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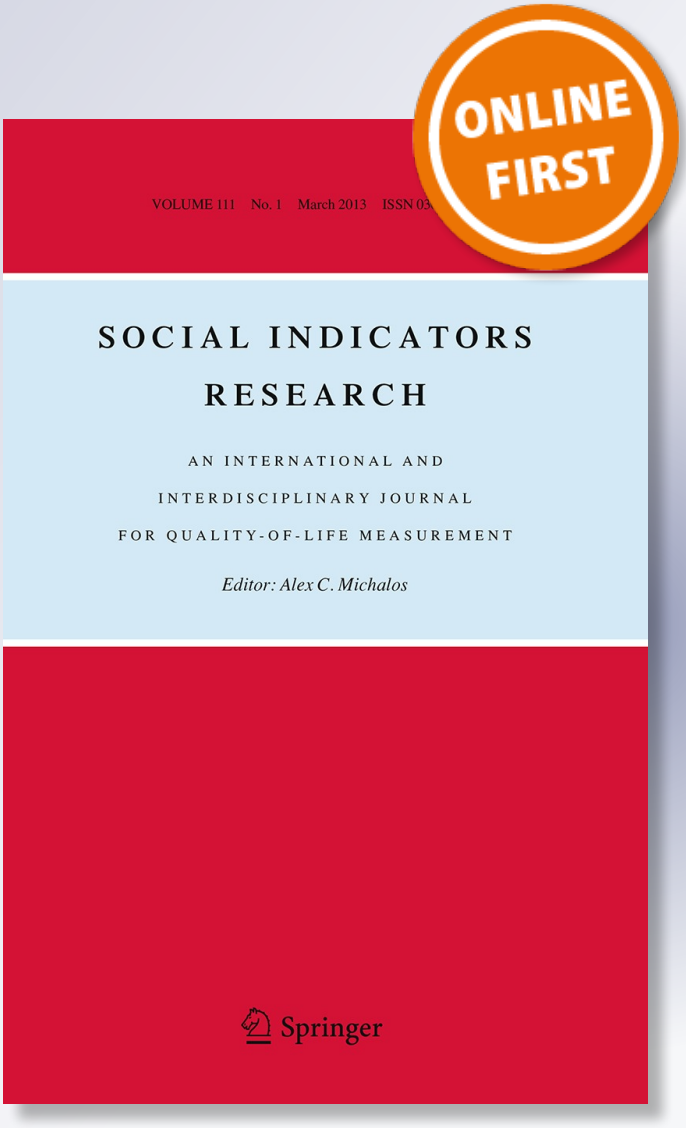

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Academic Buildings and Their Influence on Students' Wellbeing in Higher Education Institutions

Shehu Muhammad · Maimunah Sapri · Ibrahim Sipan

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Abstract The purpose of this study is to explore the perception of students about aspects of academic building that affect their wellbeing. The study adopts focus group discussion using semi structured interview guide to elicit their responses. Six different groups of students participated in the study. Interviews were recorded using digital audio recorder and were later transcribed to text. The qualitative data obtained was analysed through content analysis. Six key themes that emerged from the analysis are: comfort; health and safety; access and quality of facilities; space provision and adequacy; participation and inclusiveness; interaction. These six items are considered as parameters that are important to students' wellbeing in relation to academic buildings. The most emphasised aspects of academic building that are essential to meeting students need include thermal conditions, internet access, furniture, duration of access, availability of refreshment facilities, availability of discussion room and availability of personal workstation. This implies that facilities managers in higher education institutions should give adequate attention to these identified aspects of academic buildings as they can potentially affect students output.

Keywords Academic buildings · Facilities · Focus group · Students · Wellbeing

1 Introduction

HEIs are into knowledge business. Their core activities are related to creation and dissemination of knowledge and learning (Rowley 2000). The functions of HEIs can only be adequately performed when all the necessary resources-human, physical and financial, are made available. The physical resources consist of all physical asset and infrastructure which are necessary for the system to function properly. Sahney et al. (2004) describe physical resources in the form of facilities among the vital inputs required for the success of educational institutions. Facilities have been describes as enabler that supports the teaching and learning process (Sapri et al. 2009). In particular, academic buildings are very

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important to HEIs because that is where the core functions are carried out. Their primary function is to provide an environment (physical, social and psychological) that is conducive for teaching, learning and research activities. Since these activities are people-centred, academic buildings should be focused on meeting the user needs and priorities.

The built environment can have significant influence on wellbeing of users. Because if its impact on user behaviours, building design should take cognisance of the intended behaviour or function (Scott-Webber 2004). Irrespective of its function, the impact of building on its users can be twofold—positive or negative. Where its design and associated facilities 'effectively' support the building function and provide suitable 'working' condition, it positively influences the users. As Roelofsen (2002) stated "improvements in workplace reduce complaints and absenteeism and raise productivity". Hence, Smith et al. (2011) emphasized the need to design workplace such that they positively influence users. On the other hand buildings can have negative influence by constraining user behaviour (Monahan 2000) or through their potential to cause stress and eventually affect human health (Evans and McCoy 1998).

One of the challenges faced by most HEI is to provide services that fulfil customers' needs and expectations (Sapri et al. 2009). From business perspective, students are considered as the most important customers of HEIs. Meeting the needs and expectation of students would lead to their satisfaction with their learning experience. The overall feeling of satisfaction which students experience in college (HEI) is referred to as quality of college life. Services that students interact with more frequently largely influence quality of college life (Yu and Lee 2008). Studies (Yu and Lee 2008; Sirgy et al. 2007) showed that satisfaction with university's facilities services, among others, have a positive influence on quality of college life of students. According to Helgesen and Nesset (2007), facilities are positively related to students' satisfaction. Therefore the more facilities meet the needs and expectation of students, the more satisfied students will be. Academic buildings being one of the facilities frequently used by students would influence their satisfaction with educational experience at HEIs.

Studies (Bluyssen et al. 2011; Felsten 2009; Huang et al. 2004; Roelofsen 2002) have shown that workplace environment influence users. It can therefore be stated that students learning environment is capable of influencing their behaviour, comfort, health and productivity. This is bound to impact on their academic output or achievement as well as satisfaction with academic life. Although this proposition may be held to be true, the specific aspects of buildings through which the influence is exerted need to be known. Hence, studies are needed to establish the relevant aspects of academic building. The identification and prioritisation of such aspects would be useful to the facilities management organisation in HEIs in achieving their role of providing academic buildings that enhance students' learning or study experience. This paper reports the findings of a study designed to obtain the perspective of students on aspects of academic buildings that have influence on their ability to meet their learning needs. The exploratory study was conducted in December 2011 and January 2012 at Universiti Teknologi Malaysia (UTM) through focus group. The participants consist of six groups of students from the institution whose characteristics fall across various diversities. A total of 28 students participated in the study.

2 Literature Review

Focus on people is one of the current priorities of facilities management. Pinder et al. (2009) stated that organisations with people focus tend to develop more effective working

environments that support and encourage creativity, interaction and sharing of knowledge and ideas. They further added that such people focussed environment emphasise supporting working practice and putting the needs of occupants as top priority. Knowledge creation and dissemination are the main activities that take place in academic buildings. These are done through teaching, research, publication and other academic endeavours. Price et al. (2003) stated that facilities could foster an environment that is conducive for faster knowledge creation. They added that facilities are among the factors that can give competitive advantage to HEIs in attracting and retaining students. Considering the primary functions of HEIs, the facilities provided should be aimed at providing a comfortable learning environment, in which to cultivate students (Leung and Fung 2005).

Although the concept of wellbeing is difficult to define due to the different context under which it s used, the term is centred on people and their priorities and perspectives (White 2010). The wellbeing of an individual can be expressed in terms of certain aspects of the physical environment. Lack of environmental quality constitutes a threat to individual's wellbeing (Moser 2009). Human-friendly environments support people so that they achieve their goals, hence their potential to positively impact on their subjective wellbeing (Horelli 2006). Housing is an essential component of quality of life (Winston and Eastaway 2008) because people spend most of their time within buildings (Evans and McCoy 1998). Building may have impact on quality of life of users through their physical condition and the surrounding environment (Ng et al. 2005). Hence, efforts aimed at ensuring that academic buildings meet the purpose for which they are provided should focus the needs and priorities of students.

One of the dimensions of wellbeing concerns how people are satisfied with their access to services, amenities, their views on the physical environment and how they perceive their social setting (White 2010). One of the aspects that are of significance to the wellbeing and overall achievement of students during their study life is quality of college life (QCL). The term refers to the overall feeling of satisfaction students experience in college (Yu and Lee 2008). Studies (Yu and Lee 2008; Sirgy et al. 2007; Ng 2005) found that satisfaction with university's facilities services, among others, have a positive influence on quality of college life of students. Findings also indicate that quality of college life is heavily influenced by services that students interact with more often. Academic buildings being one of the facilities frequently used by students would influence the quality of life of students. This suggests that it is necessary for HEIs to put higher priority on enhancing their academic buildings.

Sirgy et al. (2007) developed a conceptual model for Quality of College life of students (Fig. 1). According to the model, the quality of college life of students is influenced by satisfaction with academic aspects and social aspects of students' college experience, which themselves are influenced by satisfaction with facilities and services provided by an institution. Although the model recognises that satisfaction with facilities have impact on students' quality of life, specific aspects that would lead to satisfaction with various type of facilities such as academic building need to be identified. Improving upon such aspects of academic building would lead to more satisfaction and hence positive influence on quality of college life.

Students mainly conduct their academic activities within buildings. As it is the case with any type of building, the indoor environmental conditions (IEC) are bound to influence the user activities. Many aspects of indoor environment such as thermal factors, lighting aspects, moisture, noise, particulates and so on are stressors whose exposure can cause both short-term and long-term effect. Among the effects associated with such stressors are Sick Building Syndrome (SBS), building related illnesses and productivity loss (Bluyssen et al.

Fig. 1 The conceptual model of QCL

2011). Wood (2003) also states that improvement in indoor air quality (IAQ) is a worthwhile venture for facilities managers, as even little enhancement in IAQ will directly improve productivity. Thermal environment (temperature) and air quality have been emphasized as the most significant factors that influence productivity (Roelofsen 2002). He added that how people experience air quality depends on the thermal environment.

Learning may be regarded as an activity that is mentally tasking. Students devote a lot of time studying and conducting other tasks which require sustained directed attention. This often led to mental fatigue which may reduce the efficacy of their intellectual efforts and result to lower output (Felsten 2009). Their minds need to be restored after reaching such state so that they can resume their task effectively. One of the remedies for restoration after mental exhaustion is the provision of vegetation or other natural environments within and around buildings. These features have some psychological benefits as well as positive feelings (Sheets and Manzer 1991). Students may also have the need for food or drinks after physical or mental exhaustion resulting from academic activities. Jamieson et al. (2005) suggested that places where food or drinks are served should maximise students' convenience and reduce effort and time in reaching to such facilities. They also consider outdoor or garden spaces, which generally serve aesthetic function, as potential of active learning environments. Academic building should have facilities and features that have restorative capacity as an aid to reducing or overcoming mental fatigue.

In line with HEIs mandate, a section of students may be actively engaged in research as part of knowledge creation activities. Such students may be considered similar to researchers or knowledge workers. Creativity may be regarded as particularly relevant as their task is aimed at contributing to knowledge and to which novelty is very essential (Parkin et al. 2011). According to Oseland et al. (2011), interaction is a fundamental part of the process of creativity and innovation. It is not only formal or academic interaction that is useful to learning. Knowledge work is regarded as both cognitive as well as social activity requires social interaction (Heerwagen et al. 2004). Cross and Parker (2004) stated that social interaction serve as mechanism for enhancing knowledge transfer. Thus, there is the need to provide facilities that would cater for such interactions among students within academic buildings. This would enhance their ability collaborate, share knowledge or achieve a collective task.

Modern technological development has enabled the evolution newer teaching and learning methodologies. One of such is the use of computer and information technologies (CIT). According to Jamieson et al. (2005), "active learning assumes students will have convenient access to major resources and support facilities, especially CITs". Provision of computers to university students has become a normal part of the services rendered for their academic tasks although the number of students who own their personal computer may be substantial, computer facilities provided by institution are often the only one available to some students, particularly those from weak economic background (Newby 2003). In order

to ensure equity of access to information, it is considered a moral responsibility of universities to provide sufficient computing facilities to their students (Atkinson et al. 2005; Solomon 2002). The degree to which HEIs can provide computing facilities for use of all students depends upon its financial capability. It would be expected that the more access students to these facilities the more empowered they are to achieve the study objectives.

The degree of control people have over their environment has influence on their satisfaction. Evans and McCoy (1998) define control as "mastery or the ability to either alter the physical environment or regulate exposure to one's surroundings". They further added that "physical constraints, flexibility, responsiveness, privacy, spatial syntax, defensible space", and other elements are among the design concepts that are essential to control. In the context of a study conducted in office building, Lee and Brand (2005) describe personal control as "the degree to which employees perceive they can change their physical work environment, especially by determining, altering, or modifying work areas as necessary to support or allow their work behaviours". A study by Huang et al. (2004) established that higher levels of perceived control by employees influence their ability to regulate adjustable features of their workplace and hence lead to higher satisfaction. Although the reported study is about office buildings, its implication may as well apply to other building types. Students may have different preferences with regard to certain features of the academic buildings. If they are opportune to have some level of control particularly within their learning space, it may increase their satisfaction.

Most of the activities take place within physical spaces in academic buildings. Different category of students may be involved with particular aspect of learning. While undergraduates are heavily engaged with lectures and tutorials, research students may be more involved with concentrated private study. Also, while some activities are conducted individually others need interaction and collaboration among students. Parkin et al. (2006) observe, group-centred research environment which foster informal interaction and collaboration are viewed as essential to innovation and knowledge production. Oseland et al. (2011) stressed the importance of achieving appropriate balance in the provision of spaces for both interactive and for concentrated study. According to Jamieson et al. (2005) spaces typically provided by universities are not sufficient for learning in both formal and informal settings. Hence, there is the need to provide a much wider range of spaces to cater for the diverse nature of activities.

The literature reviewed so far indicate that buildings have significant influence on it users in various ways. It is also worth noting that that the needs of buildings users largely depend on its function as well as the specific activities that are carried out. There is no doubt that even for buildings of specific use, there are bound to be different preferences. So from the students' perspective, what are the features, qualities or characteristics that academic buildings should posses? This study is premised on the belief that students would be more positively influenced by academic buildings if its design and associated facilities are such that they meet their study needs. The positive influence with the learning environment can lead to more satisfaction with their overall academic experience and hence enhance their wellbeing.

3 Method

3.1 Design

The topic of study is exploratory in nature as it seeks to identify students' needs and priorities in academic building. It can therefore be used to obtain general background

information about the topic of interest. This will help in developing a sound instrument that enables obtaining qualitative data from larger samples and statistical analysis (Krueger and Casey 2009). The method therefore fits very well into the overall design of this study. One of the advantages of the methods is the ability to gather qualitative data faster and at less costs by interviewing multiple respondents in a group rather than individually. The open format of response give opportunity to obtain data in respondents own words. It also allows for reaction to response and build-up on previous respondents views. This helps to identify differences of opinion among respondents (Stewart et al. 2007). Focus group has been successfully used in a similar study (Eby et al. 2012) on quality of life.

One of the pillars of focus group is to obtain in-depth data from participants through discussion. Although in-depth interview can be used to achieve the same objective of this study, focus group has been selected due to some of its advantages over the former. More time and resources would have been expended in obtaining about the same data. This is one of the reasons why it is adopted in this research in order to obtain the perception of relatively large number of students within short a period. The method also provides a natural environment because participants influence each other, as in real life, compared to individual interview (Krueger and Casey 2009). This gives the participants the opportunity to express their views and perceptions more freely. It is therefore expected that focus group will provide a wider perspective about how students as key users of academic building view its various aspects and how they influence their study as can be conceived by independent researchers.

3.2 Data Collection

The study population consists of HEI students, which are spread in several institutions across Malaysia. One of the challenges of organising FG discussion is the difficulty associated with getting participants at the same place and time. One of the strategies in selecting participants is to use appropriate study participants that can be gathered at the same time and venue with relative ease. This partly informed the decision to conduct the study in Universiti Teknologi Malaysia (UTM). The institution is among the biggest public universities in terms of student population. It also has a diverse student population which can fairly represent the study population. Krueger and Casey (2009) recommend 4–5 persons to enable participants more opportunity to share ideas. One disadvantage of having fewer participants is that it limits the range of perception obtained from participants. Considering the fact that limited time is available for the focus group discussion (usually not exceeding 2 h), and the need to give participants reasonable time to contribute, a minimum of four and maximum of six participants per group was used in this study.

The most commonly used method for selecting participants in FG is Convenience sampling (Stewart et al. 2007). This is due to the fact that the purpose of the focus group is to have an insight on the subject of study from respondents and not to make generalisations about a population (Krueger and Casey 2009). The method has been used in this study. However, the composition of the respondents should reflect characteristics of the study population (HEI students). Some of the important differentiating attributes of HEI students include level of study (undergraduate versus postgraduate), mode of study (taught versus research), gender and nationality (local versus foreign). The groups should reflect these diversities in order to explore the wide range of views and perceptions among the participants.

The composition of participants is important in focus group. Homogeneous groups are found to work better and tend to be more productive than groups with heterogeneous

attributes (Krueger and Casey 2009). This is because participants feel more at ease to share views or experience with people perceived to posses' common attributes. Six groups participated in the study. Each group consists of between 4 to six students as recommended by Krueger and Casey (2009), who emphasised that small groups give more opportunity to share ideas. Overall, 28 students participated in the study. The use of academic building by students is primarily for study. A major distinction is between 'research' students who largely study independently and 'taught' student who heavily attend lectures. This may result to different needs by the two groups. Hence, the participants were composed of three groups of 'research' and three group 'taught' students. The three groups of 'taught' students consist of two and one group respectively of undergraduate and postgraduate students. Seventeen male and eleven female students participated in the study. Also there are sixteen "local" and twelve "foreign" students.

The FG discussions were conducted between 22nd December 2011 and 15th January, 2012. An interview guide was prepared to aid the moderator in asking questions that are relevant to the topic of discussion. The guide allows for flexibility in the framing the questions as the discussion progress. Topics covered in the interview guide include:

1. Impact of academic buildings on 'wellbeing'.
2. Influence of academic buildings on learning and productivity.
3. Students' idea about an environment conducive for learning.
4. Facilities to meet students learning needs.
5. Students' priorities with regard to learning and "social" spaces.
6. Role of building features or facilities on students' academic and social interaction.

The discussions were captured using a digital audio voice recorder for ease of reference during the analysis. This was subsequently used to generate a full transcript in text format. Even though this method (full transcript) is slow and time consuming, it has the advantage of being more rigorous and productive (Litoselliti 2003). At the end of each discussion, the participants were asked to list five items which they consider as their top priority items that they consider very essential in academic buildings to make it more conducive for learning. They were also asked to list five items which they feel need to be improved in the academic building they mainly used presently. The purpose of the listing is to supplement views expressed during the discussion. Each FG discussion session lasts an average of 1 h 7 min. The longest session took about 1 h 25 min and the shortest session took about 53 min.

3.3 Data Analysis

The most important aspect of the analysis is to identify the factors influencing students' wellbeing in academic buildings through the important themes as expressed by respondents during the discussions. Content analysis was used in analysing the data. The method involves identifying the key substantive points in the discussion and categorising them (Litoselliti 2003). The categories need to be exhaustive in that all substantive statements fall into a category and as exclusive as possible so that one statement fit one rather than many categories (Gillham 2000). The first step of the analysis involves carefully reading the transcript. This gives idea about the thoughts expressed by the focus group participants.

From the transcript, the main points mentioned by the respondents could be identified to fall into certain main themes or aspects of academic buildings. The analysis involves classifying each relevant statement made by respondents into related themes. Based on a thorough reading of the transcript as well as related literature, six categories emerged:

comfort; health and safety; access and quality of facilities; space provision and adequacy; participation and inclusiveness; interaction.

4 Results and Discussion

4.1 Interview Transcript

In analysing the transcript, all the statements made by the respondents with regard to the research question are considered to fall into one of the six categories. Over 200 statements made by the respondents have been extracted. A summary of the building aspects to which the statements are related are presented in Table 1. It is evident that there is wide variation in the number of statements related to each of the categories. The numbers are: Comfort (50); Health and safety (15); access and quality of facilities (71); space provision and adequacy (33); interaction (14); and participation and inclusiveness (39). Under each broad category, the statements are related to various aspects of academic building. For example, statements related to comfort concerns aspects of building such as thermal condition, lighting, furniture and so on. It can be noted that even under each category, there are more statements related to particular aspects of buildings as compared to others.

The main objective of facilities in educational institutions is to provide an environment that is conducive for learning (Leung and Fung 2005). In this regard, the first issue addressed was perception of students on the potential of buildings to influence their studies. There is unanimity among all the respondents that academic building can have both positive and negative influence on their academic activities. A building in which the desirable condition and 'facilities' are present provides a conducive learning environment in which the students are more comfortable and relaxed to conduct their studies. Students are more likely to spend more time for study in such buildings, which could enhance their studies. On the other hand, lack of necessary 'facilities' or conditions in academic buildings makes students uncomfortable could negatively impact on studies. The views expressed by the respondents suggest that academic building can enhance or constrain studies depending on the conditions present. In the sections below, some of the aspects of academic building in relation to the six broad categories identified earlier are discussed.

4.1.1 Comfort

A comfortable learning environment has been identified as essential ingredient for enhancing students' learning. So what constitute comfort in an academic building? A more general perspective of comfort is captured in the statement made by a respondent:

> For one to give his best, all the tools and facilities around him should be designed in such a way that they make him comfortable.

The internal environmental conditions (IEC) within learning environments play a significant role in achieving comfort. Thermal comfort is among the most emphasized aspects of IEC mentioned by the respondents. When temperature is unsuitable, the environment is not conducive learning. This is the case when rooms are hot or too cold, although most complaints were with regard to the latter. This confirms the assertion of Roelofsen (2002) that thermal environment is one of most significant factors that influence productivity.

Table 1 Summary of Statement related to various building aspects

Category	Building aspects	Frequency
Comfort	Furniture	11
	Indoor environment: thermal	8
	Indoor environment: noise	8
	Aesthetics	3
	External environment	4
	Indoor environment: lighting	3
	Indoor environment: ventilation	2
	Maintenance	2
	Internet	1
	Toilet	1
	Teaching aid equipment	1
	Personalised workstation	1
	Classroom 'size'	1
Health and safety	Air quality	4
	Thermal	4
	Smoking control	2
	Personal security	2
	Furniture	1
	Maintenance	1
	Building finishes	1
Access and quality of facilities	Furniture	15
	Internet access	12
	Refreshment facilities	12
	Teaching aid equipment	5
	Toilet	4
	Lift	4
	Maintenance	4
	Office equipment	3
	Security of property	3
	Aesthetics	3
	ICT equipment	2
	Parking	1
	Power socket outlet	2
Space provision and adequacy	Self-study room	16
	Common room	8
	Discussion room	3
	Smoking area	3
	External relaxation area	1
	External environment	1

Table 1 continued

Category	Building aspects	Frequency
Participation and inclusiveness	Temperature control	14
	Access to study room	8
	Ventilation option	5
	Furniture	4
	Sitting arrangement	3
	Lighting	2
	Sign identification	1
	Proximity	1
Interaction	Self-study room	6
	Common room	5
	Discussion room	2
	External seat	1

> Too much heat or lack of ventilation makes the student uncomfortable. That diverts the student's attention and affects his ability to concentrate.

In addition, provision of adequate lighting helps in conditions for achieving comfort within study spaces. This is important so that students do not have to strain their eyes for any reading task. There is also the psychological dimension of comfort achieved through adequate lighting. Adequate lighting is perceived to make the classroom more attractive. It also gives a "sense of relaxation" thereby motivating the student to learn. Noise control is also important in order to achieve comfort.

> There should be no noise. There are some buildings where vehicles pass by and the noise distracts. Even some lecturers complain about it.

Furniture is one of the aspects emphasized by respondents with regard to comfort. They describe suitable furniture as one of the 'facilities' that make students to enjoy their study. This is due to the fact that learning or study is an activity that involves sitting for many hours on daily basis. Many respondents discomfort resulting from furniture can potentially reduce the time spent to study. Comfort is also perceived in terms of other aspects of the building such as adequacy of space. Classroom and other learning spaces should be spacious enough to accommodate students. For example use of small classrooms for a very large number of students results to "overcrowding". In such situations many students become uncomfortable, hence affecting their ability to study.

While most of the items mentioned earlier affect physical comfort, there are other aspects of the building which the respondents feel would have psychological effect. Even though learning mainly takes place within buildings, the external surrounding of buildings could affect students comfort. As Sheets and Manzer (1991) stated, vegetation and natural environments around buildings have some psychological benefits in addition to positive feelings. This would likely motivate students as expressed in this statement:

> I prefer to have a nice landscape, flowers and trees because it is not only good to look but also good for the environment. The student becomes proud of the environment, the faculty and the university. When they are proud it is easy to study.

Students' perception of what constitute comfort in academic building is fairly wide. However, the aspects that have mostly been emphasized by the respondents include: furniture, internal environmental (e.g. thermal and lighting), 'utilities' (e.g. toilets and other needs).

4.1.2 Health and Safety

Health is one of the important components of wellbeing. Students need to be in good health condition to be able to study well. Respondents were asked about what could be the health implication from using academic buildings. Most of their comments suggest that they have little fear or it is not obvious about becoming sick due to using academic building. However, few students raised some issues that could have health implication. Learning spaces need to be properly ventilated to minimise air-borne diseases. Very cold temperature may in addition discomfort cause some illnesses. This reaffirms the assertion of Bluyssen et al. (2011) that building related illnesses resulting due to indoor conditions. A respondent relayed a live experience about sickness due to very cold temperature:

> We have problem with the air-conditioner. There was the case of one international student who developed pneumonia as a result of the very cold temperature in the classroom and library. He was not used to it and has no control over it.

Health concern was also raised as a possible as a factor that may influence attendance and hence studies in general. There is the tendency that the rate of absenteeism would increase if students feel that their health is in jeopardy within their study environments. This may eventually affect their academic performance. Concern has also been raised about the potential of furniture to result in health problems. This is something which may not be so obvious but potentially having long term implication. A respondent stated:

> With regard to furniture, there may be some long term effects if the seat or table is not proper.

Although there are health implications particularly associated indoor conditions, they may not be obvious and their impact may also not be immediate. This may be one of the reasons why only few students raise concern in the issues. Even incidence of very cold temperature in learning spaces, which is very common in the institution (UTM), was more perceived in terms of affecting comfort rather than its health implication.

4.1.3 Access and Quality of Facilities

As mentioned earlier, availability of facilities could make academic buildings become better environment for studies. It is believed that good learning environment can have positive impact on students output. Conversely, negative influence may result due to a non conducive learning environment. Some of the respondents feel that poor condition of academic building can increase absenteeism among students. This would affect students' academic performance.

One of the useful facilities is access to internet, which in the present era has become very essential for students. The internet serves as a tool for searching useful information by students. It is also a very useful tool for communication among students, with their teachers or some other person with regard to academic matters. E-learning is also facilitated by the availability of internet. It is not surprising that the respondents consider access to internet in academic buildings as a priority item. In fact, the emphasis is not only on the availability

but also the speed of the internet as it will affect the tasks that are performed by students. A typical statement from a respondent is captured here:

> Internet access is necessary to use e-learning facilities. When lecturers come, they may ask you to connect and download the material for presentation. If there is no access, you would miss that lecture.

Concern has been raised by some respondents about the potential of misusing the internet by students when available in academic building. They feel that students may waste a lot of time on the internet for tasks that are not relevant to study. Whatever the case may be, the potential benefit is strong enough to justify its provision.

Modern teaching aids (equipment) such as projector are described as helpful to students. One of the advantages of the visuals in teaching is that it helps in attracting students' attention to what is being taught. The increased attentiveness is likely to lead to better understanding hence promoting the goals of learning. In addition, the use of microphone in delivering lectures has been described as helpful in improving audibility of lecturers' voice. Some respondents also feel that office equipment such as printers, scanners and photocopiers should be available even if their use has to be paid for. The need for computer systems has also been mentioned.

Provision of some 'refreshment facilities' in academic building would enhance students' wellbeing. Learning is a very demanding mental task. The brain may be stressed after reading for several hours. As Felsten (2009) stated, this would lead to decreased efficiency of their intellectual efforts and result to lower output. Hence, students would need to replenish some lost energy to be able to carry on. At the very least, drinking water equipment should be available. This would save students from having to go far thereby spending more energy. Many respondents are of the opinion that other equipment such as coffee or soft drink vending machine should be available. The practicability of providing such equipment in every building is a subject of several other considerations. One respondent stated:

> I also want to point out that the coffee machine is very important in study area. Coffee is a refreshing agent. It refreshes your mind to continue with study. There is also no provision for drinking water in most of the buildings. This is also very important.

The provision of some equipment in academic buildings makes it easy for students to perform some activities related to their study. Computers for example are essential for students to do their academic work. Their provision will ensure that everyone has access regardless of whether they have their personal one or not. Research students in particular indicated that provision of some office equipment like printers and scanners within their research room would make them more comfortable. However, whether this is economically feasible depends on the financial capability of institutions. Provision of teaching aid equipment like projector and public address system in lecture halls help to make learning easier for students.

4.1.4 Space Provision and Adequacy

Students may be engaged with different mode of learning. Self-study generally involves learning individually and requires some level of concentration. Another mode is through delivery of lectures by lecturers in the classroom or lecture hall. Students may also be

engaged in group learning such as through group discussion. Each mode of learning or study may require a different type of space to be conducted more suitably.

It is common for 'research' students to be provided with dedicated study workspace normally within a larger 'research room' or laboratory. The work station normally consists of table, chair, and computer system in some cases. There is total agreement on the need for workspace for research students. Those who are provided with such space stated that it enhances their study while those who are not provided feel they will study better if they are provided. Whether an institution is able to provide personalised workspace to every research student is subject to space availability and economic or other considerations. In situations where dedicated work station cannot be provided even for research students, at least shared spaces which can be used by everyone may be provided. In the opinion of some respondents, shared workspace have higher rate of utilisation than dedicated workspace. In addition, the need for such workspace for 'taught' postgraduate students was raised. While some respondents feel that it should be personalised workstations other feel that a 'common pool' of share work station would be more reasonable and economically practicable. As one respondent observed:

> It will be better if all students are provided with space but I think it may not be economically possible. But I think a general room for taught course students should be provided so that we can go there and work, do our assignment every time we need.

Apart from learning in class or lecture halls, there are some study activities that requires students to work in group. The respondents feel that a suitable space for such activities should be available within academic building. For example, discussion room should be provided and accessible to students' convenience. Where possible, access should be available 24 h. Although many such rooms are provided within libraries of institutions, access may be limited to certain hours. Students sometimes suffer from distraction by co-students within the same study or research room through holding discussions. Thus:

> There should be private study area and then discussion area (separately) so that students can choose. So that when you have something to discuss, you go to the (discussion) room.

While academic buildings are primarily meant for academic activities, that does not preclude some activities that may not necessarily be learning related. In this regard, respondents expressed the need to have some spaces for leisure or relaxation. These activities could indirectly have positive influence on learning activities. For example, when a student is exhausted after some hours of study, such spaces can be used for one to get refreshed. A respondent stated:

> I have mentioned earlier that in my faculty we have lounges apart from the research room for both male and female students. There are cushion chairs where one can sit comfortably. They are used to have discussion and sometime to relax and play games like chess. Such spaces are very useful in that regard.

While provision of space for individual study is useful for concentrated study space are also needed for students to come together and collaborate, share knowledge or perform some group task. As Oseland et al. (2011) stressed institutions need to achieve appropriate balance in the provision of spaces different type of academic activities. This depends on their peculiarities and the needs of their students. For example, a university with high proportion of 'research' students is expected to provide more dedicated or shared workspaces compared to a mainly undergraduate institution.

4.1.5 Participation and Inclusiveness

Since buildings are designed to be used by people, it is important to ensure the involvement of users in ensuring conditions that best suit them. It is also important to as much as possible consider different type of users, for example, disabled, elderly and children so that they can use the building or facilities without much difficulty adverse effect on their health and safety. These are the aspects that academic buildings that would be considered under this category.

Thermal condition within academic buildings was one of the most stressed aspect of comfort by the respondents. The complaint is mainly about the very low temperature in which the air-conditioning systems are set which is very cold for most students. This is more particular in buildings or spaces where regulating the temperature setting is beyond students' control. For example, majority of the students do not like to study in the main library simply because it is too cold for them. There is also the issue of conflict regarding what temperature is 'conducive' even where students have control on the settings. Some students may want rooms to be cold while others prefer 'mild' temperatures. It will certainly be very difficult to satisfy the need of every student in this regard. Perhaps this issue can be resolved if institutions adopt a policy on temperature setting in spaces used by students within a 'comfort' range. The significance of this measure also is the potential for energy saving. The two statements below are typical of the views expressed:

> Sometimes there is conflict as some want the room very cold while others do not. There should be a way of resolving this. Having the a/c is good but temperature control is also desirable.

> The problem is we are sharing with others. We may feel very cold but others are not. We may put higher temperature but others will adjust back to low temperature and we may be freezing.

Furniture is very important to students comfort because that is what they sit on to study. Some respondents observed that furniture of certain specification makes them uncomfortable. Obviously, due to differences in body size and height, students may need slightly different furniture specification. The best way to address the issue is by ensuring that appropriate ergonomic standards are applied with regard to furniture for academic buildings. This would certainly ensure that majority are made to be comfortable. There may be few cases of students with 'special' body features such as very tall or very fat. Such students may not be comfortable with furniture designed using standard specification. It would be worthwhile is few provision are made for people with 'special' need. A respondent commented as such:

> The seats provided are generally of the same size while we may have people of different sizes and height. Some are slim while some are fat. If the chair or table is too high or too low, or too small to accommodate one's body size, it affects the learner, simply because he cannot concentrate and makes it uncomfortable.

The time over which students have access to study rooms was raised. This is of concern to some of the students whose main academic building is closed after working hours. Students may have different preferred time for study. While some prefer to study in the morning, others may prefer afternoon, evening or form morning through evening. This calls for flexibility in terms of access, particularly to study rooms used by students. The following view was expressed by a respondent:

> I think students should have access at any time. Not everywhere in the building but reading rooms or research rooms. Some people prefer to study in the morning while others may like evening or afternoon. For that, buildings should be available at all times. The most important is to make sure that adequate security is provided against theft in other spaces within the building.

The aspects highlighted are examples of the aspects of academic buildings which the respondents feel should be given consideration. There should be some flexibility with regard to provision of certain facilities as well as building operation to 'accommodate' students' preferences. Provision for students with disabilities should also be taken care of.

4.1.6 Interaction

Students' interaction whether academic or social is an important aspect of human life. Certain aspects of learning require students to come together and collaborate or share knowledge. A task such as group assignments and discussion requires suitable space where students can sit down and work together. It is therefore important to have discussion rooms for such activities. In some institutions, such spaces are only available in the library. Where such spaces are not available, students may only have the option of using other spaces that are not purposely designed for group activities. Where such spaces are only available in the library, there could be some constrained due to restricted hours for which it is available. It will therefore be useful to have such space in academic buildings at the respective faculties.

> Also like mentioned earlier, having discussion room within faculty buildings accessible to students at their convenience. They should not only be available at the library as hours of access are limited. There should be such study spaces available 24 hours.

Apart from academic interaction, respondents have expressed desire to have a place where students can sit down comfortably and discuss not academic matters. Provision of common room or some indoor games can improve social interaction among students.

4.2 Priority Items

As part of the strategy for obtaining data from the focus group respondents, each group session ended with a listing of priorities with regard to academic buildings. Effort was made to ensure the adequate participation of all group members during discussion. However, the method has the tendency of bias through some members being dominant while others are reserved during the discussion (Stewart et al. 2007). This is one of the limitations of Focus group. Data obtained from the listing is aimed at partly addressing this limitation as well as obtaining more data to complement what was obtained through the discussion. Each participant is requested to list five items each under two categories. Clear explanation has been made with regard to the two categories. The first category is what they feel are essential for academic building to be conducive for learning. This is supposed to capture what the respondents feel should be the 'ideal condition' irrespective of the buildings they currently use. The second category is top items they feel should be improved based on their experience with the current academic building they mainly use for their study. Tables 2 and 3 show a summary of the two items respectively.

Table 2 Top priority essential items

S/N	Building aspect	Frequency	Rank
1	Furniture/furniture comfort	19	1
2	Internet access	15	2
3	Thermal comfort/temperature control	13	3
4	Drinking water/refreshment facilities	10	4
5	Personal workstation/study room	9	5
6	Office equipment	6	6
7	Computers/e-learning facilities	6	6
8	Adequate lighting	6	6
9	Clean/close toilet	5	9
10	Discussion room	5	10
11	Teaching aid equipment	4	11
12	Maintenance/cleanliness	2	12

Table 3 Top priority items for improvement

S/N	Building aspect	Frequency	Rank
1	Internet access	16	1
2	Furniture/furniture comfort	12	2
3	Drinking water/refreshment facilities	11	3
4	Thermal comfort/temperature control	9	4
5	Maintenance/cleanliness	7	5
6	Office equipment	6	6
7	Clean/close toilet	6	6
8	Computers/e-learning facilities	5	8
9	Personal workstation/study room	5	9
10	Discussion room	3	10
11	Teaching aid equipment	3	10
12	Adequate lighting	2	12

A large number of items have been listed. In some cases, similar or related items have been described using different words. For example, some students include 'internet access' some 'Wi-Fi access' some 'fast internet'. These items can be combined into internet access. Similarly, some students list 'ergonomic chair', 'comfortable chair and table', 'comfortable seat', etc. These are treated as same item i.e. comfortable furniture. A total of 38 items have been identified from the list. The listing exercise was meant to complement the interview. The top 12 item listed are presented in Tables 2 and 3. Incidentally, there is high degree of similarity between the items with high frequency as extracted from the interview transcript and those listed as top priority. This may be understood in the sense that the respondents were able to freely express their views during the discussion. The similarity of the items may be interpreted as what they expressed in the "open" is similar to what they expressed while "hidden" as the listing exercise is totally free of influence from group members. This gives some level of confidence that the items as reflected in the entire tables represent the perception of the respondents with regard to how academic buildings would enhance learning.

5 Findings

The number of participants in this study is small and the data collected was generally qualitative, hence it is difficult to be subjected to extensive statistical analysis. Thus, judgements such as difference of perception or view based on different students' characteristics could not be statistically established. However, from the results of the content analysis as well as the observation by one of the authors who served as the moderator of the focus group discussions, some revelation can be made from the study.

- All the participants of the study believe that academic buildings, in one or several ways, have influence on their studies. When the building features and associated facilities provide a learning environment that meet students' needs, it positively influences them and potentially improves their academic output or performance.
- Students' priorities in academic building facilities are much more in common regardless of their different characteristics. For example, all categories of students emphasized on the need for internet access, comfortable furniture, thermal comfort and refreshment facilities in academic buildings. These are the top four priority items from the perspective of the participants. Although it may be very difficult to fulfil all the needs of students due to resource constraint, it is possible to focus on few items that can make more impact.
- There is marked difference in terms of study space between 'research' and 'taught' students. The provision of personal workstation is essential to the former group because they are largely engaged in individual study. For the latter group it is more essential to enhance study spaces used for teaching such as classroom and lecture theatres. However, there is no much difference in terms of spaces for collaborative learning or other social needs.
- Participants have strong feeling about "control" of their learning environment. For example, negative feelings about the thermal environment—the very cold temperature, are high, as in most cases students do not have control over this aspect within academic buildings. Even where students have control, conflicts often result when those who want 'very cold' and those who prefer 'milder' temperature are using the same room. This may be resolved by institutions setting policy on range of indoor temperature settings within 'common' study spaces. Respondents also feel very strongly about access to study spaces after working hours. This would particularly help students whose preference is to study during evening hours. Thus, improving on the degree of control students have on their learning environment will increase their satisfaction with academic buildings.

As stated earlier, there are several aspects of academic building that help to make them more conducive for learning. Based on the analysis of the results, these aspects have been categorised into six: comfort; health and safety; access and quality of facilities; space provision and adequacy; Participation and inclusiveness; and interaction. For example, more conducive indoor environment implies higher level of comfort. Similarly, provision of essential facilities and spaces will result to improved satisfaction of students. Linking this to the Conceptual Model of QCL (Sirgy et al. 2007), satisfaction with academic building can increase satisfaction with both academic and social aspects of college life and hence the wellbeing of students. In this regard conceptual framework of students' satisfaction with academic buildings (Fig. 2) has been proposed. The six categories can serve as broad criteria of students' satisfaction as it relates to academic buildings in HEIs. Each category consists of other identified variables that need to be further established. Although

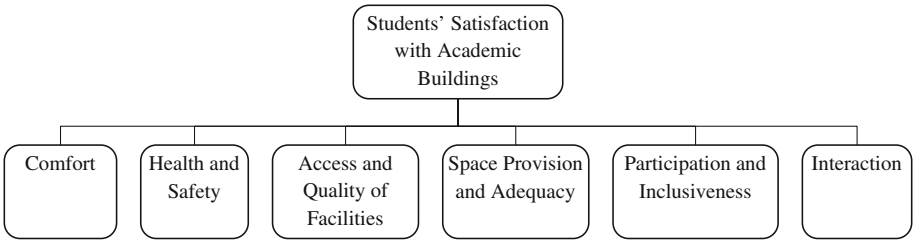

Fig. 2 Conceptual frameworks of students satisfaction with academic building

some of the variables have been identified, design and sample used in this study are inadequate hence the need for further study. This would be the goal in the next stage of the study.

6 Conclusion

This study used focus group exploring students' perception about various aspects of academic buildings and how they can influence their study. The study was premised on the belief that when students' learning is positively influenced by academic buildings, it will increase their satisfaction with facilities services provided. This will lead to more satisfaction with their overall learning experience quality of college life which is an aspect of wellbeing. The study was able to establish various aspects of academic building how they influence study. This will contribute towards better understanding of how specific aspects of academic building may impact on students' productivity as well as overall satisfaction with academic life. This implies that facilities managers in higher education institutions should give adequate attention, particularly to the top priority aspects as they are likely to have more impact. One of the limitations of this study is that the respondents were all from just one out of the many institutions in Malaysia. Ideally, the focus group participants should have been drawn from more institutions to give a better representation of the study population. The fact that the number of respondents in the focus group is very small is another limitation. However, the results of the study can serve as a basis for developing quantitative studies to further establish aspects of academic buildings that influence their studies. Thus, quantitative study using large number of students is required to determine the importance of the six key parameters as well as their respective variables.

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