of indicators might be extracted from these 10 subjects, there are several other sub indicators, which might be different from one place to another place. So using western models without localizing might be incompatible for every institute as a modular fixed method.

This paper delineates that for having a sustainable scenario apart from location and culture, at first mission, as a leading element, should be fostered. 1-Campus sustainability (operation), 2-course and curricula, 3-researches and scholarships and 4-outreach and services to the surrounding community after the mission should be emphasized in this
trend. Finally, the paper has proposed several subtopics or indicators in five
different subjects and their relations towards a conceptual sustainable higher education.

Authors believe that Implementing the assessment in these different actors not only improve the quality of top level of an organization -like mission, management, planning etc- but also enhance the awareness of people and changes consumption pattern. In conclude the paper impart that for reaching to the goal of sustainability all aspect of sustainability in higher education institution must be addressed delicately and properly.

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