Investigate the Condition of a Student Accommodation Building based on Complaint Survey

Muhd Zubair Tajol Anuar and Noor Nabilah Sarbini

March 8, 2020

Investigate the Condition of a Student Accommodation Building based on Complaint Survey

Muhd Zubair Tajol Anuar [1] and Noor Nabilah Sarbini [2]

[1] Department of Structures & Materials, Faculty of Civil Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia
noornabilah@utm.my

Abstract. There are many complaints made by publics about defects in the building they associate with including function of building services. Over the years, the deterioration may become worsened if no particular action is taken. This situation will cause unpleasant physical & emotional issues to the teaching and learning in public university. This paper aims to identify the condition of a student accommodation building in one of public university in Malaysia. To achieve the aim of the study, questionnaires were designed and distributed to 10,123 students whose are live at hostel to rate the condition and level their level of satisfaction with the hostel but only about 2,015 students responded and gave the feedback. The type of question in questionnaires were defect of structural components and deficiencies of features. The data collected was analysed using the Statistical Package for Social Science (SPSS) software. Based on the findings, majority students 52-74 % indicate that no structural defect occur in their room. Then, 26-48% of students indicate that had structural defect on their room. However, 80% students indicate all function on deficiencies of features in room. About 20% students agrees that features in their room are not function.

Keywords: Questionnaire Survey, Building Condition, Accommodation Building.

1   Introduction

There are three primary functions of a building; as a shelter from weather; and provides safety and privacy to the users or occupiers. However, the purpose of a building is increasingly functioning with time. A building nowadays has played many roles in order to support human activities. The roles are rapidly changing as human lifestyle changes. In short, today, the role of a building to support our life activity is proliferate.

However, not only roles but the actual performance of the buildings might be decline due to external and internal factor. External factors are mostly due to the weather while the internal factor comes from ageing and need maintenance take place in the building. Olanrewaju, (2011) stated that, building may become shabby and requires maintenance after 5 years as it expected to stand for at least 60 years [1].

Consciously, maintenance is needed for all buildings that had been used ever since the deterioration process begins once the building completed. So, it is not surprised, if the building owners extensively spent on maintenance and replacement of building component each year as an assurance of well perform of their building for long term. The aim of this study is to investigate the condition of a student accommodation buildings based on complaint survey. The university unable to manage about 162 block of student hostel buildings by themselves. Through complaint survey which is distributed to students will help the university managed it well. Then, the university can narrow down which hostels need to inspect and maintain. Jolaoso, et al (2012) indicated that the worsening state in the physical conditions of students' hostels on university will effect to students in term of academic performance, social life and health [2][3].

2   Literature Review

2.1   Student Accommodations

A typical on-campus hostel can be described as accommodation offered by the university authority with regulations and conditions to be followed and a low fee payable by students as a return [4]. It is said that the hostel provides basic necessities such as bedrooms that can serve the dual purpose of study and sleeping. Danso AK & Samuel Fiffi Hammond (2017) evaluated the performance of the hostel's social facilities (water supply, electricity, etc.), building features (room sizes, door sizes, fire safety, etc.), hostel sanitation, noise and security arrangements, and rent costs among others [5].

Ubong (2007) indicated that a campus accommodation consists of a specific sort of building that, in addition to being a shelter for students attending the university, should be of additional significance, i.e. an atmosphere that is comfortable and suitable for studying and academic achievement [6][4]. The main point in all housing facilities is to provide shelter, but then it goes beyond just protection from the elements of the weather such as rain, sun, wind, and dust to include the social aspects of being able to interact and socialize with friends, which is why the demand for housing facilities and services in student housing tends to be the reason [4].

Oke et al. (2017) claimed that for higher education institutions that provide lodging for all their students in a residence on campus where most students reside, there will be more obligations and responsibilities to ensure that the wellbeing of the students is taken care of. Such features include the security, reliability, and cleanliness of the lodging, the size, and worth of the furniture and fittings inside and around the hostel, as well as good internet access [7].

Therefore, there are needs to provide an on-campus hostel with adequate facilities for students to enable them to complete their studies in a comfortable environment. With this approach, it will be able to attract even more local students to pursue their education in the country along with increasing the international student intake [8].

2.2   Assessment of Buildings

The condition of hostel building in academia environment could influence the performance of a students. If the facilities are inadequate or malfunction then the learning process will be hindered and academic productivity will decrease [9]. Condition assessment is the most common method for measuring building performance and identifying maintenance needs of facilities [3].

The purpose of the assessment is to assess the state of the physical elements and building services and to assess the maintenance facilities requirements. The state assessment as a check and observation work on the outside and inside of the building, including the foundation, structure and mechanical system to identify the presence of any damage to the building and its components [10].

According to [11] the scope of inspection are split into a few elements such as architecture & civil, mechanical, electrical and external work. Architectural & Civil elements consisting of basic systems, structures, exterior parts, roofs, interior structures, staircases, ceilings, fixtures and even building structures. Mechanical elements consisting piping systems, air conditioning systems, distribution systems, fire prevention systems and elevators. Electrical elements consisting lighting, communication and security systems. External work components consisting roads, outdoor water reticulation, sewerage systems, retaining walls, sewage treatment plants, and landscape [11][12].

The building inspector gave the information about the components such as defect &condition rating, type defect, amount need to repair and useful information.Therefore, [13] stated that the building inspection is very important to organisation in providing office facilities, accommodation/high quality work in an environment that is safe, comfortable and sustainable manner. Low level of building performance can impact negatively on the organization and involves an increase in operating cost [13].

2.3   Building Defect

The best maintenance and management system of building where the building need to inspect or evaluate either had a defect or good condition. Defects and damages in the building are common phenomenon to building mostly. Defects can be referred to fault on something that detract from perfection, whilst building damage can be seen when any structure, material, equipment and also element of the building was not fully functional [14]. According to Webster's Dictionary, defect is defined as lack of something necessary for completeness; shortcoming. It is also defined as an imperfection; fault; blemish and another term for defect is deficiency [15].

The defect is divided into two categories which is structural and non-structural defect. Structural defect means any defect in a structural element of a building that is attributable to defective design, defective or faulty workmanship or defective material and sometimes any combination of these. Building structure includes earth retaining walls, columns, beams and flat slabs. Structural defect can be categorized as cracks in foundations (Substructure), cracks in floor or slabs (superstructure), and cracks in

walls (superstructure), steel corrosion, cracks, and deflection on components. Structural defects in a building can occur over time due to deterioration, wear and tear, overloading, and poor maintenance. They must be repaired to maintain the building's structure and to prevent any further failures [16]. According to [17]and [18] , structure defect defines as physical damage to the designated load-bearing elements of the building caused by the failure of load-bearing elements which affects their load-bearing functions to the extent that the building becomes unsafe. It is a defect inherent in building structures that can threaten safety for users.

A non-structural defect in a residential building is described as a defect in a non-structural element of the building as a result of defective residential building work. Non-structural defect includes defect occurs in the non-structural components of building, services like in brick work, dampness in old structures, and defects in plaster works [16]. Beside that [19] stated the non-structural exist in building components such as roofs, walls, column, beams, windows, doors, floors, stairs and apron.

Ahmad classified building defects into 14 types as follows [20]:
• Leaks- mainly caused by rain, the water supply in the building, or waste water leakage.
• Distortion- observed in most materials composed of wood and metal and in frames constructed from both materials.
• Rust – found on building materials made of metal, especially steel. Active corrosion is induced by highly oxidized and humid atmospheres. It is also caused by sodium- exposed material, such as soapy water.
• Exfoliation- typically plagues materials or building elements that are insulated or painted. v.
• Rot and mold – found on components or materials composed of wood and brick, as well as rusted steel or cast iron. This decay can be generated in both dry and wet conditions. Rotting components are often moldy as well.
• Moisture/dampness- often the result of high water content in building components, especially walls and floors.
• Bending/sagging-frequently occurs in construction materials made of wood. viii.
• Sedimentation - usually occurs in building bases. It involves the lower floor and the building apron or perimeter.
• Condensation - often caused by hot weather and humid conditions. It also occurs in cold, cramped areas with limited air flow and sunlight.
• Stretching and tearing- common in both external and internal building fittings.
• Crack – observed in many building components. Cracks are classified into various types, which range from capillary to large cracks. External cracks do not affect the building structure or the wall; however, serious cracks can harm consumers.
• Installation errors - typical in various types of fittings and equipment or in services, including piping, wiring, and machinery.
• Pest attacks- commonly plague building materials and wood-based building components.
• Clogging- occurs in many piping systems that are either tap or wastewater channels.

3   Research Methodology

The aim of this study is to identify the condition level in the accommodation building of public university. This study was conducted at one of the public university in Malaysia. Figure 1 shows the research flows of this current study
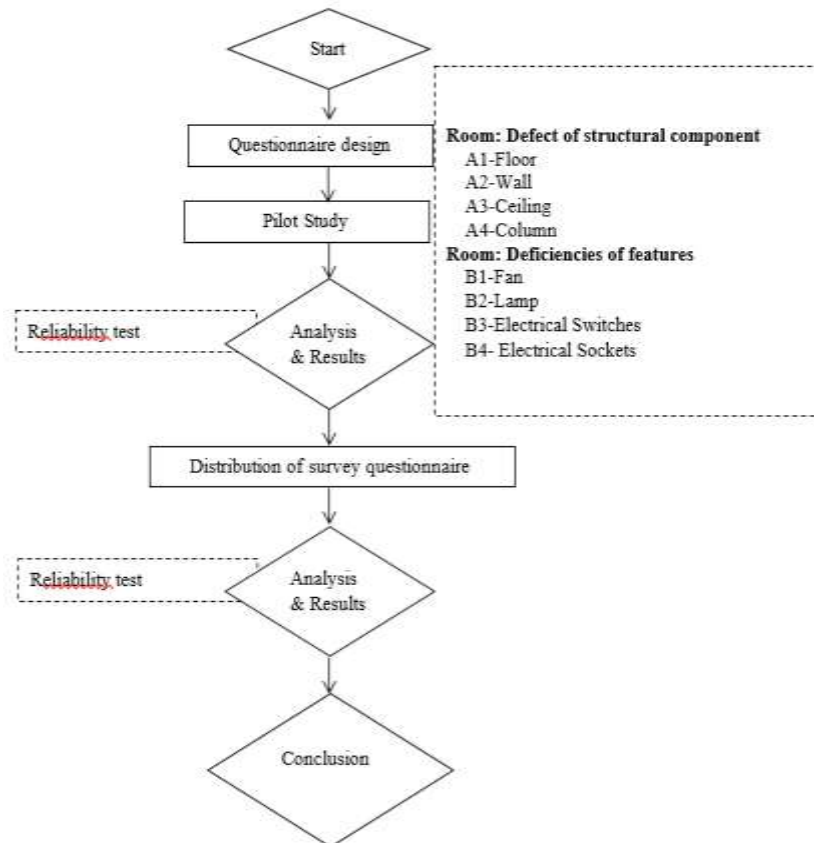

Fig. 1. Flow of Methodology.

In this current study, 50 questionnaires have been distributed for a pilot study, then there were 10,123 questionnaires has been distributed to the students that stayed in the hostel for the actual investigation stage. There are eleven hostels selected for this study. The feedback from respondents are 20% of the total students' population in the hostels. That means the whole feedback survey that collected are 2,015 respondents. The detail of surveys and respondents will be shown in table 1

Table 1. Detail of Surveys and Respondents.

Ref.	College Name	Age of building, years	No. of units,	Total units,	No. of respondent	Total respond-ents,	Percentage of sam-pling, %
C1	RPC	34	837		133		15.89
C2	TFC	34	977		366		37.46
C3	TCC	23	840		126		15.00
C4	TDIC	30	1,192		308		25.84
C5	THOC	31	1,032		199		19.28
C6	TRC	30	1,032	10,123	178	2,015	17.25
C7	PC	20	503		279		55.47
C8	DSEC	20	1,100		92		8.36
C9	C9	20	715		195		27.27
C10	C10	20	715		66		9.23
C11	DOJC	20	1,180		73		6.19

For the complaint forms, the respondents will be selected from students lived in the hostel. The questionnaire will have 2 sections which are general information (section A) and condition of structural component & features in room (section B). The questions in section A were meant to identify the background of respondent which are college name, block no, floor no and room no. Section B consists of two part which are condition of structural components and features in room. The questions about the condition of structural components in room such as defect on floor, wall, ceiling and column. Then, the questions about condition of features in room such as functionality on fan, lamp, electrical switch & socket.

The questionnaire is designed so that respondents will give the answers by ticked an appropriate box which are contents three measures indicator. There were few benefits for closed-ended questions because the respondents saved more time. Respondents only need to give the answer using a simple tick. Table 2 shows the designed questionnaire with measures indicator. The results of the data analysis were presented using percentage frequency and Cronbach's Alpha was the inferential statistical tool to test for the reliability of the data obtained for the study. These analyses were done with statistical packages, SPSS (Statistical Package for Social Science version 16.0) and Microsoft Excel. Table 3 shows the range of coefficients of Cronbach's alpha and its reliability level. Then, Table 4 shows the range of average min score/index with level of satisfaction. From this table, the level of satisfaction of each designed question is determined.

Table 2. Designed questionnaire with measures indicator.

Parameter	Condition Level		
Defect of Structural Component	(1) None	(2) Few	(3) Many
Deficiencies of Features	(1) Not Function	(2) Few Function	(3) All Function

Table 3. Range of reliability and its coefficient of Cronbach's alpha.

Coefficient of Cronbach's alpha	Reliability level
1.00	Very high
0.80-0.99	High
0.6-0.79	Moderate
Less than 0.59	Low

Table 4. Range of average min score/index with condition level.

Index	Condition level (Structural defect)	Condition level (Features deficiencies)
1.00 – 1.66	None	Not Function
1.67 – 2.33	Few	Few Function
2.34 – 3.00	Many	All Function

4 Results and Discussion

4.1 Findings from Pilot Study

Pilot questionnaire was conducted prior to the distribution of questionnaire to test the feasibility of intended questionnaire to be undertaken as well as to verify the questionnaire concepts and wording. Pilot questionnaire ensures the reliability and workability of the questions, choices of answers as well as the format of the questionnaire survey by questioning a small group of respondents before the actual questionnaire survey is conducted. The pilot survey offers unpredicted problems, comments on errors and respondents' readiness to participate in the survey.

Simultaneously, a pilot survey form was sent to two experts in structure and forensic engineering area and 50 students whose stay in residential college were randomly selected. The two experts were requested to vet the draft survey form and give their comments, including on the structured of the questions were set, the clarity of the questions, and the suitability of the options available for improvement of the draft survey questionnaire.

The questionnaire was then modified based on the results of the pilot study. The outcomes of the pilot questionnaire offered information which was utilized to further improve the latest edition of the questionnaire where a few questions were modified. Finally, the latest version of the questionnaires was ready to distribute to 50 students who stay in residential college. Reliability test was performed for each type of questionnaire.

In this study, the reliability test was performed to all the survey questionnaire. Table 5 summarized the findings. It can be seen that the Cronbach's Alpha ranges from 0.73 to 0.77 which is well above the threshold of 0.50 recommended by Lu and Yan

(2007) for general attitude or perception of assessments similar to this study and were considered to be moderate and acceptable.

Table 5. Cronbach's Alpha value.

Parameter	Cronbach's Alpha
Structural defect	0.78
Features deficiencies	0.656

4.2   Actual Survey

The questionnaires were distributed to the eleven accommodation colleges which have been highlighted in the previous Table 1. From that, 53% of the respondents are female (1,068) and followed by male of 47% for 947 respondents. It was found that the female exceeds the male as the respondents at 6% that equivalent to 121 persons. Meanwhile, Figure 2 shows the percentage of respondents for all colleges. It was found that, C8, C10 and C11 have percentages of less than 15% compared to other colleges. Nevertheless, the reliability test that has been conducted to the sampling parameter was found that all findings produced Cronbach's Alpha that was considered as sufficient to replicate the respondents' perception.
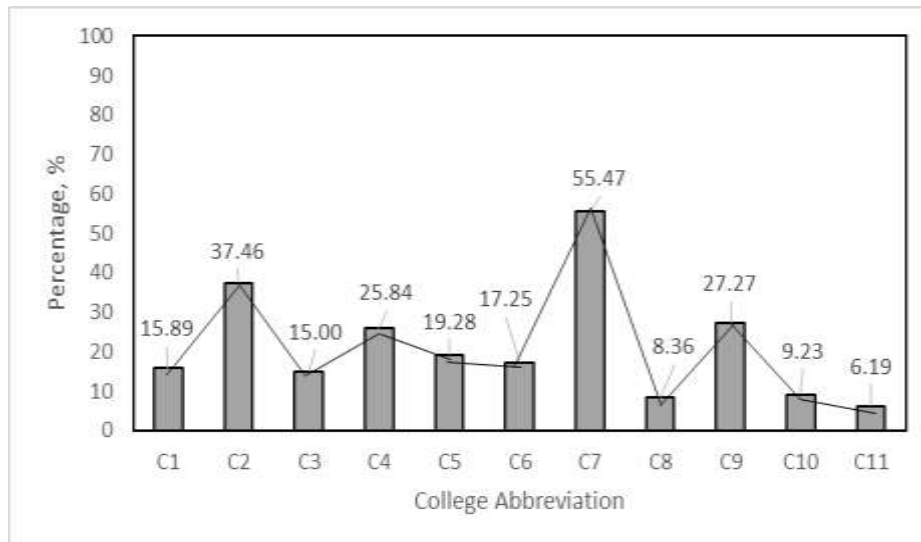

Fig. 2. Respondents Tabulation Percentage.

Figure 3 shows a relationship between the average index to the structural defect in room. From the four studied parameters, it was found that the most crucial part are wall components which is indicate as few defect. The wall components need to moni-

tor regularly to prevent it became worse condition. Most respondents indicate that no defect attached on ceiling and column components. However, the defect on floor components at the border between none and few. Overall, the floor, ceiling and column at good and prefect condition. Although, floor, ceiling and column components at good condition but still need to monitor because the building already exceeds 20 years of operation.
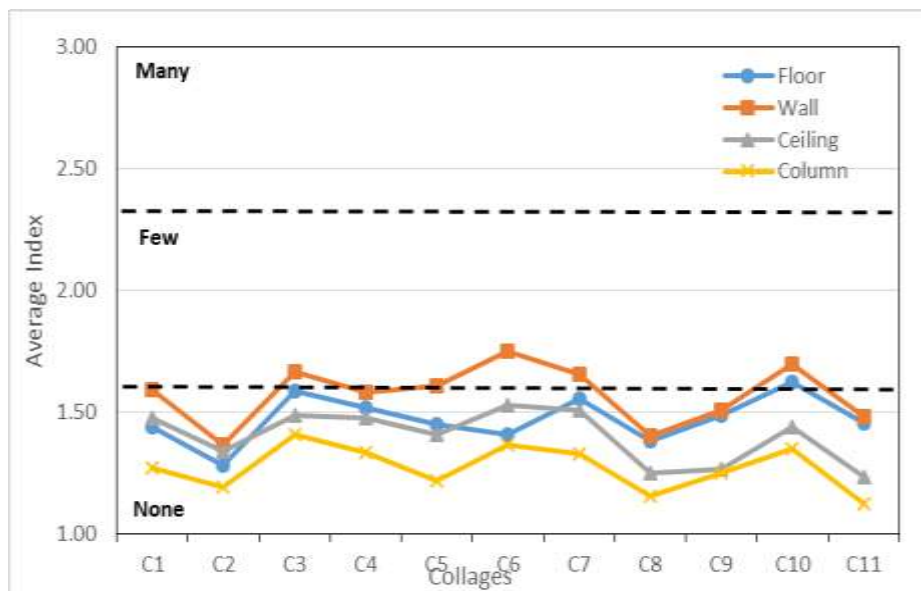

Fig. 3. Average Index for the Respective Colleges due to the Structural Defect.

Figure 4 shows a relationship between the average index to the features deficiencies in room. The average index for fan, lamp, switches and socket are above 2.70. Most students agreed the components such as fan, lamp, switches and sockets are at good condition which the components are 'all function'. Conclusion, these type components are well maintained although building has been operated for more than 20 years. These kind of condition have good impact to university because students are comfortable with the components.
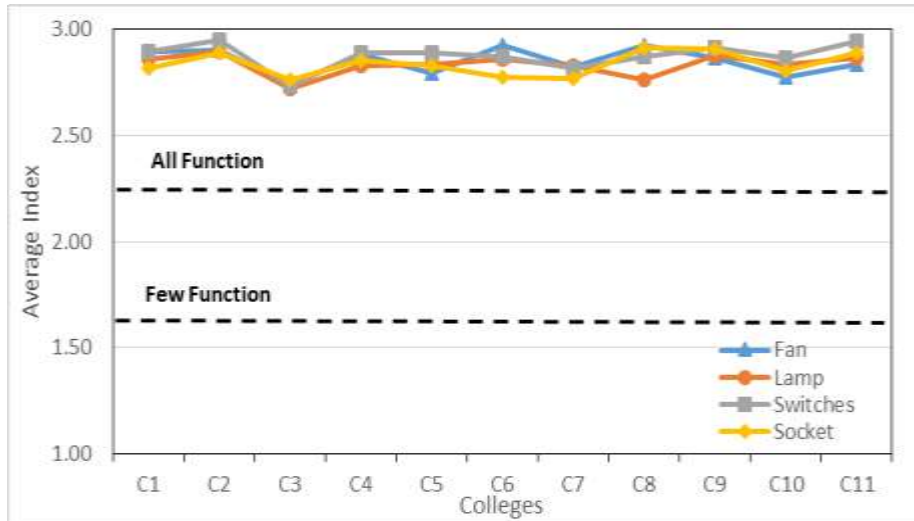
Fig. 4. Average Index for the Respective Colleges due to the Features deficiencies.

Figure 5 shows the percentage of none defect due to the structural defect. The condition was calculated based on the total 2015 respondents. It was also determined from all colleges respondent that participated. As presented in this chart, the components of column has the most none defect at 73.8%, followed by the components of ceiling at 62.8%, floor at 60% and wall at 52.5%. This result conclude that the column at good and prefect condition but wall is most prone to defect.
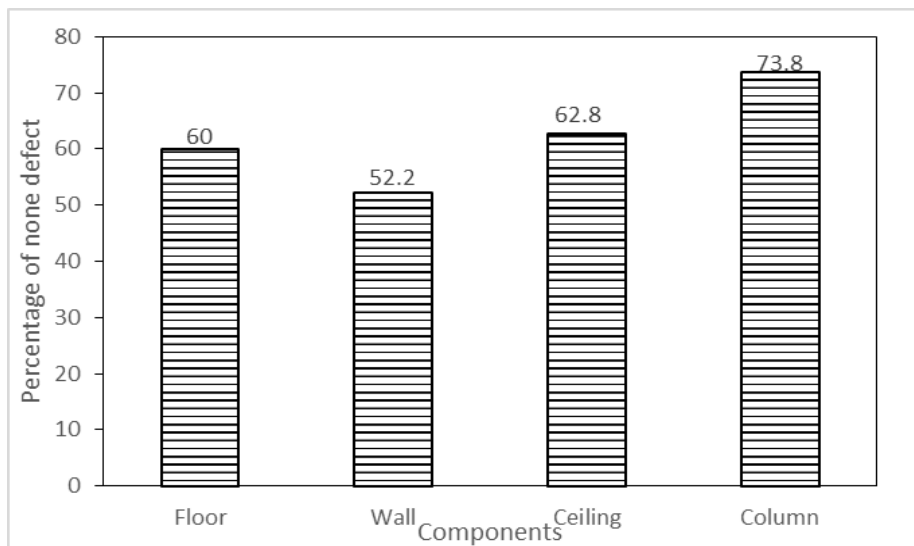

Fig. 5. Percentage of None Defect due to the Structural Defect.

Figure 6 shows the percentage of all function due to the features deficiencies. The condition was calculated based on the total 2015 respondents. It was also determined from all colleges respondent that participated. Figure 6 shows that the components of switches has the most all function at 88.5%, fan at 87.2%, lamp at 85.8% and .socket at 84.7%. These percentages shown that all components are good condition and well maintained because above 80% respondents indicate these components all function
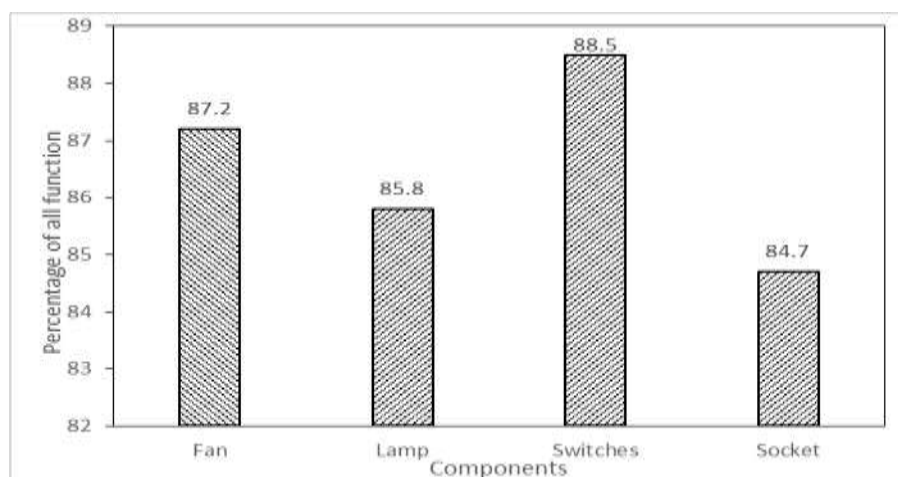

Fig. 6. Percentage of All Function due to the Features deficiencies.

5 Conclusion

The study was designed to assess the level of condition on accommodation building or hostel on UTM campus. Based on the feedback questionnaires from 2,015 students in all hostels, majority students 52-74 % indicate that no structural defect occur in their room. Then, 26-48% of students indicate that had structural defect on their room. The building already exceed 20 years of operation, logically the defect appear on it. The type of defects that appear on these components are dull, moss, cracking and peeling. However, 80% students indicate all function on deficiencies of features in room. Then, 20% students agrees that features in their room are not function. The students are comfortable with features in room because these features at good condition. Then, these features are easy to maintain and replaced if it's have damaged or broken.

12

References

1. R. N. Wahida, G. Milton, N. Hamadan, N. M. I. B. N. Lah, and A. H. Mohammed, "Building Condition Assessment Imperative and Process," Procedia - Soc. Behav. Sci., vol. 65, no. ICIBSoS, pp. 775–780, 2012.
2. B. . Jolaoso, N. . Musa, and O. . Oriola, "Appraisal of the Maintenance of Public Residential Estates in Ogun State: Case Study of Ibara Housing Estate, Abeokuta," J. Emerg. Trends Econ. Manag. Sci., vol. 3, no. 5, pp. 509–516, 2012.
3. A. D. Adamu and W. Shakantu, "Condition Assessment of Student Hostel Building on Campuses of Federal Universities in North-Central," J. Constr. Proj. Manag. Innov., vol. 6, no. 1, pp. 1330–1338, 2016.
4. P. Toyin Sawyerr and N. A. Yusof, "Student satisfaction with hostel facilities in Nigerian polytechnics," J. Facil. Manag., vol. 11, no. 4, pp. 306–322, 2013.
5. Danso AK & Samuel Fiffi Hammond, "Level of Satisfaction with Private Hostels around Knust Campus," Int. J. Sci. Technol., vol. Volume 6 N, no. March, pp. 719–727, 2017.
6. B. Ubong, "Hostel Accommodation in Tertiary Educational Institutions in Nigeria: To Be Or Not To Be," 2007.
7. A. E. Oke, C. O. Aigbavboa, and M. M. Raphiri, "Students' satisfaction with hostel accommodations in higher education institutions," J. Eng. Des. Technol., vol. 15, no. 5, pp. 652–666, 2017.
8. J. Entol, Y. Chow Ho, and T. C. Ong, "Student Satisfaction On Hostel Facilities In Politeknik Kuching Sarawak," Online J. TVET Pract., vol. 2, no. 1, pp. 1–7, 2017.
9. O. Blessing and J. Richard, "Building Condition : Rating of Higher Institutions in Niger State," pp. 32–48, 2016.
10. S. Nor, F. Zuraidi, M. Ashraf, A. Rahman, and Z. A. Akasah, "The Development of Condition Assessment for Heritage Building," vol. 01007, pp. 1–9, 2018.
11. Public Work Department, "Guideline of Building Condition Inspection for Existing Building," 2013.
12. M. Zubair Tajol Anuar, N. Nabilah Sarbini, I. Syahrizal Ibrahim, M. Hanim Osman, M. Ismail, and M. C. Khun, "A comparative of building condition assessment method used in Asia countries: A review," IOP Conf. Ser. Mater. Sci. Eng., vol. 513, no. 1, 2019.
13. S. Yacob, A. S. Ali, and A. C. Peng, "Building Condition Assessment : Lesson Learnt from Pilot Projects," vol. 00072, p. 7, 2016.
14. M. Khalid and M. A. O. Mydin, "Building Condition Assessment and Defect Analysis on Heritage Shophouses in Penang , Malaysia : Case," Int. J. Eng., vol. 3, pp. 441–444, 2012.
15. N. Ahzahar, N. A. Karim, S. H. Hassan, and J. Eman, "A study of contribution factors to building failures and defects in construction industry," Procedia Eng., vol. 20, pp. 249–255, 2011.
16. M. NehaVBagdiya and S. Wadalkar, "Review Paper on Construction Defects," IOSR J. Mech. Civ. Eng. Ver. III, vol. 12, no. 2, pp. 2320–334, 2015.
17. M. Mahli, A. . Che-Ani, H. Yahaya, N. M. Tawil, and M. A. Othuman Mydin, "School Building Defect Pattern," MATEC Web Conf., vol. 15, no. May 2017, p. 01007, 2014.
18. N. L. Othman, M. Jaafar, W. Mariah, W. Harun, and F. Ibrahim, "A Case Study on Moisture Problems and Building Defects," Procedia - Soc. Behav. Sci., vol. 170, pp. 27–36, 2015.
19. A. Suffian, "Some Common Maintenance Problems and Building Defects : Our Experiences," Procedia Eng., vol. 54, pp. 101–108, 2013.
20. I. Ismail, A. I. C. Ani, M. Z. A. Razak, N. M. Tawil, and S. Johar, "Common building defects in new terrace houses," J. Teknol., vol. 75, no. 9, pp. 83–88, 2015.