FACTORS THAT INFLUENCE USER SATISFACTION WITH CAMPUS SPACES: A COMPARATIVE STUDY OF DESIGN-BASED AND NON-DESIGN BASED CLASSROOM

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ABSTRACT

Space management is an effective management of space utilisation aimed at reducing the cost and wastage of spaces. The aim of this study is to improve the space management practices at College of Built Environment (CBE), UiTM, Shah Alam. The finding is hoped to benefit the Space Management Unit, Facilities Management Office who is in charge of the space management for CBE. In order to achieve the research aim, three objectives have been set out. The objectives were to investigate the current practices of space management at CBE's Building, to identify the space requirement at CBE's faculty and to identify the level of user satisfaction on space management at CBE's Building. The methodology adopted was qualitative and quantitative method using literature review, semi-structured interview and questionnaire survey. SPSS version 20 was used to analyse the data. The results revealed that the practices of space management were traditional and not centralise, the types of space required by the faculty includes classroom, computer laboratory, TEC room, workshop (timber laboratory and concrete laboratory), studio, lecture hall and external study area.

Keywords: *Higher learning institution, Space management, Space requirement, User satisfaction, Space management practise*

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INTRODUCTION

The satisfaction of the user that use the space at the High Education Institutional is so important towards make the learning environment makes interesting. Learning can be affected by the environment in which the learning takes places (Hutchinson, 2003). Teaching also made the same affection when the space usage is for the education purpose. There is a growing body of scientific evidence for the relationship between the quality of educational facilities and resultant educational achievement. This educational environment includes important aspects of facilities management such as the space management and the fit out of the space. The facilities management is taking the role on space management that so important to the buildings. When facilities management are being held, it can help institutions in identifying areas to focus upon in order to improve matters. However, it has to be recognised that a space utilisation survey is simply a measure of one aspect of space use or space management.

PROBLEM STATEMENT

According to the University of Dayton (2008) in Space Management Guidelines, there have several issues that usually appraised on space at Higher Education Institution. First problems are change function. The space resolution process must be followed when space within a department/unit changes function in order to document the changes in space function. For example, if office space is transformed into undergraduate student space or vice-versa, then a change in function of that space occurs. The elimination of departmental classrooms results in the classes assigned to that room being added to the centrally assigned classroom pool, which has a negative impact on available classroom space (Burke et al., 2001).

Second problems are request for additional space. Request additional space also at faculty also one of the main issues to the faculty. When additional space is needed and departmental/unit space is unavailable, the space resolution process must be followed. Resolution of additional space requests will be based on appropriate space as it becomes available (University of Dayton, 2008).

Last problems are space allocation. Burke and Varley (1998) define space allocation as a process of allocating rooms or areas of space for specific functionality. Thus, since it is limited, it must in well manage by the faculties towards availability and suitable with the user required. According to Beyrouthy et al. (2007) there is several aspects have to be concern on allocating the teaching and learning space including size the number of students in the subject, timeslot-time use for a subject in a week, space type lecture hall, seminar room, tutorial room, and department who owns or administers of course.

LITERATURE REVIEW

User and Space Requirements

Aschner (1999) said that the important of customer requirements is the new undergoing approach in high level of organization which focuses to meet the customer satisfaction. According to the Zahedi (1997), requirements can be defined as what the customer needs and utility is the extent of the customers' satisfaction when the need is fulfilled.

In higher education institution, there are includes several of user that relating on higher education institution such as students, staff, parents and society. Based on the aspect that stated above, it shows that the important of analysis on the user or customer requirement to makes the good user or customer satisfaction. The user requirements should have in the aspect of user satisfaction.

Types of Users

Student

In the UK, Higher Education students were considered to be the main customers of the University (Crawford, 1991). Even the students were charged for the payments of their student's fees but they has right to give their own opinion to the university. This is also similar right to the staff at the university, even they worked at the university as university administration as their employer but they have rights to give opinions for

the quality improvement of the university. Students are the person that directly receives the service provided by university. For example, a three-year degree programme made up of a number of modules at each level and the facilities used such as classroom, lecture hall and others.

This can be shown in the survey introduced by the Higher Education Funding Council for England (Douglas et al., 2006). This survey is aimed at the final year students to seek their views on many aspects of teaching, facilities, assessment, and support provided by the universities and its courses. The support provided also including the learning space that provide by the university whether it comfortable or not. The result will ultimately be used by the Government and Funding Bodies to produce league tables of university performance.

The position of a university that resulted from the survey collected will impact effectively on the university's image. James et al. (1999) stated that image has a strong impact on the retention of current students and the attraction of potential students in the future. Poor rates or ranking at the table will make the funding decrease that given by the Government and it will make an impact effectively to the universities management. Student satisfaction has become an extremely important issue for universities and their management. The purpose of analysis on space management user satisfaction is to try to maximize student satisfaction, minimize dissatisfaction with space management, and improve the institutions' performance across a number of university rankings.

Lecturer

The lecturer is one of the staff who uses the building for teaching and learning sessions. Lecturer is important users at the Higher Educational Institution beside student. A teaching session is an important thing that needs to be considered because if the lecturer does not satisfy the environment of space, it can affect the teaching session. The space and environment for the teaching and learning session should be the best environment to make the environment of teaching and learning session more fun and better.

Criteria of User Requirements on Academic Space Allocation

According to Standard of Academic Space at HEI's (2012), there are

four main criteria for user requirement in order to allocate the academic space and the four criteria are supporting by several aspect to makes the management can be managed in properly. The criteria that be mentioned were:

i.Time
ii.Location
iii.Equipment/Facilities
iv.Size

All of these criteria that mentioned above are simple and it can give the information for the faculty to allocate the academic space. These criteria also have more input on the information system for the faculty. For example, if there are information system that has been developed at faculty for manage the scheduling, space management and space allocation process, these criteria can be refer as guidelines for the system development and function application regarding space.

User Satisfaction

Sasser et al, (1978) stated that the outcome of service is a tangible product and a bundle of goods and services as the product offering. The bundles mean consists of three elements such as:

i.The physical or facilitating goods
ii.The sensual service provided
iii.The psychological service

For a university, the facilitating goods include the lectures and tutorials, presentation slides, supplementary handout documents or materials, and the recommended module text. It also includes the physical facilities such as the lecture hall and tutorial rooms and their level of furnishing, decoration, lighting, and layout as well as ancillary services such as recreational amenities.

Keeping user satisfaction is what leads to customer loyalty. Research conducted by Jones and Sasser Jr. (1995) divided into thirty organisations from five different markets found that where customers have choices the link between satisfaction and loyalty is linear, as satisfaction rises, so too does loyalty.
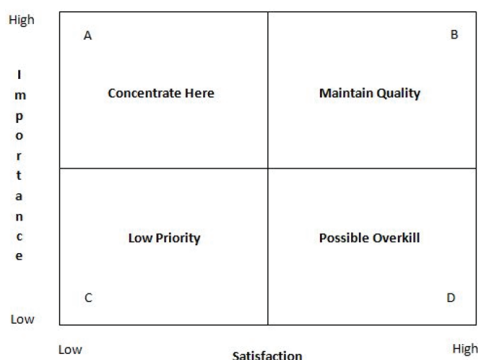
Figure 1.1. The Grid of Importance and Satisfaction Matrix

User Satisfaction in Space Management at Higher Educational Institutions

Coles (2002) found that student satisfaction is decreased when class sizes are larger and when students are taking compulsory core modules rather than optional modules.

Kotler and Clarke (1987) define satisfaction as things felt by a person who has experienced performance or an outcome that fulfills his or her expectation. Satisfaction is a function of relative level of expectations and it perceives performance. Satisfaction is also perceived as the intentional performance that results in one's contentment (Malik & Usman, 2010). According to Sapri and Finch (2009), customers are the important person in any organization, whether in private or public enterprise sectors. Student satisfaction plays an important role in determining the accuracy and effective of the system being used.

On the survey conducted with 310 all male Saudi Arabian students that located at the King Fahd University of Petroleum and Minerals, Sohail and Shaikh (2004) found that contact personnel was the most influencing factor or main factor to the student's evaluation of service quality of the university. However, physical environment, layout, lighting, classrooms, appearance of buildings and grounds and the overall cleanliness also significantly contributed to students' concepts of service quality. It shows that the

physical environment also important things that should be considered by the university including the space management at the university.

METHODOLOGY

This paper employed both qualitative and quantitative methods of data collection that attempted to answer research questions in order to achieve research aims and objectives. There are three stages in data collection involved in the study. There are literature review, interviews, and a questionnaire survey.

In conducting the research various measures have been taken to ensure the validity of the results. The research had been completed smoothly and satisfactorily within a few limitations. The case studies are focused on the College of Built Environment which is the main user is undergraduates' students.

However, a triangulation approach is applied throughout the research activities which began with multiple data sources in the literature review, multiple research methods of quantitative and qualitative

RESULTS AND DISCUSSION

The analysis is performed with the objective of identifying the level of user satisfaction with space management at CBE's Building. Data from rating scale type of question are analysed by using index method (Likert Scale) method. According to the Wahab (2010), Likert Scale is psychometric response scale primarily used in questionnaire survey to obtain respondent's preference or degree of agreement with a statement or set of statement. The respondents are asked to indicate their degree of agreement with a given views or opinions. Questions are analysed and the outcomes are presented in a sum of average index or mean. Respondents need to evaluate by giving answers in the form of a scale of 1-5 which is strongly disagree to strongly agree and very satisfied to unsatisfactory.

There were two types of data collection method implemented in the

study such as interview and questionnaire survey. It is a combination of qualitative and quantitative method of collecting data in nature, aiming to collect reliable, rich, and useful data. The collected data were analysed using SPSS that produced a descriptive analysis presented in the tabular format. The factors that focus are the satisfaction of space allocation, common space allocation, and space condition which are the main problems for space management.

Satisfaction with Space Allocation Non-Design Based Programmes and Design Based Programme

The satisfaction of space allocation is divided into non-design-based programmes and design-based programmes. The space allocation is quite similar between both of the groups which the different is there are workshop on non-design-based programmes and studio for design-based programme. Most of the users are satisfied with the allocation of classrooms and workshops which means there are no big issues on the allocation of those spaces. On the other hand, the user feels moderate about the allocation of the studio for the design-based programmes. But both of the groups are not satisfied with the allocation of computer laboratory which is the allocation is not enough with the number of students at this faculty and it will make difficult to the users to use the space for the learning session.

Table 1.1. Satisfaction on Space Allocation for Non-design-based Programmes

Types of Space	Mean (N=60)
Classroom	3.98
Workshop	4.00
Computer Laboratory	2.68
Average	3.55

Source: Author, 2025

Table 1.2. Satisfaction on Space Allocation for Design-based Programmes

Types of Space	Mean (N=79)
Studio	3.09
Classroom	3.23
Computer laboratory	2.67
Average	2.80

Satisfaction with Common Space Allocation

For the allocation of the common space which consists of the lecture hall, external study area, and library. Most users are moderately satisfied with the allocation of all space but the library is the low moderate which is the user is close to not satisfied with the allocation. This should be focused on the management for the allocation of all of those spaces. In order to make learning and study more interesting, management should be concerned for better improvement.

Table 1.3. Satisfaction with Space Allocation on Common Space

Types of Space	Mean (N=139)
Lecture Hall	3.04
External Study Area	3.32
Library Area	2.85
Average	3.07

Source: Author, 2025

Satisfaction with Space Condition

Lastly, regarding the satisfaction on space condition, it can be summarized that most of the users are highly satisfied with the condition of the studio and computer laboratory which is the condition is proper. It means that users do not have problems with the condition of both of the spaces. But user is not satisfied on the workshop condition which is improper and not comfortable with users.

Table 1.4. Satisfaction with Space Condition at this Faculty

Types of Space	Mean (N=139)
Classroom	2.87
Computer Laboratory	3.40
TEC Room	3.18
Lecture Hall	3.34
External Study Area	2.98
Studio	3.37
Workshop	2.40
Average	3.08

Source: Author, 2025

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CONCLUSION

The study was conducted with aim to improve the end user satisfaction for the space management focussing on the case study at CBE's building. Findings from interviews and questionnaire surveys were triangulated to answer the objectives of the study. The following conclusions are drawn based on the findings.

In conclusion, there are problems with space management such as the timetabling system which is this system is still relevant but it should be improved for the proper allocation of space. On the other hand, there are also has problem on the using manual system on space application. It means that the user is not satisfied with the system. Users of the non-design-based programme and design-based programme are not satisfied with the allocation of a computer laboratory which is not enough at CBE's building. This problem should be considered for the comfortable of the users.

The level of user satisfaction on space management where users are highly suitable with the system that managed by the management and they indicate the system is highly make easier to them in space management matter. Based on the problems of space management operation, problems with the condition and environment of the space have always happened at this faculty. Most of the users from two groups which are non-based programmes and design- based programmes are satisfied with the space allocation at this building. They also highly satisfied with the common space allocation even library is one of the spaces that they are not really satisfied. Based on the satisfaction of the space condition, most of the users are highly satisfied with the condition of the space which is shows the condition of the spaces allocated are proper managed.

RECOMMENDATION

Centralize Space Information

Based on the interview with the staff, there is no implementation of the centralized space information at this faculty. This centralized space

information is important and should be implements at this faculty for makes easier to the users. Centralized space information is the system that shows the centralized of information for the space. This will make the space management can be managed by a centralized system and the information of the space can be shown on the centralized system. So that, the user can look the information on space and do a complaint about the space in one source. This system will make it easier to the users regarding space management. For the management, the system will make it easier for the staff that are in charge on space management. The planning, operation, and other elements of space management will be centralized.

Improve Space Management System Tools

Space Management system means the computerized system that manages the space. For example, CWorks and Archibus. Archibus has been implemented at the Puncak Alam Campus. This system is for the Facilities Management System but their elements at this system focus on the Space Management. This UiTM Campus has a Facilities Management System that is a tool for the facilities management. But this system only implements the inventories for the space. So that, it does not implement entirely of Space Management system. With the improvement of the system or purchase a new system such as CWorks and Archibus or other tools, there can be more innovation in the space management system especially CBE's Building and UiTM Campus in general.

Managing Teaching Space during Semester Break/Weekend

Managing teaching space during semester breaks or weekends means that the Space Management Unit can rent out the space such as the lecture hall, classroom, and TEC Room to the other users. These types of space can be rent out for any purpose of activities. The activities such as conferences, teaching classes, motivation class, and so on. So, the Space Management Unit can be the service provider for space management. It means that the Space Management Unit can manage the space and also the facilities that are provided. For example, conference activities. There are management that can provide such as the Space Management Unit can rent out the space and manage the facilities for the conference activities. This service can generate income for the management.

Analysis of Room Utilization

Analysis for room utilization means that the Space Management should analyze for room utilization to make the Space Management Unit can plan their Space Management for future use. The Space Management Unit will do the space audit or any other analysis that can be contribute to the analysis of the room utilization. At CBE's Building, the student is based on the Design Based programs and Non-Design Based programs. So that, the space utilization at this building should be focus because the capacity of student and the number of rooms should be suitable. With the analysis, this space utilization can be do it correctly with the requirement of each department at CBE building.

Development and Training

Development and training mean that the development of a better space management system is needed to enhance the space management practiced. The development of a space management system is so important. This is because if the space management system is developed, the technology of the space management system will be improved. The system will be managed in a systematic and user-friendly. When the development of the space management system, training should be implemented for the staff in charge of space management. This is for the staff to know how to manage the development system. For example, when once institutions purchase the ARCHIBUS for the tools on space management, the institution should send their staff to training on the ARCHIBUS system. This is for the staff to know the system operation. If there is no training is implemented, it can make the system cannot be managed carefully and successfully. So that, when the training has been implemented, the staff can know how to manage the new system and development system.

Maintain an Accurate Record of Space Usage

Although space audit has been implemented to carry out the information on space, the information is collected not closely enough to show the good operation of space management. Thus, the database for space should be considered as a place where space allocation, occupation, and usage. This database should be documented and made available to the responsible parties such as Space Management Unit. From this database, it

can be determined on the space management procedures for space allocation and usage. This database should be done appropriately to make sure the space can be allocated fairly follows the requirements of particular departments.

Timetabling System

Management should establish a Timetabling and Teaching Accommodation Unit for the timetabling system, space booking or application, teaching accommodation, and others. This unit should provide the information requirements, timetabling forum and disability and learning support service to ensure the efficiency of the space allocation.

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AUTHOR CONTRIBUTIONS

All authors contributed to the design of the research, the questionnaire, and the write-up. The on-line survey, data cleaning and tabulation was undertaken by Universiti Teknologi MARA. All authors have read and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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