TOWARD SUSTAINABLE CAMPUS: A STUDY ON PHYSICAL DEVELOPMENT PLANNING ACROSS FOUR DIFFERENT INSTITUITIONS

[1]NADZIRAH ZAINORDIN, [2]ZAMZARINA MD JUDYAR

[1,]School of Built Environment, University College of Technology Sarawak, Sibu Sarawak, Malaysia.
[2]Faculty of Engineering and The Built Environment, SEGi University, Selangor, Malaysia.
Email: [1]nadzirah@ucts.edu.my, [2]zamzarina@segi.edu.my

Abstract: The point of this examination is to analyze the viability of grounds physical improvement arranging in Malaysia in making a supportable living on grounds by surveyed the issues that exist. The review was directed in two state funded college grounds and two private college grounds restricted to just watch the grounds physical arranging. The strategy utilized as a part of this review is subjective procedures. Quantitative procedure includes gathering information utilizing surveys disseminated among 100 respondents for every grounds. In the interim, the subjective system includes gathering remarks and conclusions from the respondents acquired from surveys, behavioral perception and visual research. The outcomes then it's to look at for every grounds for a clarification of the issue with respect to the issue may happen on the grounds in regards to their physical improvement. The expecting discoveries of this examination it's to experience the shortcoming or issue may happen and turn out with the best arrangement or proposing another design on grounds physical wanting to take care of the issue.

Keywords: effectiveness,

I. INTRODUCTION

The issue of sustainability has been speak-out all over the world and not to forget Malaysia itself. It was started after the Earth Summit taking place in 1992 in Rio de Janeiro and in 2002 in Johannesburg. Conference in 1992 led to the formulation of Agenda 21, an action plan containing broad principles to help governments and other institutions in carrying out the policies and programs for sustainable development in their respective countries. After that, the principles of sustainability began to be adopted by institutions around the world to run their operations. Sustainability is a key issue for all organizations in the 21st century (Rusinko, 2010). As an institution, the university also can't avoid the issue of sustainability (M.Z. Abd-Razak, N. Utaberta & Aisyah Nur Handryant, 2012). Beringer et al. (2008) also recognized that sustainability is an important issue for universities around the world. Thus, there are several universities that have given their commitment in creating a sustainable campus. Among the commitments undertaken by the universities toward the sustainability are through the learning process approach, the campus environment and management (Davis and Wolski, 2009). Out of these three approaches, the implementation of a sustainable campus environment is one of the most effective way possible against other approaches (M.Z. Abd-Razak et. Al, 2012).

The key part of advanced education organizations in the move to a more maintainable society has been perceived and highlighted for very nearly three decades (Wright, 2010). In regard to the most squeezing urban and planetary maintainability challenges (Seitzinger et. al., 2012), colleges are recognized as key centers inside urban areas for development and ecological training, speaking to a valuable open door for empowering the vital generational behavioral change toward going up against more economical mentalities in day by day lives (Tukker et. al., 2008 & Jackson, 2011). To be solid in this direction part, the college in primis needs to carry on mindfully and astutely in light of supportability issues in the administration of the vitality and HR of the grounds. A practical college has been characterized as a higher instructive organization that locations, includes and advances, on a local or a worldwide level, the minimisation of negative natural, monetary, societal, and wellbeing impacts created in the utilization of their assets keeping in mind the end goal to satisfy its elements of educating, research, effort and association, and stewardship in approaches to help society make the move to supportable ways of life (Hordijk, 2014).

II. RESEARCH BACKGROUND

The objective of this research are to assessed the problems that relating to the physical development planning in creating sustainable living on campus; and to examine the effectiveness of campus physical development planning in Malaysia across four different universities in creating a sustainable living on campus.Although this statement describes the building, in fact it also means the same thing for the environment. This is because the building and the

environment have the same function as place for humans to live and do activities (M.Z. Abd-Razak et. Al, 2012). The statement was supported by Campos (2008) who argue that human behavior can be shaped by the environment. Therefore, it is important to create a campus environment that can offer and encourage the community to lead a sustainable life. Thus, a sustainable campus should be implemented through the campus physical development plan.

The importance of sustainable campus development can be seen when many universities have committed to creating a 'green campus' lately (Isiaka and Ho Chin, 2008). The statement was also supported by Ryan et al. (2010) when they state that there are many higher education institutions in the Asia Pacific region, which has been promoting the implementation of 'green campus'. This is because there are many benefits that can be achieved through the development of a sustainable campus. Thus, many universities have made sustainability a priority in planning and designing new projects on the campus (Alfieri et al., 2009). As emphasized by Neuman and Kliment (2004), three main aspects that need to be addressed in the campus planning are accessibility, safety and community participation (M.Z. Abd-Razak et. Al, 2012). Research on compact planning practices found in the approach can provide a suitable environment to support all three aspects. In addition, this design approach also provides various advantages of campus planning in other aspects such as circulation, transportation, provision of amenities and others.

To obtain the necessary data and information, quantitative techniques was used. Methods and tools used in this study its questionnaires. The research was conducted in two public and two private university campuses. The selection of university campuses in this research is based on their approach, design and also actively promoting sustainability in their respective campuses. The two publich universities are University Malaya (UM) in Kuala Lumpur and University Technology Malaysia (UTM) in Johor. Next two private universities are University College of Technology Sarawak (UCTS) in Sibu and Herriot-Watt University (HWUM) in Putrajaya. This research was limited to campus physical planning only. Among the components in the physical outline of the grounds analyzed are the format of the grounds, openness, dissemination, building configuration, scene and condition, transport and versatility and security and lighting.

III. RESULTS AND DISCUSSION

Look into found that there are contrast approach has been utilized to arrange the physical improvement for look into grounds. Inquire about likewise found that each approach taken has its own points of interest and impediments. In addition, there are additionally issues that were shared among the grounds.400 sets of questionnaires has been distributed to four institutions, HWUM, UCTS, UTM and UM. Where each institutions contributed 100 sets of feedback.

By referring to the Figure 1 student's feedback on accessibility in their institution. Accessibility can be defined in this research as a how the student can reach from one point to one point. The linkage between one building block to another building and also can be describe more further as how ease student can access to surrounding of their campus. HWUM, 80 numbers of students agree with their campus arrangement. UCTS's students having the same number of feedback like HWUM. UTM, only 65 numbers of students agree and UM having 55 numbers of students agree. For UTM and UM student's, most of them agreed that the capacity and also the campus area are too large to access with limited medium to be use to access from one zone to another zone unless they are using car, motorcycle or bicycle to make them easier to move. Compared to HWUM and UCTS, they are actually still under one roof and ease to them to move from one block to another.

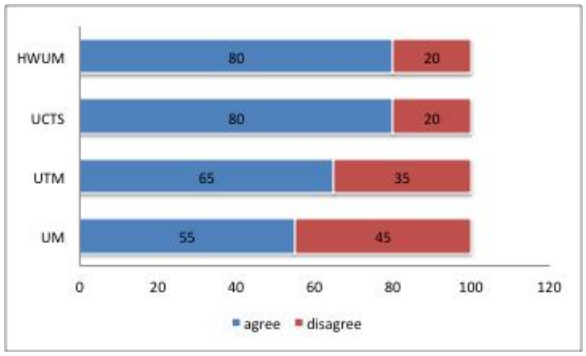

Fig. 1. Student's Feedback on Accessibility in Institution

Furthermore, by referring to the Figure 2 student's feedback on public transport in the institution. HWUM students 45 agrees and 55 are not. These its due to, in their location its not easy to get public transportation as like if they are in a city. The public transportation too limited and they have to catch with the timing interval set by the transportation's company and sometimes not goes as per schedule. Most of them choose to have their own transportation. UCTS students said 20 agrees and 80 are not. In their campus the public transportation its hardly to get and most of them were agreed that having own transportation it's a must. Otherwise, if the student stay in university hostel, the university busses are provided to them to use. From conducted research, result showed that all institutions providing bus services in order to ease movement of students, average of the respondent state that bus services is comfortable but still the most preferable medium its having their own transportation.

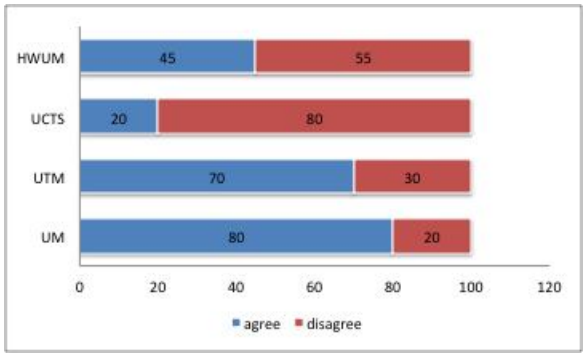

Fig. 2. Student's Feedback on Public Transport in the Institution

Figure 3 about student's feedback on safety aspect in the institution itself not including their residential or hostel. HWUM students 75 agree and 25 disagree. UCTS 65 agree and 35 disagree, UTM 55 agree and 45 disagree, and UM 55 agree and 45 disagree. In view of the input gotten from the respondents, there are a few areas that claim to be not protected in the exploration grounds. Streets, walkways and stopping are among the regions which considered high hazard regions. It is firmly identified with lighting element when rate of positive reacts in these regions is low contrasted with different territories. The rate of respondents expressed that the lighting territory at that region is great are low.

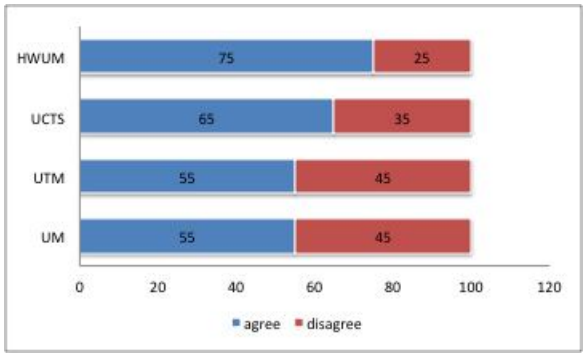

Fig. 3. Student's Feedback on Safety Aspect in the Institution

Figure 4 regarding student's feedback on visibility in the institution. HWUM students 75 agree and 25 disagree. UCTS 80 agree and 20 disagree, UTM 65 agree and 35 disagree, and UM 55 agree and 45 disagree. Visibility in these research covered on the safety and lighting factors surrounding of the institutions which may affect the student;s movement in their campus itself. Scholastic people group ought to be furnished with an advantageous and secure get to that interfaces all institutions to all students. Wellbeing and lighting are two imperative components which rely on upon each other. To guarantee the grounds is protected, lighting angles likewise assume a major part rather than safe use of outline strategy and plan. The higher the level of lighting on grounds, the higher the potential to make a protected domain, particularly around evening time. Rather than facilitate the vision, great lighting is one of the casual checking systems that can be utilized to avoid wrongdoing.

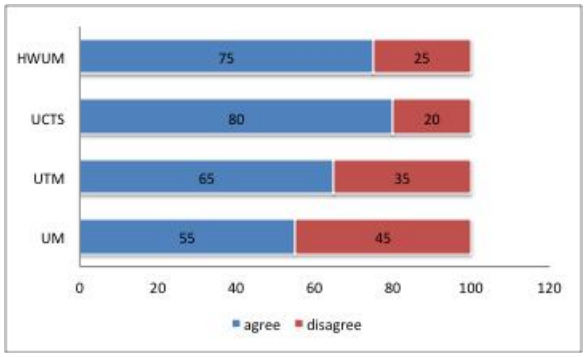

Fig. 4. Student's Feedback on Visibility in the Institution

Explore found that grounds arranging that place one building separated from another can raise a security issues (Fig. 4). Security issues emerge when area of the building is independent and far separated from other building bringing on expanding out yonder of grounds group. For vehicle utilization, the more extended the separation, the more drawn out the time they will be out and about. At the same time, they are presented to different dangers. In expansion, people on foot likewise get an indistinguishable hazard from the remove increment and they additionally need to go through high hazard territories. In view of the criticism gotten from the respondents, there are a few areas that claim to be not sheltered in the examination grounds. Streets, walkways and stopping are among the ranges, which considered high hazard ranges. It is firmly identified with lighting element when rate of positive reacts in these zones is low contrasted with different zones. The rate of respondents expressed that the lighting zone at that region is great are low.

CONCLUSIONS

Comes about demonstrated that there are a few shortcomings in physical advancement arrangements of contemplated grounds. Improvement arranges utilizing a wide range and put the area of the structures are far separated have a major effect on the grounds openness and circulatory framework. Advancement of extensive zone is troublesome for colleges to give offices, for example, secured walkways, bikeways, ideal lighting and finishing in a controlled setting all through the grounds. What's more, the grounds plans must guarantee solidarity in the building outline and arranging to build up the character of the orders advertised. To guarantee the comfort of understudies, the grounds transportation framework ought to be more precise and convenient calendar. Also, lighting is a vital angle in guaranteeing the security of understudies, particularly around evening time. It can be reasoned that the physical improvement of grounds arranging

positively play a major part in impacting the supportability of a grounds.

ACKNOWLEDGMENTS

This research was supported University College of Technology Sarawak (UCTS) Research Grant. We thank our colleagues from the same instituition as per stated in this research paper, who provided insight and expertise that greatly assisted the research, although they may not agree with all of the interpretations/conclusions of this paper.

We would also like to show our gratitude to the Director Centre of Research and Development University College of Technology Sarawak for sharing their pearls of wisdom with us during the course of this research, and we thank 3 “anonymous” reviewers for their so-called insights. We are also immensely grateful to all very supportive collegue for their comments on an earlier version of the manuscript, although any errors are our own and should not tarnish the reputations of these esteemed persons.

REFERENCES

[1] Alfieri, T., D. Damon and Z. dan Smith, 2009. Fromliving building to living campuses. Plann. High.Educ., 38(1): 51-59.

[2] Beringer, A., T. Wright and L. Malone, 2008.Sustainability in higher education in atlanticCanada. Int. J. Sustainab. High. Educ., 9(1): 48-67.

[3] Campos, P., 2008. Sustainable Education Campus inSpain: Nature and Architecture for Training.Organisation for Economic Co-Operation andDevelopment.

[4] Davis, G. and M. Wolski, 2009. E-waste and thesustainable organisation: Griffith university’sapproach to e-waste. Int. J. Sustainab. High. Educ.,10(1): 21-32.

[5] Hordijk, I. Position paper on sustainable universities. *J. Clean. Prod*. 2014, *14*, 810–819.

[6] Isiaka, A. and S. Ho Chin, 2008. Developingsustainable index for university campus. EASTSInternational Symposium on SustainableTransportation Incorporating MalaysianUniversities Transport Research Forum Conference2008 (MUTRFC08). Universiti TeknologiMalaysia. 12-13 August 2008.

[7] Jackson, T. Prosperity without Growth: Economics for a Finite Planet, 2nd ed.; Routledge: New York, NY, USA, 2011.

[8] Neuman, D.J. and S.A. Kliment, 2004. Campus planning. Building Type Basics for College and University Facilities. John Wiley and Sons, Hoboken

[9] Nurwati, B., 2006. The University in a Garden: Participatory Planning Process. Penerbit Universiti Sains Malaysia, Pulau Pinang, ISBN: 9833391702, pp: 63.

[10] Rusinko, C.A., 2010. Integrating sustainability in higher education: A generic matrix. Int. J. Sustainab. High. Educ., 11(3): 250-259.

[11] Ryan, A., D. Tilbury, P.B. Corcoran, O. Abe and K. Nomura, 2010. Sustainability in higher education in the asia-pacific: developments, challenges and prospects. Int. J. Sustainab. High. Educ., 11(2): 106-119.

[12] Seitzinger, S.P.; Svedin, U.; Crumley, C.L.; Steffen, W.; Abdullah, S.A.; Alfsen, C.; Broadgate, W.J.; Biermann, F.; Bondre, N.R.; Dearing, J.A. Planetary stewardship in an urbanizing world: Beyond city limits. *Ambio* 2012, *41*, 787–794.

[13] Tukker, A.; Emmert, S.; Charter, M.; Vezzoli, C.; Sto, E.; Andersen, M.M.; Geerken, T.; Tischner, U.; Lahlou, S. Fostering change to sustainable consumption and production: An evidence based view. *J. Clean. Prod.* 2008, *16*, 1218–1225.

[14] Wright, T. University presidents’ conceptualizations of sustainability in higher education. *Int. J. Sustain. High. Educ.* 2010, *11*, 61–73.

★★★