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PERCEPTION OF INDOOR SPATIAL QUALITY IN PUBLIC RESIDENCES IN AKURE, NIGERIA

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ABSTRACT

This study investigated the synergy between the residential indoor spatial configuration and the perception of use of the space by the occupants. This was done with the intention of fostering a better design for satisfaction having understood human condition and specific definition with their fundamental philosophy of communication with space. The primary data was sourced through the use of a questionnaire administered to the residents in the study area and further study utilised relevant text and publications on the subject matter. The data collected from the respondents were subjected to both descriptive and inferential statistics. The result indicated usage of space in contrast from the architectural specification and the rapidness of activities of daily living on a particular space rather than spread amidst the designed spaces. The study therefore concluded by suggesting strongly that the lifestyle and perception of needs and values of the people with space should form the approach in the design of spatial configuration of residential projects.

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INTRODUCTION

The provision of satisfactory housing that meets prescribed standards of quality, user needs, expectations and aspirations have always been the goal of every public housing program in Nigeria (Ibem and Aduwo, 2013; Jiboye, 2014). However, the UN-HABITAT (2006) report noted that over the past few decades, despite laudable efforts by the government, public housing has failed to achieve this goal in the country. The reality is that African urban dwellers expect their dwellings to have certain qualities that are in accordance with their own living style (Muller, 1984; Jiboye et al., 2005). However, one of the peculiar features of most dwellings in many urban areas in Nigeria is the absence of user responsive and culturally determined housing. For the housing sector to improve the quality of housing being produced, user needs and expectations, as well as the extent to which such needs and expectations are met, should be explored and understood through regular performance evaluations (Fatoye and Odusami, 2009; Ibem et al, 2013). Therefore, the need to consider user peculiar perception of needs and values is imperative in the determination of qualitative public residence.

Some studies conducted locally as regards this subject matter in some selected neighbourhood have been on the perception of residential quality in using the socio-cultural dimensions, patterns of housing quality (Akinola, 1998; Jiboye et al., 2005; Olayiwola et al., 2006; Jiboye 2010b) and residents' participation. These studies have aimed towards improving the level of satisfaction of residents in their homes (Olotuah and Adesiji, 2006; Carrol and Rosson, 2007; Villarouco et al, 2008, Villarouco, 2009; Statistics New Zealand, 2013; Wokekoro, and Owei, 2014; Taş, Taş, and Aydın, 2014). However, the arm of research have not been directed towards the aspect of residential quality, which highlights the importance of each residential indoor space to users and how users put those space to personal use.

Discoveries have shown that the use of an enclosed space is determined by the user's perspective, and that such is influenced by traits, desire, ability, understanding and previous experiences to mention a few which thereby results into what is known as spatial perception (Opoko, Oluwatayo, Ezema and Opoko, 2016). This has been substantiated in different studies records, proving that households have always seek a satisfactory residential environment through experienced changes in functional adjustment; territorial demarcation for privacy and security; and physical appearance (Nalkaya, 1980; Quercia and Rohe, 1993; Fernandez, 2007) to mention a few.

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Since the external environment which man creates for himself is a reflection of his inner state (Nasr, 2009), there is, therefore, the need to understanding the factors of human perception of space and users true intention of the residential indoor spaces demanded, hence this study. Consequently, the study investigated how the activities of daily living is been performed by users in the indoor spaces of the selected public housing residential estate. The indoor spatial configuration in residential designs was holistically studied with the view of detecting the area of defects which could help in improving on subsequent development that will satisfy residents' needs and aspirations in Nigeria.

Concept of housing

The concept of housing is associated with the social, behavioural, cultural, and personal characteristics of occupants, in addition to the physical, architectural, and engineering components of the home (Gans, 1962; Raven, 1967; Jiboye, 2014). Studies have shown that housing is more than shelter and that the habitability of a house depends not only on the physical characteristics of the dwelling, but also on the social, cultural, and behavioural characteristics of users (Oladapo, 2006; Jiboye, 2010a). Space is not an empty volume waiting to be filled but rather it is a product that cannot be separated from human activity, likewise, it is affected by and affecting that activity. It can, therefore, be seen as a product of the everyday and equally it is constantly producing. Traditionally, in western culture, space is perceived as something to be filled with scientifically constructed rationality and reason. In 1985, Hewlett called for 'a theory of human nature unique to inhabitation that is sensitive to human beings as psychological phenomena rather than objects and can deal with life in its wholeness as well as its fragments' (Ganoë, 1999). Aware of the limitations that design offers to the experience of inhabitation, Hewlett suggested developing a greater understanding by applying a variety of approaches to design. In his view, one way of achieving a better outcome would include 'altering the consciousness of the designer' to aim for a design that challenges the imagination and offers emotional rewards regardless of its pragmatic duty (Ganoë, 1999).

He further stated that design's most serious purposes are not visual, technological, object oriented, or materialistic, but rather those process within a person that reflects an individual's unique awareness of the world and a psychological relationship to the world that is meaningful in ways specific to individual consciousness. Such processes include the need to inwardly reflect on one's own life experience and to understand this experience in a way that is supported by the language, allowing for communication of personal experience with others (Ganoë, 1999).

Fundamental residential design approach

The fundamental design process for residential and other types of building project as comprehensively analysed by Alexander (1964), starts from taking a brief from the initiator of the project. In taking the brief, the designer is expected to consider a realistic approach as to what materials, fittings and fixtures are affordable to fit into the client's budget. Also, it is expedient that the designer understand the lifestyle of the client, however, this is mostly overlooked while professional takes brief from the users.

After considering other factors like client choice in use of colour and taste for material finish, design are presented and corrected through schematic diagrams, design sketches, rough detail sketches, colour outlines until the client is visually satisfied with the design. On completion and acceptance of the preliminary presentation, the designer proceeds to produce final drawings which include plans, elevations, details, sections and specifications are prepared in actual dimensions. This sometimes also includes perspective rendering in colour and scaled models. The abstract nature of design projects and the fact that most designs are virtual creations before they become a reality makes thinking about space outside the production of space challenging. Space is the core of design and surprisingly not much emphasis is given to understand space on a complex level as explored by thinkers such as Henri Lefebvre, Peter Sloterdijk, and Bruno Latour.

Lefebvre in his work "The Production of Space" interprets space on three levels; physical, mental and social space. He argues that space is not simply something we inherited from the past or is determined by the rules of spatial geometry but space is produced and reproduced by humans in which they construct their lives. A space of calculations, geometric and the visual, although abstract, is the language of architects and designers; tied to the production of those spaces and the order in which the production occurs. However, intervention or inception mostly occurs at the time of realisation or construction (Lefebvre 1991). Therefore, in studying the quality of space provided for different human activities in a residential building, it is not enough to only study the architectural properties of the space but also determine the human behaviour in accordance with the spatial dimensions and their relationships with users. The vertical and horizontal spatial dimensions, mass and volume are also experiences that the body knows, are felt, but these dimensions grow when they can be seen in a monumental construction (Tuan, 1983). Colin (2000) says that architecture has the ability to represent to people more than mere presence, not by physical evidence but for what transmit its forms. Recognize that architecture is experienced as language and that the physical elements of the architectural object provide communication tools through which other ideas beyond the strict formal settings universe can be transmitted. It is, therefore, essential to have knowledge of how the environment interacts with the user, as well as how feelings are revealed, and how these are translated into a perception of the environment in accordance with the stimuli since these elements have a direct relationship with reactions and human behaviour.

Space usability and etymology of belonging

From time immemorial, one's society has been the main driving factor that informs the living style and pattern of man (Benveniste, 2009). This drive has embedded in it the cultural, social, political confines, which are bound to form an identity (Paola, Giuseppina, and Inmaculada, 2015). The word Identity could be defined as the various meaning attached to oneself or attributed by others that depict who or what the person is (Beijaard, 1995). The paradoxical and ambivalent nature of belonging, which is closely connected to the identity of the individual becomes evident over their lifetimes and reflects in their way of life irrespective of their academic background or the environment at which they grow. This identity that emanated through the society belong to are made manifest in the choices people makes; like types of music listen to, ways

of words pronunciation, mode of dressing to mention a few. Studies have it that it is this societal influence seen in people that inform the representation of themselves, labelled as behaviour (Paola et al, 2015). However, designing spaces has been viewed as a product of compromise and limitations (material/budget), reducible to something that is calculable and measurable. Consequently, a physical space is often interpreted as a space disconnected from whom or what occupies it. Designing a space requires the capacity to think similarly to a humanities, which is directed to understanding the complexity of culture and better understand the world in which they live. However, the design of residential space as at the moment lacks identity and has had difficulty positioning itself as it is often divided between technology, science, art and production. In lieu of this, space generally needs to be viewed beyond the rule of spatial geometry, but should be produced through the understanding of how humans construct their lives.

Spatial perception in public housing

Public housing projects across the world are developed for the main purpose of improving the living conditions of citizens in the different countries. In Nigeria for instance, the goal of the current housing policy is to ensure that all Nigerians own or have access to decent, safe and sanitary housing in a healthy environment with infrastructural services at affordable cost, and with secure tenure (National Housing Policy, 2012). In pursuant of this goal, governments at the Federal and State levels in Nigeria have developed large-scale public housing for the citizens. In view of the fact that public housing schemes in Nigeria and other countries are implemented within the context of the existing housing policies, there is a need to examine how such housing schemes have achieved the goal of meeting individual needs and aspiration.

Housing delivery system in Nigeria can be divided into three types: "owned housing sector", "public housing sector", and "private housing sector". National and local government organizations play as a key actor of low-cost public housing in offering various patterns; flat, twin house, or detached house (Olotuah, 2000). These spaces are designed by professional architects. Many modern real estate developments are of similar nature. Another are the spaces that are a direct reflection of the needs of ordinary, average residents in urban forms. These spaces are formed spontaneously, without the participation of architects and they reflect the taste and culture of the residents of a given estate. They are associated with the way of life, customs and ambitions of the residents, rather than with the principles of "official planning" composition that is created for the elite. Local culture assigns a significant role to local customs, wherein the composition exhibits values such as the tradition of the place, the character of urban indoors, the acceptance of other people's needs and respect for the environment. One can find here the elements of cultural symbolism and the diversity of expression. A manifestation of this can be found in the individualisation of detail, specific proportions of urban indoors, the use of small scale and being part of the social context. Local context emphasizes such elements as: direct adaptation for a specific user (children, adolescents, the elderly and the disabled, etc.); spontaneously formed proportions of urban indoors; articulations referring to the aesthetic preferences of residents; details referring to the taste and aesthetic sensitivity of residents; and Colour scheme that is rooted in tradition.

In contrast to the canons of "official planning", imposing rigid, clear and unambiguous functional-compositional divisions, the local culture is focused on the friendly and comprehensible perception of spatial impressions by "ordinary" people. Such produced public space creates an environment that is more diverse and provides a greater number of emotional stimuli. Local cultural tradition remains a potential source of new creative inspirations that can be successfully interpreted, enriching the contemporary appearance of public spaces, giving individualized character to housing estates. Public housing stimulates a whole range of feelings; they can bring about friendly relations of man with the environment creating positive sensations. However, they can also create negative reactions, such as aversion, fear or opposition. Public housing space, being a determinant of a place, brings about specific relationships with the housing estate, such as "the sense of space", "rootedness in space", "space admiration", "space uniqueness" and "familiarity/strangeness of space"(Steele, 1981). This makes studying its performance inevitable.

METHODOLOGY

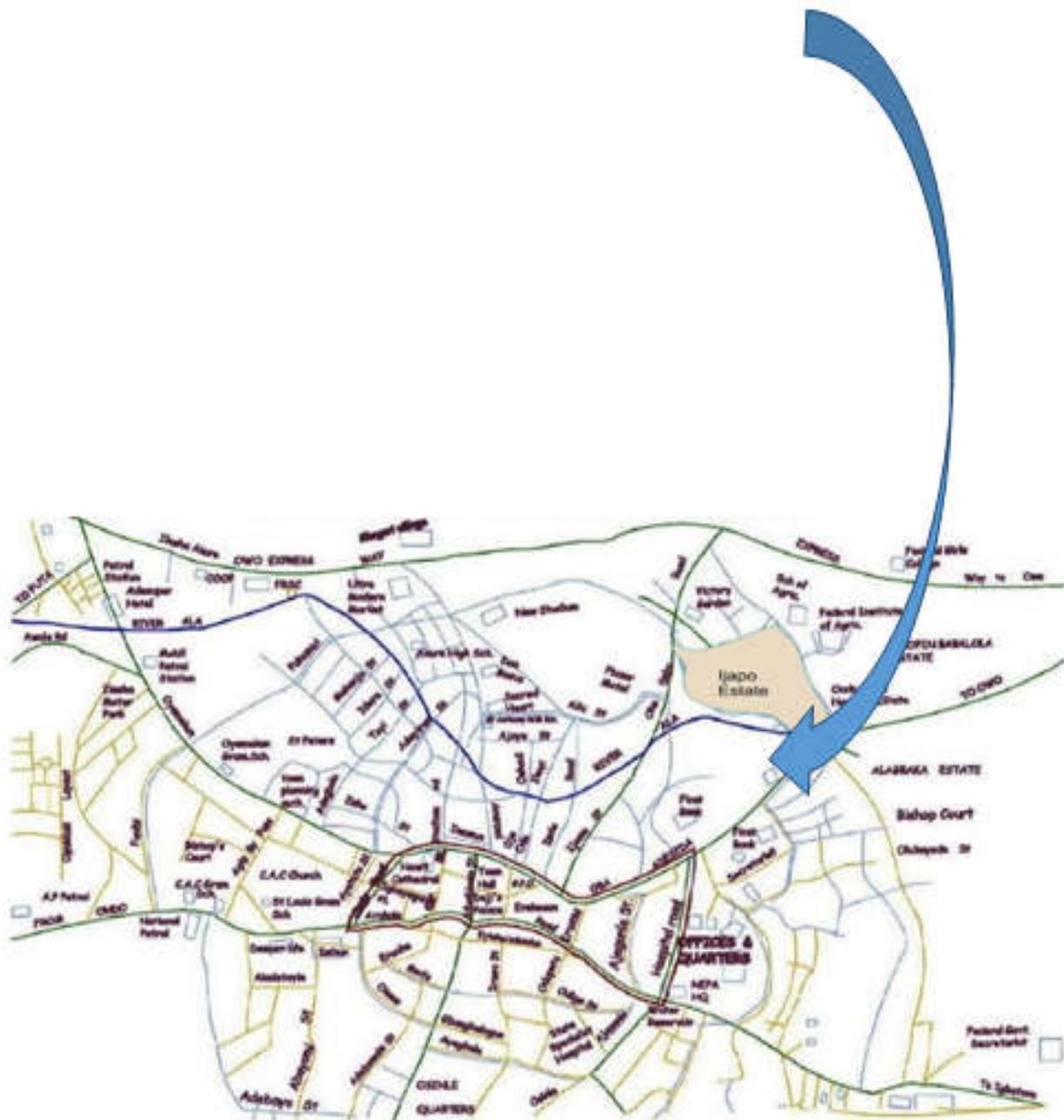
The primary data was sourced through the use of a questionnaire administered to the residents in the selected study area. Furthermore, the study utilised relevant text and publications on the subject matter; which form the background of the study. A substantial information was obtained from the well-focused housing, human psychology, human behavioural pattern and environment related journals, seminar papers, and research monographs from reputable publish houses and library in order to obtain sufficient materials for literature review. All the residents at Ijapo estate constituted the general sampling frame for the study. Ijapo estate constitutes blocks of residential accommodating arranged in clusters. It consists of four hundred and eighty (480) housing units in total, and a population size of six hundred (600) households. To get the household for the study, a reconnaissance survey was carried out to update the list of the initial designed prototype houses that are owner occupied in each of the clusters in the Area map of the study area. Households residing in the houses that fall within the enumeration buildings were then systematically numbered for the purpose of the survey.

Since the focus of the study is on household, the sample size (n) was calculated in terms of the number of households that must be selected referencing the equation for such calculation by Turner (2003) and Kothari (2012). Using research sample based on stratified sampling design, a total of 234 households were therefore randomly selected and surveyed in the study area. One in every three houses on the street was chosen as cases to be studied. The questionnaires were administered on the heads of the households, and where the head is not available, the wife serves as the respondents. A total of 180 questionnaires were returned and used for analysis. The sampled can be said to be adequate since it sums up as 77% of the questionnaires administered. The instrument was pre-tested (through pilot study) and adjusted before proceeding to the field for data collection. The pilot study was carried out by administering the instrument in an unselected government reservation area, to be able to know the appropriateness of the questions and the suitability of the instruments for the study. The instrument was used to elicit data on vital research factors highlighted in the objectives.

The questionnaire consists of 57 variables in question format, coined succinctly in short and simple form, thereby avoiding ambiguities. The data collected from the respondents were subjected to both descriptive, inferential statistics, and content analysis. The descriptive statistics was used to show the frequency and percentile distribution of the results from the study. In utilising inferential statistics, a simple chi-square test was used to demonstrate whether or not there are significant relationship between the indoor space and the activities of daily living in the residential indoor spaces. The Kruskal-Wallis Test (H – Test) was also used to demonstrate the significant relationship between the respondent's behavioural patterns of spatial usage to certain variables namely: Age bracket, Level of education, income classification and space availability.

Study area

Akure is the capital of Ondo state. Ondo state is situated in the South-Western geopolitical zone of Nigeria and lies between latitude 50⁰45N and 70⁰52N and longitudes 40⁰20E and 60⁰3E. Ondo state was created in February 1976 (Akinbamijo, 2004; Fadamiro et al, 2005), and house a largely agrarian population of 2,335,728 as at 2006 Census. Akure is the economic nerve centre of Ondo State and a leading producer of mineral resources and food crops in Nigeria. It is located on the intersections of Latitude 7° 15' N and Longitude 5° 15' E (Fig. 1) at an approximate altitude of 370m above sea level. Akure, the study area is traditionally divided into 12 zones following their historical evolution (Olotuah, 2000b; Fadamiro et al, 2005).

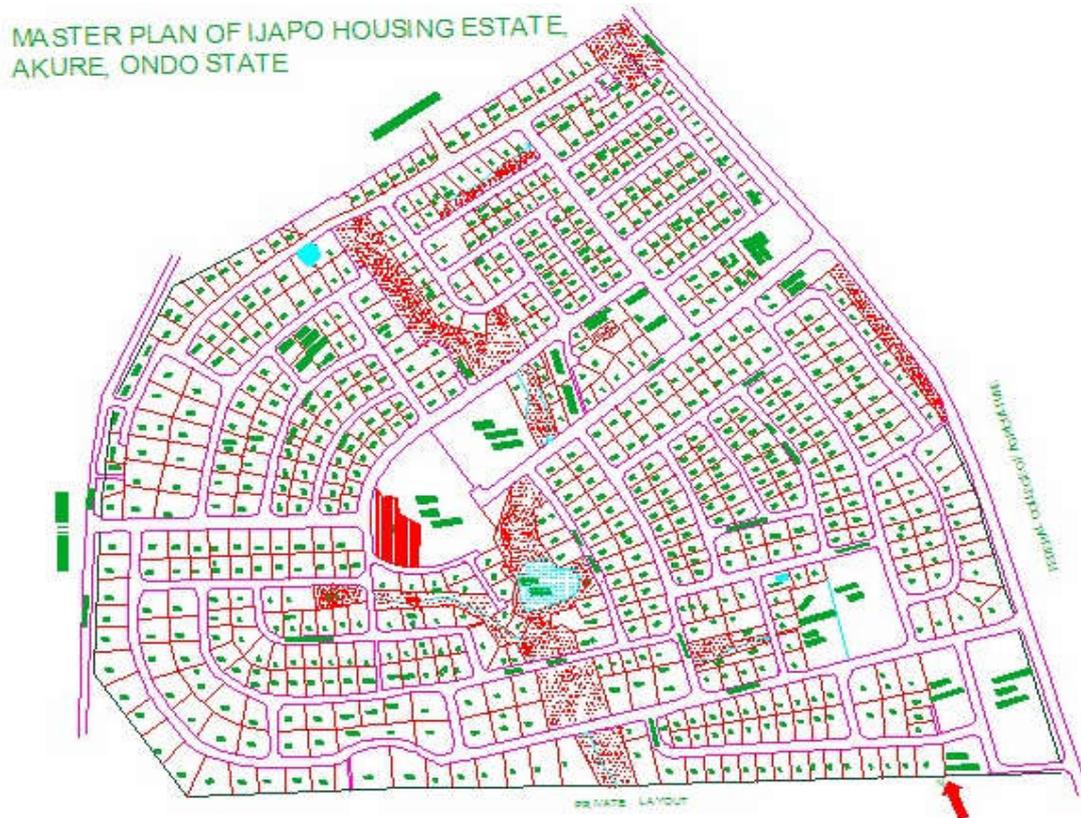


Source: Ondo State Ministry of Housing and Urban Development, Akure

Figure 1. Map of Akure showing the study area in shade

The different zones include Erekesan, Idiagba-Ijemikin, Obanla, Okegan, Adegbola-Ayedun, Gbogi, Isikan/Oke Aro Titun, Oke-Aro, Ala, Alagbaka, Isolo, and Ijapo. The study was carried out at Ijapo housing estate in Akure South local government area. Ijapo housing estate (Fig. 2) is the oldest government-built estate in Akure and it has experienced both partial and full modification over time. The reason for the selection is to be able to get data that can be relied upon for the purpose of analysis to ascertain the level of satisfaction of the users in their respective homes. This research is a community-based household survey of the user perception of their residential indoor in Akure, Ondo State, Nigeria. The intention was to study the way user put the residential indoor space design for them into personal use, fostering a better residential indoor arrangement and a satisfactory future design for household use.

This is justifiable since majority of them are at mature age. Further, about 60% were low-income earners (between no specific income and ₦100, 000), while 57% and 38% were owner-occupiers and family house occupants respectively. Similarly, 32% were self-employed while 64% were public sector workers and only 4% retired. Majority (77%) of the respondents' lives between 3-5 bedroom apartments in which 40% of the respondents occupies 4bedrooms residential apartment. Although, about 53% of the respondents indicated that there had been increase in household size since their stay in the apartment, however, only 29% complained of space inconveniency. This results suggests that the respondents are conversant with their housing conditions; and thus are qualified to provide reliable data on the level of space adequacy and satisfaction with their current housing situations.



Source: Ondo State Development and Property Corporation, Akure

Figure 2. Layout Plan of Ijapo Estate, Akure

FINDINGS AND DISCUSSION

Significance of Socio-Economic Characteristics on the Activities of Daily Living (ADL)

Table1 (see Appendixes) shows the socio economic characteristics of the respondents in the selected area of study. The demographic profiles of the respondents in the survey show that 63% and 37% of the residents encountered in the research were males and females, respectively. The male is more than the female because man has always been seen as the head of the family, since the questionnaire is been directed to the household head. The result also shows that about 79% of them had tertiary education and a majority of them were between 31years and 55 years. The rate of literacy is justifiable since majority of residence in Akure are public servants, working in one parastatals or the other. Also around 57% are married and about 6% were either divorced or widow.

Further, the significant relationship between the socio-economic characteristics of the respondents were tested against the activities of daily living (ADL) in the Living room, Dining, Kitchen, Bedroom and Bath of the respondents. The socio-economic variable used were gender, marital status, age group, income class, and level of education. Tables 2 (see Appendixes) shows the result of Kruskal-Wallis test on the significant relationship on the behavioural space usage for the ADL. Kruskal-Wallis test result revealed a strong statistically significant relationships at both 5% level of probability ($p < 0.05$) and at 1% level of probability ($p < 0.01$) between all the socio-economic characteristics of the respondents and space used for different activities of daily livings. This result therefore implies that the socio-economic status in terms of Age, Income class, Level of education, marital status and Gender of an individual is influential to the approach in the usage of indoor space for different activities of daily living.

Causal Dynamics to Space Usage by Users

Table 3 (see Appendixes) shows the result on the meaning that the respondents attached to four different residential indoor spaces, which are: the Living room, Kitchen, Bedroom and Bath. The respondents were asked to indicate where they perform different activities of daily living amidst the four residential indoor space. The activities of daily living considered for this study were; Sleeping, Cooking, Eating, Washing, Dressing, Studying/Meditating, and Bathing. The result shows that bedroom is where respondent expect to feel safe, enjoy utmost privacy, feel relax, study and even cook at wish. The result also show that majority of the activities of daily living were mostly preferred in the bedroom. About 70%, 91%, 71%, of the respondents preferred cooking, Studying/meditating, and sleeping respectively in the bedroom among others. However, the indication of several attempts to rearrange the indoor space configuration especially in the bedroom shows that the initial arrangement does not conform to the needs requirement for bedroom space by the users. Table 3 shows that 58% and 27% have altered the configurations of their bedroom and living room respectively to look like a place of once experience of comfort. The living room were seen as a place to socialize and relate with friends and families.

The table also show that respondent displays their status in terms of income and power in the living room as they pay serious attention to the material finishes of the interior, indicting the wish to change some material that are not fit to their status. Aside this, the living room was also indicated as a place preferred to wine and dine with their love ones. However, majority indicated that their living room dearth easy accessibility as an end result of several alteration through trial and error. Kitchen is not seen as a private or even semi-private space in the interior by the respondent, as against the conventional architectural teaching. Majority of the respondents indicated there preference to accommodate friends and neighbours in the space. A behaviour that can be likened to the tradition method of kitchen design usage. As a result of the alterations emerges further inconveniences in the accessibility, space ventilation, and visual level, among others of the indoor spaces as indicated in the perception of those spaces by the respondents in table 4 (see Appendixes). It can therefore be posits that the fact that the designer do not really understand the real need of the user, results in the alteration by the users to cater for the discomfort, which in turn resulted in further inconvenience for the user. With this perception of the spaces by the respondents, it is of no doubt that the assessment of their indoor will be unsatisfactory and this could affect the general assessment of the entire building.

SUMMARY OF FINDINGS

The study revealed that different activities of daily living according to the personality of users are performed in various studied residential indoor space. The more personal activities are been preferred in the bedroom, while living room has been identified as social space to majority of the respondents. This same has been substantiated by a resent research result (Opoko et al, 2016), however, judging through the ranking of attributes for perception of space, one can conveniently states that the perceptive view of the user residence in the selected study area is negative. In the attribute mean ranking; accessibility, level of ventilation, material colour, space size, privacy and quality

of vision are profoundly high in consideration of perceptive statement as indicated by the respondents. However, respondent have identified difficulty in accessibility into their social space and wish for change in material finishes used in most spaces in the building. Likewise, there are records of complaint as regards the space size which consequently could be as a result of many activities, concentrated in the desired space by users. All indication, therefore, posits that the space designed for the user does not fit well for all activities performed in those indoor space. As part of the discovered trait of the respondent in the study area, is their desire to make their kitchen space public contrary to architectural teaching. This has been substantiated in literature that what the individual user preferred of a space may substantially differ from design reality. However, most of the kitchen have therefore, been designed against the desire of the user, thereby resulted in inconveniency and poor perception to their kitchen space. Since it has been established in the literature that the frequency of the user of a particular space is determined by users perception, one can therefore say that most activities are been done in different location against their designed space due to the fact that the design does not conform to the desire of the end user. Therefore, the frequency of use is low, the effectiveness and theefficiency of the space is affected, reducing the level of satisfaction to be derived from these space, which in turn reduced the quality of the said spaces. Another thing discovered in the study is the desire of respondent to set their space related to a particular old setting. As described in the literature, this shows the relevance of personal meaning and feeling attachment operating when people form affective, cognitive, behaviour and social bond to a particular setting that form part of their experience. This phenomenon is not always considered in the design of residential space, thereby, withholding the liberty of control and independence in daily living from the user. There is no sense of belonging and identity identified with these spaces initially designed, and as a result, inception occur as residence began to augment for deficiency as posited by Manalang (2002). Since the external environment which man create for himself is a reflection of his inner state (Nasr, 2009), it is therefore, pertinent to find a way of extracting such information so as to input user true intend into residential indoor space design.

Recommendation

Conscious control of the design process is dealt by the design methodology. The methodology comprises of a brief, brief development, to design and presentation, taking cognisance of all elements and principles of design. Almost all designers consciously or unconsciously apply the elements of design methodology, as it is an imminent part of the design process. Exploring the techniques and methods assisting this process increases the efficiency and quality of projects being developed. For this reason widening the range of available design methods are very important for designers. This study concludes that methodological and conceptual support of decision-making processes that address the internal intent of users in the space design should be harnessed to invent design guidelines that can be used to evaluate users need and expectations. In other words, improving the existing design methodology to include the exploration of user's psychological needs is pertinent to achieve the goal of satisfaction in design and construction. Also, the design must be fashioned towards incorporating the understanding of how the home occupiers

work on a daily basis. This can only be known when the user lifestyle is rated as priority for design development.

Conclusion

In all indication, the respondents have shown that the architectural space designed for them have suffered several alteration towards augmenting for deficiencies of user's personal needs and wish. However, it was also confirmed that their personal believe are neither influence by their religious background nor their indoor arrangement a game of chance over time. Although, it was also indicated that their level of education influence the way the respondents put their space to use, however, the result gotten revealed that user needs changes as they age and their social status is a significant factor that influence placement of different activities of their daily living.

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APPENDIXES

Table 1. Descriptive statistics of respondent's socio economic characteristics

Variables	Frequency	Percentage
Gender		
Male	114	63.3
Female	66	36.7
Age Group		
26-40	79	43.9
41-55	72	40.0
56-70	25	13.9
Above 70	4	2.2
Level Of Education		
Sec School Cert	39	21.7
B.Sc./M.Sc.	68	37.8
M.Sc./M.Tech	39	21.7
Above Masters	20	11.1
Marital Status		
Single	65	36.1
Married	103	57.2
Divorce	4	2.2
Widow	8	4.4
Tenure Status		
Respondent	102	56.7
Family House	69	38.3
The Adult Child	4	2.2
Income Classification		
Low income earner	109	60.5
Middle income earner	39	21.7
High income earner	23	12.8

Source: Author's field work

Table 2. Kruskal-Wallis Test of significant effect of socio-economic characteristics on ADL in the studied spaces

Perception on space (Living room, Bedroom, Kitchen and Bath/Toilet) use	Variable code	Using Chi – square Test											
		Gender		Marital Status		Age group		Income class		Education			
		χ^2 value	P value	χ^2 value	P value	χ^2 value	P value	χ^2 value	P value	χ^2 value	P value		
Enjoying my privacy and being undisturbed	V45	4.139	0.126	22.791*	0.001	4.282	0.118	42.772*	0.011	8.459*	0.037		
Ease of doing every day task	V46	13.217*	0.004	30.003*	0.000	15.783*	0.000	14.854*	0.015	13.637*	0.003		
Feeling safe all the time	V47	14.526*	0.002	13.755	0.131	1.928	0.381	14.037*	0.004	7.125	0.068		
Being able to change and rearrange things as I please	V48	6.013*	0.049	31.404*	0.000	4.035	0.133	17.584*	0.000	3.142	0.370		
Being able to relax	V49	5.867	0.053	18.513*	0.005	1.454	0.483	56.715*	0.004	12.218*	0.007		
Being able to accommodate friends and neighbours	V50	17.002*	0.001	48.984*	0.000	0.978	0.613	17.229*	0.003	24.132*	0.000		
Being able to cook at wish	V51	8.887*	0.031	48.000*	0.000	33.511*	0.000	18.214*	0.000	4.591	0.204		
Being able to cook at wish	V52	25.824*	0.000	16.498*	0.011	5.118	0.077	60.325*	0.000	21.438*	0.000		
Being able to show my status and capability	V53	0.562	0.755	18.168*	0.001	6.231*	0.044	35.490*	0.002	22.667*	0.000		
Being able to study or meditate	V54	15.253*	0.000	36.143*	0.000	55.517*	0.000	18.544	0.116	5.332	0.149		
Being set to look like a place you have once lived	V55	16.121*	0.001	25.362*	0.003	12.604*	0.002	8.821	0.143	19.628*	0.000		

Table 2. Kruskal-Wallis Test of significant effect of socio-economic characteristics on user perception of space

		Using Chi – square Test									
		Gender		Marital Status		Age group		Income class		Education	
		χ^2 value	P value	χ^2 value	P value	χ^2 value	P value	χ^2 value	P value	χ^2 value	P value
It is hard accessing the space	V56	22.022*	0.000	8.686	0.069	7.602*	0.022	8.252*	0.000	6.189	0.103
The spaces is well ventilated	V57	5.921	0.052	15.851*	0.003	5.114	0.078	79.768*	0.000	2.365	0.500
It is always dark in here	V58	0.268	0.874	43.850*	0.000	4.706	0.095	76.464*	0.000	2.653	0.448
Space size is small	V59	10.632*	0.005	42.894*	0.000	55.226*	0.000	43.798*	0.000	13.353*	0.004
The space has a ugly look	V60	2.863	0.239	19.751*	0.001	32.223*	0.000	52.235*	0.000	22.008*	0.000
I enjoy my privacy here	V61	8.554*	0.014	4.762	0.313	0.907	0.635	33.757*	0.000	11.902*	0.008
The space is hot most time	V62	3.634	0.163	48.437*	0.000	40.930*	0.000	31.856*	0.035	8.171*	0.043
I wish I can change the material used for the floor	V63	17.992*	0.000	14.773*	0.005	7.320*	0.026	11.963*	0.000	4.854	0.183
I have changed the material once used for the wall	V64	2.360	0.307	24.327*	0.000	5.566	0.062	45.033*	0.001	3.831	0.280
I like the material used for the ceiling	V65	11.489*	0.009	87.620*	0.000	7.202*	0.027	21.212*	0.001	45.397*	0.000
The space does not fit well into the activities I perform there	V66	27.277	0.000	48.701*	0.000	6.320*	0.042	21.841*	0.011	7.974*	0.047

*Associations that are significant at 5% level of probability
Source: Author's field work

Table 3. Frequency Table on Perception of Residential Spaces

Variables	Variable Code	Residential Spaces			
		Living room Freq. (%)	Bedroom Freq. (%)	Kitchen Freq. (%)	Bath/Toilet Freq. (%)
Enjoying my privacy and being undisturbed	V45	38 (21.1)	129 (71.7)	5 (2.8)	0 (0.0)
Ease of doing every day task	V46	91 (50.6)	57 (31.7)	15 (8.3)	9 (5.0)
Feeling safe all the time	V47	32 (17.8)	122 (67.8)	4 (2.2)	9 (5.0)
Being able to change and rearrange things as I please	V48	60 (33.3)	92 (51.1)	8 (4.4)	0 (0.0)
Being able to relax	V49	44 (24.4)	128 (71.1)	4 (2.2)	0 (0.0)
Being able to accommodate friends and neighbours	V50	138 (76.7)	17 (9.4)	17 (9.4)	4 (2.2)
Being able to cook at wish	V51	13 (7.2)	126 (70.0)	21 (11.7)	8 (4.4)
Being able to eat and drink anytime of the day	V52	81 (45.0)	62 (34.4)	4 (2.2)	8 (4.4)
Being able to show my status and capability	V53	105 (58.3)	47 (26.1)	0 (0.0)	8 (4.4)
Being able to study or meditate	V54	9 (5.0)	163 (90.6)	0 (0.0)	0 (0.0)
I enjoy my privacy here	V61	17 (9.4)	118 (65.6)	0 (0.0)	4 (2.2)
Being set to look like a place you have once lived	V55	50 (27.8)	105 (58.3)	4 (2.2)	5 (2.8)

Table 4. Frequency Table on Perception of Residential Spaces

Variables	Variable Code	Residential Spaces			
		Living room Freq. (%)	Bedroom Freq. (%)	Kitchen Freq. (%)	Bath/Toilet Freq. (%)
It is hard accessing the space	V56	54 (30.0)	49 (27.2)	0 (0.0)	23 (12.8)
The spaces is well ventilated	V57	45 (25.0)	76 (42.2)	0 (0.0)	9 (5.0)
It is always dark in here	V58	35 (19.4)	48 (26.7)	0 (0.0)	24 (13.3)
Space size is small	V59	12 (6.7)	62 (34.4)	0 (0.0)	47 (26.1)
The space has a ugly look	V60	9 (5.0)	47 (26.1)	0 (0.0)	38 (21.1)
The space is hot most time	V62	30 (16.7)	86 (47.8)	5 (2.8)	0 (0.0)
I wish I can change the material used for the floor	V63	63 (35.0)	30 (16.7)	0 (0.0)	28 (15.6)
I have changed the material once used for the wall	V64	36 (20.0)	57 (31.7)	0 (0.0)	28 (15.6)
I like the material used for the ceiling	V65	69 (38.3)	30 (16.7)	18 (10.0)	8 (4.4)
The space does not fit well into the activities I perform there	V66	45 (25.0)	76 (42.2)	0 (0.0)	9 (5.0)

Source: Author's field work
