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Research Article

Post Occupancy Evaluation of Public Mass Housing Estate in Minna, Nigeria

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A b s t r a c t

The incessant increase of people in the urban area and the diversity of their needs make the issue of housing a recurring problem. These days, housing provision for civil servant and masses is one of the major problems facing most of our urban areas. These studies report the post occupancy evaluation of mass housing residential estate in Minna metropolis in terms of its use and responses. The objectives of this study are to evaluate level of adequacy of housing design and construction for users' satisfaction, and to examine the quality of mass housing in terms of its user's response to the facilities and services provided. The questionnaire survey approached was adopted in acquiring the data required for the analysis. A total of 150 questionnaire copies were administered randomly. The findings indicate that lack of good water supply, good drainage system and lack of regular waste disposal, adequate ventilation, poor management and maintenance are major challenges encountered by public mass housing estate users.

1. Introduction

Many buildings do not perform as planned, and this can impact on running costs, staff and client satisfaction and performance, health, safety and comfort (Eziyi et al., 2013; Akinluyi, 2013). The concept of Post Occupancy Evaluation (POE) is about procedures for determining whether or not design decisions made by the architect are delivering the performance needed by those who use the building (Ilesanmi, 2010). It is a systematic manner of evaluating buildings after they have been built and occupied for duration of time (Preiser, 2002, 1995,). Voordt and Wegen, (2005) opines that POE represents the vital diagnostic step needed to feed the prescriptive tools of planning and programming. The gap between the actual performance of buildings and explicitly stated performance criteria constitute the evaluation (Preiser et al, 1998). One of the applications of POE is the comparison between the use that the house was designed for

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and the actual use. Vischer (2002) suggests that POE can be used to determine building defects, formulate design and construction criteria, support performance measures for asset and facility management, lower facility life cycle costs by identifying design errors that could lead to increased maintenance and operating costs, and clarify design objectives. It helps to empower users to negotiate building issues and reduce maintenance works and cost (Hewitt et al, 2005; Vischer, 2002; Bordas and Leaman, 2001). POE gives feedback into existing projects in such a way that it can be considered as a diagnosis, the applied use of the results being a form of treatment (Wohwill and Weisman, 1981).

However, despite the preponderance of research in the context of building performance, POE as a systematic method of collecting data on buildings in use has not found wide usage for public housing in Nigeria (Ilesanmi, 2010). Since, POE is the process of obtaining feedback on a building's performance in use, the value of POE cannot be overemphasised and it is becoming mandatory on many public projects. POE is valuable in all construction sectors, especially healthcare, education, offices, commercial and mass housing, where poor building performance will impact on running costs, occupant well-being and business efficiency. POE highlights any immediate teething problems that can be addressed and solved. It identifies any gaps in communication and understanding in building operation. It also provides lessons that can be used to improve design, procurement on future projects and act as a benchmarking aid to compare across projects and over time. POE involves the building users in defining how buildings function for them (Watson, 2003).

The prime intent of constructing buildings by the owner is to offer the users comfort, convenience and safety as they conduct their activities and daily endeavours. This is why the design, planning, construction and managing of buildings in accordance to statutory standards and specifications is paramount and expedient (Meir et al., 2009; Zeiler and Boxem, 2008; Ukoha and Beamish, 1997; Kaitilla, 1993). However, previous studies have shown that sometimes these standards and specifications given by the experts, professionals and government officials or institutions does not align to the shifting desires and anticipations of the users of the built environment, mostly the housing estates and its facilities (Eziyi, 2013; Ukoha and Beamish,1997; Kaitilla, 1993). The users, thus raise complains of their dissatisfaction of the performance of the buildings the abode in. Studies have shown various consequence associated with living in an environment or house that the performance are below the expectation or satisfaction of the residents. Such consequences are sick building syndrome and building allied illness (Kian et al., 2001). Additionally, this

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shortfall in building performance triggers the craving for abandonment or modifications or remodelling of completed and occupied buildings (Kim et al., 2005). Such practice amounts to waste of resources, energy and some-times even adverse damage to the building envelope components and the surrounding environment (Mitterer et al., 2012).

One of the major reasons that causes the poor performance and low satisfaction derived from buildings and its facility by this users is the lack of adequate knowledge of users' shifting needs and inclinations by developers and building professionals who makes paramount decisions during the pre-design and design stage of building projects. Most time they exempt salient aspects in the design which affects the buildability and maintainability of the building. Adequate knowledge on user's desires is requires for building developers and designers to be able to provide functional, comfortable and convenient building structures and its accompanying facilities. Therefore, Kim et al. (2005), and Fatoye & Odusami (2009) advocated that in other to improve the generally performance of buildings and its facilities, the building professionals, property developers, development control officers, and the urban planners must understand the building users' desires, anticipations and aspirations through regular performance evaluation referred to as post occupancy evaluation (POE).

In the past decade, resident satisfaction has been used as an important indicator in evaluating public mass housing, quality and services. However, in the recent past, the housing deficit syndrome and the need to make housing available for all has made the practice of POE questionable. It has been noticed that in some public mass housing projects, modification and extensive remodelling of the houses starts even before the end users move into the houses. This is an economic waste, which can be avoided. Therefore, the paper presents a report of POE that was conducted based on two specific objectives, namely: to evaluate level of adequacy of housing design and construction for users' satisfaction, and to examine the quality of mass housing in terms of its user's response to the facilities and services provided. The findings of the study could provide a platform for proffering solutions to the challenges of public mass housing projects at conception and preplanning stage.

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2. Methodology

The population from which the samples was obtained are three bedrooms, two bedrooms, in Wushishi estate in Minna, Niger State. A research structured questionnaire on Post Occupancy Evaluation was design to covered paramount issues such as available facilities, level of satisfaction of the end user, condition of facility and client value ranking. A total number of 150 questionnaire copies were administered to the end-users in each area considered. The statistical frequency and percentage were used to analyse the date.

3. Result and Discussions

3.1 Demography of the users of the housing estate

This study highlights the functionality, convenience and comfortability of the use of structure, spaces and facilities provided for an emblematic mass housing estate. The physical and facility elements performance and level of satisfaction of the users are determined by conducting the post occupancy use. The response of users of these facilities in the housing estate of different socio-economic characteristic were presented and analysed below.

Table 1: Occupation of respondents

Occupation	Respondents	Percentage %
Employed	102	68
Unemployed	7	4.6
Self-employment	25	16.7
Retired	16	10.7
Total	150	100

Table 2: Income level of respondents

Income level	Respondents	Percentage %
N20,000-N30,000	15	10
N31,000-N40,000	33	22
N41,000-N50,000	68	45.3
N51,000-N60,000	14	9.3
Above N60,000	20	13.4
Total	150	100

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Table 1, Table 2 and Figure 1 presented the demographic background of the users of the housing estate studied. Table 1 shows the occupation status of the respondents residing in the housing estate. Table 2 shows that most inhabitants of this estate are medium income earners (45.3%) and they are majorly civil servants. Most inhabitants of the estate actually acquired their structures through the housing scheme instituted by Dr Muazu Babangida Aliyu administration who also gave the self-employed with a medium income earning means an opportunity to acquire too.

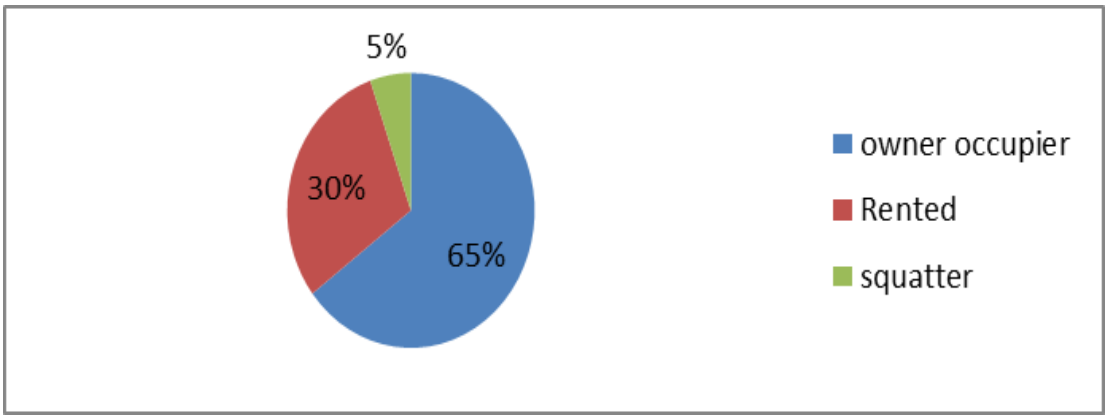

Figure 1: Tenure type of respondents

The tenure type of the respondents as shown in Figure 1 indicates clearly that majority of the respondent who are the inhabitants of the estate are owners of the building they abode with a percentage of 65%. However, it was seen that 30% rented the apartment and 5% are dependents (squatters).

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3.2 Post occupancy evaluation of building, facility and Space condition of the Housing estate

Table 3: To evaluate level of adequacy of housing design and construction for users' Satisfaction within the Housing estate.

Facilities provided for the residents	Rating	Frequency	Percentage (%)
Quality of building materials	EA	0	0.0
	VA	1	0.6
	A	6	4.0
	FA	109	72.7
	PA	34	22.7
	T	150	100.0
Level of Natural illumination in the rooms	EA	20	13.3
	VA	25	16.7
	A	63	42.0
	FA	39	26.0
	PA	3	2.0
	T	150	100.0
Level of Ventilation in the rooms	EA	23	15.3
	VA	21	16.7
	A	71	47.4
	FA	20	13.3
	PA	15	10.0
	T	150	100.0
Level of Convenience and Comfort	EA	12	8.0
	VA	15	10.0
	A	37	24.7
	FA	69	46.0
	PA	17	11.3
	T	150	100.0
Level of Aesthetics appearance	EA	7	4.7
	VA	12	8.0
	A	31	20.7
	FA	53	35.3
	PA	47	31.3
	T	150	100.0
Size of the room	EA	0	0.0
	VA	5	3.3
	A	50	33.3
	FA	70	46.7
	PA	25	16.7
	T	150	100.0

Key: EA= Excellently Adequate, VA =Very Adequate, A=Adequate, FA = Fairly Adequate, PA= Poorly Adequate, T= total.

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It is observed from Table 3 that 22.7% of the respondents rate the Quality of building materials used in constructing the structures to be poorly adequate, 72.7% to be fairly adequate, 4% to be adequate, 0.6% to be very adequate, while 0% of the respondents rate the level of Quality of building materials used in constructing the structures to be excellently adequate.

According to the table above, 13.3% of the students rate the level of ventilation to be fairly adequate, 47.4% to be adequate and 10% to be poorly adequate, while 15.3% of the students rate the level of ventilation to be excellently adequate, 16.7% of the students rate the level of natural Illumination within the room to very adequate, 42% to be adequate, 2% to be poorly adequate, while 13.3% of the respondents rate the level of natural illumination to excellently adequate.

The distribution shows that 10% of the students rate the level of Convenience and Comfortability generally to be very adequate, 24.7% to be adequate, 46% to be fair, 11.3% to be poorly adequate and just 8% of the respondents rate the level of Convenience and Comfortability generally to be excellently adequate. The distribution in table 3 shows that, 20.7% of the respondents rate the level of aesthetics of the buildings within the estate to be adequate and 35.3 to be fair, 31.3% to be poorly adequate while just 4.7% of the students rate the aesthetics of the buildings within the estate to be excellently adequate. The above distribution shows that, 3.3% of the respondents rate the size of their rooms to be very adequate, 46.7% to be fairly adequate, 16.7% to be poorly adequate, 33.3% to be adequate and 0% to be excellently adequate.

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Table 4: To examine the quality of mass housing in terms of its user's response to the facilities and services provided within the Housing estate.

Facilities and services provided for the residents		Frequency	Percentage %
Level of Drainage system in the estate	EA	18	12.0
	VA	23	15.3
	A	34	22.7
	FA	68	45.3
	PA	7	4.7
	T	150	100.0
Level of Parking Facilities	EA	12	8.0
	VA	75	50.0
	A	43	28.7
	FA	18	12.0
	PA	2	1.3
	T	150	100.0
Level of availability of Electricity	EA	9	6.0
	VA	13	8.7
	A	72	48.0
	FA	22	14.7
	PA	35	23.3
	T	150	100.0
Level of Waste Disposal	EA	27	18.0
	VA	65	43.3
	A	32	21.3
	FA	15	10.0
	PA	7	4.7
	T	150	100.0
Level of water Supply	EA	22	14.7
	VA	48	32.0
	A	29	19.3
	FA	32	21.3
	PA	19	12.6
	T	150	100.0
Level of Road Facilities	EA	3	2.0
	VA	7	4.7
	A	50	33.3
	FA	54	36.0
	PA	36	24.0
	T	150	100.0

Key: EA= Excellently Adequate, VA =Very Adequate, A=Adequate, FA = Fairly Adequate, PA= Poorly Adequate, T= total.

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Table 4 shows that 45.3% of the respondents rate the level of drainage system to be fairly adequate, 22.7% to be adequate, 15.3% to be Very adequate, 4.7% to be poorly adequate, while 12% of the respondents rated the level of drainage system to be excellent.ly adequate Also, the table shows that 12% of the respondents rate the level of the parking facilities to be fairly adequate, 50% to be Very adequate and, 28.7% to be adequate, 1.3% to be poorly adequate. While just 8% of the respondent's rate the level of parking facilities to be excellently adequate. It could also be observed from the Table that, 33.3% of the students rate the level of road to be good, 4.7% to be Very adequate, 36% to be fairly adequate, 2% to be excellently adequate while just only 24% of the respondents rated the level of road facilities to be poorly adequate.

Table 5 also shows that 48% of the respondents rate the level of electricity supply to be good and 14.7% to be fairly adequate, 23.3% to be poorly adequate while 6% of the respondents rate the level of electricity to be excellently adequate. Further inspection of the table shows that 10% of the respondents rate the level of waste disposal to be fairly adequate and 43.3% rated it to be very adequate, 21.3% to be adequate while 4.7% of the respondents rate the level of waste disposal to be poorly adequate. While just 18% of the respondents rate the waste disposal to be excellently adequate.

Also the table shows that, 21.3% of the respondents rate the level of water supply to be fairly adequate, 19.3% to be adequate, 32% to be very adequate, 12.6% to be poorly adequate, while 14.7% of the respondents rate the level of water supply to be excellently adequate.

Information from the respondents (occupant) shows that all respondents that reside in the estate evaluated showed that the majority of the occupants are between the ages of 31-50. As these two characteristics are two important socioeconomic characteristics of the users in accessing and evaluating the user use and response pattern to spaces within the estate.

Findings of these research has shown that most housing estate use space (bedroom) does not function well and they are not supportive in design aspect such as conformability, size of the unit, arrangement of fixtures and furniture number per unit, ease of movement, ventilation and privacy required by individual users. It is observed that, the design is not flexible to accommodate more number of users.

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It was observed that, if attention is paid to services and facilities such as electricity, waste disposal, parking facilities and good road, it could have resulted in more comfortable and higher housing satisfaction by the residents. Living spaces should offer adequate services as well as functional and aesthetic satisfaction to users. From the finding, the estate evaluated performed just above average as good quality ratings of the aspects used in the evaluation outweighed the poor quality ratings. Also, findings showed that lack of good water supply, good drainage system and lack of regular waste disposal, adequate ventilation, poor management and maintenance are major issues highlighted by the occupants as constrains of their estate.

4. Conclusion

This research has investigated the post occupancy evaluation of housing estate in FCT Abuja. From the analysis of the result obtained in this research, it can be concluded that the users are satisfied. To an average extent, the performance of the estate was satisfactory despite the merit problems of poor sanitary facilities, lack of privacy, and lack of good water supply and small size of the unit. There is a high probability that buildings never work out as planned; however, complaints are not necessarily the result of bad design. They could be the result of an outdated design concept, because it has been realized that post occupancy stage is a dynamic model, and changes overtime can cause different effects. In view of the above finding, the following conclusions are reached:

(i) The problems of overcrowding can be addressed by producing more accommodation. There should be proper and adequate orientation for estate users on importance of good maintenance culture of fixture, furniture and other facilities provided.

(ii) The use of space in estate's housing should be functional, comfortable and flexible to a degree so that it will be able to serve generations of estate users.

(iii) Finally, the lack of adequate knowledge of users' shifting needs and inclinations by developers and building professionals has to be bridged through further intensive study on POE.

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