

Post-Occupancy Evaluation for Green Building in Kuala Lumpur

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Abstract

Green building in Malaysia kept rising from year to year. The building that had obtained the green certificate has been increase to 388 building this year (GBI, 2017). In Malaysia, green building will be evaluated by using Green Building Index. It is a rating tool to measure the implementation of green concept in the building. These green buildings are evaluated by using GBI, but GBI did not assess how occupants feel while occupying green building. This paper presents the result of a study of Post-Occupancy Evaluation for Green Building from two case study (Kompleks Kerja Raya and Ministry of International Trade & Industry (MITI)). Aim and objective has been set in order to achieve the study. Aim for this study is to measure the occupant's satisfaction level on green building of platinum and gold award by Green Building Index (GBI) after the buildings have been occupied. Building occupants are the most important feedback to measure their satisfaction level and to identify the relationship between Post-Occupancy Evaluation and Green Building Index. The result from the study shows the arrangement and design of workplace and thermal comfort obtained the lowest means. Occupants are satisfied with the criteria but still, the criteria obtained the lowest means compared to other criteria.

Keywords: Green Building, Green Building Index, Post-Occupancy Evaluation, Occupant's Satisfaction Level, End-User Comfort

Introduction

Building is one of the contributions to the environment. The world is keep looking for a way to reduce environmental effect from the building through implementing Green Building. Green building can minimize the effect for the environment because it is designed, constructed and operated in green concept (EPA, 2016). Green Building Index is a tool introduced by Malaysian Institute of Architect to evaluate the green aspect implemented in the building and the building will be awarded according to the point. There are some criteria that will be used in the evaluation which are energy efficiency, sustainable site planning and management, indoor environment quality, material and resources, water efficiency and innovation (GBI, 2017).

Some studies have showed the relation between the rises in asthma and indoor air quality. In past 20 year, data revealed that the increasing of 70 percent of childhood asthma was come from indoor air pollution. This child who stay or occupy the building with bad indoor air quality will tend to have more disease. Base on the Michelle, indoor air quality are more polluted than outdoor air. It is because the air is trap in the space and it did not get enough ventilation. Then the air will be contaminated.

Tuhus (2010) stated in her articles that although building got the Platinum award in green building certification but they still got zero point out of 15 points in indoor environmental quality. The uses of pesticides in the building may lead to poor indoor air quality. It is because there is no requirement to inform the occupant on the chemicals that been used, the potential health effect or their rate of disappear in the air. This occurred due to lack of expertise who need to monitor on the quality of air in the building.

Thus, this prove that not all green building are well maintain and have good environmental value but instead green building are more focus on reducing the cost of the building. To solve the problem, Post-Occupancy Evaluation method is used. Anna (2014) stated that POE is important to ensure the performance of the building by evaluating tools. POE can be the most effective way for the contractor, client and design team if they carry out this method way in which this method can reducing the environmental impact for the building, in the other way it can solve the issues and problems stated above. POE also can reduce the cost of the building by reducing the environmental problem of the building.

Anna (2014) also stated that POE are useful to gather the information and give the information to the client, contractor and design team. By that, they will alert and review the issues and problems that bother the performance of the building. This will encourage them to discuss and find the solution for the building and also help to improve the performance of the building very well.

Literature Review

There are few methods have been developed to assess the performance of the building and one are Post-Occupancy Evaluation. According to Barlex (2006), POE is a way of providing feedback throughout a building's lifecycle from initial concepts through to occupation. The information from feedback can be used for informing future projects, whether it is on the process of delivery or technical performance of the building. While Preiser (2006) stated that Post-Occupancy Evaluation is a diagnostic tool and system which allows facility managers to identify and evaluate critical aspects of building performance systematically. According to Preiser (2001) quoting in Turpin- Brooks and Viccars (2006), there are three levels in POE process. The level undertaken will depend on the time, manpower, availability of financial, and the required outcome. The general approach to each level will involve planning the process, conducting the study and an interpretation of the results. The level of POE is indicative, investigative and diagnostic. The criteria of building overall stated in POE are material used, services provided, cleanliness, working environment, facilities, thermal comfort, noise, ventilation and lighting. All of these criteria will be used to measure the occupant's satisfaction level in the building.

Method

The method used is quantitative, which is by conducting a survey questionnaire. The respondents are building occupants. 10 percent of the total numbers of occupants will involve in this survey questionnaire. Method of distribution is by simple random sampling to respondent for selected green building. There will be two case studies which are for Platinum and Gold. The case study for Platinum is Kompleks Kerja Raya 2 and case study for Gold is at Ministry of International Trade and Industry. Both of the buildings are located in Kuala Lumpur.

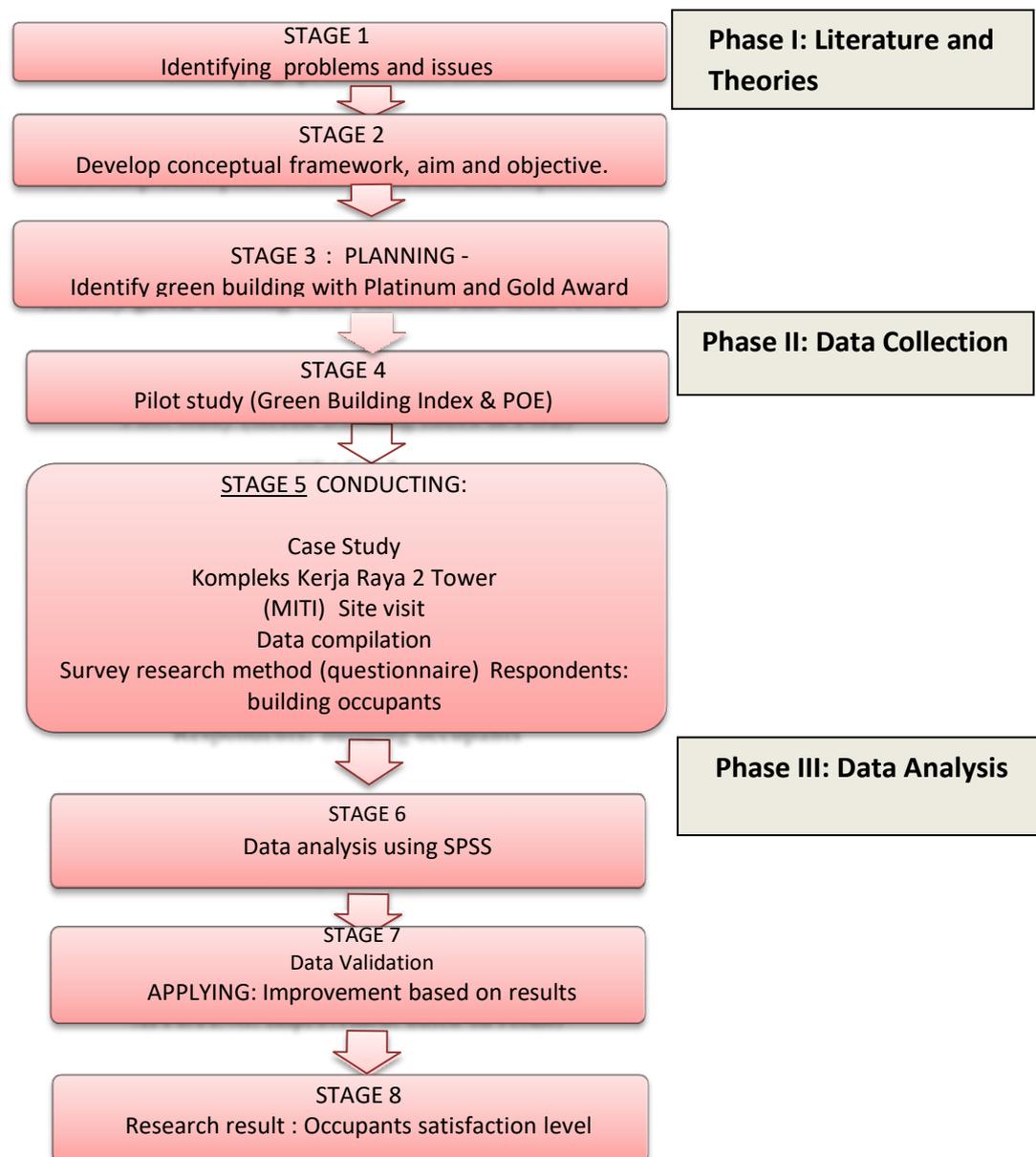


Figure 1. The flow chart below shows the methodology of this study (Author).

Results

Finding from the study shows that the arrangement and design of workplace and thermal comfort obtained the lowest means for both building. For KKR2, the result from the questionnaires shows that arrangement and design of workplace obtained 3.42 and thermal

comfort 3.61. These criteria obtained the lowest means compared to other criteria. For MITI, the result shows that arrangement and design of the workplace obtained 3.58. Thermal comfort and location of the building also obtained the second lowest means which is 3.71. For overall evaluation, most of the occupant's in both of the building are satisfied.

Table 1

The overall result of satisfaction for bolt case study

No	Items	KKR2	MITI
1	Material and finishes applied for this building	Satisfied	Satisfied
2	Ventilation system and air quality	Satisfied	Satisfied
3	Arrangement or design of the work place	Average	Satisfied
4	Thermal comfort of the work place	Satisfied	Satisfied
5	Day lighting in the building	Satisfied	Satisfied
6	Visual comfort in the building	Satisfied	Satisfied
7	Acoustic comfort in the building	Satisfied	Satisfied
8	The location of the building. (near to infrastructure, facilities and utilities)	Satisfied	Satisfied
9	Storm water runoff management	Satisfied	Satisfied
10	Cleanliness in the building (toilet and workplace)	Satisfied	Satisfied
11	Facilities provided	Satisfied	Satisfied
12	Auto sensor controlled lighting	Satisfied	Satisfied
13	Landscaping outside the building	Satisfied	Satisfied
14	Security system	Satisfied	Satisfied
OVERALL RESULT		SATISFIED	SATISFIED

Conclusion

For the conclusion, both of the buildings need to improve the arrangement and design of their workplace and thermal comfort. Although the result shows that occupant's are quite satisfied, but still an improvement need to be carry out to increase and ensure occupant's comfort while working in the building. This POE result can be their guideline for improvement in future.

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