International Journal of Advance Research in Science and Engineering
Volume No.07, Issue No.09, September 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

How Should the Ceramic Designer in Egypt Think?

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ABSTRACT

Ceramic designers face confusion when design architectural ceramic tiles; whether interior or exterior. Some follow the functional method, others follow the sentimental and cultural orientation of architecture and some try to set a plan that helps them start the design process and reach a solution to the design problem this research provides a study of methods of design in architectural ceramic in Egypt and concentrates on providing a knowledge background to the ceramic designer, and discusses the creative and innovative aspects of the designer and their role in the design process.

Theresearch has**(Case study)**: a researcher applied the methodology of design with seniors for Bachelor of ceramic architectural design projects.methodology was developed through the study of curriculum and methods of design. The research study has deployed the experimental method and the descriptive and analytical. The researcher has concluded some results through the study; most importantly that when the ceramic designer obtain a sufficient knowledge of the design methods in the architecture field, they can set a clear plan that helps them define the design problem, provide solutions and create good designs.

Key words:Designer- Methods of Design-Methodology-Ceramic Architectural Design.

1. INTRODUCTION

The intellectual studies vary in their perspective of the design process, between considering it as an individual act (the designer) which is based on the predictive potentials and the inspirational and imaginary extent of the designer which lacks methodological basis; and as an organized course of many steps that deal with both the traditional and modern methods and offers a clear and specific codification of the production processes and stages. "Lawson" suggests a viewpoint that explains the designer's way of thinking which is affected by the general implications of the word "design"; such as industrial design, engineering design, fashion design, ceramics design … etc.; as the difference in this case is based on the design orientation in each field; not on the design problem and the different methods of addressing this problem with no consideration of the product itself. Thus; there must be a brief outline that forms the requirements which the designer should study and understand, in order to examine them according to some clear standards (functional, cultural, ethical … etc.). (Lawson Bryan/ p 29-30/1997)

Definition of design:A plan or drawing produced to show the look and function or workings of a building, garment, or other object before it is made (net 1), Good design does not begin with what we can do, but rather with questions about what we want to do. (David W. Orr /P20/2002)

Design Methodology:refers to the development of method or system for a certain situation. Most often applied to technological fieldslike information systems design orsoftware or web design.

Design methods: is focuses on: Exploring possibilities – Divergence and constraints of inherited situations by applying critical thinking through quantitative research methods to create new understanding problem.(net 4)

2. DESIGNERSROLES

As designers we are well positioned to take on new roles to help solve some of the bigger problems society and the economy face because we have already begun to break free from traditional design disciplines. However, we must work harder still to further develop, craft and advocate these new roles we have started to perform. We have made a positive start, but not yet established a clear new role that is widely recognised within the realm of design and beyond. (Bas Raijmakers, p 10, 2012)Designer Victor Papenek identified the northern Alaska people as the best designers in the world. he believed, "forced into excellence by climate, environment, and their space concepts. At least equally important is the cultural baggage they carry with them" (David W. Orr /P18/2002**)**

2.1 The development of design methods and background

The science of design methods has emerged from the conflict between art (intuition) and science (rationalism), which required a classificationfor the development of design methods.One of the most recognized classifications is "Christopher Jones" classification which was published in the first edition of his book "Design methods: seeds of human future" in 1970, Jones has distinguished three theories for the **design process,as follows**:

- The designer as a black box (from a creative perspective): design is the result of the creative leap.
- The designer as a glass box (from a rational perspective): design is the result of justified process.
- The designer as a self-organizing system (from a domination perspective): design is the result of a strategy and objective design process. (ChristopherAlexander, p59, 1964)

In light of this classification, the design methods throughout history can be divided into three main types, which are:

2.1.1 The traditional design methods (Pre-modernity)

"Christopher Alexander" has called this type the self-unconscious method; as it was developed without realizing that there is an intellectual concept for design methods for solving problems; but it was the result ofthe social and cultural need for architecture. The complete design (modal result) in this method; according to Alexander; has been culturally modified or altered according to patterns of myth, traditions .Jones (1970) has called this

type the black box method, as it is based on the creativity of the designer, which makes it hard to predict and organize the design process, as its method is unknown; even for the designer himself; and the success of the design process here depends on the designer intellectual ability to control shapes. (ChristopherAlexander, p83, 1964) .Jones has used the historical development of the wagon wheel as an example of traditional design methods, he concluded that traditional craftsmen hadn't drawn a design for their products before executing them; instead; the product was modified through trial-and-error over the years, in orderto reach the best design.

From the above, it can be said that during this phase of development of design methods, design was only practiced to fulfill specific needs; thus; the design idea was based on the utilization (functional) aspect, which means that the design form came after the idea, which led to the ambiguity in design processes, and unreasonable activities during the design process**.** (Mohamed Naem, p 68,2015)

2.1.2 The modernity design methods

Design researcheshave started in the sixties, when scientific thinking was dominant, on the other hand; architecture was added to the science of design in 1956 during the Oxford conference "Architectural education in the United Kingdom".Architectures decided to be scientific and traditionaldesign methods changed into scientific design, this was the first step to come out of the black box. The most distinct characteristic of this design method is that the design process is clear and the designer can recognize it self-consciously, it facilitates problem solving by following applied mathematicalmethods, so it was called the glass box method, in which design is based on rational thinking instead; and that all design processes are assumed to be totally justified. This phase of the development of design methods is distinguished with its conferences which aimed to discover the possible relations between different creativity activities, those conferences tried to apply the methods of advanced technological industry as design standards.

In September 1962, the first conference for design methods was held in the royal college in London, its results included setting three main stages for the design process; which are named according to each specialization; the most recognizedare the following two formulas: (Conception, realization & communication - Analysis, synthesis & evaluation) .In the same conference, Dennis Thornly presented a research titled "Design methods for architectural education" in which he aimed to connect between architectural practice and education,he tried to set-out basis for design education by studying the practices of the architecture during the design process, which he specified in 4 main stages: gathering information, defining the general idea of the design, developing the final form and providing the final project).(net 2) The distinction of this method is that it deals with the elements of the problem; not with the meaning of these elements or potentials; thus the design idea in this method lacks the subjective vision of the designer, also, this method aims to generate solutions instead of study the design problem thoroughly.

Nonetheless, during the conference of the "Design Methods Group – DMG" in 1972, this method was criticized and new ideas were presented, in which the architectural design were transformed from being a mathematically systematic concept into atype of language and art that is concerned with processing the heritage architecture problem, this conference is regarded to be a main source for the pre-modernity design methods. (net3)

2.1. 3 The pre-modernity design methods

These methods have emerged as a response to the modernity movement and the dominance of fixed systems and pure shapes consistent with the scientific and industrial thinking.The limitation, simplicity and determinism of the modernity phase transformed into complication and non-specification in the pre-modernity phase. Paul Laseau, 1980, said that architecture faces major challenges, so architectures must solve the problems with the people instead of solving the problems for them, by helping them understand their needs and their available options.This means the users of a buildingshould be included in its design process, because; in design; the problem doesn't exist in the designer's mind, but itusually faces a customer that can't solve it without help.(Paul Laseau/p62/1980) This phase is the transformation from the glass box method; which is based on a rational point of view;into a self-organizing system method, which is based on a controlling point of view. The design in this method is the result of a specific strategy and an objective design process, thus; the designer is able to search for ideas and solutions in consistency with the evaluation of design processes.

3. Broadbent study, 1973: "Design in architecture: architecture and the human sciences"

This study addressed the design processes in order to identify the stages of their development; it demonstrates the flexibility of the design process concerning deriving the final formthat can be done through any of the design methods that were developed throughout the human history,which are: **pragmatic design**: Use of raw materials available to create a suitable environment. the primitive human Followed this approach wherehe relies on trial and error.

Analogicaldesign:Use to solve problems, make connections between disciplines, and use those relations to form original solutions.Designers used as their reference from start to our day: and they used the human body and nature universe source for analogy.when an analogue medium, such as a drawing, is used to simulate or represent an invented design.

Canonic design:(Syntactic design)Use a rule-based system, often geometric system, this type includes copyingdesigners' theoretical perspectives**.**which, like the classical Greek and Roman orders, builds upon iconic design by the provision of rules, or components, as design resources(Amir Saeid M. mahmoodi, p 115-116, 2001)

Iconic design: which builds upon pragmatic design by treating successful solutions (as templates for new structures, as the generally accepted form for structures of that type.(Broadbent, Geoffrey/ p 51-35/1977).

4. PRACTICAL APPLICATIONS OF THE RESEARCH

This section of the research is considered a case study that demonstrates the utilization of studying the architectural design methods as a knowledge background to support the creativity process of the senior students of the department of ceramics at the faculty of applied arts.

The researcher has followed a design method that includes several stages, which are:

I. **Theoretical study (lecture):** Provide the students with the cognitive and theoretical skills of architectural design in general, by studying the design methods and their main approaches and types. Researcher presents a design problem within one specific framework for all students, in order to evaluate their variety and creativity. The problem was specified in designing exterior& interior wall-panels for a building façade, provided that student should utilize ancient Egyptian art or the Islamic art as their source of inspiration.

II. **Studies: Students** must study the source they choose in order to learn about its aesthetic and symbolic values. Students are free to choose one or more design methods or approaches to reach a solution for the design problem.

III. **Identification of the design concept:** students should specify the concept of their designs according to their studies, and propose their ideas.

IV. **Generating ideas**: students start to generate ideas which vary according to creativity of each student. In this stage, ideas are proposed through free-hand drawings, computer sketches, can use any material help him to imagine 2D or 3D sketches.

V. **Developing design concepts:** the researcher conducts brain-storming sessions with the students to discuss their ideas, and help them choose the best one according to its potential in solving the problem and achieving the design concept, some students may need to expand their search in specific aspects.

VI. **Selecting design ideas:** the researcher conducts brain-storming sessions with the students, during which they present their ideas, and exchange roles so

that each student can take the position of their peers, discusses their ideas and provide the best solution for theirproblem from their own point of view; by the end of this stage, each student must settle on a design idea.

Archer's Eight ways an idea can be expressed design (net 4)

VII. **Presentation**: in this stage, each student presents a final

	type of analogue	examples
1	a form of words	evocative words definitive statements patent specifications
2	symbolic logic	Boolean algebra mathematical models
3	diagrams	flow diagrams circuit diagrams vector diagrams
4	sketches	evocative sketches definitive sketches
5	formal drawings	perspectives renderings scale drawings
6	simple models	block models space models scale models
7	working analogues	electrical analogues rigs photoelastic models
8	prototype	

when testing **basic design idea,** use most abstract model which will fully express it ⟶
⟵ when testing **a design embodiment** use most concrete model which can be afforded

conception of the form of their design idea using "Photoshop" and "3D max" soft wares, and their final solution for the design problem, taking into consideration the dimensions of the designed unit, its accordance with the location, its repetition method and the relations between the units.

VIII. **Prototyping**: students produce the preliminary model of the unit in a scale 1:20 using wood or plaster, the prototype must demonstrate the unit dimensions and formation method, as well as its repetition, installation and production methods.

IX. **Forming**: students produce the ceramic units in actual size (scale 1:1) using wood or plaster, production method is either plaster molding or slip casting, afterwards; units are to be dried and undergo first-firing.

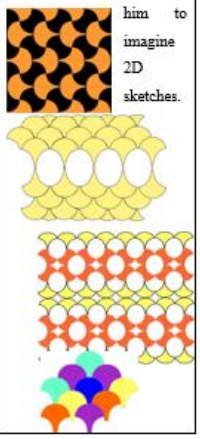
X. **Glazing**: students begin their color experiments in a team work, to obtain the glazes that achieve the design concept of each student. Afterwards; units are to be colored and undergo the second firing (glaze firing). The teamwork in this stage helps the students obtain many color shades, as each student must conduct specific experiments but share the resulted colors with their peers.

XI. **Installation:** the ceramic units (tiles) are to be fixed on the building façade using adhesive materials.

CONCLUSION

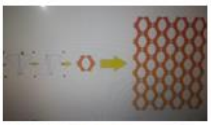
- Utilizing more than one design method develops the creativity of the students and facilitates their flexible thinking.
- The studies, analysis and evaluation held during the brain-storming sessions create new ideas or improve some of the original ideas.
- Providing the students with the knowledge background of design methods refines their creativity skills.

Case Study (1): The following table shows the design process steps of student project.

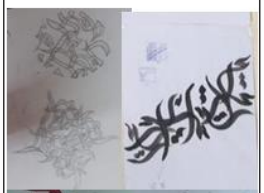
Design process	Design problem	One domain(source)	Generating ideas	Selecting design ideas
	- Designing exterior wall-panels for a building façade by handmade ceramic tiles -Designing interior wall-panels for a building façade by ceramic tiles, that produce in ceramic tile factory " CERAMICA ROYAL"	**Ancient Egyptian art**  Student studied the source and its aesthetical and symbolical. he studied ancient Egyptian architecture and Determined the concept of her design.	Ideas are proposed through free-hand drawings, computer sketches, 2D sketches. 	student, can use or computer sketches any  material help him to imagine 2D sketches. 

International Journal of Advance Research in Science and Engineering
Volume No.07, Issue No.09, September 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

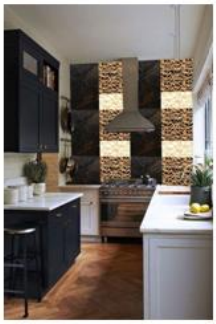
Case Study (1)

Design process	Prototyping	exterior wall-panels	Designing interior wall-panels	Analyzing
	Students produce the preliminary model of the unit in a scale 1:20 using wood or plaster, clay. 	 	   	Students produce the ceramic units in actual size (scale 1:1). Student had good theoretical background of design. And of the evolution of design methods and study types of design. It clearly reflected on thinking and had good solutions of design problem. She use two types of design **Analogical design**: she make connections between disciplines of ancient Egyptian art, and use those relations to form original solutions. **Pragmatic design**: Use raw materials available in EGYPT that know as Aswan clay to produce handmade tiles to create a suitable solution. Ceramic tilesConsidered one of the best materials used in walls cladding and Suitable for climatic factors.

Case Study (2): The following table shows the design process steps of student project

Design process	Design problem	One domain(source)	Generating ideas	Selecting design ideas
	-Designing interior wall-panels for a building façade by ceramic tiles, that produce in ceramic tile factory (CERAMICA ROYAL)	**Islamic art:** Student studied the source (**calligraphy**) and its aesthetical and symbolical. Student Determined the concept of her Islamic designs.  	Ideas are proposed through free-hand drawings, computer sketches, 2D sketches.  	Student, can use or computer sketches any material help him to    imagine 2D sketches

Case Study (2)

Design process	Prototyping	exterior wall-panels	exterior wall-panels	Analyzing
	students produce the preliminary model of the unit in a scale 1:20 student try handmadeclay sketches then she chose computer design to produce the wall-panels  	  	 	Student produce the ceramic tiles in actual size (scale 1:1). Student had a good theoretical background of design and the evolution of design methods. She uses in this case two types of design (pragmatic designAnalogical design and. It clearly reflected on thinking and had a good solutions of design problem The ceramic industry is more productive industries in Egypt, it Provides consumer with aesthetical and functional ceramic tiles, as itcovers the bathrooms and kitchens and living rooms. It is an economic product has environmental and sustainable aspect.

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