Epistemology and Creativity in Architecture

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Abstract

General visions in the architectural field shared many concepts. There are numerous indicators for dealing with these concepts, in addition to communicating with deeper areas that formed a source for scientific addition to them. Epistemology is one of these concepts that represent a necessary and essential field and has a fundamental value of knowledge. Epistemology can represent an intellectual expansion to any other field. Therefore, the scope for this study was to investigate influence of that field through its basic concept (epistemology), with common implicit idea of architecture, in addition to clarifying the state of relationship between the two main terms of the research.

This research aims to define and study the general frameworks of basic research concepts of epistemology and creativity and their interconnections within architectural propositions to identify their fundamental indicators within a specific theoretical framework that is formed for this purpose after proposing the research problem. The research problem was represented by the weak clarity of cognitive perception correlation between the concepts of epistemology and creativity, and impact of this correlation in architecture, up to applying the terms and indicators of the theoretical framework to an elected and specific architectural product, and then to present, analyze, and discuss the results of that application, reaching to final conclusions. The outcomes have revealed the significant influence of the indicators of general conceptual frameworks for the epistemology relationship with creativity versus the more substantial impact of interactive and detailed structures for that relationship.

Keywords: Knowledge, Epistemology, Creativity, Architecture.

Introduction
The general proposals discussed a variety of concepts and fields influencing the field of architecture, including the idea of epistemology, represented by the knowledge field, and what it can offer within its various frameworks, theories, and multiple approaches to the area of architecture. The above propositions neglected the study of the intertwining of that concept with implicit concepts less influential within the architectural field. Creativity has emerged as a primary indicator of influence and measurement of achievement in the area of architecture and other fields. Thus, it was obligatory to study the relationship between the two concepts, in addition to their connections and the body of knowledge relating to them, then putting forth and forming the fundamental and subsidiary indicators of the theoretical framework for the subject of research, leading to the application of that framework to an elected and specific architectural product for that purpose, and then putting forward, analyzing and discussing the results, to present the conclusions and recommendations.

The cognitive problem of research was the lack of clarity in cognitive perception correlation between concepts of epistemology and creativity and the effect of that in the field of architecture. The objective of the research was focused on clarifying cognitive perception interrelationship between concepts of epistemology and creativity, and the effect of that interrelationship in architecture.

To solve the epistemic research problem, and achieve the goal of this study, the following steps have been done:

- Presenting the general knowledge about basic concepts of research (epistemology and creativity) and their interrelations within architecture, and specifying general and detailed influences for them.
- Forming a particular theoretical framework including two basic terms (general conceptual frameworks, and detailed interactive frameworks).
- Conducting the application of the previous theoretical framework on a specific architectural product that was carefully chosen to represent the research topic, concepts, and their interconnections, in addition to presenting the results of that application and discussing them in a comprehensive and detailed way.
- Clarifying the general framework of verification levels for correlation, impact, and influence indicators for the two basic concepts of research to explore the status and standards of verification in the general conceptual frameworks of the architectural field.

1. Part one: The general theoretical framework

1.1. Knowledge

Knowledge, in general, and science, in particular, are the subjects of epistemology evolving with development of expertise until they reached what is today known as contemporary epistemology, which means epistemological field or prevailing epistemic readiness (1). Knowledge is one of the most complex concepts, just like other mysteries of the mind, which mainly include: awareness, intelligence, understanding, intuition, perception, meaning, learning, and problem-solving (2). Knowledge is the product convergence and communication between a perceiving(subject) self and a perceived object, as it is based simultaneously on the convergence and close union between them (3). Knowledge is the perception, awareness, understanding of facts, or gaining information through experience or by contemplating the nature of things and meditation of the soul or by looking at the experiences of others and reading their conclusions. Knowledge is related to intuition, research to discover the unknown, develop self, and develop technologies (4). When compared with other previous concepts, knowledge is characterized by a
fundamental difference that lies in its tangible aspects, which are manifested in the form of theories, systems, scientific discoveries, technological achievements, and creative productions. Typically, all of these manifestations provide several entries to unveil the mystery of knowledge (5).

1.2. The theory of knowledge

The theory of knowledge examines principles of human experience, nature, source, its value, its limits, the relationship between the perceiving self and a perceived object, and indicate the extent to which our perceptions are identical to what is taken independent of the mind (6). The theory also presents the possibility of knowledge and its limits within three directions, the first has an absolute doubt about the possibility of knowledge, the second sees Possibility and determinism of knowledge (potential knowledge). The last course believes in the human ability to access knowledge commensurate with the capabilities of sense and mind (the relativity of knowledge) (7).

Theory of knowledge is concerned with researching nature of human experience and explaining how to know about things and how perceptive powers of man relate to issues of perception, and whether this knowledge must be characterized by validity and certainty, or whether there is false knowledge (8). Moreover, knowledge examines ideas relating to the forms, approaches of knowledge and truth, and the means of attaining them. The knowledge concept also indicates two primary meanings: The action of the mind in which the objective phenomena are understood, that is, the process of perception, and the work of the mind through which the image of the external object is acquired in mind, that is, the process of cognition (9). As for the sources of knowledge, they are as follows: The mind is the primary and most important source (the rationalists), the experience of sense is the source of knowledge (empiricists), and intuition and inspiration are the sources of knowledge (intuitivist) (10).

1.3. Epistemology

The term epistemology is a word made up of two Greek terms, Epistem, which means cognitive science, and logos, which means (speech, discourse, science, logic, criticism, study, theory, essay). The word epistemology, linguistically, means an article in science in sense of talking about science or philosophy of knowledge or critical studies of science (11). The term epistemology is attributed to the Scottish philosopher JF Frier, who was the first to use the term “epistemology” when he distinguished between the topic of existence (ontology) and the topic of knowledge (epistemology) (12). Laland has defined epistemology as the philosophy of science and critical study of the principles, assumptions, and results of different sciences to determine their logical origin, value, and extent of objectivity. Epistemology studies knowledge in detail in various sciences and purposes more than it studies on the oneness of thought (13).

Al-Jabri argues that it is a scientific theory of knowledge or the philosophy of science that draws its topics and issues from science and the problems it presents (14). Piaget (2004) has defined it as the study of knowledge as it is at its present moment, or the analysis of experience based on its own goals and frameworks (15). Contemporary epistemology is specialized in scientific knowledge and deals with principles and productions with a critical analytical study. Contemporary epistemology sees scientific knowledge in an integrative manner, as it no longer separates knowing self from the known object (16).
Based on this new understanding of science, Piaget tried to provide a classification of sciences taking into account the dynamism of scientific knowledge and the interrelationships between the various sciences and builds his ranking based on the distinction between the four fields of each science, as follows (17):

- The Physical Field: The topic studied by each science.
- The conceptual field: a set of concepts used in each science.
- The internal epistemology: It is concerned with researching the foundations, principles, and results upon which each science is based.
- The general epistemology: It is concerned with researching the standard foundations of all sciences.

1.4. Epistemology and architecture

The epistemological thought was reflected when it was theorized when establishing the French schools of architecture, and that was in sync with the French civil movement. The primary aim of it was to build specific knowledge of architecture for education to establish a new pedagogical (educational) program for teaching architecture. This work was under the pressure of students to separate or distinguish between studying architecture and studying art (18). In this context, Ph.Boudon and his team, on the one hand, tested the place and the nature of models in architecture and design, and on the other hand, checked the discourses written in architecture. He intentionally questioned or investigated models in design, as they were the outcome of the location of those models in the practice of fine arts. In those studies, the reproduction of models occupies a wide range of them. The question then was to know whether models in architecture take on the same importance or emerge in a certain way that leads to or authorizes a specific practice of architecture (19).

Nowadays, Architecturology represents that scientific model of knowledge in architecture, as well as it helps to clarify the sudden emergence and manipulation of models in the perception of architecture. The research team built the classification of discourses with their topics or purpose from the questioning the discourses written in architecture. Hence, four types of discourse were obtained in architecture: historical, critical, intellectual trends, juristic, doctrinal, ideological, theoretical). There are intertwining and overlapping between epistemology and architecture. Epistemological transformations are reflected in the transformations of architecture. The studying of the epistemological changes helps to understand the alterations in the architecture and its structure, and shows how the interaction between architecture and contemporary intellectual structures for it, and the resulting new currents. Architecture invests epistemological model of its issues, so there is no real knowledge for architecture, except through its interrelatedness with epistemology. Mostly, architects did not invent the architectural design theories that usually invest theories of contemporary knowledge or contemporary epistemology for them, and some design theories do not go beyond being another form of knowledge theory. At the same time, some design theories are borrowing from the theory of knowledge “perceptions”, or specific concepts about the mind and nature of its work. At the same time, some others work against the prevailing cognitive attitude in society. Therefore, the relationships between theories of knowledge and theories of architectural forms are interrelated and fundamental (20). All theories of art, knowledge, and design are framed under the influence of a set of universal dominant beliefs and confined between the civilizational orientations related to (the nature of the universe), (the nature of human beings and their capabilities), and the relationship between the two (subject(self) and object). Therefore, western architectural design theories fall into two opposing directions:
• The sources of the shape are outside the designer. They are independent of his personal privacy and are waiting to be discovered or received negatively by the designer. Sources may be inherent in design restrictions and problems, or gain their inevitable appearance and form as a result of the spirit of the times and social and economic imperatives. It emphasizes the external existence, its discovery, the importance of information, external forces, avoiding pre-existing personal ideas and working with the external conditions of design.

• The architectural form is invented by the designer by (his personal opinions, experiences, internal emotions, visions and taste). Since there are no two identical personalities, therefore no two people create the same forms even if they operate under the same conditions (21).

### 1.5. Creativity

Creativity, in the language, is bringing something into being, meaning (making something happens) (22). It has mentioned in the almuheet dictionary (heresy - creativity is heresy) that something is initiated, created and invented without previous example (23). It seems that there is a convergence between the terms (creativity) and (innovation), as it came in the (alwaseet) dictionary, invent something: create it unprecedented to it. In English, the word creativity is derived from the word creation, and the verb creates from the Latin origin (Creare), and its meaning is coming to life, design, create, invent, or be a cause for it (24). The origin of the word "creativity" refers to the Latin term (Kere), which means growth or the cause of growth. The English verb (create) means bring it to existence, make or originates. Those who described by this description are the owners of creative capabilities. The name (Creativity) refers to the characteristic of the ability to create (25). As for absolute creativity, it is creation, which is a characteristic of God, the Most High.

The term (creativity) is a form of complex mental activity in which a person turns to a new type of thinking based on experiences and preconceived elements (26). Creativity is the integrated unit of the set of subjective and objective factors that lead to achieving new, original, and valuable production by the individual or the group. Creativity cannot be limited to solving problems since creativity is determined by the existence of new products, as solutions according to the regular rules have no original creative character (27). It is also the initiative that a person shows in his ability to defect from the typical sequence of thinking to a total dissent” (28).

Morris (1999) believes that creativity depends on intuition, which is a state in which the boundaries of subject(self), place, and time are exceeded (triangle of oppression). Creativity, according to the triangle of oppression, is a transcendence of self-subjugation because it is an exodus of one's self and transcendence of subjugate the place because it involves the emergence of a new object in itself that changes the intensity of the site, and transcends to oppress time, because it is an age span that begins with the rhetoric moment of birth (29). It is a mental activity accompanied by a strong desire to search and find solutions to problems (30). It is an advanced mental phenomenon in which the individual treats things, attitudes, experiences, and issues in a unique or unfamiliar way, or by presenting a set of previous solutions and coming up with a new solution (31). Imagination has been associated with creativity, and vice versa, because creativity requires the continuation of the glowing of imagination with the necessity of flexibility of style. Thus, the artist's idea of the work is rarely equivalent to what is actually achieved because what controls the work is that constant and urgent pressure from the concept to verify the creator's tools (32).
Scientific creativity differs from artistic creativity, but there are areas such as the art of architecture that meet scientific creativity with artistic creativity (33). Relying on intellectual freedom, the possibility of expressing according to a cultural, multiple, interactive, conflictual, and compulsory context requires not only circumstances that become lenient over time, but also dynamic conditions (34). It requires producing a new model in the art that represents a revolution against and opposition to the previous traditional model. Originality in art calls for excluding everything traditional, as there is no real artistic effectiveness in using traditional forms (35).

1.6. Epistemology and creativity

Traditional epistemology separates science from art, to link science with truth and fact while linking art to the field of images and repercussions. In light of the development of scientific thought, many epistemological concepts change. Through crises that appear in the structure of science, new epistemological thinking emerges to direct those crises that the previous epistemic model has failed to explain. This is what Kon (1987) calls scientific revolutions, which are those evolutionary events that replace an entire old model or part of it with a new model that contradicts it (36). Revolutions could lead to the development of thought because they work to change the tools of mind and change the impact of both theoretical thinking and experience (37). Art is considered as a cognitive product by the specialized thinking mechanism of a set of mental processes achieved by the thinking mechanism (38). It might be simpler to talk about artistic revolutions than it is to scientific revolutions because the transformations of the creative model do not need an essential reference to the truth that science seeks. Therefore, artistic revolutions do not measure by the standards of honesty that dominate scientific activities (39).

The architect seeks to put forward assumptions that are solutions to a design problem, which is an attempt to develop his experience he makes through corrections on those assumptions to get rid of the error and move the experience from the simple to complex stage. This coincides with Popper's assertion that knowledge begins with a problem that is put to it a temporary solution with an assumption or guess placed before any observation. These assumptions are an attempt to build a new format that seeks to compose real progress in knowledge by correcting and modifying those assumptions and eliminating erroneous attempts and excluding failed attempts (40). Jones puts forward an idea that design is a field in which intuition and logic merge, represented by the ideas in the mind of designer, and the possibility of laying them out on the drawing paper within a circle of the designer's dialogue with himself as an approach that provides the designer with regular mechanisms to keep his information out of memory without preventing them against freedom to transmit his ideas. Thus, it helps him to reduce errors by increasing the linear mechanism in his work and reducing the rotational mechanism on the one hand and allowing for more fabulous imagination without worrying about going into closed, intuitive areas of unknown end on the other side. The study categorized the stages of a designer's dialogue with himself in the design process into three primary intellectual stages: (analysis, composition, and evaluation) (41).

Rowe likened the process of architectural design effectiveness to a set of successive scenes or intellectual scenes represented by designer's dialogue with himself through a rotational process that includes guessing and evaluation of the big idea, which often arises in the initial stages of design, to be a general line that leads the course of action in determining the nature of the design.
problem and type, depending on the designer's dialogue with himself in handling available information. Designer dialogue consists of three stages: defining the problem's space, generating the solution, and then evaluating it, with an emphasis on the designer's interactive production mechanisms often take the analogy and induction formula by which an intellectual construction is made. Five methods can be defined in intellectual development as follows: (anthropological analogy, literal analogy, environmental analogy, typological analogy, and pictorial analogy) (42). Razzaqi has proposed three types of creative methods, namely, (The diversification manner, the inventive manner, and the experimental manner) (43). Ching put forward several principles of the subject, which are: (fluency, overflow, flexibility, tolerance of ambiguity, looking at things with a new look, setting interconnections, analysis, and composition, and selectivity) (44).

Between subject(self) and object, both theories of previous knowledge and theories of architectural production line up to form intermediate binaries that depend on the classifications of theories of creating architectural forms, which are as follows (45):

1. Classical Tradition Theory “Classicism”: It confirms that the source of the architectural form is outside the mind of the designer.
2. Romantic Theory “Romanticism”: It emphasizes reliance on a vision that insists that the form is found in the intuition of the designer.
3. Positive theory “Positivism: It depends on the Existing vision that facts in the outside world jump into the human mind without help from him.

General discussion
Knowledge is the product of convergence and communication between subjective and objective, and understanding the facts or gaining information through experience or meditation or reading about the experiences of others and reading their conclusions. As for epistemology, it is the critical study of the principles, assumptions, and results of different sciences. It comes as a scientific theory of knowledge. The relationship between theories of knowledge and theories of the formation of architectural forms is interrelated and fundamental, as the epistemological shifts are reflected in the transformations in architecture. The study of the epistemological transformations helps to understand the changes in architecture and its structure, as design theories may not exceed to be another form of the theory of knowledge.

Creativity is a new and purposeful production characterized by novelty and originality. It is the integrated unit of a set of subjective and objective factors that lead to achieving unique, original, and valuable output by the individual or group. The relationship of epistemology to creativity is evident by its similarity to the relationship between structures of science and art and their work in the same way as research, construction, and synthesis. Art is a cognitive product by the specialized thinking mechanism of a set of mental processes achieved by the thinking mechanism. The architectural design, according to this vision, is a scientific and epistemological approach based on the attempt in which intuition and logic merge, and is linked to the designer's raising of questions in the presence of types of creative methods and several principles.

2. Part two: The general application framework
The conceptual framework for research concepts has been introduced and formed after presenting the general knowledge about them by adopting what has been determined to put forward the elected application model, and then performing, analyzing and discussing the ratios of indicators achieved in a theoretical framework. Later on, conducting the application and go to
present, analyze, and discuss the results for its results to show the conclusions and recommendations.

2.1. Theoretical framework formation
The theoretical framework for the topic and vision of the research have been formed according to the two main terms of framework, namely (general conceptual frameworks, detailed interactive frameworks), to be subsequently proposed to present secondary terms, sub-indicators, and possible values within them.

Table 1. The theoretical framework for the research. (Prepared by: researchers)

| The main term                        | The secondary terms                         | The possible values                                                                 | The verification |
|--------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------|------------------|
| General Conceptual Frameworks 17-29 | General vision of knowledge 6-11            | prevailing epistemic readiness                                                     | O                |
|                                      | Convergence and communication between aware | Possibility and determinism of knowledge (potential knowledge)                     | O                |
|                                      | subject(self) and object                     | Possibility commensurate with the capabilities of sense and reason (relativity of knowledge) | O                |
|                                      | acquisition of information through experience or meditation |                                                                                  | O                |
| Knowledge possibility trends         | Absolute doubt(skepticism)                  |                                                                                  | O                |
| Knowledge meanings                   | The act of mind and realizing the objective phenomena |                                                                                  | O                |
|                                      | The act of the mind and get the image of the external object in the mind |                                                                                  | O                |
| Knowledge sources                    | The mind                                    |                                                                                  | O                |
|                                      | The sense                                   |                                                                                  | O                |
|                                      | Intuition and inspiration                    |                                                                                  | O                |
| Epistemological principle 4-6       | Logical origin and objective value of the principles and hypotheses. |                                                                                  | O                |
|                                      | Study of knowledge at its present moment     |                                                                                  | O                |
| Dynamic science classification based on fields | Physical field                              |                                                                                  | O                |
|                                      | Conceptual field                            |                                                                                  | O                |
|                                      | Internal epistemology                       |                                                                                  | O                |
|                                      | General epistemology                        |                                                                                  | O                |
| General Creative Features 7-12      | Integrated unit for a set of mental and objective factors |                                                                                  | O                |
|                                      | A form of complex mental activity           |                                                                                  | O                |
|                                      | Relying on intuition by transcending the boundaries of time, space, and self. |                                                                                  | O                |
|                                      | An advanced mental phenomenon to uniquely address things, situations and problems. |                                                                                  | O                |
|                                      | distinction in novelty and originality.     |                                                                                  | O                |
| Detailed interactive frameworks 31-49 | Architectural epistemological communication 11-17 |
|--------------------------------------|--------------------------------------------------|
| **Impressive persistence of imagination.** | O |
| **Require specific cultural conditions for creativity.** | O |
| **Relying on intellectual freedom to change according to an interactive, multiple cultural framework** | O |
| Attributes of creative production | Scarce |
| | Not common |
| | Social value |
| Types of architectural discourse | Historically |
| | Critically |
| | Ideologically |
| | Theoretically |
| Cognitive and design theories frameworks | The nature of the universe |
| | Human nature and capabilities |
| | The relationship of the subject(self) to the object |
| Design theories trends on the sources of shape | Shape sources outside the designer |
| | Shape sources by designer invention |
| postulates for visualizing the cognitive activity of future space thought | Space |
| | Thought |
| | Mechanism of structural thought |
| Creative Epistemological Interaction 20-32 | Similirities in structures and methods between science and art |
| | Transferring the experience from the simple stage to the complex stage |
| | Deletions and additions and changing the spatial relationships of shapes |
| | The digital system in architectural science |
| | The dialogue using computer graphics as a new medium for thinking |
| | Introducing new design variables |
| | The classical theory (Traditions) | Source of form out of the designer mind |
| | | Objective characteristic |
| | | No changes by changing individual designers’ differences |
2.2. The application sample
General knowledge has been presented about the applied model, which represents an architectural project for application in a manner that suits most of the criteria of the basic concepts of research, as follows:

2.2.1. Yas Hotel, Abu Dhabi - United Arab Emirates, 2009
Yas Hotel is one of the essential landmarks in Abu Dhabi, UAE. It was designed by Al-khat Al-Moqarib - Hani Rashid + Lais N Couture. It was completed in October 2009 to coincide with the launch of the Formula 1 championship. The project includes 500 hotel rooms and occupies an area of 85,000 square meters. The idea of the project is related to the speed, movement, and courtyards scene, and its architecture that form the basis of ancient Islamic art and craft traditions.
While the organic and streamlined shapes are employed, the glass panels form a veil-like network that covers and contains the two hotel towers connected by a bridge that is similar to the sculptural object. This network connects the visual parts of the project and, at the same time, produces visual effects and spectral reflections that reflect the ocean represented by the sky, sea, and desert scenery. This makes the architecture as a whole responsive to the environment as well

| Romantic theory | Source of the designer's individual intuition |
|-----------------|---------------------------------------------|
|                 | Individual susceptibility to inspiration and genius |
| Positive theory | The facts in the outside world pop up for the human mind without help |
| “Positivism”    | Discovering forms by nature without prior ideas |
| Stages of designer dialogue | Analysis O |
|                  | Synthesis O |
|                  | Evaluation O |
| Types of creative visualizations | Diversification type |
|                  | Invention type O |
|                  | Experimental type |
| Design analogous manner | Anthropological analogy |
|                  | craft analogy O |
|                  | Environmental analogy |
|                  | Typological analogy O |
|                  | Imaginary analogy O |
| Creativity attributes and steps | Fluency O |
|                  | Overflow O |
|                  | Flexibility O |
|                  | Endure mystery O |
|                  | Looking in a new way |
|                  | putting interdependencies O |
|                  | Analysis and synthesis |
|                  | Selectivity |
| Total            | 48-78 |
as the scene and event, where the project responds visually and tectonically with its environment to create a bright and robust feeling of the place as well as creating a breathtaking backdrop through the event of the championship and upcoming events. The main advantage of the design of the project is the presence of a 217-meter-long curved cover made of steel and glass in the form of diamond-shaped, which constitutes employment for the technology embodied in the distinctive structural frame, as well as the adoption of several techniques such as safety, lighting, and lighting control associated with remote communication and automation services (46).

2.3. Practical application

The application of the theoretical frameworks previously derived on the selected practical model will be conducted in a way that indicates the verification cases for the possible values, and thus for the secondary and primary terms to determine the status of the overall verification and discuss them within the results, as shown in Table 1.

2.4. Result analysis and discussion

After conducting the required application, presentation, analysis and discussion of the verification results for possible values and secondary and primary terms will be done in this section at the individual and overall levels of the basic concept of the research as follows:

2.4.1. Detailed analysis

1. Results for the first main term (general conceptual frameworks)

A- Results for the first secondary term (General Vision of Knowledge)

- The results recorded verification for (6) cases out of a total of (11) cases of possible values (prevailing epistemic readiness, convergence and contact between aware subject (self) and object, acquisition of information through experience or meditation, Knowledge possibility trends possibility (possibility commensurate with the capabilities of sense and reason (relativity of knowledge)), Meanings of knowledge (The act of the mind and get the image of the external object in the mind), sources of knowledge (intuition and inspiration)).

B- Results for the second secondary term (epistemological principle)

- The results recorded verification for (4) cases out of a total of (6) cases of possible values (logical origin and objective value of principles and hypotheses, study of knowledge at the present moment, classification of dynamic science based on fields (internal epistemology, general epistemology)).

C- Results for the third secondary term (general creative features)

- The results recorded the achievement of (7) cases out of a total of (12) cases of possible values (a form of complex mental activity, relying on intuition to transcend the boundaries of time, space, and self, distinction in novelty and originality, Impressive persistence of imagination, relying on intellectual freedom to change according to an interactive, multiple and cultural framework, attributes of creative product (Not common, and social value)).

2. Results for the second main term (detailed interactive frameworks)

A- Results for the first secondary term (Architectural epistemological communication)

- The results recorded verification of (11) cases out of a total of (17) cases of possible values (interrogation and investigation of models in design, The overlap between epistemological
transformations and transformations in architecture, overlapping theories of knowledge with theories of architectural forms composition, types of architectural discourse (historical, critical, theoretical), Frames of cognitive and design theories (the nature of human beings and their capabilities, the relationship of the subject(self) to the object), trends of design theories on the sources of shape (sources of shape outside the mind of the designer, sources of shape invention by the designer), postulates for visualizing the cognitive activity of future space thought(thought).

B- Results of the second secondary term (creative epistemological interaction)

- The results recorded the achievement of (20) cases out of a total of (32) cases of possible values (transferring the experience from the simple stage to the complex, deletions and additions and changing the spatial relationships of shapes, the digital system in architectural science, Introducing new design variables, the classic theory (traditions), Source of form out of the designer mind, objective characteristic, romantic theory (individual susceptibility to inspiration and genius), positive theory “Positivism” (Discovering forms by nature without prior ideas), stages of designer dialogue (analysis, Synthesis, evaluation), types of creative visualizations (Invention type). Design analogous manner (craft analogy, typological analogy, Imaginary analogy), features and steps of creativity (fluency, overflow, flexibility, Endure mystery, putting interdependencies).

2.4.2. Total analysis

1. Results for the first main term (general conceptual frameworks)
   - The results recorded 17 cases out of a total of 29 cases.

2. Results for the second main term (detailed interactive frameworks)
   - The results recorded 31 cases out of a total of 49 cases.

3. The results for the overall situation
   - The results recorded 48 cases out of a total of 78 cases.

2.5. Conclusions

1. Knowledge is the product of convergence and communication between a subject(self) and a object that are aware of the facts or gaining information through experience or meditation or reading about the experiences of others and reading their conclusions. It has a theory that examines principles of knowledge, nature, source, value, limits, and an indication of the extent to which our perceptions are identical to what is taken independent of the mind.

2. Epistemology is the critical study of the principles, assumptions, and results of different sciences. It comes as a scientific theory of knowledge. It is a study or analysis of knowledge at its present moment, based on its goals and frameworks, according to an integrative view that takes into account the dynamism of scientific knowledge and interrelationships between various sciences.

3. The relationship between theories of knowledge and methods of the composition of architectural forms is interrelated and fundamental. Epistemological shifts are reflected in transformations in architecture and that their study helps to understand the changes in architecture and its structure. Design theories may not exceed to be another form of knowledge theory, so Western architectural design theories divided into two opposite
directions, the sources of the form lie outside the designer mind, or that the architectural form is invented by the designer (the self).

4. Creativity is a new and purposeful production characterized by novelty and originality. It is a form of complex mental activity, which can be described as a process with multiple stages that generally begins with a sense of the problem and ends with the appearance of the solution based on experiences, preconceived elements, and intuition. It is the integrated unit of the set of subjective and objective factors that lead to achieving new, original, and valuable production by the individual or group.

5. The relationship of epistemology to creativity is evident by its similarity to the relationship of the structure of science and art and their work in the same way as research, construction, and synthesis. Art is a knowledge product by the specialized thinking mechanism of a set of mental processes achieved by the thinking mechanism. Architectural design, according to this vision, is a scientific and epistemological approach based on the attempt, in which intuition and logic merge and represented by the ideas in the mind of the designer and the possibility of dropping them through the stages of self-dialogue and its connection with the designer raises questions about the existence of types of creative methods and several principles.

6. The effect strength is illustrated by the indicators of general conceptual frameworks for the relationship of epistemology and creativity versus a more substantial effect of detailed interactive frameworks of that relationship, which confirms the strength of the correlation between the two basic concepts of research at the precise level more than that at the general level.

2.6. Recommendations
1. The authors recommend the necessity of expanding the study of general values and concepts that can contribute to highlighting the general knowledge and creative role of the field of architecture.
2. The authors recommend that it is necessary to study the possibility of having multiple and varied formulas within other fields that have a more profound impact, such as art, philosophy, and others, that have a more significant effect on the concepts of architecture solution and employ them in the course of architectural design work.

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Figure 1. Yas Hotel project, Abu Dhabi, United Arab Emirates, 2009