Student's Perception on Walkability Performance of Campus Facilities: a Case study of UiTM Perak, Seri Iskandar Campus

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This study is trying to investigate the perceptions of student in term of walkability performances of campus facilities in UiTM Perak, Seri Iskandar Campus. For the past few years, UiTM Perak has been promoting "Experiential Learning in A Green Environment". One of the main component to achieve green environment is walkability. Walking has been a part of an everyday routine for students in Malaysian universities. Almost every university in Malaysia is built in a complex compound. Therefore, walking is a must for moving from one point to another. Walking as mode of transportation will promote good health and a sustainable environment. The pedestrian and walkway seem to be lacking and not well maintained. This has been an issue for the students who live in the campus, when they need to walk from their residential block to their academic block as they tend to walk on the street rather than on the pedestrian. This study incorporates two methodologies, based on quantitative and qualitative method to justify this situation. Data collected via questionnaires from 200 students of UiTM Perak, Seri Iskandar Campus who reside on campus. For qualitative method, a visual study was conducted to study in terms of visual perception. This study is expected to give a clear perspective to the university regarding the problems and what needs to be done for the future development of the built environment.

Keywords: User Friendly Pedestrian, Walkability, University Planning, Green Environment

1. Introduction

The issue of sustainability has been addressed in most universities around the world. The importance of sustainable development can be seen on many campuses where many universities have established the ‘green campus’ (Isiaka et al. 2008). Nowadays, most universities find it is crucial to provide a conducive learning and living environment for the students. "Implementing and integrating Green agenda into campus planning and design can provide several advantages such as minimized land used, reduced vehicle reliance, reduced resource consumption and pollution, encourage the use of public transport, walking and cycling, increase accessibility to facilities and service areas, more efficient provision of infrastructure and utilities, and re-develop used area" (Burton, 2000). From this notion, campus walkability is one of the main components in achieving the status ‘green campus’ where walking become ‘green transportation’ in a green campus (Makki et al., 2012).

1.1 Study Background

The study was conducted among students at Universiti Teknologi MARA Perak, Seri Iskandar Campus. It is located within Bandar Baru Seri Iskandar, approximately 37 km from Ipoh. The size of the campus consisted is 392.36 acres with approximately eight (8) thousands of students and one (1) thousand staffs. The campus is divided into 4 zones, which are administrative, academic, college and recreational facilities (Figure 1). All these zones are connected by pedestrian walkways and vehicular roads.

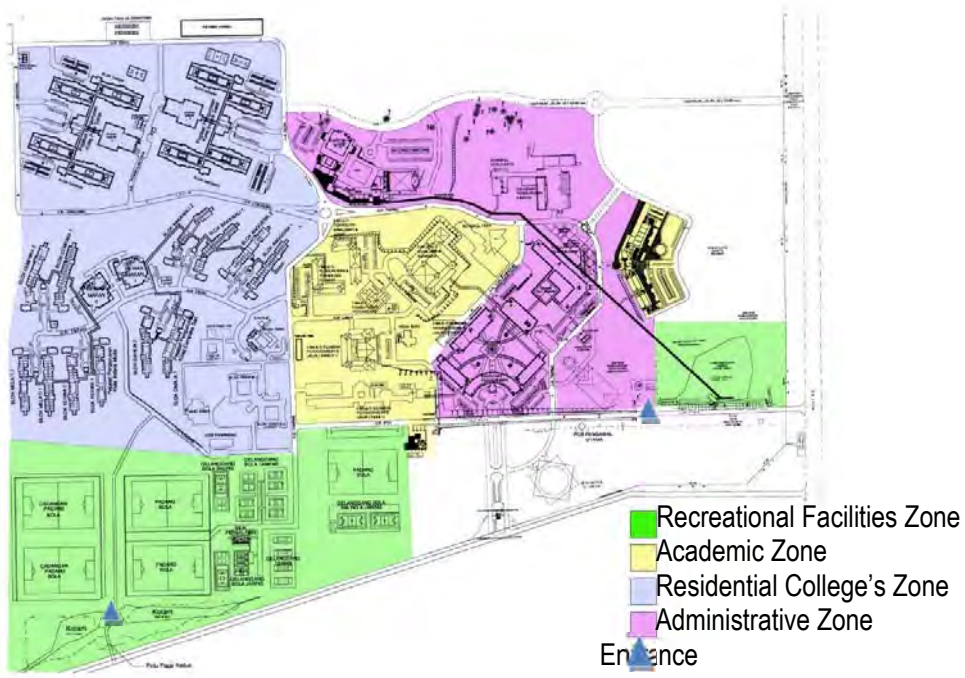

Figure 1: The Layout of UiTM Perak, Seri Iskandar Campus

The college zone comprises of 18 apartment housing catering approximately 7000 - 8000 students at a time. Meanwhile, the academic zone consists eight (8) blocks. These academic blocks occupied by two faculties, namely *Fakulti Senibina, Perancangan dan Ukur* (FSPU) and *Fakulti Seni Lukis dan Seni Reka* (FSSR). The development of this campus was done by in several phases. This campus can be considered as a well-planned development, whereby zones demarcation can be clearly seen in Figure 1. The academics zone is considered as the main area, located in the centre surrounded by three other zones.

3. Literature Review

3.1 Campus Sustainable Planning

The sustainable campus can be considered as a development that response with the present needs to enhance the quality of life and environmental, social and economic aspects are well-taken as future generation needs[OBJ]. Mushtaha. In the aspect of accessibility on campus, ease of movement of users is measured from one place to another in the campus including offices and administrations, academic blocks, college and recreational areas. In the aspect of accessibility on campus, ease of movement of users is measured from one place to another in the campus including offices and administrations, academic blocks, college and recreational areas.

3.2 Campus Walkability

Campus walkability plays significant roles in campus mobility planning. This is to accommodate the students need to move around within campus connecting colleges, lecture halls, recreational facilities, library, food court and cafes, and other facilities[OBJ]. Walking instead of using motor vehicles help to reduce carbon footprint which leads living environment a better place to live. Walking is a green travel mode that

is helpful to the earth and the economy and can advance the strength of users.

3.2 Walkability Environmental Factors

An environment such as availability of streets plays important factors in influencing walking activities Lautso and Murole considered factors on walking under the influence of environmental. This model measures seven contracts namely system coherence, safety, comfort, convenience, continuity, security, and attractiveness. Furthermore, Faris. These qualities are related to walkways character depending on how a campus setting provides well-connected places. This includes the existence of multiple choices to various destinations, comfort, safe and the legibility of the walkways. Most walkways design elements have significant relationships with the ease of movement on the case study campus. All components of the first category, namely the connectivity of walkways including continuity, multiple choices, directness, and nodes design emerged as significant factors. In terms of the comfort when using walkways, design qualities included walkway width, the potential of walking away from the street, paving quality, separating pavement from the street by plants and the protection from weather effects were resulted as significant factors. Moreover, the safety of walkways represented by the conflict with vehicles also emerged as significant in this issue. . These qualities are related to walkways character depending on how a campus setting provides well-connected places. This includes the existence of multiple choices to various destinations, comfort, safe and the legibility of the walkways. Most walkways design elements have significant relationships with the ease of movement on the case study campus. All components of the first category, namely the connectivity of walkways including continuity, multiple choices, directness, and nodes design emerged as significant factors. In terms of the comfort when using walkways, design qualities included walkway width, the potential of walking away from the street, paving quality, separating pavement from the street by plants and the protection from weather effects were resulted as significant factors. Moreover, the safety of walkways represented by the conflict with vehicles also emerged as significant in this issue.

4. Research Methodology

In order to understand and determine the student's perception on the walkability performances of walking facilities, data was collected with an application of two methods:
i. Survey questionnaires
ii. Visual study via student’s observation and interview

4.1 Survey Questionnaires

Survey questionnaires were developed to obtain the level of perception among students in term of the condition and performance of walking experiences in the campus. 200 questionnaires were distributed to the students who live in the residential college and also non-resident (NR) students. Both groups of students are the main users of walking facilities on campus as students who reside on campus will use the walking facilities to the academic block while NR students will have to walk from the designated student's parking facilities to the academic block. In Addition, students are considered ‘clients’ and are encouraged to criticize the activities of the campus and allowed to demand reform on environmental issues and sustainability (Dahle & Newmayer 2001; Nicolaides 2006). Then, the questionnaires were tabulated by using SPSS software in order to analyse the data collections.

4.2 Visual Study and Interview

The data obtained from the visual study method would give a better understanding of the issue. The information was gathered by using photography technique. Images and photograph of the campus area during peak hour where a large number of students will walk from one place to another were captured and analysed. The observations were conducted on site in order to see the real issue concern in term of five walkability indicators, which are sidewalk width, Sidewalk Maintenance, Streetscape, Shading Devices, and Vehicle-emitted pollution (Keat, 2016). According to Ten Minutes Wide, Human Walking Capacities and the Experiential Quality of Campus Design by David Spooner, 10 minutes is an ideal amount of time to travel by walking. Thus, 10 students were asked to walk and observe any obstacles and restrictions during walking around the campus. They were expected to use the designated pedestrian on the campus. They also were asked to record the time travelled and also to capture images if they stumbled upon any obstacle that can influence their walking experience. Also, they were asked to photograph any features that caught their attention and eyes. After the walking task ended, the students were interviewed regarding their satisfaction with their walking experience. The interview was conducted based on three main categories, which are functional, aesthetical and experiential (Spooner, 2011).

5. Result and Findings

5.1 Survey Questionnaire

The questionnaires were distributed among student of UiTM Perak, Seri Iskandar Campus. The questionnaire comprised of 4 sections, which are Personal Details, Walking Background, Walking Facilities and Suggestion and Recommendation. Likert Scale was used where 5 is 'strongly agree' to 1 which is 'strongly disagree'. The results of the survey questionnaire were tabulated in Table 1.

200 survey questionnaires were provided and distributed to the respondents. 34.5% of respondents are male while 65.5% are female. 55% of the respondents are On-Campus residents and 45% are campus Non-Resident (NR). Based on the campus programme, 58% of the respondents are currently studying in a Studio-based programme while another 42% are Non Studio-based program. In term of their year of study, the highest participation came from the third-year students, with the percentage of 34.5% whereas the lowest participation is from the fourth-year students, on 12% percentage.

Table 1: Result of survey questionnaire among students of UiTM Perak, Seri Iskandar Campus on campus walkability

Scope of Study	Strongly Agree				Strongly Disagree
Section A: Walking Background	**5**	**4**	**3**	**2**	**1**
i. Safety	23 (11.5%)	92(46.0%)	62(31.0%)	23 (11.5%)	92 (46.0%)
ii. Comfortable	16 (8.0%)	56 (28.0%)	89 (44.5%)	30 (15.0%)	9 (4.5%)
iii. Easy Walking	12 (6.0%)	62 (31.0%)	80 (40.0%)	35 (17.5%)	11(5.5%)
iv. Sufficient	11 (5.5%)	30 (15.0%)	73 (36.5%)	67(33.5%)	19 (9.5%)
v. Best Mode	15 (7.5%)	31 (15.5%)	73 (36.5%)	55 (27.5%)	21 (10.5%)
Section B: Walking Facilities	**5**	**4**	**3**	**2**	**1**
i. Well Maintained	8 (4.0%)	48 (24.0%)	88 (44.0%)	48 (24.0%)	7 (3.5%)
ii. Well Connected	7 (3.5%)	45 (22.5%)	80 (40.0%)	55 (27.5%)	12 (6.0%)
iii. Safe and Secure	13 (6.5%)	68 (34.0%)	81 (40.5%)	30 (15.0%)	6 (3.0%)
iv. Well Segregated	17 (8.5%)	59 (29.5%)	58 (29.0%)	47 (23.5%)	18 (9.0%)
v. Free from Obstacles	13 (6.5%)	46 (23.0%)	70 (35.0%)	52 (26.0%)	17 (8.5%)
Section C: Suggestion and Recommendation	**5**	**4**	**3**	**2**	**1**
i. Need more Pedestrian Walkways	99 (49.5%)	56 (28.0%)	37 (18.5%)	6 (3.0%)	1 (0.5%)
ii. Need more Zebra Crossing	51 (25.5%)	50 (25.0%)	60 (30.0%)	33 (16.5%)	6 (3.0%)
iii. Need more Shelter	156 (78.0%)	26 (13.0%)	13 (6.5%)	3 (1.5%)	1 (0.5%)
iv. Need more Linkages	141 (70.5%)	40 (20.0%)	16 (8.0%)	1 (0.5%)	1 (0.5%)

Based on Section A (Table 1), it can be concluded that most of the students feel that walking facilities in UiTM Perak, Seri Iskandar Campus, has been provided sufficiently for them. This is because most of the results show that the highest percentages of student's opinion were on the neutral side that includes all 4 indicators under walking background. Excluding the safety indicator, 46% of respondents agree that the pedestrian walkways are safe and another 46% s strongly disagree. This has brought to our assumption that not all students are provided with a safer pedestrian walkway that leads to their faculty compared to the others.

On Section B, the respondents were asked about the condition of the walking facilities. Using indicators, students were asked in regards to these aspects, which are on maintenance, connectivity, safety and security, segregation and obstacle. Out of 5 indicators, 4 of them received neutral as the highest result. The question regarding the pedestrian walkways as being well segregated from the vehicles was perceived as agreeable by the respondent, at about 29.5%. We can conclude that the respondents perceived walking facilities on campus provided are adequate.

On the final section, information regarding their feelings on the suggestion and recommendation that can be done to enhance the walkability performance on campus was gathered. 49.5% of the respondents strongly agree that they need more pedestrian walkways. A staggering percentage of 78.0% students strongly agreed that more provision of sheltered
pedestrian walkways are required on campus. Next, 70.5% students strongly agreed on the motion that more linkages are desired on campus for their daily commute on campus. Last but not least, half of the respondents agreed on the implementation of more zebra crossings throughout the walking facilities on campus.

Hence, after analysing the results from the survey questionnaires, we came to a conclusion that most of the respondents were satisfied with the walking facilities provided on campus. However, there are also a lot of rectifications that can be implied in the future. This is portrayed based on the data in Section C where most students generally agreed on the suggestion and recommendation.

5.2 Visual Study and Interview

10 Students were required to walk from point A to point B (Figure 2). These walking paths were determined by the student themselves. This was to ensure the precise decision made by the students themselves in term of the walking path used on a frequent basis.

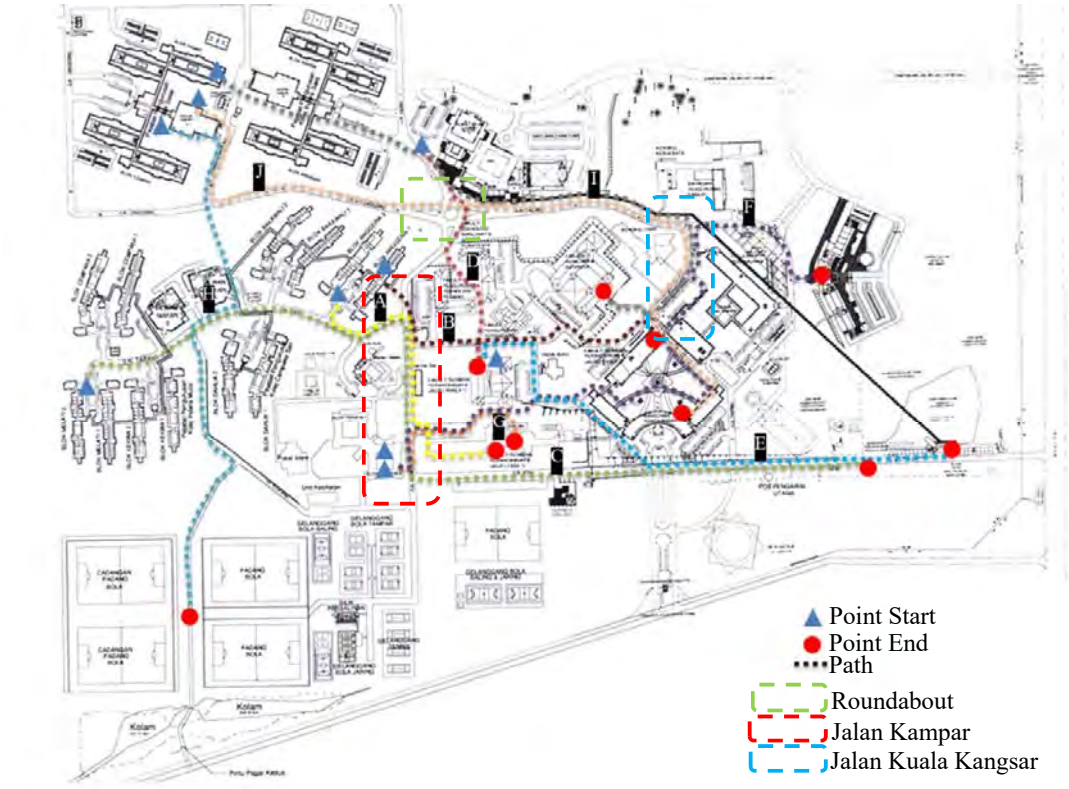

Figure 2: Walking path taken by the students in UiTM Perak, Seri Iskandar Campus

From the Figure 2 analysis, it is clearly seen that most of them used the designated pedestrian walkways. However, there are also a number of non-designated paths used by students to reach their destination. Evidently, students prefer using Jalan Kampar as their walking paths. Besides that, the roundabout and Jalan Kuala Kangsar were also frequently used (Figure 2). In term of time taken for every walking paths (Table 2), 60% students reached the endpoint 10 minutes or less, except for those using path C, E, G and J. According to David Spooner, the 10-minutes idea is very important in term of the human-scaled design standard. Thus, we can conclude that those four walking paths that recorded more than 10 minutes did not achieve the design standard as students would need to prepare and come out early from their respected resident in order to go to class. Students who live in Damar, Cemara, Kekwa and Cempaka Colleges tend to walk more to the academic blocks, especially to the FSPU QS Building (Figure 2, Walking Path G).

Table 2: Walking Path, Point Start and End, Duration

Walking Path	Point Start	Point End	Duration
A	Anggerik College	Main FSPU	6m 42s
B	Anggerik College	Annex 1 FSPU	4m 24s
C	Melati College	UiTM Main Gate	19m 46s
D	Pusat Islam	Annex 2 FSPU	5m 12s
E	Annex 1 FSPU	UiTM Lake	15m 16s
F	Teratai College	Main FSPU	3m 24s
G	Teratai College	FSPU QS Building	11m 51s
H	Cemara College	UiTM Field	8m 30s
I	Damar College	FSSR Workshop	9m 45s
J	Damar College	Administrative Block	15m 18s

Table 3: Result of student's interview based on their walkability experience

Experiential	Aesthetic	Functional
Uncomfortable due to the hot weather	Street Furniture	The pedestrian walkways were less maintained, muddy surface
Unsafe because need to share the path with motorized vehicular	Landscape and hardscape but very limited	The pedestrian walkways width are sufficient but obstacles reduce the performance
Uneasy to cross the road	Food Kiosk and booth	Uneven surface and dirty pedestrian walkways
Unclear with the pedestrian walkway direction	Pedestrian walkway pattern	Less linkage between pedestrian walkways, need to divert walking path depends on the condition
Need to be alert all the time	Gabion wall	Provision of covered pedestrian walkway was too little
Annoyed – clothes get dirty	Public Square	Drainage was not covered – create hazard
Feel Bored – Nothing interesting along the path		Less and hardly seen zebra crossing
Feel comfortable when walking underneath the sidewalk trees		It is time-consuming to use dedicated pedestrian walkways

From the data analysis of walking paths, the students tend to walk on unofficial pedestrian walkways. Students created their own path walking on the grass, the vehicular road and also walking within building corridor as using the designated pedestrian walkways are much more time consuming. It can be seen in path D, students choose to walk on the vehicular road (Figure 3(B) and 4(C)). Time of walking influences the student's decision on their walking path. The pedestrian walkways should be directive and efficient (Spooner, 2011).

Figure 3: (A) Pedestrian walkway filled with sandy soil and dirt at Jalan Lumut, (B) Students walks on the vehicular road at Jalan Lumut, (C) obstacles on the concrete pedestrian walkway at Jalan Tapah

After each of the students ended their walking sessions, they were interviewed focusing on their experiential, the aesthetic elements and the functional aspects of the pedestrian walkways. Generally, the feedbacks from students on experiential section were mostly negative. However, there was one positive point, the students feel comfortable when walking on the pedestrian walkways with the presence of sidewalk trees. The first point highlighted was the sense of hazard because they need to share the path with motorized vehicular. This shown in Figure 4(A) where there was no provision of a proper pedestrian walkway and the students need to cross and continue their walk on the road. This led us to the second point of the interview where the students felt uneasy when it comes to crossing the road. The crosswalks can be considered one of the most dangerous areas because there is where conflict happens with the motorized vehicular (Keat, 2016). One of the students interviewed felt annoyed because the condition of the pedestrian was too muddy (Figure 3 (A)) dirtying up student's clothes. The situation will get worse on rainy days because the pedestrian walkway will pile up with puddle and mud. The hilly area next to the pedestrian walkway contributes to the muddy condition.

Figure 4: (A) Vehicle and people need to share the same road in Jalan Kampar,
(B) Sculptures at FSSR academic block, (C) Covered pedestrian walkway at Jalan Taiping

On the aesthetic value aspect, most of the students agreed that the walking environment lacks hardscapes and landscapes. There are some efforts to place a landscape element on the pedestrian (Figure 3(C)), but the student felt the trees were placed in an inappropriate position. For instance, the trees along Jalan Tapah has created obstacles and reduced the width of the walkway. One of the students pointed out that the pattern of the pedestrian walkways was mediocre, no excitement and too bland. In contrast, there are several sculptures at FSSR academic block in the courtyard of the building. The

students suggested more of those sculptures need to be placed around the campus compound, strategically at the academic blocks area. In order to create an aesthetic experience, pleasurable, beautiful, and leisurely walks must be part of the consideration in designing pedestrian walkways (Spooner, 2011).

On the functional aspects, most of the students expressed their concern on the provision of the pedestrian walkways in the campus. Most of them felt that the number of covered pedestrian walkways are insufficient and need to be added. They did mention that the problem worsens during rainy season. The students who walked on Jalan Lumut stated that it was impractical to use the pedestrian walkway because it was covered with mud and the level of the pedestrian walkway is lower than the vehicular road. Due to the change of level and lack of maintenance, the student decided to walk on the vehicular road. The students that used Jalan Tapah did raise their concern on the functionality of the pedestrian walkway on accessibility aspect. The obstacles and interference on pedestrian walkway (Figure 3(C)) also posed as a problem to students on wheelchairs.

6. Conclusion

This study shows necessary measures needs to be taken in order to overcome the issues related to walkability performance in UiTM Perak, Seri Iskandar Campus. It can be concluded that the provision of the pedestrian walkway on campus is adequate and sufficient but improvements need to be taken vigorously. Since UiTM Perak has been promoting "Experiential Learning in A Green Environment", it is crucial for them to learn from the best practice of other universities in term of campus walkability. Students are expecting a conducive and vibrant atmosphere on the campus. Therefore, revisiting the component of walkability is important in order to achieve them. Architects, designers and campus planners should take the component of walkability thoroughly in order to achieve sustainable and conducive campus environment in the future.

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