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EARLY VIEW

Prioritizing the Maintenance of University Hostels to Improve Students' Satisfaction

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Abstract: The maintenance of university hostels is found to be unsatisfactory due to budget constraint in general. Hence, the purpose of this paper is to find out a solution to improve the building maintenance and student satisfaction within the budget allocation. The development of maintenance prioritization framework through the association between conditions of building components and student satisfaction is done to achieve the purpose of this research. Seven main building components were listed after a thorough literature review. Then, a total of 415 valid questionnaire responses were analysed to measure the conditions of building components and to establish the relationship between the conditions of building components and student satisfaction. Moreover, semi-structured interviews were carried out to validate and further interpret the survey findings. The research findings confirmed that utilities and floor as the significant building components to be prioritized in maintenance. It is worthwhile to be served as a guide to other university hostels. Furthermore, it opens a research opportunity to cover other institution hostels. This research is informative to the university hostel managements in efforts to improve the maintenance efficiency within limited budget. The paper proposes a solution to tackle the maintenance issues in university hostels.

Keywords: maintenance priority, university hostels, maintenance cost, occupant satisfaction, building condition

INTRODUCTION

Facilities management encompasses various aspects, including operation and maintenance, to ensure the longer lifespan of buildings and components (Nafrizon et al., 2020). It plays a vital role in supporting the core business of an organization by retaining the operation, productivity, and performance of the facilities (Alsayyari et al., 2019). Besides, Nafrizon et al. (2020) highlighted that operation and maintenance is the main focus in facilities management to sustain the building functionality. Therefore, the application of facilities management, particularly operation and maintenance, is of paramount important.

According to Talib et al. (2014), the physical appearance of public institutional buildings, including university buildings, creates the foundations of society to make the first judgment for the quality of services provided by the maintenance team. The maintenance of university hostels is important to maintain the life cycle of the building and minimize the cost of building maintenance (Ab Wahab and Hasan Basari, 2015). Adequate budget allocation in acquiring manpower and equipment for maintenance is crucial to ensure the continuous implementation of preventive maintenance (Au-Yong et al., 2014b). Unfortunately, the lack of budget leads to improper preventive maintenance to be executed and eventually leads to negative impacts on the part of production, security, environmental integrity, system quality, customer satisfaction and extra cost to be brought about (Au-Yong et al., 2014a). Izobo-Martins et al. (2018) stated that neglect of maintenance results in greater deterioration of the material and textures of the building and

hence leads to damages to the building and its inhabitants. Nevertheless, they found that some of the stakeholders tend to sustain minimal maintenance costs, disregarding the negative impact of inadequate maintenance.

The complaints lodged by the students to the college or hostel management towards maintenance show that the buildings are still in need of high maintenance (Ilyana et al., 2014, Osazuwa et al., 2021). The building maintenance service begins with some information about the deterioration of the building components, either through the investigation of the building by the maintenance team or through the hostel management responding to users' complaints (Olanrewaju et al., 2011). Most of the time, the type of maintenance work carried out by the university hostels are corrective maintenance (Sanusi, 2019). The general observation by Philip et al. (2018), showed that the hostel maintenance is not concentrated to the needs of the student as well as no evaluation has been carried out from hostel users. The maintenance works are carried out based on the maintenance budget rather than users' interest. Therefore, the satisfaction of students is neglected, and the assessments are seldom taken into consideration for further improvement. Studies also show that due to limited budget, current maintenance is carried out only on certain components that are damaged without a thorough assessment of all building components (Fawzy et al., 2017).

The assessment for the building components by Adamu and Shakantu (2016) revealed that the walls, floors and roofs of hostels in many encased spaces such as rooms, show fluctuating degrees of deterioration. In many

rooms, there are small cracks and worn finishes with an indication of insufficient regular maintenance. There are many doors and windows with enormous issues, such as damaged locking devices and door handles, broken window sheets and door panels as well as toilets that nearly do not work and require urgent maintenance. Besides, the plumbing services in the hostels are in poor condition, and some of them were viewed as unsatisfactory for their utilization. Overall, Alsayyari et al. (2019) argued that the current maintenance practice in higher education institutions is weak and the conditions of buildings, components, and facilities are not well maintained. The significant relationship between building maintenance and building components are proven Yacob et al. (2019) too. The researchers further debated that there is no implementation of preventive maintenance in general.

Recently, some researches revealed the disappointment of students towards building component defects like roof leakage, broken door and window, inconsistent water supply, power supply disruption, and poor ventilation in their hostel (Simpeh and Shakantu, 2020a, Simpeh and Shakantu, 2020b). These defects indirectly affect the students' comfort in terms of indoor air quality, temperature, humidity, security, cleanliness, and lighting quality (Adewunmi et al., 2011, Ikediashi et al., 2020). Ojedokun et al. (2012) recommended that a few deformities require urgent maintenance contrasted with others and dependent on which it is inferred those resources ought to be coordinated to the most critical, while the less critical ones could be incorporated into the subsequent maintenance program. The survey done

by Ajayi (2014) found that bathroom and bathroom accessories, faulty electrical systems, faulty locks, fire extinguishers, fire alarms, and smoke detectors are the flaws due to human activities that respondents consider extremely urgent to maintain.

Recent research by Sanusi (2019) also argued that poor maintenance in university hostels implicates decay and deterioration of building components and hence, affecting the students' productivity and satisfaction. Taking into cognizance the maintenance inefficiency and budget constraint that influencing student satisfaction, this paper seeks to find out a solution to improve the building maintenance and student satisfaction within the budget allocation. Maintenance prioritization is proven to be effective in optimizing the maintenance budget (Au-Yong et al., 2019b). Moreover, Simpeh and Shakantu (2020b) highlighted the existence of gaps between students' expectation and university prioritization towards the management and maintenance of the hostel facilities. Thus, the student satisfaction towards maintenance prioritization is crucial for studies on the improvement and development of maintenance work in the university hostels. Consequently, this paper aims to develop the maintenance prioritization framework for university hostels by measuring the level of student satisfaction towards the conditions of building components in the university hostels. Hence, the outcomes will be able to provide valuable information as a guideline to the building maintenance management.

MAINTENANCE IN MALAYSIAN UNIVERSITIES

In Malaysia, the government allocates the fund to public universities for operation and maintenance. On the other hand, private universities utilize student fees for operation and maintenance. The maintenance practices in private universities focus more on customer orientation. Therefore, some researchers are still arguing that student is the customer and the maintenance should be customer-oriented(Nafrizon et al., 2020). However, the budget allocation for the operations of public universities by the Government of Malaysia is insufficient, particularly for the maintenance works (Palis, 2019). According to Farahani et al. (2019), building maintenance is a complex task, mostly due to the density of buildings in terms of its large number of components that have different maintenance requirements.

The effectiveness of the maintenance planning is the key element to influence the routine of general maintenance management. Likewise, the hostel buildings in the university campus need effective maintenance to preserve the condition of building components. According to Farhana Omar et al. (2017), inappropriate building maintenance management by the organization will significantly interrupt general building maintenance. The researchers also specify that the most significant factor for successful maintenance management is the proper planning and maintenance approach to handle the building.

In fact, the relationship of student satisfaction with the hostels' maintenance is significant for getting to know the students' comfortability with the maintenance services provided by hostel management (Au-Yong et

al., 2015, Ismail et al., 2017). Nafrizon et al. (2020) stated that occupant satisfaction can be measured to check if the requirements or expectations of the occupants are fulfilled. Thus, the study needs to evaluate the conditions of the building components in university hostels and associate them with student satisfaction. Consequently, the students' expectations towards the conditions of building components can be determined. Eventually, it will lead to prioritization and generating of information on the building maintenance requirements (Adamu and Shakantu, 2016, Au-Yong et al., 2019a).

BUILDING COMPONENTS OF UNIVERSITY HOSTELS

According to Thohir et al. (2017), there are seven building components that are important for the building maintenance in university hostels, including roof, ceiling, wall, door & window, floor, foundation, and utilities as shown in Table 1. These building components deteriorate under various conditions, including wear and tear, climate change and ageing process. The selection of appropriate and high quality materials for the maintenance of building components is crucial (Palis and Misnan, 2018). Nevertheless, maintaining all the building components concurrently may incur enormous expenses (Au-Yong et al., 2019b). Hence, maintenance prioritization may be a wise approach to optimize the conditions of the building components within the limited budget (Velmurugan and Dhingra, 2015, Amos et al., 2021b).

Table 1. Building components of university hostels

No	Building Component	Sub Building Component	Review
1	Roof	Roofing Roof frame Roof gutter	• Roof is a very important component to any buildings. • Failure of the roof may cause the buildings unsuitable for occupants and implicate vulnerability to buildings and to users. • Delaying actions to replace collapsed roofs can lead to much greater damage to the wall structures, thus exposing the contents of the structure to damage (Adesogan, 2018). • Regular roof inspection and maintenance is crucial to prolong the lifespan of the roof and avoid any further damages as a result of roof failure (Michelsen, 2016).
2	Ceiling	Frame of ceiling Ceiling cover Paint	• Ceilings help to create an enclosure and a separation between spaces (Cassell and Parham, 2001). • They control the spread of light and sound in a room as well as prevent the passage of sound between rooms; act as the passive firefighting system; accommodate construction offers such as vents, lighting, and sprinklers; conceal different fittings or services such as ducts, pipes, and wiring (Sanford, 2014). • Proper ceiling maintenance is essential as it improves indoor air quality (Odeyemi et al., 2019).
3	Wall	Lintel and column Brick masonry wall Paint	• Wall partitions a building into multi spaces and provides privacy (Ugwu et al., 2018). • Wall can present or feature sandwich-type insulation. • In maintenance aspect, external walls should be inspected carefully at least once a year (Thohir et al., 2017).
4	Door & window	Sill Door Window	• Openings are regularly given within the dividers as the entryway, windows, and ventilators. • Doors give entry and exit; windows and ventilators give light and ventilation. • They direct the measure of air and daylight that enters a building as well as secure the property of the occupants (Ugwu et al., 2018). • Windows and doors deteriorate over time due to age, use, wear, and exposure to the weather (Odeyemi et al., 2019). • Proper maintenance will ensure that they remain in good operating condition.
5	Floor	Structure	• Floor includes a wide variety of different types

		Floor finishes	of surfaces, which meet both human and natural environments (Tena-Colunga et al., 2015).
			• It experiences the most action, inhabitants stroll on the floor and substantial moveable burdens are positioned to remain on the floor on a specific spot for quite a while without repositioning, every one of these causes wear and tear to the floor (Ugwu et al., 2018).
			• Floor maintenance emphasizes on the aspects of safety, appearance, and cleanliness, as well as following a routine maintenance program that helps shield the floor area (Amos et al., 2021a).
6	Foundation	Foundation Foundation beam	• Foundation is vital for transmitting the entire stack of buildings on the ground in the same way so that no harmful settlements occur.
			• Therefore, establishments must be developed on a good or solid basis or ground (U.S. Environmental Protection Agency, 2013).
			• Poorly built foundations, unlike poorly installed gutters or wooden floors with holes, can eventually bring down the entire building.
			• Defects on a foundation rarely occur. Nevertheless, the condition of the foundation must be monitored as it supports the whole structure of a building (Thohir et al., 2017).
7	Utilities	Electrical Water supply Internet network	• Utilities in university hostels encompass electrical system, power supply system, and internet network system to cater the needs of students.
			• Water supply frameworks need to convey satisfactory measures of water to meet consumer utilization, and in the meantime be dependable and accessible to give the required water 24 hours, 365 days in a year (Mwanza and Mbohwa, 2016).
			• Importance of power supply and internet network to be available continuously.
			• Internet significantly affects the educational process (Siddiquah and Salim, 2017).
			• Especially during the COVID -19 pandemic, most of the teaching and learning activities are conducted through e-learning platforms that require electricity and internet provisions (Mishra et al., 2020).
			• Proper preventive maintenance may help to prevent failure of the utilities to that might jeopardize the students' activities.

METHODOLOGY

After a thorough review of literature, the theoretical framework of the study was developed as shown in Figure 1. To achieve the aim of this paper, this research adopted a mixed method approach involving two basic approaches, which were quantitative and qualitative approaches. The research process involved an explanatory sequential mixed method as illustrated in Figure 2, that enabled the answer to research questions as unambiguously as possible. The data collection was begun with the questionnaire survey. The survey data was then analysed using Statistical Package for the Social Sciences (SPSS) software. To validate and further elaborate the survey findings, a semi-structured interview was conducted after the data collection and analysis of the questionnaire survey. Subsequently, the results could be interpreted and concluded.

Condition of Building Components
- Roof
- Ceiling
- Wall
- Door & Window
- Floor
- Foundation
- Utilities

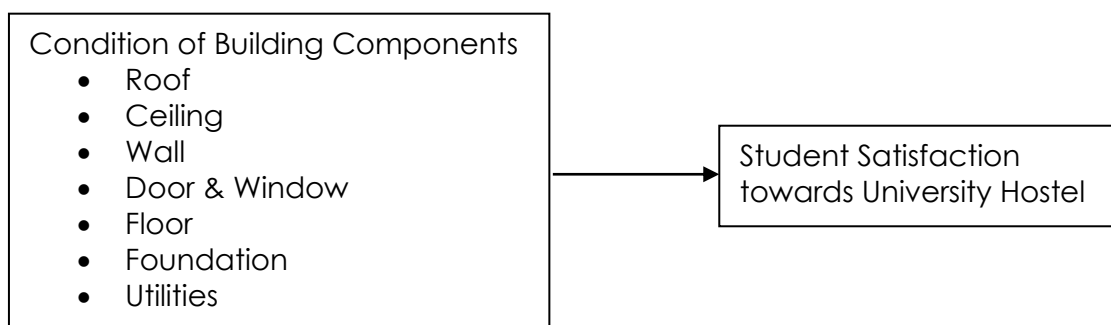Student Satisfaction towards University Hostel

Figure 1. Theoretical framework – condition of building components towards student satisfaction
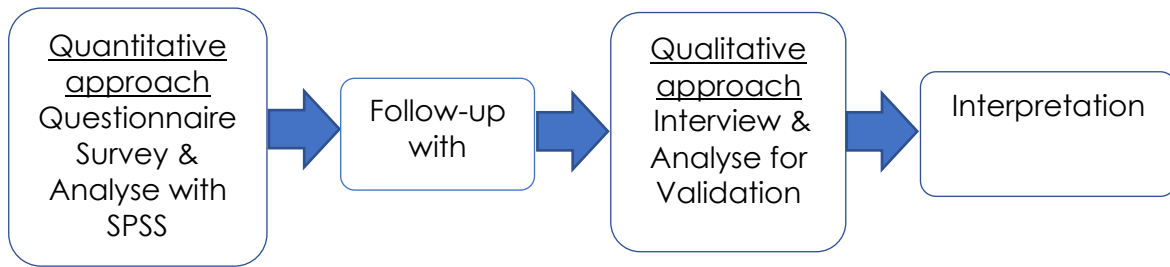
Figure 2. Research process - explanatory sequential mixed method

Scope of Research

Universiti Malaya (UM) is the first and top university in Malaysia (QS Quacquarelli Symonds Limited, 2021). Thus, it becomes a benchmark to most of the public universities as well as the private universities in Malaysia for their policymaking and operations. In UM, there are twelve hostels located around the campus. Each hostel is managed by a principal and assisted by Fellows, including maintenance staff. The hostels are occupied by approximately 12,585 students. As such, UM was selected as the scope of research for data collection purposes.

Typically, all the twelve hostels in UM are multistorey buildings as shown in Figure 3. Each hostel consists of various building blocks to accommodate its purposes. The hostels offer not only accommodation for students, but also facilities such as sports and recreation areas, reading rooms, grocery outlets, cybercafes, computer labs and multipurpose halls. They are constructed in similar construction technology and materials, including reinforced concrete structural frames, plastered brick walls, tiled floors, and pitch roofs. Therefore, all of them were considered in the study.

Figure 3: Hostels in UM

Data Collection and Analysis

According to Kothari (2004), the survey is the sample of the population studied that is based on interrogation or observation to determine its characteristics and then relate it to the population. The quantitative data was obtained by distributing the questionnaire to the students staying in the university hostels, which consisted of 12,585 students in twelve hostels around the UM campus (data obtained from the administration of the Student Affair Division, UM). Thus, the minimal sample size of the study was 375 as obeyed to sample size table of Krejcie and Morgan (1970). To cover equal representations from the students of twelve hostels, the stratified random sampling method was employed. A total of 415 responses were gathered upon completion of the questionnaire survey. The male and female respondents were 34.5 percent and 65.5 percent, respectively. The

percentage distribution is due to the higher numbers of female students compared to male students. Meanwhile, most of the respondents were undergraduate students (98.8 percent) as the hostel management offered accommodation priority to the undergraduate students instead of the postgraduate students. At the end of the survey, it would provide a critical and analytical perspective through data analyses (including ranking analysis, correlation analysis, and logistic regression analysis) to student satisfaction, which were correlated to the conditions of building components (Ajayi, 2014).

In other methods, the qualitative approach refers to the subjective evaluation of attitudes, opinions and behaviours of the population (Kothari, 2004). The qualitative approach of research was the semi-structured interview with twelve maintenance personnel, each from different hostels to verify and validate the outcome of the survey responses. The interview findings were also intended to further elaborate the survey results. Lastly, the recommendations about the maintenance prioritization were interpreted in accordance with the survey and interview results.

FINDINGS AND DISCUSSION

To identify and distinguish the needs of maintenance for the building components of the hostel buildings, ranking analysis was performed to compute the average condition scores of the building components. The average condition scores may range from 1=very poor to 5=excellent. Table 2 indicates the average condition score of every building component rated by the survey respondents.

Table 2. Average condition scores of the building components

Condition of Building Component	N	Mean	Std. Deviation
Roof	415	3.93	.747
Ceiling	415	3.84	.821
Foundation	415	3.82	.780
Wall	415	3.75	.910
Door & window	415	3.70	.910
Floor	415	3.68	.903
Utilities	415	3.52	.940

Based on the given table, the priority of the maintenance could be easily identified in ascending order or from bottom to top. The bottom three components were identified as having the lowest average condition scores compared to the top four components. Hence, the findings highlighted that the condition of utilities, floor, and door & window are the main components that need to be given priority for maintenance in the hostel buildings.

Most of the time the occurrence of building defects could be due to human factors, faulty design, lack of maintenance, inappropriate material used, and improper assembly and installation of equipment in the hostels (Yacob et al., 2019). In the case of utilities, however, there were two contributing factors, namely lack of maintenance and human error. For example, the students were found using additional electrical appliances and resulting power supply trip. Then, the poor usage of toilets by the students also led to the issues of clogged toilets. These examples were related to poor user behaviours (Palis and Misnan, 2018). Next, faulty water pumps occurred due to lack of maintenance, causing low water pressure and low water levels in

storage cisterns. Based on the interview findings, eleven of the interviewees revealed that there were defects and maintenance issues of the utilities, including water supply system, power supply system, as well as internet network strength and stability. For the floor, defects related to dirt, cracks and holes were common, especially in the students' rooms and corridor. The causes of the defects were lack of care or cleaning by the students and improper moving in and out of large belongings. Again, maintenance issue as a result of poor user behaviour was recorded (Palis and Misnan, 2018). An interviewee also highlighted that no maintenance concern was given to the floor component. The floor finishes that made of cement rendering experienced an ageing process and hence developed with cracking defects. In fact, floor maintenance should focus on the aspects of safety, appearance, and cleanliness (Amos et al., 2021a). Door & window also possessed common defect problems in the hostels. The defects on door & window were always regarded with wear and tear factor. One of the interviewees listed the common defects of door & window, including faulty door lock, damaged doorknob, and broken window handle.

Then, the Spearman rank-order correlation was carried out to establish the relationship between the conditions of building components and student satisfaction. This correlation analysis was selected as it is suitable to analyse either or both ordinal-scaled variables (Graziano and Raulin, 2010). Referring to Table 3, note that the *r* is the correlation coefficient and asterisks are placed next to the *r* values indicating the probability is less than or equal to .01 to flag these as statistically significant correlations (Gray and Kinnear,

2012). Furthermore, the researcher stated that the correlation coefficient ranges from -1 to +1, the value indicates the strength of the relationship while the sign (- or +) indicates the direction. Coefficient, $r < .30$ indicates a weak relationship; $.30 < r < .50$ indicates a moderate relationship; and the $r > .50$ indicates a strong relationship (Saunders et al., 2009).

Table 3. Relationships between conditions of building components and student satisfaction

	Spearman's rho	Student Satisfaction
Condition of roof	Correlation coefficient	.494**
	Sig. (2-tailed)	.000
Condition of ceiling	Correlation coefficient	.529**
	Sig. (2-tailed)	.000
Condition of wall	Correlation coefficient	.528**
	Sig. (2-tailed)	.000
Condition of door & window	Correlation coefficient	.457**
	Sig. (2-tailed)	.000
Condition of floor	Correlation coefficient	.569**
	Sig. (2-tailed)	.000
Condition of foundation	Correlation coefficient	.581**
	Sig. (2-tailed)	.000
Condition of utilities	Correlation coefficient	.622**
	Sig. (2-tailed)	.000

**. Correlation is significant at the 0.01 level (2-tailed).

With this, the findings summarized that all the building components were significantly correlated to the student satisfaction. The interviewees validated the survey findings. Many of them agreed that the poor condition of any building components would lead to student dissatisfaction and hence lodging complaints to the hostel management. The correlation coefficient indicated that the condition of door & window and the condition of roof

were in a moderate relationship with *r* above .30 but less than .50 compared to the other components, which indicated *r* values of more than .50. Utilities was having the strongest relationship with student satisfaction as compared to other components, with correlation coefficient, *r* = .622. Meanwhile, the positive correlations of all the building components with student satisfaction demonstrated that the better the conditions of the building components, the higher the level of student satisfaction.

Having mentioned all, the alternative focus for this analysis was to compare the condition of the components towards the overall satisfaction of the students. The condition of the roof was significant to student satisfaction, and this finding supported the statement by Adesogan (2018), that the roof is an important component in any building maintenance. Mijinyawa et al. (2007) also supported that the roof is the protection of the internal structure of the building. Failure of the roof component can harm the building structure and eventually lead to severe damage to the entire building.

Next, the condition of the ceiling showed stronger relationship with student satisfaction compared to the roof. This finding also agreed to the statement by Cassell and Parham (2001), that ceilings help create an enclosure and a separation between spaces. Not only that, but they also help to control the spread of light and sound in a room as well as prevent the passage of sound between rooms. Thus, ceiling requires proper maintenance planning according to the condition of the building. Following would be the condition of the wall which was like the ceiling component. The correlation coefficient indicated that there was a strong relationship towards student

satisfaction. As supported by Ugwu et al. (2018), the wall is the critical component in the building which portioned the building and serves the purpose significantly.

Subsequently, the condition of door & window indicated a moderate relationship though it had a significant relationship with the overall satisfaction of the students. The finding supported Ugwu et al. (2018) that proper maintenance would help prevent major damage from the door & window and optimize the security and safety of the occupants and assets. Then, the condition of the floor clearly showed that there was a strong relationship with overall student satisfaction. Obviously, it fell into the top three components that had higher significance value. This finding showed that the main observation that someone makes when he/she enters the hostel building is the floor, which reflects the condition and maintenance carried out in the hostel's facilities depending on cleanliness and tidiness of the floor condition.

Surprisingly, the condition of the foundation was having the second strongest relationship with student satisfaction. Even though the foundation of the building was quite hard to observe and identify, it still influenced the overall satisfaction of students. The U.S. Environmental Protection Agency (2013) strongly supported that the building foundation is crucial and should not be treated as an ordinary maintenance component (Odeyemi et al., 2019). Finally, the condition of utilities was having the strongest relationship with student satisfaction. Varies researchers disclosed that the water supply, electrical supply, and internet provision are the fundamental requirements for any hostel buildings (Mwanza and Mbohwa, 2016, Siddiquah and Salim, 2017).

Mwanza and Mbohwa (2016) revealed that there should be a proper framework for the utilities to be optimized to function as the crucial elements in building maintenance.

To further validate the relationships between conditions of building components and student satisfaction, logistic regression analysis was performed. This analysis helped to identify the significant predictors of student satisfaction too. By running forward stepwise method, the insignificant predictors (with significance value more than 0.05) would be excluded from the regression model automatically. In the analysis, student satisfaction was coded to 0 and 1, indicating not satisfied and satisfied, respectively.

Table 4. Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1[a]	ConditionUtilities	1.806	.226	63.774	1	.000	6.086	3.907	9.481
	Constant	-3.786	.659	32.968	1	.000	.023		
Step 2[b]	ConditionWall	1.016	.202	25.349	1	.000	2.762	1.860	4.101
	ConditionUtilities	1.693	.245	47.763	1	.000	5.436	3.363	8.786
	Constant	-6.782	.988	47.155	1	.000	.001		
Step 3[c]	ConditionWall	.768	.216	12.600	1	.000	2.156		
	ConditionFloor	.785	.253	9.599	1	.002	2.191	1.411	3.296
	ConditionUtilities	1.607	.261	37.836	1	.000	4.988	1.334	3.600
	Constant	-8.215	1.191	47.594	1	.000	.000	2.989	8.324

a. Variable(s) entered on step 1: ConditionUtilities.
b. Variable(s) entered on step 2: ConditionWall.
c. Variable(s) entered on step 3: ConditionFloor.

As tabulated in Table 4, the SPSS developed three steps to include three predictors that significantly contributed to the logistic regression model. Step 1 confirmed the condition of utilities significantly predicting the probability of student satisfaction with X^2 = 104.82, p < .05. Then, Step 2 included the condition of wall with X^2 = 28.82, p < .05. After that, Step 3 indicated the condition of floor significantly predicting the change of student satisfaction with X^2 = 10.04, p < .05. Consequently, there were three independent variables significantly predicting if the students are satisfied with the condition of hostel buildings (X^2 = 143.68, p < .05). In this case, 52.0% of the variance in student satisfaction could be predicted from the conditions of utilities, wall, and floor. Then, the p-value for Hosmer-Lemeshow goodness of fit was 0.083, which was more than 0.05. Hence, the model adequately fit the data. Following to this, the logistic regression equation was produced as follows (see Table 4):

$$Z = -8.215 + 1.607 \text{ (ConditionUtilities)} + 0.768 \text{ (ConditionWall)} + 0.785$$
$$\text{(ConditionFloor)}$$

Solution to Improve Student Satisfaction and Building Maintenance

The research result has proven that the conditions of building components significantly influencing the student satisfaction towards the hostels. Therefore, adequate maintenance must be implemented to keep the building components in acceptable conditions (Sanusi, 2019). Unfortunately, all the interviewees revealed that the budget allocation for hostel maintenance is

inadequate to resolve all maintenance issues simultaneously. University management allocates a fixed amount of budget annually for the maintenance of each hostel, regardless the needs of maintenance (Palis and Misnan, 2018). Taking into cognizance the limited fund available for maintenance activities, maintenance prioritization is seen as a potential solution to run the maintenance works effectively within budget (Au-Yong et al., 2019b). Based on the findings produced from the ranking analysis, correlation analysis, and logistic regression analysis, the conditions of utilities and floor are the building components that require an utmost concern in the hostel buildings. Thus, top priority should be given to the maintenance of utilities and floor at the current stage. In consideration of the COVID-19 pandemic, the provision of stable power supply and internet network is crucial so that the e-learning process can be done without unwanted disruption (Mishra et al., 2020). Meanwhile, the provision of consistent water supply could ensure the student to upkeep their hygiene level (Amos et al., 2021a). The floor that experiences frequent contact from occupant movements must be cleaned and sanitized regularly to reduce the chance of disease spreading, while securing student satisfaction level. In summary, the maintenance prioritization framework is proposed as in Figure 4.
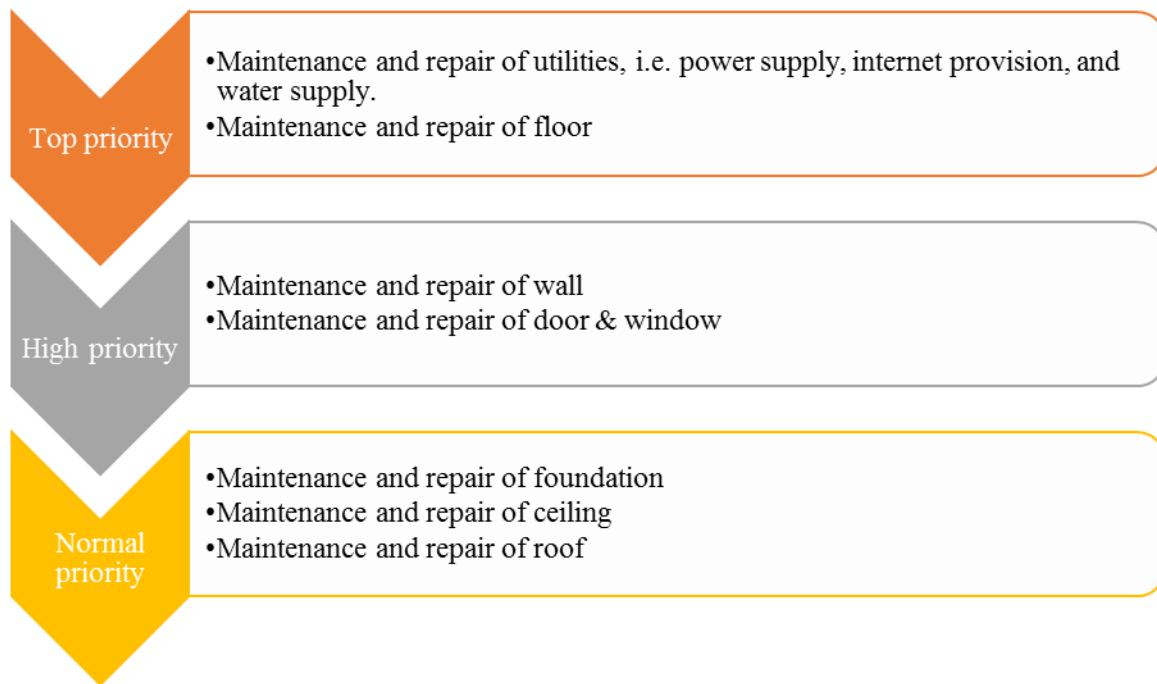
Figure 4. Proposed maintenance prioritization framework

Significance of the Findings and Result

Many previous studies on hostel facilities focuses on the occupants' perceptions such as indoor air quality, thermal comfort, sense of security and privacy via post-occupancy evaluation (Ab Wahab and Hasan Basari, 2015, Adewunmi et al., 2011, Ikediashi et al., 2020, Philip et al., 2018, Simpeh and Shakantu, 2020a). These perceptions are indeed influenced by the physical conditions of the hostel buildings and components. Therefore, this study investigates the physical conditions of different building components in hostel buildings. The result reflects the needs of maintenance priority to each building component based on the occupant (student) feedback. It is easier and simpler for hostel managements to adopt or apply the prioritization framework in their maintenance planning and execution directly. Furthermore, the research approach can be adopted by researchers in other regions with

distinct climate conditions, construction technology and materials, as well as teaching and learning cultures. Whereby, the researchers might determine the varied priority rankings of the building components because of those distinctions.

CONCLUSION

The literature review discusses the importance of building maintenance to keep all building components in acceptable conditions. Due to the budget constraint faced by the university hostels, however, it is almost impossible to maintain all the building components simultaneously. Thus, the only remedy is to introduce the maintenance prioritization to maintain the building components by stages with the available budget. The study suggests prioritizing the building component maintenance based on the student expectation and satisfaction.

The research results demonstrate that the building components that are of paramount importance to be maintained include utilities and floor. These building components have been demonstrated as essential for the hostel buildings to be operable in an acceptable condition, especially during the COVID-19 pandemic. Whereby, the students heavily rely on the usage of utilities like electricity supply and internet network for learning and communication purposes. Furthermore, the water supply for cleaning purposes and the hygiene level of floor are likely to minimize the spread of disease. In overall, the maintenance priority of the building components in hostel buildings should be ranked as follows:

1. Utilities (top priority)

2. Floor (top priority)

3. Wall (high priority)

4. Door & window (high priority)

5. Foundation (normal priority)

6. Ceiling (normal priority)

7. Roof (normal priority)

In conclusion, the introduction of maintenance prioritization in university hostels is critical in fulfilling the student expectation as well as utilizing the limited maintenance fund. The findings of research can serve as a guide for university hostel managements to plan and implement maintenance planning in a more realistic way within budget constraint. Meanwhile, the research approach is applicable in other regions with distinct climate conditions, construction technology and materials, as well as teaching and learning cultures, to determine the suitable maintenance prioritization framework for different case study.

Limitation of Research

This research focuses on the physical conditions of the building components in university hostels and their effects to student satisfaction. Undeniably, the student satisfaction level towards the university hostels can be influenced by other factors, contributing to a lower percentage of the total variance in the regression model. In addition, the discussion related to COVID -19 pandemic heavily relies on the literature review and authors' views. The survey was

conducted before the pandemic outbreak. Hence, it creates a research opportunity to study the similar topic during or after the pandemic.

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