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Campus Sustainability: Student's Perception on Campus Physical Development Planning in Malaysia

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Abstract

Campus physical development plan is an effective tool to shaping campuses' life, especially among students to promote a sustainable living community. The purpose of this study is to asses and evaluates student's perception about the physical development planning of their campuses. The case study conducted in four public research university campuses. The quantitative and qualitative methods have been use in this study. Quantitative method involved data collection by using questionnaire distributed to 100 students for each campus. While the qualitative methods involved behavioural observation and visual study. The findings from qualitative methods clarified the quantitative data. The overall findings revealed that all campuses had a similar typical problem. However, there are differences about the extent or severity of the problems in each campus. The result shows that the most compact campus (USM) among these campuses, have a minimal problems in term of physical development planning that affect student's life compared to others campuses.

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1. Introduction

Sustainable development means development that meets current needs without compromising the needs of future generations [1] by focusing on a balance of environmental, social and economic [2]. In the other hand, the number of students who further their studies at universities is increasing every year. Thus,

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universities must have a long term development plans for their campuses [3] or better known as sustainable development nowadays.

The importance of sustainable development can be seen on many campuses when many universities have established the ‘green campus’[4], promoted its implementation [5] and making sustainability a priority in the campus planning and development [6]. This is because there are many benefits that can be achieved through the development of a sustainable campus [6] when there is a balance in the three aspects of economic, social and environment [7]. However, there are still many who view sustainable development from the aspect of environmental alone [7,4].

From the view of physical development planning, a wide and disperse planning contrast to the concept of sustainability as it increases the distance between areas; increasing reliance on vehicles; increasing air pollution; create accessibility problems, constrict infrastructure and facilities management, reduce energy efficiency, create poor social life and many more [8]. In term of campus planning, [9] stated that there are three (3) aspects that should be emphasized; accessibility, safety and social engagement. Research on compact planning practices found that the approach providing a suitable environment to support all the three aspects. In addition, this planning approach also provide various advantages in other aspect such as circulation, transportation, provision of facilities and other related aspects. Analysis by [10] found that there are seven advantages when implementing the compact development, such as:

- a) Minimized land used
- b) Reduce vehicle reliance
- c) Reduce resource consumption and pollution
- d) Encourage the usage of public transport, walking and cycling
- e) Increasing accessibility to facilities and services areas
- f) More efficient provision of infrastructure and utilities
- g) Redevelop used area.

[10] analysis showed that compact development planning affect all three aspects in sustainability; social, economy and environment. Besides [10], there are some researchers recognized the benefit of compact development planning such as [11], [12] and [13].

The study was conducted to examine the effectiveness of the approach of campuses’ physical development in Malaysia on campus sustainability. Assessment was undertaken on the perception of students about the environment and life on their campuses. The result of this assessment was then compared between the campuses. This paper will discuss a part of the research including campus layout structure, accessibility, safety and lighting.

2. Research Methodology

Case study was conducted on each campus by using quantitative and qualitative methods to collect all the data needed. The methods used in this research are questionnaire survey, behavioral observation and visual study. The selection of campuses is based on the status as research universities. First four research universities in Malaysia has been selected; Universiti Kebangsaan Malaysia (UKM), Universiti Sains Malaysia (USM), Universiti Malaya (UM) and Universiti Putra Malaysia (UPM). The study was limited to the campus physical development planning.

The instrument of quantitative method used in the study is questionnaire. The purpose of questionnaire is to obtained students’ feedback about their campuses. Subjects for this method were students who live on campus. [14] stated that students are encouraged to criticize the activities of the campus because they are ‘client’ and allowed to demand reform on issues of environment and sustainability. In

addition, [15] agreed that students' perceptions provide an important perspective for an 'educational settings'. Feedback from target groups is essential to ensure that their needs are taken into account in the planning stage [16]. In the context of the planning process, these elements are known as community participation [16].

The number of respondents was determined based on the [17]. At 95% confidence level and 5% sampling error, [17] stated the required sample size was 400 sets. He also stipulates that the sub-group in the study, the minimum amount required in each group were set between 50-100 subjects. Thus, a total of 400 students were selected for this study. The amount is divided equally for each campus. This means the number of students who are selected for each campus is 100, which coincides with the determination expressed by him about the minimum sample size in each sub-group.

The data obtained from the questionnaires were statistically analyzed to show the results for each campus. The results for each campus were then compared with each other. For further clarification on the results, qualitative methods were used.

Qualitative methods used in this study involved three (3) techniques; questionnaires, behavioral observation and visual study. Through questionnaires, the students can give their comments or opinions. This approach is aim to gather information about students' feelings and emotions from their campuses.

Behavioral observation is one of the techniques of field studies are often used in social science research [18]. Behavioral observations were conducted to record the behavior and reactions of students to the campus environment. Researchers observe and record the observations using notes and photographs. Researchers not involved in the activities performed by students. This technique is a complement to studies in which the results of the observations can be compared with findings from other techniques [19].

The study was conducted to evaluate the visual character of an area [15]. These techniques allow researchers to study the shape, composition and appearance of the city as well as evaluating the assets and liabilities of a city [15]. Through visual study techniques, researchers can record the physical and social character of the campus is important or prominent in the campus environment and to comment on the weaknesses and problems in planning the physical development of campus [15].

The qualitative methods gathered information about the physical condition of the campuses studied, and feelings of students on their campuses. This information is very important to complement the findings of qualitative methods. Information obtained from the qualitative methods was used to explain the findings derived from quantitative methods.

3. Result and Discussion

The comparison revealed that there are differences in term of physical development planning of the campuses. Each approaches undertaken in planning the campuses physical development has in own advantages and disadvantages. In addition, there are some same problems occur in all the campuses.

3.1. Campus layout structure

All four campuses were planned by using different approaches. Campus layout structure affects the pattern of life on campus, especially in terms accessibility and circulation. In addition, there is a lack of physical development of the campus emphasizes a functional relationship between the areas or buildings in the campus. The following diagrams show the distribution of areas in the physical development planning of the campuses.

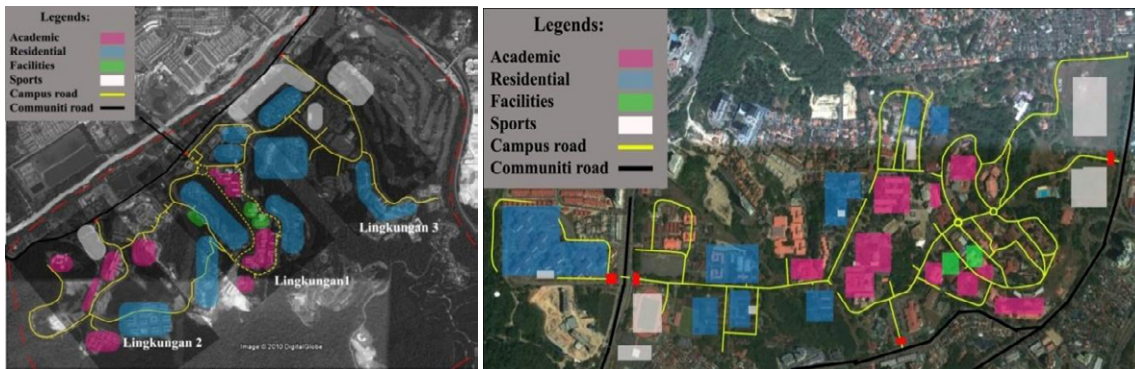


Figure 1 Campus layout structure of UKM (left) and USM (right).

(Source: Google Earth. Edited by author)

UKM’s campus layout structure divided into 3 area; Loop 1, Loop 2 and Loop 3. Loop 1 was planned using the concept of 'centralized core' that locates the residential areas surrounding the social and residential areas. The development of Loop 2 and Loop 3 look like simple accretion, by placing new buildings without a proper evaluating the functional relationship between new and old buildings.

USM’s campus was planned more compact compared to other campuses. This may be due to the limited area of the campus as it surrounded by the developed areas. Facilities areas located in the center and it’s surrounded by academic areas while residential areas stationed at the edge of campus. The position of buildings, especially in academics and facilities areas are close to each others.

UM’s campus layout was scattered where there are some academics areas located far away from the main area. However, overall layout looks like ‘centralized core’ structure that placed the residential areas surrounding the social and academic areas. But, the structure is quite broad and not clearly defined when the center of the area is not developed. Hilly terrain may be a barrier to develop the area.

UPM’s campus planning divided its area into two main area; academic area and residential area. Academic buildings are grouped in same area, while residential area also grouped in the same manner. In addition, the administration and student facilities located along the academic area. In residential area, there are residential building, field, sport court and fitness center.

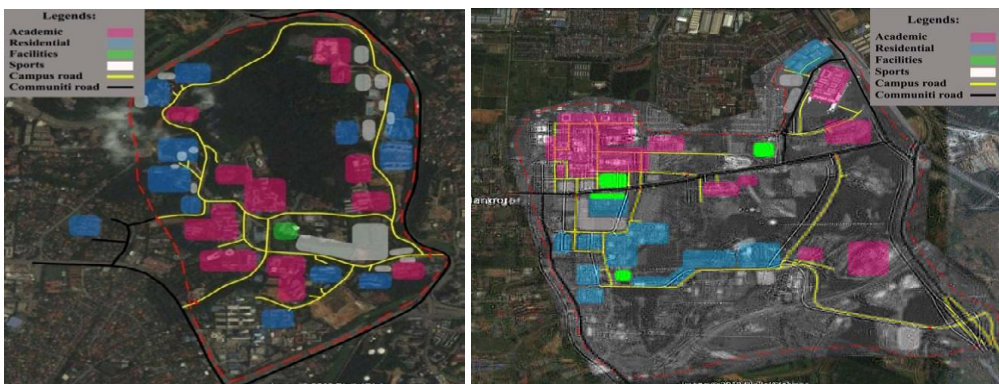


Figure 2 Campus layout structure of UM (left) and UPM (right).
(Source: Google Earth. Edited by author)

3.2. Accessibility

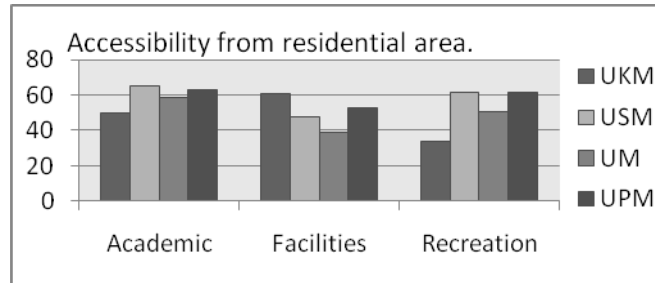


Figure 3 Students' feedback on accessibility from residential area.

Accessibility defined as the ability to obtain goods, services and activities [20]. The feedbacks gathered from the questionnaire showed that accessibility from residential areas to academics areas are highest in USM followed by UPM, UM and UKM. This may be cause by the layout structure of USM that more compact than other campuses. It reduced the distance between those areas. For UKM campus, the random placement of students in residential areas and widely campus development by simple accretion increase the distance between residential and academic areas and reduce the level of accessibility.

Accessibility level from residential to facilities area are highest in UKM campus and lowest in UM campus. This result may be due by UKM facilities area that located in the center of the campus. In addition, the continuity of covered walkway and the location of most residential buildings surrounding the complex also affect the result. For UM campus, the location of all facilities also located at the center of the campus. However, the distance of the building is far away from residential areas and there are no covered walkway connecting the building to residential areas.

USM and UPM campus recorded the highest result in term of accessibility from residential to recreational area, followed by UM and UKM. USM and UPM campus provides recreational areas that are not confined to one area only. Although the location of main recreation area is far away from some residential area, the campuses provide sport court in most of the residential colleges. It is easier for students to exercise. For UKM campus, which has a lowest accessibility level, the location of recreational and sport areas are far from most residential areas as it is located on the edge of the campus. Meanwhile, most of the residential colleges are not providing facilities for recreational activities in residential areas.

3.3. Safety and Lighting

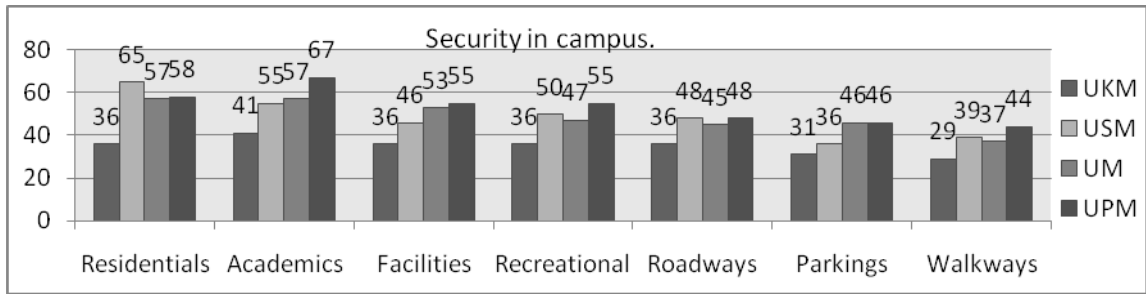


Figure 4 Students' feedbacks on security level in their campuses.

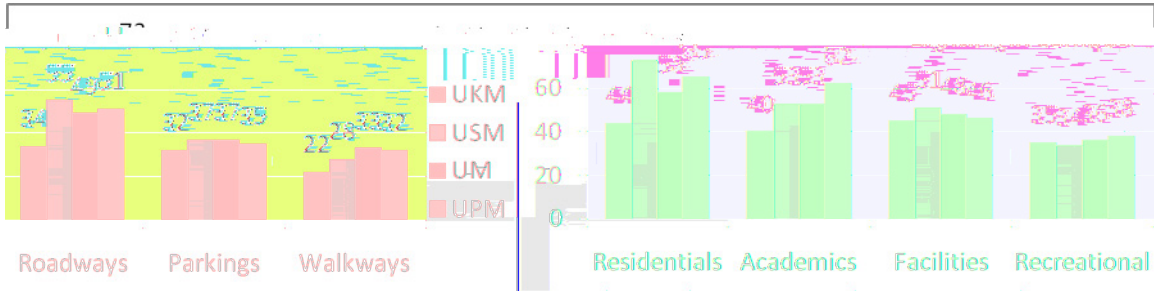


Figure 5 Students' feedback on lighting level in their campuses.

Academic community should be equipped with a convenient and secure access that connects all facilities to all users [15]. In campus physical planning, pedestrians safety should come first [21,16]. Based on feedbacks received from students, there are several locations that are unsecured in the campuses. Roads, walkways and parking areas are among the locations which are considered as the most risky areas. It is closely related to the illumination factor when the feedback also shown that the illumination level in these area are the lowest compare to other locations. Here are some of the complaints received from students:

“There are few places outside the residential college that is too dark. Some roads on the hill also are dark kind of haunted house”. - The 17th respondents from UM campus.

“Ensure the security and better lighting in Pusanika and walkways at night”. - The 37th respondent from UKM campus.

“Add the lights in campus. Dark and quite campus areas make student feel unsafe at night, especially when we go back from night classes”. - The 25th respondent from USM campus.

The survey also found that the circulation design is not user friendly. Dark walkway, no segregation of pedestrian walkways and roads, long distance travel, and risky area along the walkway cause feeling of insecurity to the students. Moreover, poor roads condition increases the risk of accidents and damage of the vehicles.

Complaints and comments received indicate the importance of safety and lighting on campus. The planning and design of the campuses are not well-emphasized on both aspects. The main factor that created this problem is the unsuitable layout and placement of the buildings. As a result, the provision of secure spaces and routes and optimum illumination are difficult to implement.

4. Conclusion

Result showed that the physical development planning of the campuses are weak and not well-planned. Wide and dispersed planning approach creates a bad impact on students' life. It will reduce the level of accessibility, safety and lighting. In addition, it constricts the provision of the facilities throughout the campus. Referring to the findings obtained, the USM campus which is the most compact campus compared to others show minimum problems. This proves that the compact planned campus is more practical to provide and support the sustainability in campus. This statement fulfill the view of others researchers such as Burton (2000), Burns (2001) and Santana et al. (2009).

References

- [1] Brundtland Report 1987. *Our Common Future: The World Commission for the Environment and Development*. Madrid: Alianza Publication.
- [2] Sohif Mat, Kamaruzzaman Sopian, Mazlin Mokhtar, Baharuddin Ali, Halimatun Saadiah Hashim, Abdul Khalim Abdul Rashid, Muhammad Fauzi Mohd Zain dan Nurakmal Goh Abdullah, 2009. *Managing Sustainable Campus in Malaysia – Organisational Approach and Measures*. European Journal of Social Science. Volume 8, Number 2, pp 201-214.
- [3] D'amico L. A. & Brooks, W. D. 1968. *The Spatial Campus. A Planning Scheme and Annotated Bibliography*.

- [4] Isiaka, A. & Ho Chin Siong. 2008. *Developing Sustainable Index For University Campus*. EASTS International Symposium on Sustainable Transportation incorporating Malaysian Universities Transport Research Forum Conference 2008 (MUTRFC08). Universiti Teknologi Malaysia. 12-13 August 2008.
- [5] Ryan, A., Tilbury, D., Corcoran, P. B., Abe, O., & Nomura, K. 2010. *Sustainability In Higher Education In The Asia-Pacific: Developments, Challenges, And Prospects*. International Journal of Sustainability in Higher Education. Vol. 11, No. 2, pp. 106-119.
- [6] Alfieri, T., Damon, D., dan Smith, Z. 2009. *From Living Building to Living Campuses*. Planning for Higher Education. Vol 38, No 1, pp 51-59.
- [7] Norton, R. K., Brix, A., Brydon, T., Davidian, E., Dinse, K., dan Vidyarthi, S. 2007. Transforming The University Campus Into Sustainable Community. *Planning for Higher Education*. Vol 35, No 4, pp 22-39.
- [8] Salas-Olmedo, H. 2008. Spatial And Transport Planning Integrated Policies: Guidelines For Northwest Spain. Transport Studies Unit, Oxford University Centre for the Environment.
- [9] Neuman, D. J. 2004. Campus planning. *Building Type Basics For College And University Facilities*. John Wiley & Sons. Canada.
- [10] Burton, E. 2000. The Compact City: Just or Just Compact? A Preliminary Analysis. *Urban Studies*. Vol. 37, No. 11. pp. 1969-2006
- [11] Burns, R. 2001. Designing the university campus: It matters. National Forum. Summer 2001.
- [12] Steffen, A. 2008. Cities: A Smart Alternatif to Cars. *Business Week*. 11 Februari 2008.
- [13] Santana, P., Santos, R., Costa, C., Roque, N. & Loureiro, A. 2009. Crime and Urban Environment: Impact on Human Health. City Futures in a Globalising World. An international conference on globalism and urban change. 4 to 6 June 2009, Madrid.
- [14] Dahle, M. & Neumayer, E. 2001. Overcoming Barriers to Campus Greening: A Survey among Higher Educational Institutions in London, UK. International Journal of Sustainability in Higher Education. Vol 2 No 2. pp. 139-160.
- [15] Shuhana Shamsuddin, Ahmad Bashri Sulaiman, Hasanuddin Lamit, Rozeyta Omar, Norsiah Abd. Aziz, Masliyana Md. Noor. 2007. *Kriteria Reka Bentuk Persekitaran Kampus Yang Kondusif Bagi Institusi Pengajian Tinggi Di Malaysia*. University Teknologi Malaysia.
- [16] Nurwati Badarulzaman, Lim Yoke Mui, Yeong Siew Yan, Lee Lik Meng & Aldrin Abdullah. 2006. *The University In A Garden. Participatory Planning Process. Healthy Campus Series (No. 16)*. Universiti Sains Malaysia. Penerbit USM. Pulau Pinang.
- [17] De Vaus, D. 2002. Sample size. *Surveys in Social Research*. 5th edition. Routledge. London.
- [18] Chua Yan Piaw. 2006. *Kaedah Penyelidikan*. McGraw-Hill (Malaysia) Sdn. Bhd. Malaysia.
- [19] Sapsford, R. & Jupp, V. 2006. Data Collection and Analysis. Second Edition. SAGE Publications Ltd.
- [20] Litman, T. 2008. Measuring Transportation: Traffic, Mobility and Accessibility. *Victoria Transport Policy Institute*. Victoria. 4 November 2008; at <http://www.vtpi.org/measure.pdf>.
- [21] Strange, C. C. & Banning J. H. 2000. Educating by Design. Creating Campus Learning Environments That Work. Jossey-bass.