Preliminary research as used by practising architects in Lagos, Nigeria

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Abstract. A design process is universal and flexible, providing designers with a cyclic-path in thinking out solutions to design problems. A design process, therefore, acts as mediation between the design problem and design decisions through the three basic activities of 'analysis', 'synthesis' and 'evaluation'. Preliminary research is an important phase of the design process. The preliminary research stage of the design process is a vital tool in solving the design problem of a variety of clients the architect meets. The study aimed at accessing the use of preliminary research by practising architects in Lagos, Nigeria. The study found that preliminary research is being carried out by a large percentage of architects in Lagos, Nigeria and that preliminary research was found relatively relevant to their design at different stages. Case studies on previous projects and study of the proposed users of the design to identify their needs are the predominant methods used for preliminary research. The study recommends ways to improve the application of preliminary research in the practice form the start of architecture schools.

Keywords: Design process, preliminary research, practising architects, design information, design freedom, architectural education

1. Introduction

Every piece of architecture is a product of a series of activities, which considers a fragment or whole of the design task, ensuring that decisions are taken based on rationalizing. These series of activities are regarded as the design process. Design process entails a series of interdependent activities, aimed at the realization of the desired product [1]. The design becomes a completed process when it has solved its initial design problem -the client's needs. The stages in the design process are iterative, usually having a cyclic pattern of progress, hence having a back and forth movement. The design process, therefore, acts as mediation between the design problem and design decisions through the three activities of 'analysis', 'synthesis' and 'evaluation' [1],[2].

Preliminary research as a stage in the design process involves sorting for relevant information that helps the understanding of the design brief and trigger questions on an existing structure in line with the brief [3]. Preliminary research when properly done serves as a great tool for the architect in satisfying the needs of the client and a platform that enhances the architect's flexibility in the design.
process, as a larger array of options are known. The role of preliminary research in the design process is essential when the satisfaction of the client’s needs and the efficiency of the design is paramount to the architect. In developing an ethical architecture [3], suggests that designers should possess a good research culture, as a necessary prerequisite for unifying the art and science aspects of architectural design practice. Design thinking progresses with the amount of information acquired about the design task, making information gathering about the design task a necessary aspect of the design process. This is because designers have a better understanding of the design task, as information and insights are unravelled through research [3].

2. The design process in architecture
The design process is applied in all disciplines that deal with providing solutions through ‘product design’. Architecture is one of such disciplines. The design process in architecture is the period in the whole life cycle of the design product where the architect makes the most significant impact. The designer is currently viewed as facilitatory in the design process rather than a key design expert, which coordinates rational activities to solve design problems [3]. The appreciation of every product of design should include the process that created it, to encourage designers who engage in it and shed light on the process as a significant and important stage in every design. The architectural design should focus on the product design process rather than the product itself. In other words, architectural design is not a simple process of drawing lines, it needs more complex tools to decode this complexity and purify it to be presented in the built environment [4].

Besides, the architectural design could be fit into the genuine tool instead of the standardized ones. Valid instruments mostly don't underline the genuine learning as an end itself. Be that as it may, it centres on the capacity to utilize fitting learning, abilities, and method for taking care of structure issues [5]. This point of view on the planned procedure could change the semantic and result of structure from ‘final result’ into ‘process item’ [4], investigation on how the design process can be made relevant to the students of architecture, stating its limitation of use from the sole focus of the students' strength in the end product rather than the process [1]. The study suggested that the strengths and advantages that are in the design process be exposed to the students and assessment of the design process, as students take the assessment as important.

3. Steps in design process in architecture
In recent times, many studies on architectural design process have proposed theories on how the design process should be structured. In this field, the process of design is a decision sequence of ‘analysis’, ‘synthesis’, ‘appraisal’, and ‘decision’ as progressively detailed stages of the design process [4].

![Markus & Maver diagram of design method](image)

**Figure 1:** Markus & Maver diagram of design method [4].
The stages of the design diagram in figure 1 show the application in every phase of the architectural scheme, confirming the usefulness of the design process. It also shows the cyclic nature of the design process as the process is like a loop which repeats itself.

4. Preliminary research in the design process
The research process in the design allows for information gathering that helps critically judge the decisions of the designer and allows for flexible thinking. The design process should begin with a certain amount of researched information on the design problem [4]. Preliminary research is the science of systematic and logical collection of data that explain the design problem, to guide the architect's art thinking. The design process requires researched information about the design problem to progress [6].

In traditional design processes, maximum research is carried out at inception stage for data collection [4]. As the design progresses the effect of the preliminary research decreases as shown in figure 2. The data collected are applied in the context of the design task, then the data collected is narrowed to solving the problem.

![Figure 2: the balance between research and design in the process](image)

5. Challenges in preliminary research
The design itself is a hunt for reality (solution), that gets clearer with the evolution of the design problem and its possibilities. The solution to the design problem is uncertain from the start of the project, so is the information needed about the project, making a design like a big black box: ‘needs’ form the input and ‘blueprint solutions’ make up the output [6].

As shown in figure 3, the level of design information at the initial phases of design is low with yet a high influence on the design. Almost all decisions pivotal to the project are taken at this stage, on the basis of the low design information gotten. Though maximum research for data collection is carried out at the initial phases of design, the information about the design is low but progresses as the design evolves, making the research needed to be carried out low in volume since context is being formed.

![Figure 3: Influence/information contradiction in the early stages of design](image)
Figure 4: Schematic description of knowledge/information versus design freedom during the design process [6].

Design freedom is limited to the level of our knowledge about the design problem. As the design process progresses, knowledge of the design problem and possible solutions will become available, while the impact capacity of these solutions to the project decreases [6] as expressed graphically in figure 4. Knowledge of the design problem tends to restrict the freedom to examine generally the other ends to the design, channelling the designers thinking to solve just that problem. Preliminary research in the process of design does not absolutely solve the puzzle in the design, it helps to give transparency to the design but does not guarantee the true quality of the design product (figure 3).

6. Methods of carrying out a preliminary research

6.1. Case Study Research
Case study research as a method of carrying out preliminary research generally involves multiple sources of data pooled from different cases. It would involve the researcher analysing some already existing design, to produce a new design. The researcher attempts to find the merits and demerits of such a design, to integrate the solutions provided in the already existing design into his/her present design contextually. Case study research is very advantageous because one can critic the process that was imbibed in a specific case and see if it actually solved the problem. It enables the researcher to know what and what not to do in the design process. Yin (1984) as cited by [7] notes three Categories of case studies, namely exploratory, descriptive and explanatory case studies. Exploratory case studies set to explore any phenomenon in the data which serves as a point of interest to the architect. The architect bases the study on premises or questions to further examination of the phenomenon observed. Descriptive case study set to describe the natural phenomena which occur within the data in question. The architect recognizes the attributes of the article in study. The test of an enlightening contextual analysis is that the architect must start with a descriptive theory to help the explain the research objectives. [7]. A logical contextual investigation looks at the information firmly both at a surface and profound dimension so as to clarify the research objectives in the information. The architect additionally utilizes the technique where design coordinating can be utilized to examine certain phenomena in extremely intricate and multivariate cases.

6.2. Ethnographic and Naturalistic
Ethnographic is an all-encompassing way to deal with research created by anthropologists so as to comprehend individuals inside their social and cultural wellbeing. The basic hypothetical system of the ethnography is that individuals' activities and musings are subject to a tremendous scope of components and what they state and do in one setting isn't really what they really do in another. In this manner, to completely comprehend people groups' conduct, opinions and choice processes, research
must invest time with them in their different physical and social conditions. The essential technique for the ethnographer is the 'member perception'. This includes the total commitment of the researcher into the lives of those that are being examined. The ethnographer spending the day shadowing a respondent in their home, educational, and social environments [7].

6.3. Survey Research
Survey research is a standout amongst the most imperative tools of estimation in connected social research. The wide region of review investigate envelops any estimation methodology that includes making inquiries of respondents. A "survey" can be anything from a short paper-pencil input structure to an escalated one-on-one top to bottom structured interviews. The purpose of survey research is to obtain relevant information that can be used to analyse various aspects of the study population. It gives the researcher different views of different people. One problem would most likely have different solutions. Survey research helps the researcher to pry into the minds of the chosen set to be surveyed to get necessary feedback [7].

6.4. Document Research
Document research, filling in as both a supplement to an expansion of personal request, takes on various implications in the field of education. In one sense, report inquires about winds up synonymous with authentic research and addresses issues identified with the role and utilization of archives and open and private records. For this strategy of research to be completed the researcher must approach credible records. In another sense, archive looks into produces antiquity's and material culture through imaginative portrayal, moving and still symbolism, and sound recordings which are essential in primer research in light of the fact that such information would help in achieving the ideal result. Evaluating records ordinarily incorporates four criteria: genuineness, believability, representativeness, and meaning [7].

7. Research Methodology
This study used questionnaires as a method of data collection. The questionnaires consisted of a series of close-ended questions to obtain data from the participants on their use of preliminary research in the design process. Nigeria. According to the ARCON list of registered architectural firms (2013), there are 876 firms registered. Amongst this 876 firms, 289 are based in Lagos, Nigeria. According to this result Lagos state represents 32.99% of the registered architectural firms in Nigeria. Therefore, it is logical to use a state with the highest number of firms of all the 36 States in Nigeria as a study frame for practising architects in Nigeria. The participants involved in the survey were practising architects in firms registered by the Architect registration council of Nigeria (ARCON) in Lagos. A total of 100 questionnaires was administered to practicing Architects in Lagos, Nigeria and selections were based on random sampling techniques to ensure that everyone has equal opportunity to be selected for the study. Nigeria at the monthly Nigeria Institute of Architects meeting and at registered firms within Lagos. Ninety-two questionnaires were filled, returned and analysed using the IBM SPSS statistics software. The data was analysed using descriptive statistics.

8. Results and Discussion
Table 8.1 presents the frequency of the response to how the respondents often engage in preliminary research. Amongst the respondents, 5.9% rarely engage in the process, 10.6% engage in the process sometimes, 42.4% often engage in the preliminary process and 41.2% always engage in the preliminary process during every design problem. This result shows that practising architects in Lagos, Nigeria to a large extent engage in the preliminary aspect of the design process in their design projects.
Table 8.1: The respondents use the preliminary research process.

|          | Frequency | Per cent |
|----------|-----------|----------|
| Valid    | 77        | 92.8     |
| No       | 6         | 7.2      |
| Total    | 83        | 100.0    |

Table 8.2 presents the result of the analysed data on the relevance of the findings from the preliminary research process to the design. Amongst the respondents, 8.4% find the findings from the preliminary research sometimes relevant, 38.6% of the respondents find it often relevant and 53.0% of the respondents find the findings from the preliminary research process always relevant. The result proves the importance of the preliminary research process, as its relevance has been admitted by a large population of the study sample.

Table 8.2: The relevance of the findings of preliminary research to the respondents

| Valid          | Frequency | Per cent |
|----------------|-----------|----------|
| Sometimes relevant | 7         | 8.4      |
| Often relevant  | 32        | 38.6     |
| Always relevant | 44        | 53.0     |
| Total          | 83        | 100.0    |

Table 8.3 shows the result of the mean for the method the respondents use in carrying out their preliminary research process. The results show clearly that practicing architects would best prefer to carry out preliminary research through case studies on previous projects and studying the proposed users of the design to identify their needs with a mean value of 4.4066 and 4.3516 respectively as against studying literature on the design problem and historical building in line with the design with mean values of 3.7143 and 3.7582 respectively. Consultation with professionals and asking questions about the design problem is an alternative to the first two preferred methods.

Table 8.3: Respondents' use in carrying out preliminary research.

| Method                                         | N  | Mean  | Std. Deviation |
|------------------------------------------------|----|-------|----------------|
| Case study on previous projects                | 91 | 4.4066| .59588         |
| Studying the proposed users of the design to identify their needs | 91 | 4.3516| .65614         |
| Consultation with professionals                | 91 | 3.9890| .76731         |
| Asking questions about the design problem      | 91 | 3.9780| .95427         |
| Studying historical building in line with the design | 91 | 3.7582| .84775         |
| Studying literature on the design problem      | 91 | 3.7143| .94617         |

The result from this section as shown in table 8.4, presents that a mean value of 4.4889 for analysing, synthesizing and evaluating design issues, 4.2273 for developing ideas and conceptual thinking, 4.1111 for preparing architectural presentation and rendering, 4.1011 for construction and supervision, 3.9000 for developing working drawings and 3.5795 for building finished models. This result supports the place of the preliminary research process as an early part of the design project since design decisions can be made and changed quite easily. The preliminary research has little or no effect on the building finished models as it is supposed to be the blocks to building such models. The progression in the scale of works experienced a simultaneous degree in the effect the preliminary research findings have, supporting the Schematic description of knowledge/information versus design freedom during the design process in figure 3.
Table 8.4: Relevance of the findings to stages in the project of the respondents

| Stage                                                                 | N   | Mean    | Std. Deviation |
|----------------------------------------------------------------------|-----|---------|----------------|
| Analysing, synthesizing, and evaluating design issues                | 90  | 4.4889  | .75319         |
| Developing ideas and conceptual thinking                            | 88  | 4.2273  | .97941         |
| Preparing architectural presentation and rendering                  | 90  | 4.1111  | 1.08560        |
| Construction and supervision                                        | 89  | 4.1011  | .95400         |
| Developing working drawings                                         | 90  | 3.9000  | 1.14214        |
| Building finished models                                            | 88  | 3.5795  | 1.14190        |

9. Conclusion

The study has shown that practising architects in Lagos, Nigeria, engage in preliminary research and acknowledge its relevance to their design decisions. Consequently, practising architects would best prefer to carry out preliminary research through case studies on previous project and studying the proposed users of the design to identify their needs as against studying literature on the design problem and historical building in line with the design. This study strengthens the place of the preliminary research process as an early part of the design project, where design decisions can be made and changed quite easily as shown (table 4.), with regards to the relevance of the findings to stages in the project.

The authors hereby recommend that preliminary research should be carried out at the analysis, synthesis, evaluation, construction and supervision stages of the project. Also, the authors considered improvement in the use of preliminary research in the design process as an educational challenge from schools of architecture and recommend that schools of architecture should place emphasis on inculcating the research culture into the students’ design process through a process-based design studio curriculum. In addition, schools of architecture should adopt a means of grading the preliminary research of students’ designs, as part of the cumulative scores. This grading can help stimulate the energy required to undergo the ‘stress’ in researching, with the anticipation of good grades as rewards. The study identifies the gap of preliminary research in assuring the true quality of the design process and therefore recommends that further studies should investigate how to use the information sourced from the preliminary research to solve the design problem.

10. Acknowledgements

The authors of this paper acknowledge the management of the Nigeria Institute of Architects (NIA), for the platform to administer these questionnaires in the monthly NIA Lagos chapter meeting.

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