Post-occupancy Modification and the Effect on the Aesthetic Layout of Low-income Housing Estates in Owerri Metropolis

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Abstract: The housing units in the low-income housing estates in Owerri metropolis show significant modifications of the exterior and interior spaces as well as in the site and estate layouts. The nature of Post-Occupancy modification in four housing estates; Aladinma Housing Estate (AHE), Federal Housing Estate Egbeada (FHEE), Trans-Egbu Housing Estate (TEHE), World Bank Housing Estate (WBHE), which includes Addition of rooms, Alteration of site arrangement, Alteration of fence design, Alteration of roofing pattern. Addition of shop spaces, total modification and change of use were studied and the effect of these unauthorized and poorly planned modifications on the aesthetic layout of the study area were analyzed. One sample test of proportion was used to analyze the research hypothesis and the result showed that the post-occupancy Modification of these housing estates has significantly affected the aesthetic layout of the housing estates studied negatively. The following recommendations were made; the need for more pragmatic and proactive action by the development control of the study area in enforcing already existing building regulations of minimum setbacks and building coverage which most layouts flaunted. Future housing designs should be more flexible to accommodate some level of modifications that will be monitored for compliance by the development control.

Keywords: Aesthetics, Designs, Housing, Modifications, Regulations

1. Introduction

Housing has been defined as a process and a product of providing safe, comfortable, attractive, functional, affordable and identifiable shelter in a proper setting within a neighbourhood, supported by continuous maintenance of the built environment for the daily living activities of individuals/families within the community [1, 2]. It further has been posited that housing should reflect the socio-economic, cultural aspirations and preferences of its users with adequate physical infrastructure and social services to meet the basic and special needs of the population. To this end, it has been realized that a successful housing design is one that meets the needs and aspirations of the end user [3, 4]. Research has further submitted that housing is bound up with concepts such as shelter itself, personal property, safety, privacy, location, environmental amenity and investment [5].

Various programmes by the federal and state governments of Nigeria aimed at eradicating the dearth of adequate and functional housing for the urban low-income earners across the study area have been executed. However, a consistent occurrence is that the housing programmes/schemes planned for and targeted at the low income population in the urban areas end up being occupied by higher income earners, whatever housing units that are left for the low income group appear not to meet their requirements or satisfy their basic housing needs. The high-income group that took over the houses originally meant for the low-income group alters the houses to suit their higher tastes and requirements. The low-income earners who also find what is left for them unsuitable

similarly alter or modify the buildings and their surroundings. This situation holds true in the study area and is a consequence of the fact that more often than not, an understanding of the functional housing needs of these consumers (who are often kept in anonymity), does not precede the development of the schemes [6-9].

This results in improper articulation of housing development culminating in inadequate housing that leads to dissatisfaction of the housing residents. They often express this dissatisfaction through unauthorized and poorly planned modifications of their residences [10-13].

Consequently, the housing units in the low-income housing estates in the study area show significant modifications of the exterior and interior spaces as well as in the site and estate layouts. The aim of this study is to determine the effect of post- occupancy modifications on the aesthetic layout of the low-income housing estates in the study area.

2. The Study Area

This is a study of the post occupancy performance of low-income housing units proposed and built by the federal and state governments under the mass housing programme in Owerri metropolis which is the capital territory of Imo state. Imo State lies within latitude 4°45'N and 7°25'E with an area of about 5,100sq.km. It is bordered in the east by Abia state, on the south by Rivers state, and on the west by Delta state and on the north by Anambra state. It falls within the rainforest zone of the warm humid tropics characterized by high temperatures and high relative humidity for most of the year. The topography of Imo state is dominated by plains, making the area susceptible to flooding during the rains. Owerri metropolis consists of parts of three Local Government areas including Owerri Municipal, Owerri North and Owerri West. It has an estimated population of 400,000 people as at 2006 and is approximately 40square miles (100km^2) in area [14].

3. Research Methodology

This research will be both quantitative and qualitative in approach. Quantitative data, based on precise measurements using structured and validated data collection instruments whose purpose is to examine the cause and effect of the subject under discussion and to test the hypothesis.

The nature of post-occupancy modifications in the study area comprising of four housing estates purposively selected based on their ownership; Federal and State Government owned); (State Government Owned {Aladinma Housing Estate (AHE) and Trans-Egbu Housing Estate (TEHE)}, Federal Government Owned (World Bank Housing Estate (WBHE) and Federal Housing Estate Egbeada (FHEE) will also be determined through data gathered from physical observation of the study area and responses from residents which will be categorized and reduced to numbers and manipulated for statistical analysis [15].

3.1. The Research Hypothesis

The basic hypothesis for this study is here stated in both the null and alternate forms.

Ho: Post-occupancy modification of low-income houses in the estates under study has no significant effect on the aesthetic layout of the study area.

H$_A$: Post-occupancy modification of low-income houses in the estates under study has a significant effect on the aesthetic layout of the study area

3.2. The Nature of Post-Occupancy Modification in the Study Area

The nature of Post-Occupancy Modification in the study area is broken into the various estates matching them with corresponding variables (Addition of rooms, Alteration of site arrangement, Alteration of fence design, Alteration of roofing pattern, Addition of shop spaces, Total Modification and change of use).

Table 1. The nature of Post-Occupancy Modification in the study area.

Nature of POM	HOUSING ESTATES				TOTAL 437
	AHE 28	TEHE 11	WBHE 396	FHEE 2	
Addition of rooms	20	6	101	1	128
%	71.43	54.55	25.51	50	29.29
Alteration of site arrangement	5	5	300	1	311
%	17.86	45.46	75.76	50	71.17
Alteration of fence design	19	9	150	2	180
%	67.86	81.82	37.88	100	41.19
Alteration of roofing pattern	15	8	100	2	125
%	53.57	72.73	25.25	100	28.60
Addition of shop spaces	7	5	150	0	162
%	25	45.46	37.88	0	37.07
Total Modification	10	6	200	1	217
%	35.71	54.55	50.50	50	49.66
Change of use	4	1	10	2	17
%	14.29	9.09	2.53	100	3.89

The results obtained from the field on the nature of post-occupancy modifications in the study area as shown in table 1 outline that a greater percentage of the residents (71.17%) of the study area engaged in the alteration of their

site arrangement 49.66% had totally modified their housing units, 41.19% altered their fence design, 29.29% added rooms and 37.07% added shop spaces to the original design of their housing units. 28.60% altered the roof pattern of their dwelling units. The least (3.89%) type of modifications carried out in the study area is the change of use of the residential houses to other purposes such as schools, churches and erection of telecommunication masts.

4. Effect of Post-Occupancy Modification on the Aesthetic Layout of the Study Area

Four housing estates (Aladinma, Trans-Egbu, World Bank and Federal housing Estate Egbeada) were studied to decipher the effect post-occupancy modification has had on their aesthetic layouts.

Table 2. Effect of Post-Occupancy Modification on the aesthetic layout of the study area.

RESPONSES	HOUSING ESTATES				TOTAL 437
	AHE 28	TEHE 11	WBHE 396	FHEE 2	
Positive effect	8	1	10	0	19
%	28.57	9.09	2.53	0	4.35
Negative effect	18	7	371	2	398
%	62.29	63.64	93.69	100	91.08
No effect	0	1	0	0	1
%	0	9.09	0	0	0.22
No response	2	2	15	0	19
%	7.14	18.18	3.79	0	4.35

The figures from Table 2 show that a greater number of the respondents (398; 91.08%) feel that post-occupancy modification in the study area has impacted negatively on the Aesthetic layout. 19 (4.35%) respondents gave no response to the asked questions while another 19 (4.35%) respondents submitted that there are some positive effect of post-occupancy modification on the aesthetic layout.

5. Statistical Test of Hypothesis on the Effect of Post-Occupancy Modification on the Aesthetic Layout of the Study Area (EPOMAL)

The hypothesis was subjected to a statistical test using the one sided test of proportion to prove its validity or not. The hypothesis was subjected to a statistical test using the one sided test of proportion to prove its validity or not.

P=proportion (x) variable x=number of Obs.
H_O: p=0.5
Ha: p<0. Ha: p !=0.5 Ha: P>0.5

Table 3 shows that 50% of the residents agree that post-occupancy modification has negatively affected their housing estate. It presents a p-value of 0.9869. From a sample of 28 persons and p=0.29. The null hypothesis then holds. This means that the aesthetic layout of Aladinma Housing Estate (AHE) has been affected negatively by post-occupancy modification of the estate.

The test from table 3, confirms that the proportion of those who feel that the aesthetic layout of their houses were positively affected in TEHE were less than 50% with a p-value of 0.9967. From a sample of 11 persons from TEHE, p=0.09. The null hypothesis holds. This means that the aesthetic layout of Trans-Egbu has been affected negatively by post-occupancy modification of the estate.

Table 3. EPOMAL.

	HOUSING ESTATES			
	AHE	TEHE	WBHE	FHEE
Number of obs. (variable x)	28	11	396	2
Mean	.29	.09	.03	0
Std. Err	.085753	.086287	.0085723	0
Z	-2.2224	-2.7196	-18.7058	-1.41420
Pr (Z>z)	0.9869	0.9967	1.0000	0.9214
%[95% conf. Interval]	.1219273	-.0791195	0131985	0
	.4580727	.2591195	.0468015	0

The proportion of those who feel that the aesthetic layout of their houses were negatively affected in WBHE were less than 50% with a p-value of 1.0000 from a sample of 396 persons from WBHE, p=0.03. The null hypothesis holds. This means that the aesthetic layout of World Bank Housing Estate has been affected negatively by post-occupancy modification of

the estate.

The proportion of those who feel that the aesthetic layout of their houses were negatively affected in FHEE were less than 50% with a p-value of 0.9214, from a sample of 2 persons and p=0.00. The null hypothesis holds. This means that the aesthetic layout of Federal Housing Estate Egbeada has been affected

negatively by post-occupancy modification of the estate.

In Summary, table 3 dealt with the statistical analysis and the testing of the basic hypothesis, based on the effect of Post-Occupancy Modification on the Aesthetic layout (EPOMAL) of the study area, it was seen that the null hypothesis was proven true and the alternative rejected in all low-income housing estates in the study area. This means that the aesthetic layout of all the Housing Estates have been affected negatively by post-occupancy modification of the houses in the estates.

6. Conclusion/Recommendations

Post-occupancy modification was seen to have affected the aesthetic lay-out of the study area. This further buttresses the fact that the development control agencies in charge of the study area should device stringent control measure to checkmate this incessant modification of public housing for the low-income group in the study area as their negative effect on the entire neighbourhood fabric is overwhelming. The result of this study is in line with findings from a previous research [16, 17].

This research established that proper articulation of interior spaces is key in provision of housing that will suit the user requirements of the public housing owners in Owerri Metropolis. It was also established that a proper understanding of the user needs of these inhabitants did not precede the development of the public housing estates in the study area hence the spate of housing modifications which appear uncontrollable with dire consequences on the environment. Therefore in planning and designing public housing in the future, the target users should be involved right from conceptualization to its implementation and the housing design should be flexible enough to give allowance for some degree of internal modifications.

Acknowledgements

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