Post Occupancy Evaluation Assessment of Students’ Residence - A Report from South Africa

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Abstract — this paper present the findings of post occupancy survey of Sophiatown residence; presently the largest residence in University of Johannesburg Auckland pack campus in Johannesburg, South Africa. The purpose of the paper is to evaluate the building performance qualities. The data were collected during October and November 2012. The primary data for the study was collected through a structured questionnaire survey. A total of 150 questionnaire were distributed and 135 were received from the occupants of the Sophiatown residence at Auckland pack campus of the University of Johannesburg. The survey results revealed that occupants (students) of the residence were only satisfied with the quality of artificial light in their rooms and disable facilities but are not satisfied with other factors in the building performance such as quality of natural light, size of the study hall, quality of space provided in there study hall and others.

Keywords — Post occupancy evaluation, building performance, student residence.

I. INTRODUCTION

POST occupancy evaluation (POE) is a general term for a broad range of activities aimed at understanding how buildings perform once they are built, and how satisfied building users are with the environment that was created [1]. Over the years many theorists and practitioners have grown uncomfortable with the term ‘POE’. This is because the literal meaning of the term seems to suggest that it occurs after people leave the building and it seems to emphasise evaluation done at a single point in the process. Despite the diversity of the practice, the term ‘post-occupancy evaluation’ remains common for historical reasons and it will as such be used in this research. In this guidance, the term POE is used as an umbrella term that includes a review of the process of delivering the project as a review of the technical and functional performance of the building during occupation.

A completed residential building should be able to function in such a way that it satisfies the occupant’s needs. Once the building has been completed and it is occupied, maintenance commences to ensure that the elements or facilities in the building function to their maximum capacity. Occupants of the building will then evaluate the facility to determine whether the building is functioning in accordance with its intended purpose [2].

Having POE as a tool in the residential building will help facility manager to determine the level of satisfaction of occupants in terms of comfort, studying and conduciveness with respect to usability of the furniture and privacy [3]. POE can be used to assist with upgrading an existing facility. It is often very useful to conduct a POE before planning for any refurbishment or renovation because users’ expectation, requirements and needs are addressed and the design term is properly informed.

POE is the process whereby a building has to be evaluated in an accurate manner after it has been built and occupied for some time [4]. POE has come to represent a broad range of activities aimed at understanding how buildings perform once they are built, and how satisfied building users are with the environment that was created [1]. The idea of POE was established in relations to the problems arising from the building industry, especially in care facilities such as mental hospitals, nursing homes and correctional services [5]. Although the term seems to suggest that it occurs after people leaves the building and it seems to emphasise evaluation done at a single point in the process, new building do not only need to preserve energy during construction and operation, but also, they must provide satisfactory indoor environment for occupants [6]. It is however notable that POE is relatively new in the built environment in South Africa. A literature search shows limited literature in the subject area and facility management texts fail to provide needed South African based knowledge. Thus, an explorative study was conducted in Johannesburg, South Africa. The problem statement and corresponding objectives are formulated below.

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II. THE PROBLEM STATEMENT

The problem statement for the study, states that the lack of adequate evaluation of performance of buildings after the completion of the construction phase hinders optimum management of built environment facilities. Hence, the problem to be investigated is does the students’ residence perform as intended.

III. THE RESEARCH OBJECTIVE

The objective of the study is to create the working environment to be more conducive to the human wellbeing which will ultimate accelerate the productivity of the residence. The study was conducted to evaluate the building performance. The aim of the study is to emphasize that the built environment (student residence) is conducive for occupants (students) and other users’ daily activities.

IV. THE REVIEW OF POE RELATED LITERATURE

POE was derived from the “occupancy permit”, a document that is issued once the building has been inspected and is declared free from all defects and ready for occupation [5]. During the early years of POE, academics decided to research the topic in-depth to determine the effectiveness of the POE because the profession of architecture had elected not to embrace POE as a field of study. According to Riley et al. [5], POE was introduced as a result of complaints from the building occupants regarding problems such as Health and safety security, disability, leakage, poor signage, lack of storage and privacy, halfway blockage, aesthetic shortcomings, inadequacy of designed space for equipment such as copier, the maintenance of glass surfaces such as skywalks.

Since POE is the process that assesses how well buildings match user’s needs and also identifies ways to improve building design, disabled people will not be over looked. People with disability are always the minority number of population in any were POE is to be conducted. Velleman [7] defined disability as limitation of function that results directly from an impairment at the level of specific organ or body system. Executive managers should make adequate provision for disable facilities like car parking space, handrails on staircases and toilets, disable signs, level ground for wheel chairs movements, etc. in the residence. The ability to provide all the necessary disable facilities will make them feel comfortable like every other person and not to feel inferior or handicapped.

POE is a systematic collection and evaluation of information about the performance of the building in use. By conducting the POE, we will measure the energy consumption of the Sophiatown residence, and will also try to establish the level of comfort and satisfaction of the occupants of the residential building. By taking these factors into account in my research, it will enable me to identify and improve the design, performance and fitness of the building in accordance with its purpose.

POE is the evaluation of the performance of a building after it has been occupied [2]. Using POE as a tool and interacting with the occupants will provide the organisation with information about how the building performs. This useful information will be used as the benchmark when new or future projects start. It plays a very important role in the interaction between the users and the building, and is intended to be used for improving on the shortfalls that exist within the existing building currently used by the occupants. POE also fulfills other objectives, such as identifying the building’s defects as well as providing the design team with alternatives on how to prevent similar mistakes from happening in future projects. With POE in place, the quality of building management in the organisation will be improved by using cost-effective strategic methods.

It is important to conduct a POE in the residential building or any other building so that the results can be used to gauge the level of satisfaction of designers, occupants and owners of the building, and to determine whether the occupants are happy or not. As the purpose of the building is to serve the needs of the owners and it is critical that the building should be evaluated from time to time to ensure that it is serving its intended purposes. The building is an immovable asset, and it is affected by external factors such as exposure to the climate, which leads to the necessity for maintenance [8].

Nawawi and Khalil [2] define POE as a systematic evaluation of opinion about buildings in use, from the perspective of the people who use them. POE is concern with building performance so as to satisfy occupants with regard to noise control. Implementing POE in an organisation will help to identify measurable link between the building quality and performance outcomes of the occupants. POE is so crucial to be conducted because it indicates how well building performance works in order to satisfy the occupant’s needs and organisational goals. To sum up the abovementioned, POE provides structured review of the process of delivering a project as well as a review of the operational, functional and strategic performance of the building during occupation. POE provides feedback on the performance of the building throughout its service life.

V. RESEARCH METHODOLOGY

The data used in this paper were derived from both primary and secondary sources. The primary data was obtained through the survey method, while the secondary data was derived from the review of literature and archival records. The primary data was obtained through the use of a structured questionnaire survey. This was distributed to a total of 150 occupants (students) who are residing in Sophiatown residence. Out of the 150 questionnaires sent out, 135 were received back representing a 90% response rate. This was considered adequate for the analysis based on the assertion by Moser and Kalton [9] that the result of a survey could be considered as biased and of little value if the return rate was lower than 30–40%. The data presentation and analysis made use of
frequency distributions and percentages of all the respondents. The research was conducted between the months of October and November 2012. The questionnaire was in two sections (A & B). The designs of the questionnaire envisage a maximum of 20 minutes for its completion.

Section A gathered the demographic information of each member of the residence that participated in the survey. This included questions on their gender, their age, their ethnicity or population group, student status, their present level of study, their highest education qualification and how long they have been living in Sophiatown residence. Section B is the environmental performance of the building. It requires respondents to indicate the effect each factor has on their ability to study during their stay in residence.

A. Mean Item Score (MIS)

A five point Likert scale was used to determine the environmental performance of the residence. The adopted scale was as follows:

1 = Very negative
2 = Negative
3 = Neutral
4 = Positive
5 = Very positive

The five-point scale was transformed to mean item score (MIS). The indices were then used to determine the rank of each item. The ranking made it possible to cross compare the relative importance of the items as perceived by the respondents. This method was used to analyse the data collected from the questionnaires survey. The mean item score (MIS) was calculated for each item as follows:

\[
\text{MIS}= \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{\sum N} \quad \text{Equation 1.0}
\]

Where;

\[n_1 = \text{Number of respondents for very negative;}
\]
\[n_2 = \text{Number of respondents for negative;}
\]
\[n_3 = \text{Number of respondents for neutral;}
\]
\[n_4 = \text{Number of respondents for positive;}
\]
\[n_5 = \text{Number of respondents for very positive;}
\]
\[N = \text{Total number of respondents}
\]

After mathematical computations, the criteria are then ranked in descending order of their mean item score (from the highest to the lowest).

VI. RESULTS AND DISCUSSION

Findings from the 135 usable questionnaire revealed that 33% were female, while 67% were male. Majority of the respondents (97%) were full time and (3%) were part time. Majority of respondents level of study were (34.1%) first year, followed by (30.4%) second year and the minority were (2.2%) fifth year. Majority of respondents highest education qualification were (76%) grade 12 (matric), followed by (11%) post graduate degree(s) and the minority were (2%) diploma or certificate. The respondents were asked how long they have been living in the Sophiatown residence; the results of the study indicated that the majority of the respondents were (44.8%) less than 1 year, followed by (38.8%) 1 year and the least was (16.4%) more than 1 year.

Respondents were asked to rate their opinion based on the environmental performance of the residence. Based on the ranking of the weighted average from the mean item score (MIS) for the listed statements (Table 1), it was observed that the majority was the quality of artificial light in your room (MIS=4.27; R=1), quality of natural light in your room (MIS=3.99; R=2), Size of the study hall (MIS=3.82; R=3), Quality of space provided in your study hall (3.74; R=4), Quality of air in your room (MIS=3.70; R=5), Temperature in your room (MIS=3.53; R=6), Size of the room (MIS=3.47; R=7), Noise level in the study hall (ability to have conversation without neighbours overhearing it) (MIS=3.13; R=8), Distraction from noise outside your room (MIS=2.91; R=9), Distraction from noise outside the study hall (MIS=2.84; R=10). The findings of the present study agrees with findings from previous researchers. For instance, Konara and Sandanayake [8] state that it is important to conduct a POE in the residential building or any other building so that the results can be used to gauge the level of satisfaction of designers, occupants and owners of the building, and to determine whether the occupants are happy or not. This was also confirmed in the present findings. However, since the purpose of the building is to serve the needs of the owners and it is critical that the building should be evaluated from time to time to ensure that it is serving its intended purposes. The building is an immovable asset, and it is affected by external factors such as exposure to the climate, which leads to the necessity for maintenance.

<table>
<thead>
<tr>
<th>Environmental qualities</th>
<th>MIS</th>
<th>Rank(R)</th>
</tr>
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<tbody>
<tr>
<td>Quality of artificial light in your room</td>
<td>4.27</td>
<td>1</td>
</tr>
<tr>
<td>Quality of natural light in your room</td>
<td>3.99</td>
<td>2</td>
</tr>
<tr>
<td>Size of the study hall</td>
<td>3.82</td>
<td>3</td>
</tr>
<tr>
<td>Quality of space provided in your study hall</td>
<td>3.74</td>
<td>4</td>
</tr>
<tr>
<td>Quality of air in your room</td>
<td>3.70</td>
<td>5</td>
</tr>
<tr>
<td>Temperature in your room</td>
<td>3.53</td>
<td>6</td>
</tr>
<tr>
<td>Size of the room</td>
<td>3.47</td>
<td>7</td>
</tr>
<tr>
<td>Noise level in the study hall</td>
<td>3.13</td>
<td>8</td>
</tr>
<tr>
<td>Distraction from noise outside your room</td>
<td>2.91</td>
<td>9</td>
</tr>
<tr>
<td>Distraction from noise outside the study hall</td>
<td>2.84</td>
<td>10</td>
</tr>
</tbody>
</table>

Considering disabled facilities in the residence, 64.7% of the respondents said yes, 8.2% said no while 27.1% of the respondents were not sure if there are disabled facilities in the
residence. Velleman [7] concur with the survey findings that executive managers should make adequate provision for disable facilities like car parking space, handrails on staircases and toilets, disable signs, level ground for wheel chair movements in the residence.

In terms of how they would describe disabled facilities in the residence (figure 3), 37.9% of the respondent said they would describe disable facilities in the residence very good, 19.4% said is good, 33.9% said is average, 4.0% said is poor while 4.8% said is very poor. Literature reviewed indicated that the ability to provide all the necessary disable facilities will make them feel comfortable like every other person and not to feel inferior or handicapped [7].

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Very good</td>
<td>37.9%</td>
</tr>
<tr>
<td>Good</td>
<td>19.4%</td>
</tr>
<tr>
<td>Average</td>
<td>33.9%</td>
</tr>
<tr>
<td>Poor</td>
<td>4.0%</td>
</tr>
<tr>
<td>Very poor</td>
<td>4.8%</td>
</tr>
</tbody>
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Fig. 3 Description of disabled facilities in the residence

VII. CONCLUSION

This paper gives an insight in terms of POE and its effects when it is not addressed adequately. Given that a similar study in the South African context was not identified during the literature search, the study is deemed to be explorative in nature. Using a student residence as a case study, POE evaluation was conducted in order to come up with the primary data of the study. In other words, this was done since POE is often utilized as diagnostic tool to evaluate building performance.

The findings from the study revealed that occupants (students) of the residence were satisfied with the quality of artificial light in their rooms and disable facilities. In essence, occupants were not satisfied with other factors in the building performance. They expected improvements in the quality of natural light in there room, size of the study hall, quality of space provided in there study hall, quality of air in there room, temperature in there room. They also need improvements in the size of their room, noise level in the study hall (the ability to have conversation without neighbours overhearing it), distraction from noise outside there room and distraction of noise outside their study hall. In essence, based on the findings from the survey evaluations, the building performance is not as intended.

REFERENCES


