Reflections on Architecture Design Education in Khartoum: Understanding the Role of the Design Method

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Abstract: A growing dissatisfaction with design failures in architecture design studio appears to be the main concern of researchers and academicians around the world [1]. The main problem in teaching architectural design lies in that the assessment is focused on the product of student's efforts not on the process. The real danger in the studio, as Keith McAllister [2] sees it, is that students in paying so much attention to the end product they ignore the development of the essential design process skills. Similar problems were reported in Khartoum. The ongoing discourse over architecture design studio in Khartoum has in the recent years raised questions in relation to various aspects of design education and revealed misconceptions about the role of design method. Criticism has been particularly directed to the teaching approach, which is often focused on presentation drawings not the process. This policy, in addition to other reasons, encourages students to ignore the design method, turn their attention to form making relying only on intuition and artistic skills. This approach leads to lack of balance between rationality and creativity in the design process. Using design method is a legacy in architecture design education in Khartoum, but probably has diverted its original path and has become implicit through years of unchecked practice. Many difficulties associated with the conventional design method are related to its implicit nature, other important reasons include the lack of a clearly defined role, structure and procedures of design methods. The aim of this paper is to discuss the problems resulting from the earlier factor that is the usage of the implicit design method, while the other ones will have to wait for future studies. The specific aim of this paper is to discuss why the implicit model fails to act as a systematic approach to design and why it is necessary to introduce an explicit methodical design model.

Key words: Design education · Form making · Human needs · Rational base · Methodical approach · Implicit method

INTRODUCTION

A growing dissatisfaction with design failures in architecture design studio appears to be the main concern of researchers and academicians around the world [1]. One of the main problem in teaching architectural design lies in that the assessment is focused on the product of student's efforts not on the process. The real danger in the studio, as Keith McAllister [2] points out, is that students in paying so much attention to the end product they ignore the development of the essential design process skills.

Similar problems have been debated in Khartoum in the past years. Most criticism has been directed to the teaching approach, which is often focused on presentation drawings not the process. This policy, according to many observers, encourages students to ignore the design method, turn their attention to form making relying only on intuition and artistic skills. As a result, lack of balance between rationality and creativity in the design process is now common in Khartoum, which inevitably leads to design failure.

Using design method is a legacy in architecture design education in Khartoum, but probably has diverted its original path and has become implicit through years of unchecked practice. Many difficulties associated with the conventional design method are related to its implicit nature, however, other important reasons include the lack of a clearly defined role, structure and procedures of design methods.

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Only recently has the increasing recognition of the problem raised awareness among educators of the need for change in studio programs and teaching policy. This study is the first in a documentation series, which is intended to report the efforts by the author to influence the transformation in architecture design education in Khartoum.

Two main issues the present paper is concerned with: the lack of balance between rationality and creativity in students' work and; the role of design methods is not clearly understood in the studio. The specific aim is to discuss how better understanding the role of design method can lead to a more balanced relationship between rationality and creativity in the design process. In the first paper in this series the inadequacy of the conventional design method because of its implicit nature was discussed. The specific aim of this paper is to discuss why the implicit model fails to act as a systematic approach to design and why it is necessary to introduce an explicit methodical design model.

The study methodology relies on the literature and observation. Reviewing the literature was necessary to provide a theoretical background to inform the discussion and to frame the study in consistence with the conventional format in the literature. The study relies also on the author's personal observation throughout many years of experience in design studio teaching and as a practitioner.

The Historical Evolution of the Methodical Approach to Design: The awareness of the inadequacy of the intuitive approach for the complexity of modern time design projects [3] has in the 20th century lead to the realization that more informed and methodical approaches to designing were required.

The paper argues that the use of design method is indispensable as part of human system of doing something. The use of design method is evident throughout indication architectural history. There are strong indications that this was the case in Egypt and Greece and in medieval Muslim and Christian architecture as well.

There has been a long history of scientific approach to design that can be traced back to the ancient civilizations. We know that, since the Egyptians, the ancients have studied nature and tried to apply the law of nature in architecture design. The Greeks were the first to learn how to interpret the law of nature in mathematical order and to develop the use geometry. Greek design methods were discovered by the Muslims and transmitted to the Latin world in the 11th and the 12th centuries.

Throughout its history architecture has produced integrative, space and form, homogeneous designs based on scientific approach. The ancient basic design methods governed not only the appearance of buildings, but also determined space characteristics. Gridline pattern which governed façade proportions and planning layout, were based on functional modular units initiated by human needs. This was true in Classical architecture, medieval architecture in the East and the West as well as in the Renaissance.

The revival of classical design principles occurred several times most notably in the renaissance. Alberti and later Palladio steeped in classical tradition. The last classical revival occurred in the 20th century Modern Movement. Throughout much of the Modern Movement, we see a desire to produce works of art and design based on objectivity and rationality; that is, on the values of science- most noted were the efforts of Le Corbusier in the early 20th century. These aspirations to scientise design surfaced strongly again in the 'design methods movement' of the 1960s. In the past 25 years there was a significant shift in focus toward design discipline [3].

Only in contemporary time when architecture-as-art became the norm that focusing on form design as an aim in itself occurred. Architects began to reflect intrinsic feelings and express self satisfaction as there main concern (Salama, 1995), leading to the recession of the methodical approach relying instead on the intuitive method. Most designers use some sort of design methodology and methods even though they don't like to admit it. They rely on the craftsman 'knowing how' traditions, they fear the use of design methods may hampers imagination.

As the lesson from the past clearly indicates, the question is not so much why the use of design method is needed? The question should be: why must the design method be explicit, efficient and learnable?

The Role of Design Method: The rise of the Design Methods movement in the 1960s marked the emergence of the study of design methodology as a subject or field of enquiry. The desire of the new movement was to base the process of designing as well as the product of design on objectivity and rationality, that is, on the values of science [3]. Theoreticians of the design movement, however, realized the need to balance creativity and rationality in the design process. John Chris Jones aimed to redesign the design process so that intuition and rationality could co-exist, rather than one excluding the other [4]. Since the1960s many writers recognized the

importance of the relationship between creativity and rationality in the design process. They both are mutually interdependent and should not be thought of as separate concepts and that innovation requires both concepts [5,6,7].

Throughout architecture history the evolution of architectural form has always built on past experiences. The theory of the contemporary mosque design for example is basically the same as the first mosque built in the 6th century. Design traditions, such as the multi-storey internal atrium, as Mark Gelernter [8] noted, have creatively evolved from earlier forms in response to a particular problem and then applied by many subsequent designers to quite different problems. This indicates no building is a new building completely. Because no one would want to go on wasting time re-inventing the wheel every time they design a hospital or textile factory, the role of the design method in this respect is vital to explain how other architects went by designing similar projects and to understand the relationship between spatial arrangement and needs. This knowledge constitutes the essential rational base upon which the conceptualization of both the design problem and the solution develop. Dorst [9] refers to this dual progression activity as co-evolution of the problem and the solution.

Design methodology theorists distinguish between the two fundamentally different paradigms of design methodology the field is based on. In the main paradigm, according to him, design is seen as a *'rational problem solving process'* as introduced by Simon in the early 1970s. A radically different paradigm was proposed by Schon [10] who describes design as *'an activity involving reflective practice'* [9].

Creative design process, according to Dorst, can be described in two ways: from the *rational problem solving* paradigm as well as the *reflective practice* paradigm. In this study, however, architectural design process is seen as the integration of the rationally based process approach and the creativity based practice. It involves two kinds of design activity: the inquiry based *'rational designing'* is mainly concerned with the conceptualization of both the design problem and solutions. While *'creative design'* is focused on the interpretation of the conceptual design into space planning and form making ideas.

To sum-up the above we can say that the role of the design method is concerned not only with the formulation of design problem and solution ideas, but also the integration of the rationally processed and the creatively generated aspects in a unified process. The question which is often asked in the studio is how to bridge the gap between the rational and the creative design activities. Bill Hillier and his colleagues [11] showed us how this can practically take place in design.

Bill Hillier and his colleagues Adrian Leaman, Professor John Musgrove and Professor Pat O'Sullivan offered a model of designing activity which tries to explain how an architectural idea is generated both by outside conditions and constraints and by the inner creative resources of the designer. The first is inquiry produced knowledge while the latter is a product of creative act. The model suggests that design is accomplished in two stages, making conjectures about possible solution and then testing that conjecture against constraints of the problem. Bill Hillier and his colleagues [11] termed this process the conjecture-test model of design. This model of design arguably bridges the superficial gulf between rational and creative acts in the design process.

The Failure of the Conventional Design Method in Khartoum: Using design method is a legacy in architecture design education in Khartoum. But probably because of focusing on appearance of design not the rational base, it has diverted its original path and has become implicit through years of unchecked practice. This approach relies on artistic creativity, disregards the systematic method and reflects misconceptions in studio teaching approach about the goals of design education, as a result of the prevalent architecture-as-art views. However, teaching is not the only reason of the failure of the conventional design method, but many other difficulties related to its implicit nature can be identified.

Two reasons can be identified for the failure of the conventional design methodology: the first reason is because of its implicit nature. The disability of the conventional design method, because of its tacit nature, can be recognized in several ways. In Khartoum students are required to study the design problem, make analysis and write a dissertation reporting the decision making process as part of their project presentation. In a major step students are supposed to examine precedent examples and produce design theory, however, relying only on implicit methods they frequently go about the inquiry without a pre-planned program. In the absence of adequate studio instructions students are unlikely to know what to examine, why or how. L*et al*one to be aware of the reasons why they must study precedent examples, or the importance of learning from the accumulated experiences of the past. This mess often leads to inadequate data collection and analysis, in which case monitoring, testing and revising design decisions becomes doubtful.

Another feature of the disability of the conventional design method because of its implicit nature, which has far reaching effect, is that it diminishes its ability to produce knowledge. Visual representation, using diagrams, is no doubt the most effective method of analysis and analysis produced design theory representation. Lacking such important tool simply deprives students of a most effective method of analytic decision making.

The other reason of the failure of the conventional design methodology is because of the implicit knowledge which it relies on. Most of the knowledge produced in the studio through data analysis, discussions or criticism is in implicit form. This wealth of knowledge, however, couldn't be used effectively to formulate design theory unless converted in explicit form. By the very nature of the implicit method, it tends to be goal oriented problem solving rather than knowledge generating process, the reason why it has a limited capacity to process knowledge. As a result only little knowledge is made explicit as exemplified in a single design solution which represents the student's chosen approach, while the greater part is unfortunately lost.

Another feature of the inadequacy of the implicit knowledge is its inability to serve as basis for analytic decision making. The limited knowledge produced by using the implicit design method runs short of producing generalizable knowledge. In good design practice the design method should provide for analytic selection to be made from among multiple design solutions. It is obvious that the exclusion of the methodical approach, the alternative is relying on intuition and artistic skills. students fail to demonstrate explicitly the rationale upon which his or her design decisions were made to gain evaluation and verification. Friedman [12] points out that only explicit articulation allows us to test, consider, or reflect on the theories we develop.

The failure of the conventional method has reduced the inquiry process to just a formality that has no significance for students' design. As a result they feel no need to waste time in referring back to inquiry results and prefer to go straight on to design drawings which matters most as they were probably lead to believe. This explains the odd disappearance of the inquiry results from students' presentation drawings. They focus instead on presentation which is the visible part while the rational knowledge base of design is inaccessible by others. Unless the rational process is made visible as part of the student's project, students are unlikely to pay attention to that design decisions must be made on rational basis and that they have to be prepared perhaps to defend their decisions to others

In the absence of documentation design methodology has been retained only in the mind of students and learned by doing. The way the design method was handed over from student to student over the years without any interference from the faculty shows no sign of any serious attempt to address the problem either by teaching design methodology or offering an alternative explicit design model. This has exposed the design method to continuous change and transformation has now shrunk to inconclusive effort with little or no value.

CONCLUSIONS

The previous discussion has shown how excluding the methodical approach to design either because of the inadequacy of the implicit model of design method or because of the deliberate disregard of the rational base of design, has lead to the reliance instead on intuition and artistic skills and consequently the lack of balance between rationality and creativity in the design process.

Only recently has the increasing recognition of the problem raised awareness among educators of the need for change in studio programs and teaching policy. What is yet to be appreciated is the shift in architecture design education around the world from a professional and craft based training [13], which has been prevalent in Khartoum for many years, toward the contemporary approach which views architecture design as a discipline based on methodical approach [14]. "Therefore, the design process is necessarily in transition from art and craft to form of technical and social science focused on how to do things to accomplish goals" [12].

Since the beginning of regular architecture education in the 17th century the dominant approach focussed on design practice with emphasis on form manipulation and basic design principles as the most important aspect of architects' education [1,14]. It should be emphasized that university education is different from training that is only giving knowledge and skills necessary to serve the profession. This education in one end should prepare students for the profession with necessary abilities and skills and on the other end should educate them as people aware of social realities [15].

So far design with its craft tradition has relied far more on tacit knowledge. It is now time to consider the explicit ways in which design theory can be built [12]. Perhaps the vision is not clear enough yet in Khartoum so as to define the road map for the change in architecture design studio. This paper is the first in a documentation series which reports the efforts by the author trying to influence the prospective transformation. The paper has discussed the importance of the design method, why it

should be transformed from the crafts tacit tradition to the discipline learned method. It also identified the need of explicit design method as indispensable tool not only for designing but equally important for studying existing buildings and for the assessment of new designs as well. These must be subject of future studies.

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