# PEAT

# A Study on Post Occupancy Evaluation (POE) of Student Housing Facilities in Kolej Kediaman Pagoh, Universiti Tun Hussein Onn Malaysia

**Nurul Ashikin Ahmad Shafie[1], Mohd Kamaruzaman Musa[1]\*, Mohd Eizzuddin Mahyeddin[1]**

[1]Department of of Civil Engineering Technology, Faculty of Engineering Technology,
Universiti Tun Hussein Onn Malaysia, 84600 Pagoh, Johor, MALAYSIA

*Corresponding Author Designation

**Abstract**: Universities need an advanced development system by providing students with good residential facilities and services, including Universiti Tun Hussein Onn Malaysia (UTHM), which offers residential students on the Pagoh campus. Post Occupancy Evaluation (POE) should be conducted to find out the performance of the college. Therefore, this study aims to identify the performance criteria needed for student housing facilities in Kolej Kediaman Pagoh (KKP) using POE and assess the students' satisfaction with the performance criteria of student housing facilities in KKP through POE. According to the seven criteria known from the literature review, a survey questionnaire was carried out on 322 samples of students living in Kolej Kediaman Pagoh. The respondents' target was UTHM students who live in student housing provided by UTHM, which were KKP 1, KKP 2, and KKP 3. The sampling method used in this study was a non-probability method, the convenience sampling method. This study analyses the frequency, descriptive, and Pearson correlation coefficient analysis using Statistical Package for the Social Science (SPSS). The results show students' satisfaction with the student housing facilities performed well except for the internet and Wi-Fi services, and the rest and sports areas with 53.00 % (174) and 41.00 % (132) respondents dissatisfied with the facilities and services provided. From the frequency and descriptive analysis data, most of the students were satisfied with the room's ventilation and furniture provided. Next, there is a significant correlation between genders with four performance criteria; proximity to essential facilities, cleaning and maintenance, security and safety, and privacy and territory with the correlation (r) 0.140, 0.141, 0.119 and 0.173. The interpretation is very weakly positive. From this study, the facility manager can determine students' satisfaction and further improve the needs and comfort of student housing facilities in Kolej Kediaman Pagoh.

**Keywords**: Post Occupancy Evaluation, Student Housing Facilities, Kolej Kediaman Pagoh

## 1. Introduction

The fast development of higher education has resulted in stiff competition between public institutions and private colleges [1]. Most universities have accommodation and student housing like a hostel, single house, etc. Quality amenities services are essential to enhance the success of learning activities and improve user satisfaction [1]. University facilities are considered one of the most important strategic resources for obtaining a competitive edge in the higher education sector. Student housing plays a vital role in students' academics because a good quality environment can give students good vibes to carry on what they were studying. Students need to be encouraged, not discouraged by buildings and equipment during their learning process [2].

Studies using Post Occupancy Evaluation (POE) on student housing facilities have been widely conducted worldwide in Sri Lanka, China, and Malaysia. According to [3], a systematic way to identify and distinguish the impact of the new facility on student learning is by doing POE. A study evaluated current services and satisfaction for student residential colleges at the main campus of UTHM located in Batu Pahat, Johor. According to [4], student satisfaction for campus dormitories has different happiness levels. The critical factors for student housing facilities are the cost of living, internet facilities, number of students per room, adequacy of laundry, mosquito protection, and parking spaces. The university management will consider the study results to improve the quality of their hostels. However, research on student housing facilities using Post Occupancy Evaluation (POE) at UTHM Pagoh has never been done before. The study on POE for student housing facilities in Kolej Kediaman Pagoh will be conducted in this context.

Students' accommodation is one of the services that students use. Before deciding which universities they want to attend, they must consider various factors, such as the facilities of the universities themselves. Student housing facilities play a vital part in ensuring that students on campus have a pleasant and healthy living. According to [5], schools need to prioritise student housing while also improving their credibility among colleagues. Furthermore, improvements should continually be made in response to the passage of time and technological developments so that students may make the most use of them.

UTHM must guarantee that the college is in excellent condition and that the facilities are operating correctly to improve and set an example for other colleges. Unfortunately, UTHM does not know how well the student housing facilities at Kolej Kediaman Pagoh are performing. There was research on the performance of services and student housing satisfaction at UTHM in Batu Pahat but not at UTHM Pagoh. Therefore, a survey on Post Occupancy Evaluation is needed to carry out. The facility management and UTHM administrators could not identify the difficulties and dissatisfaction of students with the colleges if the POE were not carried out.

According to the problem statement above, this study aims to identify the performance criteria needed for student housing facilities in Kolej Kediaman Pagoh using Post Occupancy Evaluation (POE) and assess the students' satisfaction on performance criteria with student housing facilities in Kolej Kediaman Pagoh through POE.

### 1.1 Literature review

Five related studies have been obtained from some articles, journals, and other reliable sources on related topics; the student housing facilities, post-occupancy evaluation, criteria performance of student housing, students' satisfaction on student housing facilities, and lastly, student housing in UTHM Pagoh. According to [6], the essential characteristics and support services are study bedroom, bathroom, laundry, pantry, study room, computer room, meeting room, lobby, and Musolla. Meanwhile, the support services are the parking lots, cafeteria, mini markets, book store, ATMs, internet services, CCTV system, electrical wiring, water supply, etc.

Next is the post-occupancy evaluation; based on [7], Post-Occupancy Evaluation (POE) is a broad technique for gathering input on a building's operational performance, such as energy efficiency and indoor environmental quality (IEQ), occupant satisfaction, productivity, etc. Another research stated that Post-Occupancy Evaluation (POE) is the practice of systematically assessing the performance of buildings after they have been completed and used for some time [8]. Poe also gives some benefits to the owner and the user. In general, POE can benefit the building performance assessment, the discovery of relationships between resident behaviour and building resource use, the optimisation of the indoor environment, more information about future building design, and opportunities to improve discussion among design teams and their partners [7].

There are many previous research about student housing performance criteria. One of the research stated that the facility services criteria are safety, waste collection, fire protection, friendliness of resident management, power supply, water supply, and transportation system [9]. There are seven performance criteria suitable to be used; comfort and space performance, accessibility and circulation, housing support services and functionality, proximity to essential facilities, cleaning and maintenance, security and safety, and privacy and territory.

In addition to the student's satisfaction with the student housing facilities, according to [10], student satisfaction is a short-term sensation that results from students' assessments of educational experiences, services, and facilities encountered during the learning process. Furthermore, a survey had been conducted to the UTHM student in Batu Pahat regarding the satisfaction of the student housing. The research outcome is that most students were dissatisfied with the Internet's sufficiency, laundry service, bus transportation, housing costs, and mosquito protection provided in that student housing facilities.

Last but not least, the student housing in UTHM Pagoh. Students' hostels at UTHM Pagoh are referred to as "Kolej Kediaman Pagoh" or "KKP." There are 3 different colleges which are KKP1, KKP2, and KKP3. UTHM campus Pagoh also provided various facilities and services such as cafeteria, transportation, development and counselling services, religious area, resources centre, sport and recreation, and shared facilities.

## 2. Methodology

This research was carried out in two progressive phases to achieve the objective discussed in Chapter 1. Each step of this study has illustrated the methods used, respondents and analysis techniques to achieve each research objective. The methodology procedures will involve phases 1 and 2 of the study, as shown in Figure 1. Phase 1 uses the literature review to complete objective 1, and phase 2 uses questionnaire preparation, reliability test, data collection, questionnaire survey, and data analysis to achieve objective 2.

2.1 Phase 1

Phase 1 of this research is to achieve the first objective of the study, which is to identify the criteria needed to evaluate the performance of student housing facilities in UTHM Pagoh using Post Occupancy Evaluation (POE). The first phase in the methodology involved literature review for related areas to achieve the research's first objective. The literature review results are conceptual or initial findings of performance criteria needed for student housing facilities in Kolej Kediaman Pagoh using Post Occupancy Evaluation (POE). The criteria performance were established through various previous researchers. There is a total of seven criteria performances that are suitable to be carried out in this study:

- The comfort and space performance
- Accessibility and circulation
- Housing support services and functionality
- Proximity to essential facilities

- Cleaning and maintenance
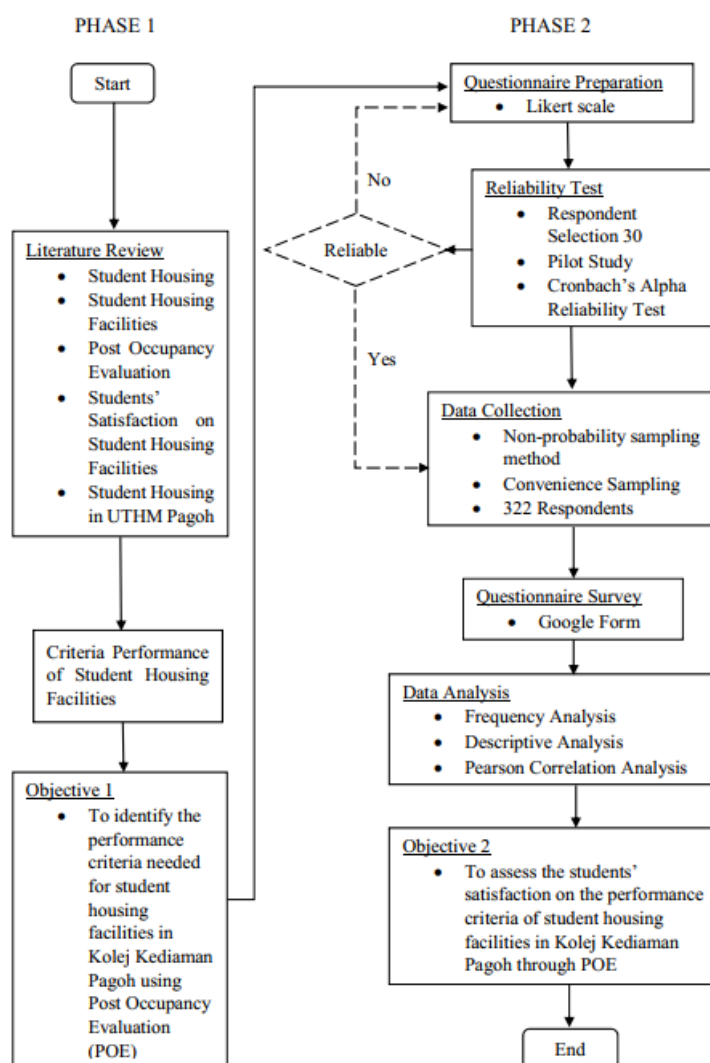- Security and safety
- Privacy and territory



**Figure 1: Research methodology diagram**

2.2 Phase 2

The second phase uses quantitative data, which is a questionnaire assessment. The methods to achieve the second research objective involved questionnaire preparation, reliability test, respondent selection, data collection, and data analysis. A questionnaire allows the collection of quantitative data in a standardised manner, resulting in internally consistent and reliable data for analysis [11]. The questionnaire used in this study is close-ended questions. The scale option used in this survey is the Likert scale, as shown in Table 1.

**Table 1: The scale used in a questionnaire survey**

| Option | Scale | Meaning |
|--------|-------|---------|
| 1 | Strongly disagree | Totally disagree with the statement |
| 2 | Disagree | Disagree with the statement |
| 3 | Neutral | Neither agree nor disagree with the statement |
| 4 | Agree | Agree with the statement |
| 5 | Strongly agree | Totally agree with the statement |

Reliability testing is essential since it relates to a measuring instrument's component [12]. The reliability of the study will be tested by conducting a pilot study to test the reliability of the questionnaire. There are 30 questionnaires distributed to students living in Kolej Kediaman Pagoh to answer. The pilot study result will be used for the Cronbach's Alpha Test. According to [12], there are no definitive standards for internal consistency; however, most people agree on a minimum internal consistency coefficient of 0.70. The Cronbach's Alpha reliability test results, as in Table 2 determine that all the questions given are accepted and pass the reliability test scores, more than 0.7. The total of the Cronbach's Alpha reliability test is 0.93 means that the questionnaire was reliable with internal consistency excellent.

**Table 2: Cronbach's Alpha reliability test**

| No. | Performance criteria | Cronbach's Alpha reliability test |
|-----|----------------------|-----------------------------------|
| 1. | The comfort and space performance | 0.911 |
| 2. | Accessibility and circulation | 0.725 |
| 3. | Housing support services and functionality | 0.872 |
| 4. | Proximity to essential facilities | 0.945 |
| 5. | Cleaning and maintenance | 0.928 |
| 6. | Security and safety | 0.959 |
| 7. | Privacy and  territory | 0.952 |

The population of this research consists of types of student housing in Universiti Tun Hussein Onn Malaysia (UTHM), Pagoh, which are Kolej Kediaman Pagoh 1, Kolej Kediaman Pagoh 2, and Kolej Kediaman Pagoh 3. The total number of students is 2187 means the number of samples in this study is 322 based on Krejcie and Morgan's sampling method in Table 3[13].

**Table 3: Number of samples**

| Population size | Sample size |
|-----------------|-------------|
| 1250 | 294 |
| 1500 | 306 |
| 2000 | 322 |
| 2500 | 333 |
| 3000 | 341 |

Types of sampling methods are non-probability which is a convenient sampling method. Convenience sampling is a type of non-probability in which individuals of the target population are chosen for the research based on practical reasons such as geographical closeness, availability at a specific time, simple accessibility, or desire to volunteer [14]. The survey method used in this study is an online survey by distributing a questionnaire using Google Form to students in Kolej Kediaman Pagoh. This survey is about students' satisfaction with the performance criteria of student housing facilities in Kolej Kediaman Pagoh. The researcher uses social media such as WhatsApp, Instagram, Facebook, and Twitter. In this way, data collection will be easier and faster than using paper and one interaction.

In this research, frequency analysis is used to analyse the frequency and the percentage of students' satisfaction on the performance criteria of student housing facilities in Kolej Kediaman Pagoh. Meanwhile, descriptive analysis is used to analyse the mean and standard deviation for each criteria performance. A large mean value indicates the respondent agrees with the statement, while a small standard deviation value approaching 0 is better because it describes a homogeneous change between individual scores around the mean score value. In addition, the Pearson correlation coefficient analysis was also conducted in this study. According to [15], even though the correlation coefficient does not indicate the causal link between two variables, it is helpful in many scientific fields. The Pearson correlation coefficient is used to determine the relationship between variables in this study. SPSS was

chosen as a data analysis tool in this study because it can handle essential data in easy steps, reducing the time required. Furthermore, the output may be received in the form of a graphical depiction, allowing the user to comprehend the result readily.

## 3. Results and Discussion

The data analysis was carried out to assess the students' satisfaction on performance criteria for student housing facilities in Kolej Kediaman Pagoh using Post Occupancy Evaluation (POE). Seven performance criteria were identified from the literature review and tested in a survey involving 322 respondents of the student from UTHM that live in Kolej Kediaman Pagoh.

3.1 Frequency analysis results

Frequency Analysis is a branch of statistics that studies the number of occurrences and examines mean, median, mod, central tendency, dispersion, and percentile. The frequency analysis for demographic information and performance criteria in student housing facilities are as below:
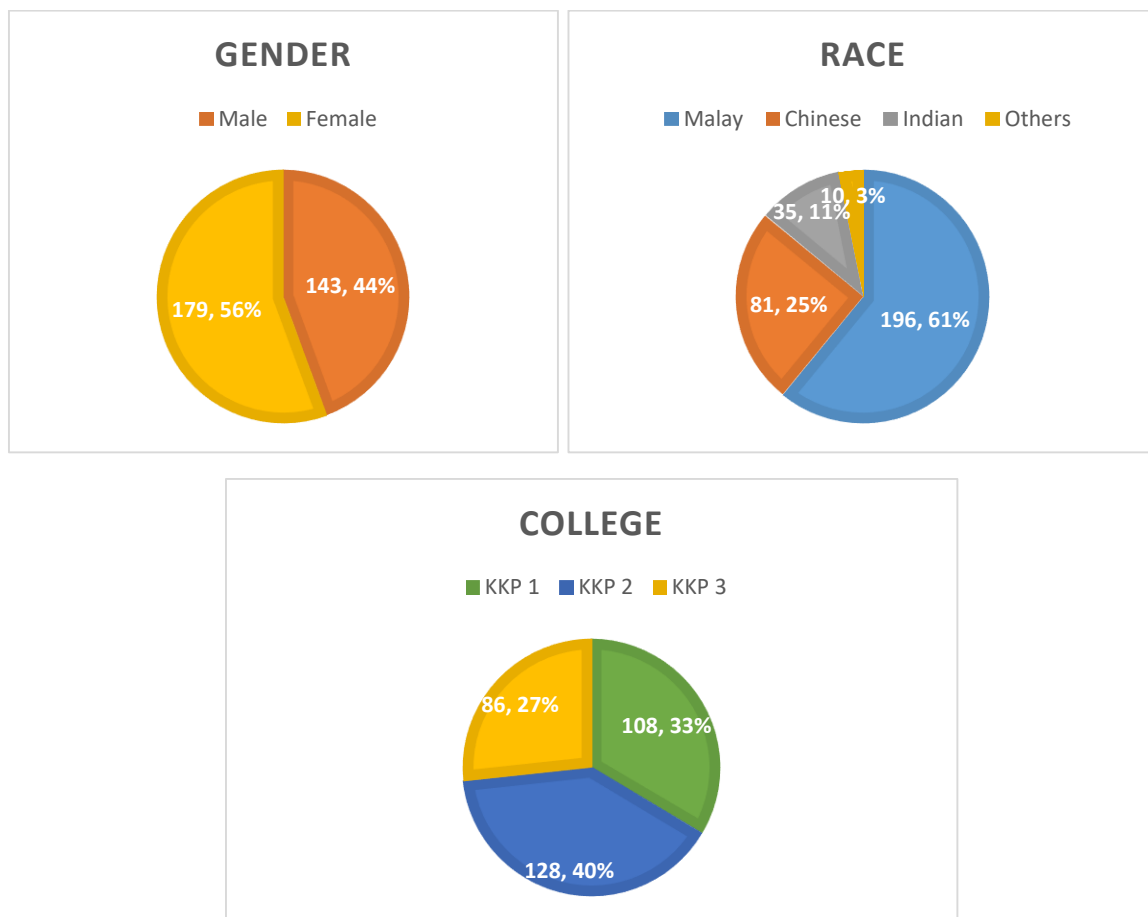


**Figure 2: Demographic information**

Based on Figure 2, the highest percentage for gender was female respondents with 56 percent and the frequency 179 from 322 respondents. The remaining responders were male, with a frequency of 143 and 44 percent. Malay had the most considerable proportion of respondents (61 percent) and 196 respondents. The Chinese were the subsequent most common responders, accounting for 81 and 25 percent. There was an 11 percent response rate, with 35 Indian students participating. The highest number of respondents was Kolej Kediaman Pagoh 2, with 40 percent and 128 respondents. The second-

highest number was from KKP 1, with 108 out of 322 of them with a percentage of 33 percent. Next, followed by the remaining 86 respondents from KKP 3 with 27 percent.

**Table 4: Housing support services and functionality**

| Item | Housing support services and functionality | Frequency (percentage %) | | | | |
|------|---------------------------------------------|------|------|------|------|------|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | The vending machines have a variety of snack and beverages | 1 (0%) | 73 (23%) | 164 (51%) | 80 (25%) | 4 (1%) |
| 2 | The cafeteria is strategically located and does not disturb the comfort of the occupants | 1 (0%) | 43 (13%) | 180 (56%) | 91 (29%) | 7 (2%) |
| 3 | Parking provided in Kolej Kediaman Pagoh are enough for all occupants | 1 (0%) | 65 (20%) | 171 (53%) | 77 (24%) | 8 (3%) |
| 4 | The mini market has a variety of necessities needed by students | 1 (0%) | 59 (19%) | 178 (55%) | 80 (25%) | 4 (1%) |
| 5 | Internet and Wi-Fi services are fast and stable | 10 (3%) | 164 (50%) | 100 (31%) | 43 (13%) | 5 (1%) |
| 6 | Laundry services in Kolej Kediaman Pagoh are functioning well | 4 (1%) | 101 (31%) | 154 (48%) | 59 (19%) | 4 (1%) |
| 7 | Rest and sports areas are provided with adequate equipment | 3 (1%) | 129 (40%) | 124 (38%) | 61 (19%) | 5 (2%) |

Table 4 above shows the highest number of students agreed and strongly agreed was the location of the cafeteria with 91 respondents (29 percent) agreed and seven respondents (2 percent) strongly agreed the cafeteria was strategically located and did not disturb the comfort of the occupants. Furthermore, 84 respondents were satisfied with the parking provided in Kolej Kediaman Pagoh, and 8 of them, with 3 percent, strongly agreed about the statement. For the vending machines and mini market, 80 respondents agreed with 25 percent, and four respondents strongly agreed and were satisfied with the housing support services provided.

However, most respondents disagreed and believed the internet and Wi-Fi services were not fast and unstable in Kolej Kediaman Pagoh, with a total of 164 respondents and 50 percent. There were 10 respondents (3 percent) who strongly disagreed about the statement. The second housing support service students were dissatisfied with was the rest and sports area, with 132 respondents. 129 respondents (40 percent) disagreed, and three respondents (1 percent) strongly disagreed and believed the rest and sports areas in Kolej Kediaman Pagoh were not provided with adequate equipment.

3.2 Descriptive analysis results

Descriptive analysis is used to analyse the mean and standard deviation for each criteria performance. A large mean value indicates the respondent agrees with the statement, while a small standard deviation value approaching 0 is better because it describes a homogeneous change between individual scores around the mean score value.

**Table 5: Accessibility and circulation**

| Item | Accessibility and circulation | Mean | Std. Deviation |
|------|-------------------------------|------|----------------|
| 1 | The accessibility for persons with disability are functioning well | 3.29 | 0.638 |
| 2 | Students are easy to move from one space to another space in the building | 3.31 | 0.654 |
| 3 | The electricity consumption in the hostel building is enough according to the needs of the students | 3.25 | 0.687 |

Based on Table 5, the mean values and standard deviations, most respondents agreed with statements 2 and 1 as their main parameter in accessibility and circulation criteria performance for

student housing facilities in Kolej Kediaman Pagoh. The mean values for items 2 and 1 were 3.31 and 3.29, respectively, while the standard deviation for both items approached the value of 0, which were 0.654 and 0.638, respectively.

### 3.3 Pearson correlation coefficient

Pearson correlation coefficient analysis was also conducted in this study. According to [15], even though the correlation coefficient does not indicate the causal link between two variables, it is helpful in many scientific fields. The Pearson correlation coefficient is used to determine the relationship between variables in this study.

**Table 6: Pearson correlation coefficient**

| Item | Variables | Correlation coefficient value (r) | Interpretation of relationship between variables |
|------|-----------|-----------------------------------|--------------------------------------------------|
| 1 | Proximity to essential facilities | 0.140 | Very weak positive |
| 2 | Cleaning and maintenance | 0.141 | Very weak positive |
| 3 | Security and safety | 0.119 | Very weak positive |
| 4 | Privacy and territory | 0.173 | Very weak positive |

Table 6 above clearly proves four significant positive relationships between gender variables with performance criteria of student housing facilities in Kolej Kediaman Pagoh. The value of the Pearson correlation coefficient, r for the relationship between gender and performance criteria in terms of proximity to essential facilities is 0.140. The value of p is 0.012, which is smaller than 0.05 ($r = 0.140$, $p < 0.05$). Next, significant between gender variables with cleaning and maintenance. The value of Pearson correlation coefficient, r for the relationship is 0.141 while the value of p is 0.011, which is smaller than 0.05 ($r = 0.141$, $p < 0.05$).

Furthermore, there is a significant positive relationship between gender variables with security and safety. The value of Pearson correlation coefficient, r for the relationship is 0.119 while the value of p is 0.033, which is smaller than 0.05 ($r = 0.119$, $p < 0.05$). For the last item, there is a significant positive relationship between gender variables with privacy and territory in Kolej Kediaman Pagoh. The value of Pearson Correlation coefficient, r for the relationship is 0.173 while the value of p is 0.002, which is smaller than 0.01 ($r = 0.173$, $p < 0.01$).

There is a relationship between the genders with four performance criteria of student housing facilities in Kolej Kediaman Pagoh. The interpretation of the relationship for all variables, proximity to essential facilities, cleaning and maintenance, security and safety, and privacy and territory, is very weakly positive.

### 3.4 Discussion

The housing support services and functionality of student housing facilities in Kolej Kediaman Pagoh consist of the vending machines, cafeteria, parking lot, mini market, Internet and Wi-Fi services, laundry services, and rest and sports areas. From the frequency and descriptive analysis data, most students were satisfied with the cafeteria's location. Respondents believed the cafeteria was located strategically and easy to access. It also does not disturb the comfort of other occupants with the smell of cuisine and food from the cafeteria. However, Kolej Kediaman Pagoh users were not satisfied with the internet and Wi-Fi services provided by UTHM facility management. Students think that the Internet and Wi-Fi provided are very slow and unstable for daily use. Therefore, the facility management needs to improve internet and Wi-Fi services in Kolej Kediaman Pagoh to not interfere with students learning. In addition, another aspect that does not meet student satisfaction is in terms of sports equipment and rest areas available in student residential colleges. Most students were dissatisfied with the sports

equipment and rest areas as they could not use the facilities. It may be due to a lack of equipment and not being placed in the proper location.

The accessibility and circulation of student housing facilities in Kolej Kediaman Pagoh consist of the persons with disability facilities, the student's movement from one space to another space in the building, and the electricity consumption in the hostel building. From the frequency and descriptive analysis data, most of the students were satisfied with the student's movement from one space to another space in the building. Students can quickly move from one area to another space in the building due to the use of stairs that are easy to access on each floor. However, respondents believed the electricity consumption in the hostel building was not sufficient according to the needs of the students. It may be due to some students using electrical equipment over the limits set by facility management. Therefore, the facility management needs to be sensitive to the energy consumption for each student residential building so that unwanted things do not happen, such as short circuits and power outages.

## 4. Conclusion

Seven criteria for performance were identified in the literature review. In conclusion, the performance criteria needed for student housing facilities in Kolej Kediaman Pagoh are the comfort and space performances, accessibility and circulation, housing support services and functionality, proximity to essential facilities, cleaning and maintenance, security, and safety, and privacy and territory. The students' satisfaction with student housing facilities in Kolej Kediaman Pagoh shows an outstanding level of satisfaction. It shows the building is in good condition and performs well except for internet and Wi-Fi services and rest and sports areas in the housing support services and functional performance criteria. From this study, the facility management can find out the level of performance criteria of student housing facilities, the condition of the building, and the performance criteria that need to be improved and require maintenance. In addition, facility management can further improve the needs and comfort of student housing facilities at Kolej Kediaman Pagoh according to the comfort of building users. This study accomplished both of its objectives.

The recommendation for future study is to investigate POE and a diagnostic POE toward student housing facilities to objectively analyse the building's performance. It can assist the facility manager in understanding the causes and impacts of building performance concerns and subsequently propose a solution to the problem. There is a list of recommendations for future study to take further action:

i. The importance of performance criteria towards building's performance

ii. The causes of the issues of performance criteria among students

iii. The performance criteria of student housing facilities among the expertise and facility management

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