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Innovations in the teaching of architectural studio: The covenant experience

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Abstract

Architectural design is the process through which the architect attempts to capture his thoughts and present it in a form that others can see. There are basically two methods of architectural design, namely the black box and the glass box methods. While the black box method is mainly intuitive, the glass box employs logically derived data for design. Various schools of architecture adopt either of these methods in training their students. This paper reports on the outcome of a home-grown combination of both methods adopted in the teaching of architectural design to second year architectural students in a private university in Nigeria. Data has been collected over a period of four years from the students involved through questionnaires and interviews. This has been complimented by discussions with the tutors involved. Results indicate that this innovative method provides a strong theoretical and analytical background for the students design projects while opening them opportunities to explore their creative potentials. The major challenges, however, are that the process is more demanding on the part of both the students and tutors and requires more contact hours between both paper.

Keywords: architectural studio, Innovations, experience, design.

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1. Introduction

As Albert Einstein has stated, imagination is more important than knowledge, for knowledge is limited while imagination embraces the whole world. For us, art has become a reasonable tool which embodies people's experiences since they began drawing in ancient times on cave walls what they saw or imagined. Art expresses verbally or in writing whatwe perceive, our dreams and our creativity. Art has always been a part of a successful and quality education. Works of art increase intellectual, personal and social development of the young. Dealing with art enhances the capabilities of individuals in order to understand the world and different cultures, and provides a rich and engaging way. To instill the art in people enables them to have a tendency towards analytical skills, perseverance and perfection, by giving direction to their habits of lifetime. Browsing through works of art, people can develop creative skills and new ideas, gain new experiences and also carry personal satisfaction (Nunan, 2009).

Design arguably is the main skill expected of an architect. The process of acquiring design skills has evolved over the years. Traditionally, training of architects was through oral teachings observing and following the processes of the 'masters' (Mahmoodi, 2001). Formal architectural training can however be traced to the 15th century. Within such settings architectural training is divided into the theoretical courses and the design projects. In many schools, the process of teaching architectural design involves the studio tutor providing students with the project and allowing each student to evolve his own version of the project, which is graded at the end of the project period (Vecchia, da Silva, & Pereira) However, in between the project period, students may consult the tutors for guidance. Design is complex and involves several levels of decision making. The process of design essentially takes place in the mind of the students. Often influences by the information available to him. This process of design has been referred to as the "black box" approach to design (Jones, 1970). Literatures like Dongre, Deshpande and Ingle, (2007) opine that the approach is influenced by the assumption that design is inspirational, irrational, and abstract and therefore cannot be analysed. Sometimes the designer may not even be able to explain how he arrived at the solution. Consequently, the design process appears shrouded in mystery. The need to demystify the design process became heightened in the 1960s because of the complexity of architectural practice and the need to subject architectural training to scientific assessment as in other disciplines. The contributions of theorists like Asimow (1962), Broadbent (1969), Archer, 1969) and Jones (1970) attempted to make the process more transparent, scientific and replicable. Design methods in this category are classified as the glass box methods. According to Mahmoodi, (2001) they are more rational and engaged in "externalised" thinking. In this paper, the authors share their experience in introducing students of architecture to architectural design using an indigenous design method, which combines both the glass box, and black box methods.

2. Literature Review

major preoccupation of the professional architect is architectural design. Kim & Kim (2007) define design as "an evolving process interwoven with numerous intermediate representation and various design information". It is essentially the process via which the architect provides solution to the client's brief within its unique context.

Cho (2012) opines that architectural design is a multifaceted discipline. Design is a complex process involving series of activities. Consequently, it demands that the architect possesses a variety of skills and competencies in order to perform the design task credibility. The design process includes several steps which may be summarized to include analysis, synthesis, evaluation and decision-making, (Asimow, 1962). Literature however suggests that the design process is interactive and non-sequential.

Traditionally, these processes took place in the mind of the designer, unveiling a surprise product at the end of the process. However, the need for a better understanding of the design process has been

recognized as a result of the growing complex demands of architectural projects; the need to engender greater cooperation amongst project teams (which are increasingly more interdisciplinary); the need to improve the tool support for design and the need to improve the process of training architects. Consequently, there have been significant interests in design methods since the 1960s with the pioneering work of (Asimow, 1962). A detailed review of research in design methods since the 1960s including the contributions of not only architects but others like scientists and engineers has been provided by Kowaltowski, Bianchi and de Paiva (2010). They note that the aim of these efforts has been to improve both the process of design and the product of design.

A major goal of architectural education is to equip architecture students with the skills they need to effectively fit into the professional world. As Kowaltowski, Bianchi, and de Paiva (2010) noted the need for architecture students to acquire core competence has been heightened by the competitiveness of the job market. Consequently, students need to be firmly grounded in design, understanding the design process as well as the need of users and how best to meet them within the constraints of quality, funds and time. Creativity in design is one of the skills students are expected to acquire through architectural education (Cho, 2012). Consequently, in many architectural schools, creativity is one of the major criteria for assessing students architectural design projects. However, there have been debates on whether creativity is a natural endowment and also whether it can be taught and acquired. In the past, creativity was generally believed to be the preserve of the gifted and mysterious. Literature suggests that over the years, it is increasingly realised that creativity can be acquired. Accordingly, Eigbeonan (2013) stresses the need to foster creativity in students in the course of their architectural education. According to Cunliffe (2008) creativity can indeed be enhanced through knowledge, experience and ideas. Kowaltowski et al. (2010) has also identified confidence as another crucial element needed in fostering creativity

2.1. The homegrown design approach

This design approach was developed by Olajide Solanke, a Nigerian professor of architecture in the early eighties while teaching at the Ahmadu Bello University, Zaria Nigeria. Over the years, the method has witnessed several stages of development based on evaluations and reviews. As an alternative to the traditional black box design method, this method evolved in a bid to offer students of architecture an objective and scientific basis for creative expression in their architectural design assignments. Essentially, it is a form of sequential method of design characterized by six major stages. These are the brief development stage; conceptualization 1 - functional analysis stage, space derivation/adequacy check, graphical analysis; conceptualization 2- stage, graphical interpretation; design evolution stage; design delineation stage and the outline proposal and finally architectural presentation and detailing stage. The first and second stages require a lot of thought process and documentation while understanding definition of function. A good understanding of functional relationships is also required at this stage. Functional relationships are weighed on a 3 point scale as follows: 1= weak, 2= semi-strong and 3=strong. Each of the six major stages consists of sub-stages. Space derivation is developed to be a function of the furniture requirements of the activities in a functional space and the space derivation ratio SDR (Solanke, 2008; Solanke & Dare-Abel, 2009).

The graphical analyses involve the use of two graphical tools: the Triangle of function and the Functional Diagram. The tools physically express the decisions of the designer from the first stage and forms the basis for outline proposals and design work. Once a student succeeds at these tasks, the assurance of a functional design is evident. The conceptual stages require the integration of objectivity and creativity to give rise to the design and Architectural presentation. Since, the onset of the application of this method at Covenant University, about eight years ago, deliberate efforts to harvest feedback had been taken. This study is one of such attempts. It is obvious, that the method is effective in tackling large design projects that involve multiple units, where the design data to be analyzed are sizeable.

2.2. Operational Method

Students on this programme are second year architecture students who are being introduced to architectural design for the first time. The course is structured into two parts, namely the theoretical and the practical parts. The theoretical part consists of lectures on architectural design and drafting principles as well as tools aimed at providing students with adequate theoretical base. In addition, students are introduced to this innovative design method and taken through the various stages in order to familiarize the students with them. All students registered on the course participate as a group in these lectures which hold weekly at the beginning of the course. For the second part, students are divided into smaller groups with an instructor assigned. The group meets two to three times a week for at least three hours per meeting. During these meetings, the students are encouraged to present and discuss their works, providing explanations to design decisions they have taken. During these sessions, the tutor moderates discussions while providing guidance (including practical tips), clarifications, and counseling. Students are encouraged to consult their tutors or other tutors on the course beyond these statutory periods. In line with the University requirements, each student is expected to meet at least 75% class attendance. At the end of the semester, each student is required to submit a project consisting of a report (comprising of all the analysis leading to the design) and a design proposal based on a brief issued at the beginning of the semester. Using an agreed marking scheme, the submissions are graded by all the tutors in conference in order to reduce subjectivity.

3. Research Method

Mahmoodi (2001) suggests that pedagogy adopted for teaching architectural design be subjected to periodic evaluation. Such evaluations help to determine effectiveness of pedagogies and identify areas that need fine-tuning. Evaluation in this case was done mainly from the students' perspective using questionnaires. Questionnaires were randomly administered to students who are currently in their second to sixth year on the architecture programme at the Covenant University, Ota, Nigeria. Participation in the survey was voluntary. Out of 122 questionnaires distributed, 89 (representing 73%) were returned and used for the study. Questionnaires were analyzed using simple statistics of frequencies and percentages.

4. Feedback from students

Results suggest that a high percentage of the students (83.1%) found the lectures helpful at the design stage while 9% claim the lectures were not helpful. On the other hand, 77.5% found the analyses useful for design while 22.5% reported the analyses were not useful. The analyses were considered time consuming (86.5%) and majority of the students (73%) did not enjoy preparing the required documentation. Although 47.2% of the students reported that time allotted for the design stage was adequate, 77.5% indicate they would have needed more time for this stage. 83.1% of all respondents suggest more time be allotted to design stage, while 36% and 19.1% suggest that more time be given to the analysis and lectures respectively.

The findings reveal that majority of the students receive support considered adequate from their tutors. However, more students report receiving more support from tutors at the design stage. While 65.2% claim to have received support at the analysis stage, 84.3% report receiving support at the design stage. Results indicate that the method allows long contact hours between the group tutors and their students. While 56.2% agree with this position, another 19.1% strongly agree. However, a significant proportion of the respondents (14.6%) were indifferent. Results indicate that the method engenders good relationship between the tutors and their students as indicated by 66.3% of the respondents.

The stages of the design process were examined to evaluate the students' understanding of them. Results presented in Table1 indicate that majority of the students have a good understanding of the various stages involved in the design method. Over all, the students were asked to evaluate the method. The findings are presented in Table 2. Majority of the students (84.2%) report that the method provides them with adequate analytical data on which to base their designs; 64% claim it makes the design process easier while only 46.1% think it makes the design process faster. In the area of creativity however, 23.3% of respondents indicated that it hinders creative expression while 37.1% expressed a contrary opinion. However, 36% of the respondents were undecided.

Table 1. Students' Reported Understanding of the Design Process

Understanding of:	very well	well	Fairly well	rarely	Not at all	No response
Brief development	42(47.2)	32(36.0)	12(13.5)	2(2.2)	1(1.1)	
Functional analysis	37(41.6)	33(37.1)	16(18.0)	1(1.1)	0	2(2.2
Definition of functions	3640(.4)	41(46.1)	9(10.1)	2(2.2)	1(1.1)	
Functional relationships	38(42.7)	37(41.6)	12(13.5)	1(1.1)	1(1.1)	
Space derivation	33(37.1)	30((33.7)	18(20.2)	7(7.9)	1(1.1)	
Space adequacy check	34(38.2)	21(23.6)	18(20.2)	14(15.7)	1(1.1)	
Triangle of function	28(31.5)	37(41.6)	14(15.7)	3(3.4)	5(5.6)	1(1.1)
Functional diagram	33(37.1)	30(33.7)	20(22.5)	2(2.2)	3(3.3)	1(1.1)
Arbitrary boxing	17(19.1)	19(21.3)	26(29.2)	16(18.0)	10(11.2)	1(1.1)
Boxing to scale	21(232.6)	26(29.2)	22(24.7)	15(16.9)	4(4.5)	1(1.1)
Outline proposal	19(21.3)	33(37.1)	17(19.1)	11(12.4)	5(5.6)	4(4.5)
Detailed drawing	48(53.9)	26(29.2)	12(13.5)	1(1.1)	1(1.1)	1(1.1)

Source:fieldwork (2014)

Table 2. Respondents' Perception of the Design Method

	strongly agree n(%)	agree n(%)	uncertain n(%)	disagree n(%)	strongly disagree n(%)	no response n(%)
It provides analytical data for design	18(20.2)	57(64.0)	9(10.1)	2(2.2)	0	3(3.3)
It hinders creativity	5(5.6)	16(18.0)	32(36.0)	29(32.6)	4(4.5)	3(3.3)
It makes designing easier	14(15.7)	43(48.3)	20(22.5)	9(10.1)	0	3(3.3)
It makes designing faster	12(13.5)	29(32.6)	13(14.6)	19(21.3)	19(21.3)	5(5.6)
Lectures provide good theoretical knowledge for design	14(15.7)	50(56.2)	13(14.6)	9(10.1)	0	3(3.3)
The method provides long student/tutor contact hours.	17(19.1)	50(56.2)	13(14.6)	5(5.6)	0	4(4.5)
The method engenders good relationship student/tutor	18(20.2)	41(46.1)	17(19.1)	5(5.6)	3(3.3)	5(5.6)

Source:fieldwork (2014)

5. Discussions

Results of this study show that the students generally have a good understanding of the design method they are introduced to although the proportion of students who have good understanding of the process (well or very well) begins to decline from the "functional relationship" step. This suggests the need for the tutors to review the training strategies in order to ensure that more students have a proper understanding of the method. This is essential if the students are to proceed with this method to higher classes and professional practice in future.

A major observation from the data is that the data analysis stage takes a lot of time. This is to be expected because of the range of information required for the design of a project. Students are actually encouraged to undertake thorough data collection and analysis as this makes the design stage

easier as reported by the students. It may also be pointed out that the analysis stage becomes less cumbersome and time consuming over time as designers build up their data base which may be referred to as the need arises. For this stage also, students are encouraged to use their computers in order to fasten the process. It is also suggested that tutors provide more support to the students at this critical stage as findings reveal that the perceived support of tutors at this stage is less than that received at the design stage.

The long contact hours between the students and their tutors helps to build good working relationships create a "home atmosphere" which encourages students to loosen up and express themselves more confidently over time in relaxed atmosphere. It is believed that such an atmosphere is essential for creativity. The tutors consider their experience quite rewarding as overall quality of work produced by the students is considered commendable. However, there is a desire for the method to be adopted at all levels in the school so that the benefits can become more evident.

6. Conclusions

The design method discussed above holds great promise for architectural education. However, such benefits accrue over time as data base is developed and the designer gets more familiar with steps involved in the process. The demands it makes on both the students and tutors are adequately compensated by the quality of the process output and cordial relationships developed not only between students and tutors but also between the students.

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