

APPRECIATION OF INTERIOR ARCHITECTURAL ELEMENTS SPECIFICATION OF RETROFITTED RESIDENTIAL BUILDINGS AMONG ARCHITECTURE GRADUATES IN NIGERIA

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ABSTRACT

The impact of architectural education and the need for specialized knowledge in building materials and specification in Nigeria are being discussed. The specification process and the reliability of materials are critical aspects of training in architectural studies. Poor interior finishing can have severe implications for the users' health. This study seeks to investigate how architecture graduates appreciate architectural elements in low-cost living room of retrofitted residential buildings, which is essential for successful renovation projects and sustainable development. Data were collected on most preferred floor, wall, and ceiling finishes in six Nigerian States using a structured questionnaire administered to a stratified randomly sampled population of non-educators and educators in architecture. The data was analyzed using SPSS, descriptive and chi-square analysis. The study found that ceramic tiles, stucco, and plaster of paris (POP) are the most preferred flooring, walling, and ceiling materials respectively. Respondents considered durability, ease of cleaning, good appearance, fire resistance cost, lighting enhancement, as important factors. The references were consistent across different experience levels and between educators and non-educators. The study recommends emphasizing the importance of specifying the right interior architectural elements in low-cost living room of retrofitted residential buildings and aligning training with the available possibilities in the industry.

Keywords: *Appreciation, Architecture Education, Architecture Graduates, Interior Architectural Elements, Retrofitted Building.*

INTRODUCTION

Education has an impact on its recipients not merely in terms of knowledge transfer but also in terms of the acquisition of modes of

operation and the creation of attitudinal preferences (Utabeta et al., 2012). One of the strengths of architecture education is that it has always used a range of teaching and learning strategies. Experimental learning through studio has been at the core of these. Trends in architectural education have been in discourse along matters of quality and competence of graduates of architectural institutions; Some architectural educators ask if the training in Nigeria is in synergy with the ongoing in building industry; others want new materials in the market and techniques of fabrication integrated into training to current activities in the building sector (Musa, et al., 2022). Issues being discussed at present on methods and curriculum of training programs and products of training institutions are either at parallel with what is expected of them or lacking in active aspects of skills and knowledge. This view was clearly expressed by Uji and Ngai (2013) were architectural training was described as being stagnated in growth, limited in expansion, and stymied in development, the situation portrayed led to calls for conversion department of architecture into faculties, school, or collages with departments under them, the thinking is that if implemented, is capable of ensuring in-depth study of all aspects of architectural knowledge and promotion of specialization.

The heart of every building designed lies on the effectiveness of the materials used during construction. Uji (2002) posited that "to design a building, size, finishes, materials and construction technology all make statement on the image of a building". Materials used add to the aesthetics, health of the users and durability of the completed building (Emmitt, 2001). Although most codes and standards for building design and construction try to meet sustainable principles, however its downside is that they are general in context with no geographic boundary; these leads to the need for specification. National Building Specification (NBS, 2008) defined specification as both a product and a process. The process is the total documentation detailed inside the contract and design document while the product is a written description of the quality of the built product and its component products. However, Nigeria a colony of Britain whom building codes and standards are prototypes of the British standards, the selection materials usually is reduced to selection reliant on tradition wherefore materials are selected based on familiarity (Emmitt, 2001). The reliability of any specification given depends on the observed durability of such material which means that every material specified meets their required performance (Murthy, 2008); this emphasis that

trainees in architectural studies need to learn these domains of knowledge.

Interior architectural elements are finishes, defined as the appearance of a surface within a building. Building components like floors, walls and ceilings which this study is limited to are finished with different types of architectural elements like ceramic tiles, terrazzo, wood, and synthetic carpet for flooring; wall tiles, wall paper, laminated wood, emulsion paints and stucco for walling and Polyvinyl Chloride (PVC), Plaster of Paris (POP), wood, asbestos, and Polystyrene for ceiling. The use of different architectural elements ensures that taste, comfort and aesthetics of users are met. The architectural element types also ensure that varying elements used are in accordance to the cost preferences of users as regards strength, durability, heat control, moisture control, sound control, etc. Consequently, interior finishing is a critical part of all building as it mostly comes in direct contact with users and typically bears the brunt of everyday load and activities. Therefore, the importance of strong, long lasting, durable, beautiful finishes cannot be over emphasized.

Inefficient performance of these finishes may constitute challenges to house occupant, the utility of the building and the environment. Furthermore, building quality are also affected by poor finishing to extent that entire value of the building may be compromised (Ekwelem & Oloke (2014). Equally, there are health implied consequences of poorly finishing on the users; domestic accident proneness; falls, abrasion of human skin, instability, sinking and collapsing, etc. Some of these dangers are increased if the materials are slippery, too sharp and not smooth, to extent that they exist, they constituted human hazards that may lead to untimely death and injuries, grave consequences (Okolie & Okata, 2020).

However, the incidence of poor interior finishing may be traceable to factors such as corruption, poor quality of materials specified, poor quality of work done and general inefficiency of enforcement by regulatory organizations. It is based on this background that house owners desired to have a comfortable house that will support them live long on earth. This drive leads to retrofitting of their existing failed buildings by architects; implies that their structure have undergone improvement in their design and functionality and as such, required the integration of architectural elements to enhance their aesthetic appeal and functionality. In a study conducted by Hajizadeh and Ahmadi (2019), it was observed

that the integration of architectural elements in retrofitted residential buildings could significantly impact the occupant's satisfaction and overall well-being. The appreciation of architectural elements in retrofitted residential buildings is also important for sustainable development. According to Koo and Kin (2019), sustainable development requires the integration of architectural elements that improve the building's energy efficiency, reduce the carbon footprint, and promote environmental sustainability.

However, despite the importance of architectural elements in retrofitted residential buildings, little is known about graduates of architecture's appreciation of such elements. In a study conducted by Owusu-Ansah et al. (2020), it was observed that architects' understanding and appreciation of architectural elements in retrofitted residential buildings are vital to the successful implementation of renovation project. Therefore, this study aimed to find out how sensitive the graduates of architecture are to specification of interior architectural elements of retrofitted buildings in response to certain design parameters for comfort, with a view of enhancing their understanding and contribution to sustainable development, the wellbeing of building occupant as well aligning architectural training to available possibilities in building industry. The paper looked at which variations of the specified architectural elements are preferred by non-educators of architecture programme and architectural programme educators in Nigerian Universities. The two results were compared to get a feed back to whether the knowledge acquired through the university curriculum is in line with what is in practice by graduate of architectural programme in practice. This is meant to inform and guide improvement as posited by Hattie and Timperley (2007). To explore this, data collected from six (6) States in Nigeria, viz: Adamawa, Taraba, Gombe, Bauchi, Jos and Nasarawa are analyzed and the results are reported.

MATERIALS AND METHODS

The method of investigation is the collection of requisite data from the primary source. The method used for obtaining information consists of quantitative approach. This study was confined to Government low-cost quarters of six (6) States in Nigeria which includes: Adamawa, Taraba, Gombe, Bauchi, Jos and Nasarawa State, sampled based on availability and accessibility. The quarters were later sold as owners' occupier and were retrofitted according to individual financial strength. A structured

questionnaire using liker scale of 1-most preferred, 2-preferred, 3-mildly preferred, 4- not preferred, 5- undecided, was used for respondents to choose most preferred floor finishing, wall finishing and ceiling finishing out of five options gotten from observation of the study areas base on eleven (11) required performance which include: durability, easy to clean, noiseless, good appearance, free from dampness, fire resistant, low maintenance cost, enhance lighting, affordable and low chemical emittance, obtained from literature; the options as observed from the study area include: for floor finishing -carpet, terrazzo, ceramic tiles, laminated wood and rubber tiles; for wall finishing- wall tiles, wall paper, laminated wood, emulsion paints and stucco; for ceiling finishing- PVC, Plaster of Paris (POP), laminated wood and concrete deck, then they were asked comment on the most preferred choice. It was tested and administered on stratified randomly sampled population of non-educators (88) and educators (88) with either Msc./M.tech. or PhD. in architecture. This was chosen and used since it is cumbersome to study the entire population; first dividing into strata and then random sampling within each stratum was made. This method ensured the provision of unbiased, suitable close estimate of the relevant characteristics of the sample population. The questionnaires were administered hand to hand to some of the respondents and collected, while others were administered through social media groups of architects via watsapp. On the whole, a total of 176 questionnaires were retrieved and statistical Package for Social Sciences (SPSS) tool was used to analyzed the data and for preparing descriptive analysis. Data were grouped on spread sheets that represent each response, and were analyzed by frequency distribution analysis and percentages, as well Chi-square test to determine if there is an association among the preferences of non-educator and educators of architecture programme.

RESULTS

Based on the responses of the non-educators and educators of architecture programme as shown in table 1 below and based on required performance of durability, ease of cleaning, good appearances, freedom from dampness, fire resistance, low maintenance cost, enhance lighting and affordability, ceramic tiles is chosen to be the most preferred floor finishing for living room of retrofitted residential buildings with 78(88.6%) mentions. Laminated wood and rubber tiles are the next options with 6(6.8%) and 3(3.4%) mentions as preferred and mildly preferred, respectively. Terrazzo and Carpet are not preferred and undecided

options with only 1(1.1%) and 0(0%) mentions, respectively. The table also reveals that, stucco is chosen to be the most preferred wall finishing for living room of retrofitted residential buildings with 42(47.7%) mentions; tiles and laminated wood are the next options with 33(37.5%) and 10(11.4%) mentions as preferred and mildly preferred, respectively; Wall paper and emulsion paint are not preferred and undecided options with only 3(3.4%) and 0(0%) mentions, respectively. Additionally, the table reveals that, POP is chosen to be the most preferred ceiling finishing for living room of retrofitted residential buildings with 48(54.5%) mentions; Asbestos and laminated wood are the next options with 16(18.2%) and 13(14.8%) mentions as preferred and mildly preferred, respectively; Polystyrene and PVC are not preferred and undecided options with only 11(12.5%) and 0(0%) mentions, respectively.

Table 1: Most preferred Interior Architectural elements of living room in low-cost retrofitted residential buildings.

S/N	Building components	Required Performance architectural element	Specified of architectural element	Response (1-5)	Frequency of mentioned	Percentage
1	Floor	Should be durable	Synthetic Carpet	5	0	0
			Terrazzo	4	01	1.1
		Should be easy to clean	Ceramic tiles	1	78	88.6
			Laminated wood	2	06	6.8
		Should be noiseless	Rubber tiles	3	03	3.4
		Total		88	100	
2	Wall	Have good appearance	Tiles	2	33	37.5
			Emulsion paint	5	0	0
		Free from dampness	Stucco	1	42	47.7
			Wall paper	4	03	3.4
		Fire resistant	Laminated wood	3	10	11.4
		Total		88	100	
3	Ceiling	Low maintenance cost	POP	1	48	54.5
			PVC	5	0	0
		Enhance lighting	Laminated wood	3	13	14.8
			Asbestos	2	16	18.2
		Affordable	Polystyrene	4	11	12.5
	Low chemical emittance	Total		88	100	

Key: 1-most preferred, 2-preferred, 3- mildly preferred, 4- not preferred, 5- undecided

Source: Field Survey (2023)

Table 2 below shows the link between the most preferred interior architectural elements of living room of retrofitted residential buildings, two types of Architectural practice that is, Non educators and educators and as well their years of experience. It reveals that, 18(20.4%) out of 78(88.6%) non educators and educators with 0 to 5 years of experience choose ceramic tiles as the most preferred floor finishing, 17(19.3%) and 10(11.4%) respectively out of 42(47.7%) choose stucco for wall finishing and 7(7.9%) and 10(11.4%) respectively out of 49(59.7%) choose POP for ceiling finishing. Similarly, 19(21.6%) for both type of practice out of 78(88.6%) with 6 to 10 years' experience choose ceramic tiles for floor finishing, 13(14.8%) and 9(10.2%) respectively out of 42(47.7%) choose stucco for wall finishing and 13(14.8%) for both type of practice out of 49(55.7%) choose POP for ceiling finishing. Also, 21(23.9%) for both type of practice out of 78(88.6%) with 11 to 15 years' experience choose ceramic tiles for floor finishing, 8(9.1%) and 12(13.6%) respectively out of 42(47.7%) choose stucco for wall finishing and 15(17.1%) and 11(12.5%) respectively out of 49(55.7%) choose POP for ceiling finishing. Additionally, 20(22.7%) and 22(25%) out of 78(88.6%) with 16 and above years' experience choose ceramic tiles for floor finishing, 4(4.5%) and 11(12.5%) respectively out of 42(47.7%) choose stucco for wall finishing and 14(15.9%) and 15(17%) respectively out of 49(55.7%) choose POP for ceiling finishing.

Table 2: Comparative linked most preferred Interior Architectural elements of Living room in Low-cost retrofitted residential buildings.

S/N	Building component	Preferred architectural element	Years of experience	Types of practice			
				Non educators		Educators	
				Frequency	Percentage	Frequency	percentage
1	Floor	Ceramic tile	0-5	18	20.4	16	18.1
			6-10	19	21.6	19	21.6
			11-15	21	23.9	21	23.9
			16+	20	22.7	22	25
			Total	78	88.6	78	88.6
2	Wall	Stucco	0-5	17	19.3	10	11.4
			6-10	13	14.8	09	10.2
			11-15	08	9.1	12	13.6
			16+	04	4.5	11	12.5
			Total	42	47.7	42	47.7
3	Ceiling	POP	0-5	07	7.9	10	11.4
			6-10	13	14.8	13	14.8
			11-15	15	17.1	11	12.5
			16+	14	15.9	15	17
			Total	49	55.7	49	55.7

Source: Field Survey (2023)

To determine if there is a significant difference between the preferences of non-educators and educators of architecture programme shown above, a Chi-square test was conducted for floor, wall and ceiling finishing as shown in table 3,4,and 5 below.

Table 3 result shows that the chi-square value is 2.293 with a P-value of 0.514. Given that the P-value is greater than our alpha value which is 0.05, we fail to reject the null hypothesis and conclude that there is no association between the preference of non-educator and educators of architecture programme. The result also clearly shows that ceramic tiles are mostly preferred as interior architectural element by both the non-educators and the educators for the living room of retrofitted residential buildings. Thus, there is no significant difference between the perception and response of the non-educators and the educators of architecture programme.

Table 3: Chi-square test for ceramic tiles as most preferred floor finishing

Age Distribution	Observed Non-Educators	Expected Non-Educators	Observed Educators	Expected Educators	Chi-square Value	Asymp. Sig.
0-5	10	12	17	15.0	2.293	0.514
6-10	11	13.3	19	16.7		
11-15	22	19.1	21	23.9		
16+	20	18.6	22	23.4		

Source: Field Survey (2023)

Table 4 reveals that the chi-square value is 7.114 with a P-value of 0.068. Since the P-value is greater than 0.05, we do not reject the null hypothesis and therefore conclude that there is no association or significant difference between the preference of non-educator and educators of architecture programme. The variability in the expected and the observed counts from the table indicates that the variables are entirely independent i.e. there was no association between the variables. The result also shows that Stucco is mostly preferred for walls as architectural element for finishing by both the non-educators and the educators for the living room of retrofitted residential buildings. Therefore, there is no significant difference between the perception of the non-educators and the educators of architecture programme.

Table 4: Chi-square test for stucco as most preferred wall finishing

Age Distribution	Observed Non-Educators	Expected Non-Educators	Observed Educators	Expected Educators	Chi-square Value	Asymp. Sig.
0-5	17	13.3	10	13.7	7.114	0.068
6-10	13	10.9	9	11.1		
11-15	8	9.4	12	9.6		
16+	4	7.4	11	7.6		

Source: Field Survey (2023)

Table 5 result indicates that, the chi-square value is 1.209 with a P-value of 0.751. Since the P-value is greater than 0.05, we do not reject the null hypothesis and therefore conclude that there is no association or significant difference between the preference of non-educator and educators of architecture programme. The variability in the expected and the observed counts from the table indicates that the variables are entirely independent i.e. there was no association between the variables. The result also shows that Plaster of Paris (POP) is mostly preferred for ceiling

by both the non-educators and the educators for the living room of retrofitted residential buildings. Also in this case, there is no significant difference between the perception of the non-educators and the educators of architecture programme.

Table 5: Chi-square test for POP as most preferred ceiling finishing

Age Distribution	Observed Non-Educators	Expected Non-Educators	Observed Educators	Expected Educators	Chi-square Value	Asymp. Sig.
0-5	7	8.6	10	8.4	1.209	0.751
6-10	13	12.6	13	12.6		
11-15	15	13.1	11	12.9		
16+	14	14.6	15	14.4		

Source: Field Survey (2023)

DISCUSSION

The study found that Ceramic tile, stucco, and POP were the most preferred floor, wall, and ceiling materials respectively for retrofitted low-cost residential buildings among both educators and non-educators of architecture program. When selecting floor, wall and ceiling finishing, the respondents considered several architectural elements. The most important factors were durability, easy to clean, and good appearances. Ceramic tiles, stucco and POP meet these requirements as they are durable, easy to clean and come in a variety of designs and colors. Additionally, they are fire resistant and low maintenance cost. They are also affordable and enhance lighting in a room. However, at the initial construction stage, ceramic tile, stucco and POP may emit some chemicals. The ceramic tiles may not be completely noisily; the stucco as walling material has low performance in terms of dampness which some respondents have considered all as less important factors. The study also concluded that there was no significant difference in preferences between educators and non-educators and their experience level.

The findings of this study are consistent with previous research on the use of ceramic tiles, stucco, and POP as flooring, walling, and ceiling materials, respectively. For instance, a study by Soares et al. (2018) found that ceramic tiles were the most commonly used flooring material in Brazilian homes due to their durability, easy maintenance, and good appearance. Similarly, stucco has been widely used for wall finishes due to its low cost, easy application, and good insulation properties

(Erdem&Sanusi, 2019). Furthermore, a study by Sanusi et al. (2015) found that POP was the most preferred ceiling material in Nigeria due to its ease of installation, low cost, and fire resistance properties.

The study recommendation that architectural training should emphasize the importance of specifying the right interior architectural elements in retrofitted buildings to achieve optimal comfort is also supported by previous research. For example, a study by Gohari et al. (2019) found that appropriate interior finishes could significantly improve the indoor environmental quality and occupants' comfort.

CONCLUSION

In conclusion, the findings of this study demonstrate that graduates of architecture are highly sensitive to the specification of interior architectural elements of low-cost retrofitted buildings; this study contribute to the existing body of research on the use of ceramic tiles, stucco, and POP as interior architectural elements in low-cost living room of retrofitted residential buildings. Therefore, the study recommends that architectural training should emphasize the importance of specifying the right interior architectural elements of living room in low-cost retrofitted residential buildings, with a particular focus on the advantages of ceramic tiles, stucco, and POP. These findings have important implications for architectural education and the building industry, as they highlight the need to align training with the available possibilities in the industry. However, the study limitation in focusing only on the living room suggests the need for more research on the use of specific interior architectural elements in other areas of the home, such as bedroom, bathroom and kitchen.

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