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The Method and Intellectual Repercussion in Architecture

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Abstract

The architectural studies in general dealt with the study of several concepts that have an important role in the design part as well as providing preparation and support of its requirements, procedures, and rules for a variety of aspects and details. The current research directed towards a specified study of the relationship of two influential concepts within the framework of architectural design. These concepts are; the method and its relationship to the state of intellectual repercussion with the necessity of introducing, clarifying and defining the general knowledge frameworks for the nature of those relations and the effect of the indicators of that situation with respect to the general knowledge about them**.**
This research is Directed to define the general frameworks of the basic research concepts, which are both the method and the repercussion with other concepts that are influential, design, thought or thinking, to determine the cases of interconnection between them and then to refer these cases to several levels, and to propose the models adopted from the studies and architectural proposals, which will determine the indicators needed to define the situation The correlation between the basic concepts of research (method and repercussion) within the framework of the field of architecture to show that the final outcome refers to the adoption of the repercussion as an instrument or preparation for the benefit of the method within the architectural design

Keywords*:* Method, design, idea, thinking, repercussion.

1. Introduction

There are a diversity of sides dealt with by the general propositions of architectural field concepts, therefore, it is crucial to investigate specific concepts with an important impact on a specific aspect of the architecture that is the design to suggest the importance of the study of these concepts and their interrelationships and interaction with each other. This research is to introduce the relationship of the method with the intellectual repercussion within the framework of architectural field and its specified design aspect, in order to propose the different associations between the other assistance concepts and classification of them later within levels to determine the correlation between the two basic concepts (method and repercussion). This interdependence is studied within the verification framework in the specified studies of paradigms and intellectual indicators resulting from them with respect to the general architectural subtraction cognitive of the subject.

The knowledge problem of research
The knowledge problem of this research is the lack of clarity of the knowledge perception about determining the state of interdependence and the relationship between the method and the intellectual repercussion in the architectural design and their related indicators.

Objective of research
Clarify the knowledge about the interconnection and the relationship between the method and the intellectual repercussion

in the architectural design and their relevant indicators.

Research Procedure

- Presentation of general architectural knowledge about the basic concepts of research and the adjacent concepts within the architecture field**.**
- Building a knowledge perception about the nature of the interrelationship between the above-mentioned concepts and sorting out the state of the basic correlation, which is the goal of the research (method and repercussion).
- Exploring the general situation and the basic character of the case of the basic correlation of research (method and repercussion) within the architectural studies that introduce conceptual models of the design concept**.**
- Explain the patterns of the verification features within the previous models in order to understand the possibility of generalizing the above results in contemporary architectural design frameworks.

2. Part One: General Knowledge Framework

2.1.The design

The design is defined as the strict and meticulous prearrangement of the lines and angles that the artist perceives in his mind utilizing his thoughts and imagination separately from his work. [1]. In order for the design to occur, numerous things must usually occur, and there must be a summary of the requirements that the designer must study and understand, and then test them against some clear and implicit criteria. Finally, the designer should deliver the design to the customer and the builders. The design is a process in which the problem and the solution appear at the same time and most likely the problem is not fully understood without some acceptable solutions to clarify it. [2]. Architectural design is not an destination itself, it is an act its destination is change in the environment by means of construction, thus making it Quick for it to be fascinated by problems that were previously unheard of, and solve them in a specific period of time as one of the most important design skills. The artistic and design effectiveness is similar in that they are open-ended, their steps are uncertain, reveal the problem in their attempt to reach a solution, the subjectivity dominates the nature of their provisions and their functions are indicative, as well as the operative functions that they share with the science. [3]. Scientific activity is also involved with design activity as it is a solution to the problem and the solution at the same time. It differs from it at its almost closed end, its logical steps, its judgment dominated by objectivity, and its goals which can be descriptive and achieved only at the theoretical level as in the case with theoretical sciences. [4].

2.2. Methodology

The Method is presented as systematic processes or techniques formulated in a proper question that fits into the studied field, while the method is defined as a set of methods and rules that require a particular systematic application, in particular, a set of processes, often in contexts that make them refer to a broader term than the method or contains several methods. [5]. It is also known as a specific route of actions as well as general rational processes that can adapt to various problems and as a means of supporting and leading design processes. Or it may be defined as a set of procedures for a group of individuals who meet for a particular purpose to achieve mutual benefit. [6]. Or, as (Jones) describes, it is a particular route characterized by regularity and clarity that can be relied upon with high confidence, contains a set of rules and procedures that are used to reach specific problem solutions. [7].The methodology of design is presented as one of the primary attempts to equip a whole new way of processes in design, based on the distinction between intuition and phonological aspects of ideas and clarifying their important rules of design as logical system processes.[8]. Another definition is suggested by Cross, as it is the study of rules, applications and processes in the design act, and in a broad and general sense, its fundamental issue is how to design and the possibility of directing it, so the focus is on how the designer works and thinks. [9]. The most important characteristics of scientific thinking are the accuracy of concepts in the scientific formulation, infallibility, the possibility of testing honesty, truthfulness stability, arrangement construction, objectivity, and analysis. [10].

2.3. Thinking

Thought is the effort made by the mind in order to acquire new knowledge or new science from previous knowledge which is related to the process of thinking in this respect, the intellect is able to collect new knowledge constantly interaction of information available with the mental rules of the total mind and subjected to the relative variation in mental abilities and special privileges between human beings, depending on external circumstances and influences. [11]. Or as it describe, the thought is the intellectual content and the sum of the ideas of the human mind, which are, in their entirety, take their privacy from the constant contact with the cultural and social environment to which we are dealing. The way of thinking contributes to several factors, the reality is a large part of them.[12]. There have been several definitions of the concept of thinking, from a linguistic point of view, (fairooz abadi) defines it as the realization of the consideration of the thing. Actually, Humanists and psychologists differed in defining a precise definition of the word, is it a behavioral process....? Or is it purely a cognitive process...? [13].

2.4. The act of thinking in architecture and design

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The intellectual inventory of architecture represents the set of cultural rules and regulations that the architect stores from his total practical experience and his dealing with his own replicable experiences.[14]. In this field, researchers have tried to find some sort of connection between the thinking actions of the mind and the processes of production in architecture by linking the mechanisms of thinking and the stages of finding a solution for the design problem which is a combination of mental acts that often seem to be uncommon and do not work according to a common mechanism, it is difficult to find such correlations for each stage of production. Although the thinking model is well-known in analysis, synthesis, and evaluation, the overlap of these stages with each other and the absence of a clear dividing line between them were the main cause to making such linkages more difficult. (Zisel) explained that the design process involves the overlap of three intellectual patterns achieved by visualization, presentation and testing with two types of information: the information that is stimulated by the imagination with a knowledge body to verify that the design act progressively and complete by a series of conceptual matching with creative transitions in which the responsibility of the designer deepens successively by proceeding the time of the task. [15].

2.5. Repercussion

The repercussion is the link between the soul-elements, which are the emergence of any of them may cause to remember other elements associated with it under certain circumstances. The repercussion may appear during the interaction between the self and the subject as one of the primary outputs of that interaction, and this reflects the real links between things and phenomena, which is a prerequisite for mental activity and a basis of all the most complicated formations of the psychological side of man.[16]. (Hume) returned all mental actions to the interdependence of all phenomena in the soul and returned the reinterpretation between the ideas to the law of the repercussion of the meanings, which is within the concepts of similarity, and spatial and temporal transcendence, or the he attic relationship and arise when people counted twice in two cases, they believe that the successor follows and follows the former. [17]. In the view of Hume, the frequent association of two subjects of a certain kind in the perception of the mind is a mental habit leads to a link between the two ideas which are produced by impressions. When this habit reaches enough power, the mere emergence of one subject in the sense calls in mind the interdependence of the two ideas. This is not something that is inevitable or necessary, but the process, as he put it, is usually mind habit.[18]. However, the principle of interdependence, in terms of the way, is an interpretation to how the mental habits are generated, a useful tool for psychological interpretation which still has an important impact, while for (Hume) himself, he is not entitled to talk about habits or mental preparations or at least not entitled to talk about their compositions because, in the time in which he adheres to the full accuracy, he describes as merely a succession of perceptions, and so there is nothing that can develop habits, as it does not benefit to say that the sequels of perceptions actually lead to the development of certain patterns as long as the same expression even in its abstract form reveals ambiguity, unless we have somehow made that development seems to be more than just a coincidence successful.[19]. (Hume's) desire to find out why the psychological process of the method of repercussion instead of the style of separation between ideas is another evidence of what is in his mind of faith in the causation necessity so that he was never able to bear that the relationship between them is an absolute coincidence. On the whole, the psychological interpretation of Hume is successful to the extent that it is a recognition of what our imagination is influenced by impressionistic perceptions that may be imposed on the objective reality. [20].

2.6. General Discussion

From the previous section, a conclusion of the abstract of narratives of the main research items. can be listed in Table (1). that should be represented the studies views about the basic concepts for the research which deal with the main ideas in knowledge.

Item	Abstract
Design	The mental pre-organization to form the requirements and test them against the obvious and implicit criteria to show the problem and the solution at the same time. It is an act aims to change the environment, its end is open, its steps are not self-assured, self-dominates the nature of its judgments and its function is usually guidance, with resorting to conceptual events.
Method	It is processes, procedures or rules that require the use of a specific system. It is always generated due to the crises of science, which arise because of a mistake or doubt in the credibility of the previous Methods with the basis on the distinction between the manifestations of intuition and irrational ideas with its possession of features like accuracy, obscurity, objectivity, honesty ... etc.
Thinking	It is the mental effort to acquire new knowledge as a direction related to human after thought to choose the orientation evaluate on it based on the approach of his life and the human values which he follows. In architecture, it is a set of cultural rules and systems that the architect stores from his total practical experience, and dealing with his repeatable personal experiences. The thinking here goes in spiral design progress, and that the intellectual interactions during the design work occur to form what is so-called analytical evaluation events and structural evaluation activities.
Repercussion	It is an automatic interdependence that appears in all psychological phenomena, referred to by the law of the Repercussion of meanings by bases on the necessity. This conjunction and succession between phenomena is a condition to achieve what is called causality in the substantive reality. Herein, mental relativity leads to the connection between two ideas that are produced by impressions. The principle of interdependence is an interpretation of the way of generating mental habits.

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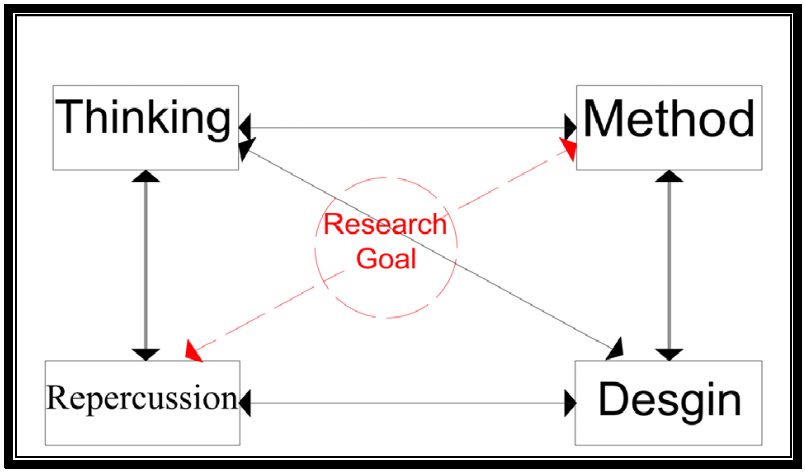

Fig. 1: Basic and Secondary Concepts of the Research and their Interrelations

3. Part two: General analytical and Application framework

In the previous part, the general knowledge visions of the primary research concepts, (method and repercussion) , were presented with the introduction of concepts adjacent and parallel to them in importance such as (thinking and design) as secondary concepts that serve each of the two previous concepts. In this part, a vision of research is presented towards the formation of various binaries to the four concepts according to the nature of the possible link between these concepts to be within multiple levels and special visions as follows:

3.1. Analysis Levels

3.1.1. First level:

- First binary: (Method– Thinking): Code (C1).

Represents the interdependence and the relationship between the two terms, method and thinking, with neutralization of primacy and importance of each party.

- Second binary: (Method– Design): Code (X1).

Represents the interdependence and relationship between the two terms of Method and design with neutralization of primacy and importance of each party.

- Third binary: (Thinking – Design): Code (F1).

Represents the interdependence and the relationship between two terms of thinking and design with neutralization of primacy and importance of each party.

It is clear that the binaries presented at the previous level are binaries either follow the concept of method as one of the parties that is a key party in the research or follow other concepts which are clear in interdependence and meaning, knowing that the previous studies were enriched by their information and interdependence.

3.1.2. Second level:

- First binary: (Repercussion– Thinking): Code (X2).

Represents the interdependence and the relationship between the two terms of repercussion and thinking with the neutralization of precedence and importance of each party.

- Second binary: (Repercussion– Design): Code (C2).

Represents the interdependence and the relationship between the two terms of repercussion and design with neutralization of precedence and importance of each party.

It is clear that the binaries presented at the previous level are binaries that follow the concept of repercussion as one of its parties which is a key party in the research, although the previous proposals enriched the presentation of all of them and their interconnections.

3.1.3. Third level:

- First binary: (Method– repercussion): Code (F2).

Represents the interdependence and relationship between the two terms of method and implication, which represent the main concepts, knowledge problem and the research objective for this research, as shown in Table (1).

Table 1. Interrelationships between Basic and Secondary Concepts of the Research

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C1		Method -Thinking	X1	Method -Design	F1	Thinking-Design
	First Level					
C2		repercussion -Design	X2	repercussion -Thinking	F2	Method - repercussion
	Second Level				Third Level	

After introducing and clarifying the levels of binaries and cases of interconnection between the basic and secondary concepts related to this secondary research, which was mentioned previously in the first part of the research, the knowledge description of the interdependence of these concepts will be presented here, as shown in Table (2).

Table 2. The correlation nature between basic and secondary concepts of the research

C1	A set of cultural rules and regulations that the architect stores from his total practical experience and dealing with his personal experiences, which are replicable and compatible with processes, procedures or rules that require the use of a particular system.	X1	Processes, procedures or rules that require the use of a particular system indicating the prior mental regulation to form and test requirements against clear and implicit criteria.	F1	A set of cultural rules and regulations that the architect stores from his total practical experience and dealing with his own replicable experiences in the use of prearranged mental organization to form requirements and test them against clear and implicit criteria.
	Compatibility status		Preparation status		Utilization status
C2	An automatic correlation appears in all mental phenomena due to the law of meaninglessness depending on the necessity and the usual psychic to help in the introduction of the mental pre-regulation for the formation of requirements and test them against clear and implicit criteria.	X2	An automatic correlation appears in all mental phenomena and is referred to by the law of meaninglessness by adopting the necessity and the usual psychic to assist in the introduction of a set of cultural rules and regulations that the architect stores from his total practical experience and dealing with his own replicable experiences.	F2	The lack of clarity of the knowledge perception of the identification of the correlation between the method and the intellectual repercussion in the architectural design and its indicators.
	Preparation and help status		Preparation and help status		Not clear status

3.2. Architectural Studies

This section will be directed to the presentation of the architectural studies concerned with the attempt to clarify the intellectual models of the design aspect and their assistant role trying to understand and clarify the nature of the knowledge perception of the interrelationship patterns between the two basic research concepts (method and repercussion), with the related indicators and special features to present the general visions of the indicators of general introduction in the studies, and then analyze the correlation points and the relationship with the basic concepts of this research and the relationship between them, reaching the final theme of the type of interdependence derived from those studies, as shown in Table (3).

Table 3. Indicators of the general proposition in the studies and points of correlation and relationship with the basic research concepts and the final characteristic of the interdependence pattern

The study	Indicators of general offerings	F2 The relation (Method-repercussion)	The final general character
Al-Saadi, 2006	-Architectural simulators explain the rule of methods and configurations or principles of treatment in a certain period of time that is not adaptable to human needs. -Architectural simulator is the part of knowledge that is used by the architect to solve and form a mental image about the design problem, or it feeds the designer during his daily practice. -Certified simulators seek to form a system of information connections for the designer to ensure durability and spread. -The success factors for the spread of architectural simulators are (simulator generation factors, simulator perpetuation factors, simulator modulation factor). [21].	-The relationship is concentrated in that it feeds the designer through his daily practice by transferring it in the knowledge environment surrounding him to form the system of the informational associations for the designer, and adopt the factors of generation, rehabilitation and charge. -Identifies the similarity of attributes between the basic vocabularies of the study with the concept of implication.	Intellectual
Al-Sadkhan, 2003	* Guilford Model: -The architect in the production of his designs practices the analysis and installation. -The summary consists of (determinants, concept and location).	-The relationship is focused on the adoption of specific thinking methods (closed and adventurous) as well as analysis and installation. -Identifies the similarity of events with the	Intellectual-Design

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	* Bartlett Model: -Thinking of closed systems. -Adventurous Thinking. [22].	concept of the Method.	
Al-Qimaqchi, 2008	* Feedback technology: -Perform documentation of his / her performance based on recovering recall, and then describe his thinking while viewing this documentation. * Synchronous or non-repetitive technology: - Assigning the designers a specific task and then presenting the work to a number of experts, so that they can examine and track the process of the cognitive process by observing the activities of the designer or tracking the video tapes of his work during the achievement of the task. [23].	-The relationship is focused on the adopted techniques (documentation, recovering recall and description of the mechanisms and content within the description of thinking), or adoption of the style of observation after the completion of the design task and re-evaluation. - Identifies the similarity of events and applications with the concept of the Method.	Design-Practical
Monem, 2004	-Lynn's approach, which explores the space sequence in the computer. -Bos's approach, depends on the layout of the space blocks on the site and then distort them by the physical or optical location. -Eisenman's approach, depends on the overlap as a basic stage in his designs in general. - The University of Washington Approach, this approach is based on the digital medium through the development of creative design processes using digital potential. [24].	-The relationship is concentrated on the methods adopted by the computer applications and the means of movement with multiple mechanisms (space relay, site distortion forces, overlay, and possibilities of the digital medium). -Shows the similarity of applications with the concept of Method.	Design-Practical (performance)

3.2.1. General application (participated)

3.3. Result

Here the general vision of the studies will present on the main relationship of the concepts of research (method- repercussion) and concept Characteristics.

3.3.1. The General Vision.

- There are similarities of Characteristics between the concept of repercussion and the intellectual model of simulations. (Al-Saadi, 2006).
- There are similarities of Characteristics between the method concept and the intellectual model for the activities of analysis, installation and closed and adventurous thinking systems. (Al-Sadkhan, 2003).
- There are similar of applications Characteristics for both, the method concept and the intellectual model of the techniques adopted for intellectual analysis. (Al-Qimaqchi, 2008).

There are similar of applications Characteristics for both, the method concept and the intellectual model of the design methods that depend on computer applications and means of movement. (Monem, 2004). As shown in Figure 2.

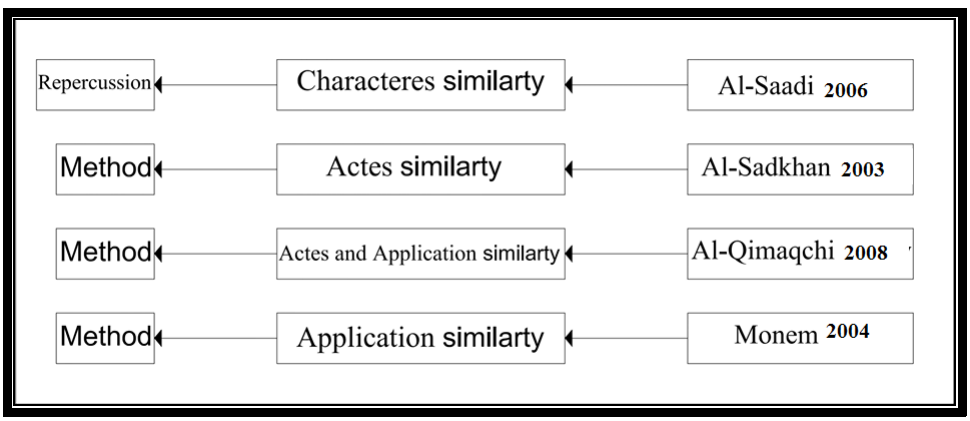

Fig. 2: Previous studies and the location of their vision of basic research concepts

3.3.2. The Concept Characteristics.

- Adoption of the intellectual property of symmetry between the concept of repercussion and the intellectual model

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of simulations. (Al-Saadi, 2006).

- Adoption of intellectual and design characteristics of symmetry between the method concept and the intellectual model for the activities of analysis, installation and closed and adventurous thinking systems. (Al-Sadkhan, 2003).
- Adoption of design and applied characteristics of symmetry between the method concept and the intellectual model of the techniques adopted for intellectual analysis. (Al-Qimaqchi, 2008).
- Adoption of design and application (performance) characteristics of symmetry between the method concept and the intellectual model of the design methods that depend on computer applications and means of movement. (Monem, 2004).
- The recognition of the clear weakness of symmetry for the repercussion in favor of symmetry with the method, to be the tendency towards similarity with the method is presented repercussion as a mechanism or prepare for it. As shown in Figure 3.

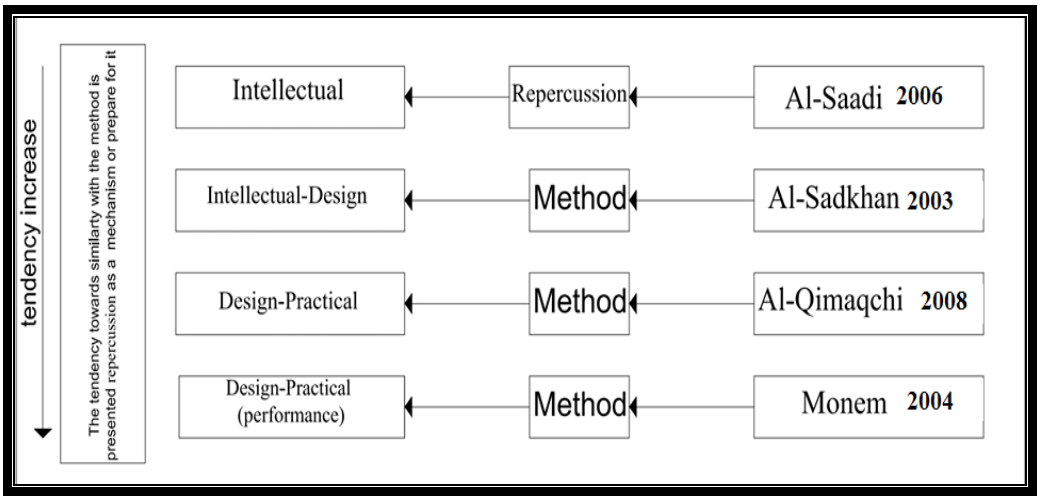

Fig. 3: Characteristics of concepts within previous studies

3.4. Conclusions

- The presented concepts in this research are varied between the Method, which is processes, procedures or rules that require the use of a particular system that is always generated by the crises of science that arise due to a mistake or doubt in the credibility of the previous Methods. In addition to the design, which is the pre-mental organization for the formation of the requirements and testing them against the obvious and implicit criteria of the problem to show the problem and the solution at the same time. The thought is the mental effort to acquire new knowledge. In the architecture, the thought is a set of rules and cultural systems that the architect stores from his total practical experience and his dealing with his repeatable personal experiences. The repercussion is an automatic correlation manifests in all mental phenomena due to the law of the meanings' implications by the adoption of necessity, and here the mental state leads to the connection between two ideas.
- There are several cases of the link between the basic and assistant concepts of the research with several forms as follows:
    - (Method- Thinking) / Compatibility status.
    - (Method- Design) / Preparation status.
    - (Thinking - Design) / Utilization status.
    - (Repercussion- Design) / Preparation and assistance status.
    - (Repercussion- Thinking) / Preparation and assistance status.
- There are similarity features in the basic correlation status of the research (method- implication) for the architectural and intellectual models as follows:
    - There are similarities of Characteristics between the concept of repercussion and the intellectual model of simulations with the adoption of the intellectual property of symmetry.
    - There are similarities of Characteristics between the method concept and the intellectual model for the activities of analysis, installation and closed and adventurous thinking systems with the adoption of intellectual and design characteristics of symmetry.
    - There are similar of applications Characteristics for both, the method concept and the intellectual model of the techniques adopted for intellectual analysis with the adoption of design and applied characteristics of

symmetry.

- There are similar of applications Characteristics for both, the method concept and the intellectual model of the design methods that depend on computer applications and means of movement with the adoption of design and application (performance) characteristics of symmetry.

- The characteristics of the similarity between the intellectual models of the architectural ideas with the basic concepts of research vary from the intellectual to the intellectual design to the applied design to the applied design (performance) with the recognition of the clear weakness of symmetry for the repercussion in favor of symmetry with the method, which shows that the final result refers to the adoption of repercussion as a technique or preparation for method within the architectural design aspect.

3.5. Recommendations

- The research recommends the necessity of expanding the study of general concepts that can contribute to highlighting the general correlations affecting the general architectural design process which deal with the research concepts**.**
- The research recommends the need to study the possibility of the existence of other forms of knowledge, intellectual and practical repercussion of general associations affecting the architectural design process and the possibility of employment and investment in the course of design work.

3.6. References

1. Al-Sadkhan, A. K. M., “Design in Architecture between Science and Art, Contemporary Stage,” PhD thesis, Department of Architecture, Faculty of Engineering, Baghdad University,p.13, 2003.
2. Lawson, B., DESIGN IN MIND, Butterworth Architecture, Oxford, p.84, 1994.
3. Al-Sadkhan, A. K. M., “Design in Architecture between Science and Art, Contemporary Stage,” PhD thesis, Department of Architecture, Faculty of Engineering, Baghdad University,p.15, 2003.
4. Al-Sadkhan, A. K. M., “Design in Architecture between Science and Art, Contemporary Stage,” PhD thesis, Department of Architecture, Faculty of Engineering, Baghdad University,p.15, 2003.
5. Webster Dictionary (2000).
6. Roozenburg, N. and Eekels, J. (Product Design: Fundamentals), p.77, 1995.
7. Jones J., C., (Desgin methods; seeds of human needs), (2nd Ed.), John Wiley & Sons Ltd. Chichester, p.6, 1992.
8. Jones J., C., (Desgin methods; seeds of human needs), (2nd Ed.), John Wiley & Sons Ltd. Chichester, p.40, 1992.
9. Cross, N. (Development in design methodology), John Wiley & Sons Ltd. London, p.17, 1984.
10. Rizko, N. J., “The Approach in Academic Architectural Research, Analytical Study in Local Research Strategies for Doctoral Dissertations,” PhD thesis, Department of Architecture, Architecture. , University of Technology, Baghdad, p.p.49-50, 2013**.**
11. Al-Muzaffar, S. M. R., “Origins of Jurisprudence,” 3rd edition, Al-Nu'man Press, Najaf, p.11, 1971.
12. Al-Jabri, M. A., “Composition of the Arab Mind,” Arab Unity Studies Center, Seventh Edition, Lebanon, p.12, 1998**.**
13. Waheeb, M. Y., and Zidan, N. F., “Development programs thinking, types, strategies, methods,” Ministry of Higher Education and Scientific Research, Mosul University, Mosul,p.11, 2001.
14. Dutton, T. A., Mann, L. H., (Reconstruction Architecture – Articles Discourses and Social Practices), University of Minnesota, U.S. A., p.152, 1996.
15. Al-Qaimaqji, N. T. A., “The logical structure of the architectural design process,” PhD thesis, Department of Architecture, University of Technology, Baghdad, p.56, 2008.
16. Rosenthal and Yudin, “The Philosophical Encyclopedia,” translated by Samir Karam, Dar al-Tali'ah, Beirut, 5th edition,p.119, 1986**.**
17. Al-Azzawi, H., “The influence of the intellectual structure change on the urban fabric form,” PhD thesis, Department of Architecture, Faculty of Engineering, University of Baghdad, p.p. 122-127,1998.
18. Russell, B., "Wisdom of the West," translated by Fouad Zakaria, World of Knowledge Series, No. 72, C2,p.103, 1983**.**
19. Russell, B., "Wisdom of the West," translated by Fouad Zakaria, World of Knowledge Series, No. 72, C2,p.104, 1983**.**
20. Al-Sadr, M. B., “The Foundations of Induction,” Center for Research and Specialized Studies of the martyr Sadr, 3rd edition,p.31, 2007.
21. Al-Saadi, H. A. H., (Design Authority and Architecture Expression), Master thesis, Architectural Engineering Department, Faculty of Engineering, Baghdad University p.p.1-102, 2006.
22. Al-Sadkhan, A. K. M., “Design in Architecture between Science and Art, Contemporary Stage,” PhD thesis, Department of Architecture, Faculty of Engineering, Baghdad University,p.p.1-134, 2003.
23. Al-Qaimaqji, N. T. A., “The logical structure of the architectural design process,” PhD thesis, Department of Architecture, University of Technology, Baghdad, p.p.1-112, 2008.
24. Monem, S., “The Creative Architectural Form in Design Methodology), Master Thesis, Department of Architecture, University of Technology, Baghdad, p.p1-61, 2004.

DOI: 10.52113/3/mjet/2020-8-2/17-24