Journal of Applied Sciences Research, 9(3): 1438-1448, 2013
ISSN 1819-544X
This is a refereed journal and all articles are professionally screened and reviewed

ORIGINAL ARTICLES

Develop Methods Perceptions for Architecture Students

Hesham Mohammed Mohammed Hussein

Architecture Department, Faculty of Fine Arts – Minia University, Egypt

ABSTRACT

We are in need of new methodology for studying architecture. A methodology that stimulates creativity be connected with the career needs, the social affairs, the environmental cases and challenges. The perception process is considered an essential component of the architectural thought and its influence is clear in the creative and design processes for architecture students and graduates. This paper studies perception, its stages and its influence on creativity of the design process. The paper discusses the development of the sensor perceptions using a helping tools which is the 3-D model as a means for broadening the imagination capacities in the design process that provides new tools and terms that help in developing the design thought with new and creative ideas that elevate the general taste.

Key words: Perception, Creativity, 3-D models, Helping tools, Design process.

Introduction

The architect's advancement has always been connected with the scientific and knowledge perceptions he owns as well as the tools and techniques he possesses. The architect's sensory perceptions participates in increasing his learning and creating capacities.

The perception process is considered a major component of the architectural thought. Therefore, using the helping tools to develop the sensory perceptions for architecture students help them seek the development of their skills and capacities in order to increase the efficiency of their sensory perceptions consequently the increase of their creative efficiency of the design process.

The paper studies the architectural perception and creativity and its stages. It studies also the means to use the 3-D model as a helping tool as a major process in developing the educational process.

Whoever follows the history of architecture from ancient times until now will definitely find obvious influences for using the 3-D models whose effect is clearly emphasized on developing the architectural thought.

Problematic research:

The problems we suffer nowadays in the creative and design processes for most architecture graduates are in most cases a result of neglecting the helping tools and means in developing the sensory perceptions of the architecture students, an issue that leads to a shortage in the creation process.

The problems that this study presents are summarized into two main points:

- Ignoring the development of the sensory perceptions for the architecture generations and the limitedness of the educational curriculum that only uses the traditional syllabus neglecting the role of the exchange and practical training programs for the students.
- Undermining the importance of the use of 3-D models seen only as a means of showing or marketing not as a means to develop the sensory perceptions, creativity, design and evaluation. It is important to raise the awareness of the necessity of inserting the exchange programs in the educational curriculums and establishing technical and handicraft workshops used in manufacturing the 3-D model.

Research Objective:

- Directing the attention to developing the sensory perceptions for the architecture students showing the importance of this in raising the architectural design capacities.
- The importance of using all the helping tools which influence on developing the students' skills and perceptions leading to producing creative works.

Corresponding Author: Hesham M. M. Hussein, Architecture Department, Faculty of Fine Arts – Minia University,Egypt
E-mail: hjapanh@yahoo.com

- Stressing on the necessity of directing the design thought to the direction of the 3-d model and highlighting its importance in the architectural design works.

Search heading mainly to:

- Faculty members in the architecture departments.
- Architecture students and practitioners.

1- Architectural Perception:

(1-1) Definition of perception:

Perception can be defined as "the process through which the sensory receptors are organized and formed into meaningful experiences". (Hassan Suleiman, 2003)

It includes alert and detection of the stimulus, directing the sensory receptive tool towards it, distinguishing between two different stimulants and filtering the information coming to the brain crust and identifying these receptors and clarifying the incoming messages, therefore building the correct concept about them.

Perception also includes intelligence, feelings, ideas that are outcomes of the brain activity saved inside the biopsychology formula (Bater M. Wardem, 2005). Perception is "the structure through which the individual experiences are organized and the impressions explained individually therefore dealing with the environment accordingly". The spatial perception could be what determines the human body's place in space and what determines the place of objects in relation to the human and to the other objects (Vernon, 2004). Perception is the second in the cognitive mental processes that the student use with the environmental stimuli to shape them in a system of thought that expresses a meaningful concept. Perception can also be defined as "a process of correctly understanding through linking and concluding previous information saved in our minds to a certain situation and explaining it in a correct manner as the final step in transforming what we learn into a permanent culture that has both importance and meaning".

Perception includes many cognitive activities in the life of the individual. The awareness and the degree of awareness also are included in these activities as well as the memory that is related in many ways to perception because the senses' ability to save information for a while before the perception process. We cannot forget that the language has a great influence on knowledge and on the indirect formulation of perception. Therefore, we can say that the cognitive processes are intertwined with each other and we shall present here only one side of the perception process with its simple levels which is using the language of architecture through the 3-D model.

2-The physiological influences of the perception process:

Many psychologists declare that we - as human beings- when we wander in the world around us, we build our own model of how this world works.

We feel our real objective world, but our feelings are converted to temporary marginal perceptions; we also form many scientific temporary hypotheses until they are finally proved.

When we receive new sensory information, our perceptions are changed according to them, and this is what proves the flexible nature of the human imagination. In the case of sensory perception, some people can see the fact of the change in the visual perception which is what we can call "the mind's eye". (Magazine Wikipedia, 2006)

But other persons who do not owe a visual thinking actually cannot feel the change of the shape that accompanies the change of their world.

- One example of this case is "the ambiguous image" which has more than one explanation on the perception level.

Through the theory extracted from his studies in the pilots' training field that he developed, Gibson stressed on the importance of the information capturing process in the artistic perception, pictures and paintings. In his opinion this process is a means of communication, saving information, accumulation of knowledge and transforming them to next generations. There is a certain structure in the picture and language, but the information in the light of the surrounding are richer and more continuous than the structure of the information existing in language. Gibson declares that each artist knows that there are ideas that can be expressed optically needless of the verbal expressions. "A picture is a display of optical information and that optical information does not consist of either spots of color or conventional figures with assigned meanings. It comes in an optic array, to be sure, but the array is composed of a hierarchy of nested units, not of rays. Information is contrasted with energy. There has to be enough stimulus energy in an optic array to excite the retinal receptors but the stimulus information is what counts for perception. And stimulus information is invariant under all sorts of changes in stimulus energy". (J. Gibson, 1971)

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

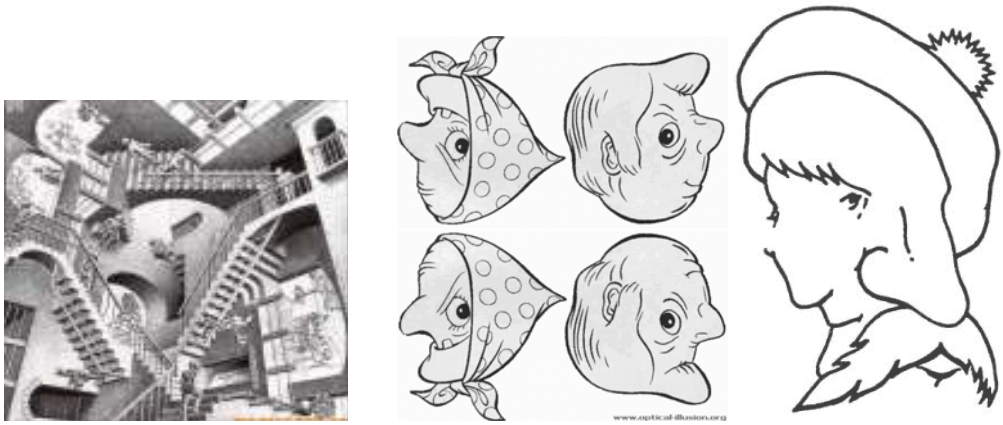


Fig. 1: A picture explaining the ambiguous image
Source: http://plato.stanford.edu/archives

3- The Psychological perception patterns:

Victor Oviveld suggested that there are two types of the psychological perception patterns and of the drawing methods in both art and architecture. (The world of knowledge, 2001)

The first pattern is the optical and the second is called "Haptic" or tactile, from the Greek word "Hapitkas" which means able to grasp. The two patterns are described by Oviveld as follows:

(3-1) The optical pattern:

The owner of this pattern usually gets near to things because of its appearance, feeling that he is watching them. One of the important factors of the optical observation is the ability to see the whole first without being aware of the details, then analyzing the whole into partial or detailed impressions, at the end combining these parts in a new total. The owner of this type sees the general form of the tree first then its leaves and branches. At the end he combines all these factors together into the shape of a total tree i.e. he starts with a general plan and partial impressions where integration happens forming a total homogenous picture. This is not true only to the psychological part but also to the creation activity. Thus we can notice that the visual patterns are usually concerned with the general plans of the subjects, and then enrich the form with the details when the visual analysis is capable of penetrating, going or delving deep into the nature of the subject. The visual penetration deals mainly with two factors:

1- Analyzing the basic characteristics of the form and structure of the subject.

2- The transformed influences of these forms and structures as identified through light, shade, color, air and space. Therefore noticing details is not always a mark of the optical intelligence because it can be a mark, (indicator) or evidence of a strong memory or a personal or specific care of such details. As for the optic mind, it is important for its owner to see the changes subject to these details under the various pre mentioned circumstances.

The owners of the optic mind tend to transform the tactile and internal dynamic experiences into optical experiences. If the owner of the optic mind becomes familiar with a certain object in complete darkness, he tries to imagine (visually) all the tactile experiences and asks himself about "what that thing might be?" In other words, he tries to imagine – under optical circumstances – what he perceives through other senses. From this perspective, Oviveld sees that the visual-oriented approach of the outside world is an analytical approach of that person who tends to watching and finds problems and solves them through the complex observation of the ever-changing aspects of forms and patterns (The world of knowledge, 2001)

(3-2) The tactile pattern:

The primary mediator side of the person's tactile pattern is the body's own muscle sensations, the ego, the dynamic experiences, the tactile impressions and all the experiences that put the ego in a valuable relationship with the outside world. In that sort of art or pattern the ego is being projected as the true representative of the picture that is the outcome of a special complex process that is achieved through the mental, emotional and body understanding of the form, shape, size and area which can be defined here through the emotional value of the form and the importance. Therefore the tactile pattern is a subjective pattern, the owners of the tactile minds do

not transform the tactile and muscle experiences into optical experiences, but they accept and are satisfied with the sensitivity, the tactile or the muscle itself as shown through the experiments, and this happens also in complete darkness. Since the tactile experiences are partial ones, one can reach only an integrating ranking when he becomes emotionally and sensitively interested with the subject connected with touching. The individual is more often than not satisfied with the partial tactile experiences, and here, he uses his ego as a real subject where his experiences are projected. Therefore the individual's pictorial representations are often largely subjective and his ratios are the ratios of the emotional value of things. The taste for art, art education and creativity has the same efficiency if the individual concerned about alerting these two forms or patterns of perception and artistic expression. The optical creativity is also dependent on these two types to varying degrees; sculpture and ceramics for instance need the tactile pattern then the optic pattern comes next while in painting and drawing the opposite happens.

(4) The tactile impact and how it activates the role of 3-D model for students of architecture:

The process of receiving, interpreting, selecting and organizing the sensory information is what we call sensory perception. It is noted that the child acquires the skills of sensory perception, attention, speech, thought and imagination and that is what makes him more attached with toys that allow him to explore and examine, therefore we find him eager to play enthusiastically (Hussein A.H. Rashwan, 2000).

From that perspective, the role of the 3-D model can be activated through providing the students of the architectural sections with the tools and curriculums that increase their thought and creative abilities to reach a high degree of the general taste besides broadening their imaginary abilities. The 3-D model gives its users new tools and expressions that help them to develop their design thinking. Peter Eisenman's argument (Eisenman, 1992) in which he analyses the decrease of the architectural production referring it to the weakness of the architecture himself and his method of preparation for his career might actually raise many points in the field of developing the architectural sense.

There are some basic conditions for perception (Vernon, 2004):

The presence of a stimulus:

of the new tools and terminologies such as the apparent formations of the Walt Disney Musical Hall and the Seattle Museum where we find new building tools and magnitude.

Fig. 2: Seattle, Washington Experience Music Project
Source: http://www.jblpro.com/General/photos

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

Fig. 3: The Walt DisneyMusical Hall Designed by Frank Gehry

2-Feeling the Stimulus:

one can feel the influence of the stimulus then uncovers the feeling of the presence of a stimulus through the diversity of the schools of architecture.

- Structural architecture – Functional architecture
- Expressive architecture – Future architecture – Organic architecture –

Cubic architecture.

Exhibition Hall in public garden- Germany A train station in Strasbourg - Germany

Fig. 4: examples within the architecture of deconstruction
Source: http://journal3.net/spip.php?article79

3-Identifying the stimulus:

perceiving it, i.e it has to have a certain meaning.

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

Fig. 5: A group of Exsamples that represent obvious meanings or objects
Sourse: http://www.alsowar.com/imagedetails/

4- Response:

the individual response is due to his previous experiences and the former experiments so that he knows the properties of the stimulus and what it symbolizes **(http://cas-courses.buffalo.edu/classes/psy).**

The process of the architectural perception is a product of a previous image that is clarified, identified, functioned, used, imagined and developed according to what it symbolizes.

(5) Developing the sensory perceptions of the students of architecture:

Developing such perceptions starts with the stage of dealing with surfaces, then with 3-D models after understanding the live characteristics of the shapes at different stages of complete or incomplete forms. In other words, accommodating the live characteristics of shapes at various stages requires an actual dealing with these forms through a series of exercises where the student tries to understand and apply these characteristics on the absolute shapes that actually represent the backbone of the architectural design (Maher M. Steno, 1993).

(5-1) Optical skills refinement:

The term “optical skill” is symbolic rather than organic. The eye is a means of contact with the world and the skills of the psychological and dynamic domains depend on the sense of sight. Therefore, the term “optical skill” was agreed upon because the senses present the optic information to the brain or transmit the feelings, and

if they did not exist, the mind would have been empty of any content or substance (Sadiq A. Sadiq, 2004). The optical skills are refined via the skills of watching and optical observation which are represented in:

1- The optic perception skill:

The optic perception is not an automatic process of the eye, but the mind and a set of the viewer's subjective elements interfere to influence them, and thus the optic perception process develops with the development of the student's knowledge, and with the increase of his optical memory.

2- The optic separation skill:

It is the skill of separating the relationships or the interlocking optical patterns from each other. Or, the skill of separating the architectural or urban elements from the surroundings in order to identify their characteristics in a separate manner and to identify the relationships, patterns, vocabulary and structure.

3- The optic connecting skill:

It is the process of revising the work where the mind monitors and controls during the free hand drawing, shaping or optically composing.

4- The optic analytical skill:

It is one of critical skills in identifying the concepts of building the relationships and optic patterns in the building and the constructed environment. This skill depends on a methodological management of the mind to arrange its system of operations and to identify its strategic or phase objectives and thus represents the stage of combining the optical memory with the mental inventory.

6-Creativity in architecture:

(6-1) Definition:

It is "a mental work done by the individual using his abilities to reach new ideas or unusual usages or detailing limited experiences into detailed features".

It is also "the integrated unit for a group of subjective- objective factors that lead to accomplish a new and original product appreciated by the individual and society (Tiseer Subhi, 1992).

Creativity is a mental process through which the individual can reach new ideas, results or reconnect previous ones in a new and original method (Reber A.S., 1997).

It is also defined as the ability to deal – in a comfortable way – with the mysterious or unidentified situations, to find new entries and experiment completely new methods and applications.

Another definition for creativity is that it is a new way to solve a certain problem in a logical manner. While Swart and Parks define it as the ability to generate ideas and use the potentials and employ imagination to form unfamiliar ideas and objects. The individual's ability to generate new ideas depend on the former experience that represent the base, therefore he will be able to scrutinize these ideas and reproduce them to become creative and original thoughts that result from the creative thinking of those individuals (Abdul Sattar Ibrahim, 1978).

Finally, Torrance suggests that creativity means "finding new solutions and authentic relationships, depending on specific data "(Dowing, 1997).

(6-2) The history of the concept of creativity:

(6-2-1) The first stage:

It starts with the Ancient Egyptian Era -where we received the oldest written and mobile antiquities- then the Greco Roman, the Pre Islamic, the Islamic and finally The Renaissance and The first decades of the Twentieth Century.

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

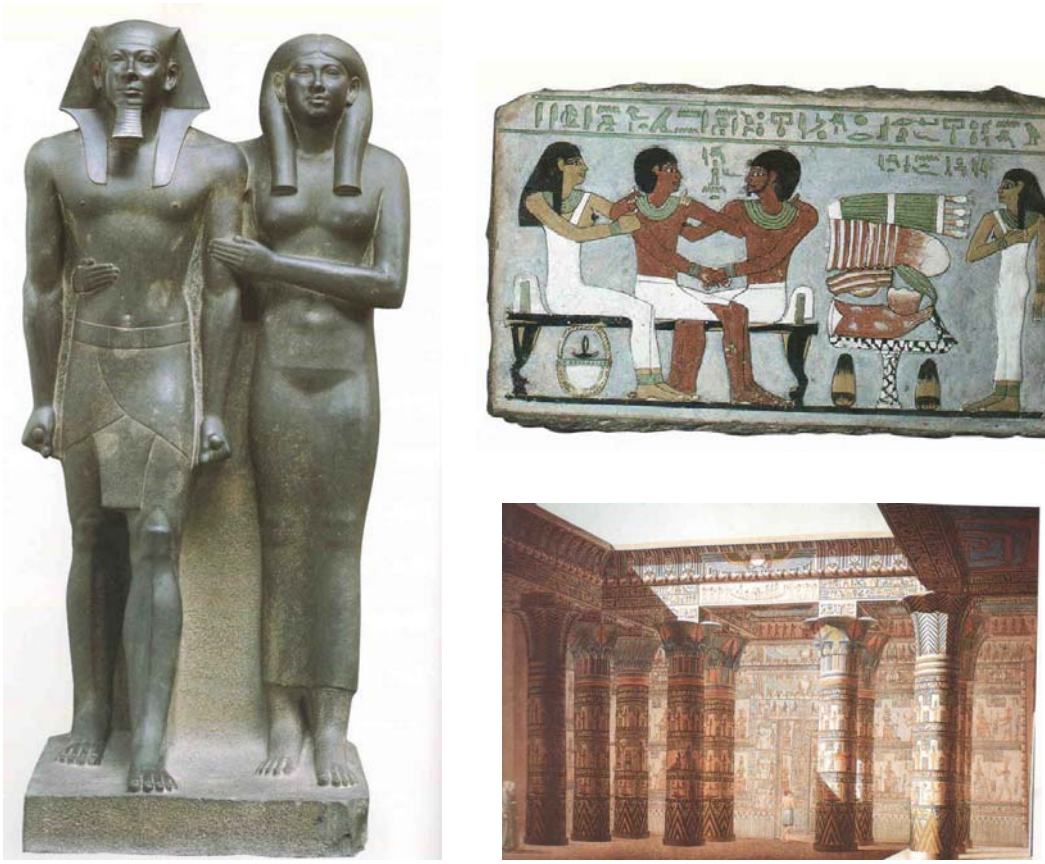


Fig. 9: Creativity in painting and sculpture of ancient Egyptian
Source: http:Egypt the world of the pharaohs

(6-2-2) The second stage:

Starting from the ends of the19th Century when issues like the influence of the social and environmental factors on the human behavior started to appear. The first half of the 20th Century witnessed a broadening discussion cycles and debate from the supporters of the environmental factor concerning its role in shaping the behavior, characteristics and the various mental abilities. It was obvious that the European School of Psychology was more enthusiastic in showing the role of heredity versus the American School that represented the nature of the American Society that was a product of an immigrated majority, therefore was much more enthusiastic to reflect the role of the social and environmental factors (Lang Jon, 1987).

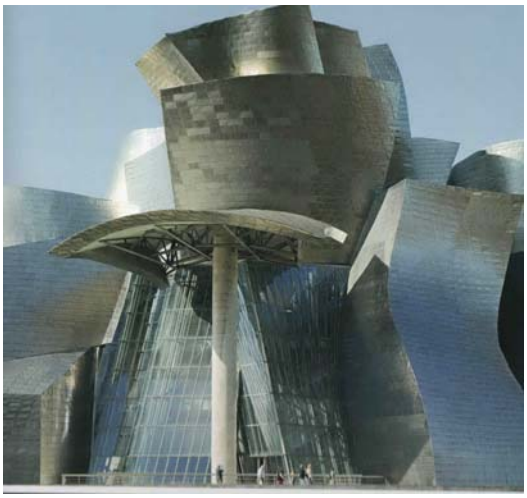
Fig. 10: One architectural examples creativity with the end of the nineteenth century Royal Jewelry Museum in Alexandria.
Source: the researcher

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

(6-2-3) The third stage:

We can say that this stage started in the mid 20th Century until the now. At this stage the concept of creativity is seen as a blend that combines the mental cognitive processes, thinking patterns, personality, motivation and environment. With the great cognitive revolution that the humanity is witnessing thanks to the huge development in communication and information technology, the practical studies and research dealing with creativity developed a lot with the psychological and neurological sciences as well as the knowledge about the brain composition, the mental functions, artificial intelligence, psychometric testing … etc. that have also developed greatly.

Creativity thus represents a very important component in architecture especially when it is connected with one of the major fields of education. In his famous study about the personal characteristics of the creative architect, Donald W. MacKinnon argues that creativity in architecture is mysterious and that the contemporary architecture schools stemmed from the classic model presented by the "Beaux art" school whose educational philosophy relied on a professional production that is able to exercise the architectural work efficiently and to achieve the levels of performance consistent with specific and clear objectives (Isis Radwan, 2000).



Guggenhem Bilbao museoa Spain - Bilbao

Art Gallery of Alberta Canada - Edmonton

Fig. 10: The importance of innovation as it represents a key component in the architecture
Source: Contemporary museum

Actually this educational vision contradicts the role of university which must be helping the student in transforming the cognitive outcome into influential concepts that help him understand the surrounding environment with its life, societies, nature and the multiple, complicated and different relationships.

(6-4) Developing and measuring the level of creative thinking skills:

The subject of developing the creative abilities might seem problematic and accurate; it needs specialists in the field of thinking to apply it. This fact is true to some degree but we need to know – as participants in the educational field generally or in the design education specifically – that we should be aware at least of the basic principles of the creative thinking and how to develop them. The creativity skills are not developed through education but – most importantly- through urging the practice and encouraging the creative activity (Mohammed Al-Tuwaijri, 2000).

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

Fig. 11: Perspective of a public projects (commercial building administrative entertaining and multi-storey garage).
Source: the researcher

There is of course a degree of difficulty in measuring the creative thinking skills, but there are also various methods and measuring tools; some are complicated while others are simple and some identify the creativity of the product while others discover the creative abilities early through the individual or the process itself (Abdullah Nafie, 2006).

In an article criticizing the advanced and complex methods of measuring the creativity level which are difficult for the non specialists to use, Nagel (2001) has pointed out that no matter how much developed those methods are, their results could be doubted. The experience of the teacher in his own domain and specialty and his deep understanding of creativity in addition to coexisting with his students can all put an accurate evaluation of the student's creativity level. So the field is wide, the alternatives are available and the tools are varied. The most important case is still the true desire of motivating creativity and to discover it early.

Search Results:

Within the framework of studying the methods of developing the sensory perceptions of the students of architecture the researcher reached the following:

1- Perception includes alert and detecting the stimulus which means directing the sensory receptive tool towards it. There are two types of the psychological receptive patterns; the optical and the tactile patterns.

2- Perception depends on several key factors (the existence of the stimulus- feeling the stimulus – identifying the stimulus and responding).

3- Developing the sensory perceptions of the students of architecture starts with the stage of handling surfaces then handling 3-D models and applying them on the absolute forms or shapes which is considered the basis for the architectural design.

4- Creativity is a mental process through which the individual can reach new ideas, results or reconnect previous ones in a new and original method.

5- Creativity includes four elements or components the (4Ps) which represent the person, the process of creativity, the product of creativity and persuasion of the originality of the product.

6- The importance of developing and measuring the levels of the students' creative thinking and the science of thinking in order to apply them on their studying levels.

Recommendations:

The importance of developing the students' sensory perceptions through the following:

1- improving the visual skills and clarifying the basics of the reception process.

2- Developing the students' perceptions and skills in order to produce creative works.

3- The necessity of developing the creative ability using the 3-D model.

4- Presenting new methods for architectural education that stimulate creativity and be connected with the professions' needs, the social problems and the environmental challenges.

J. Appl. Sci. Res., 9(3): 1438-1448, 2013

References

Abdullah Nafie, I.T., training program higher-order thinking skills and leadership abilities, knowledge magazine, issued zero,.

Abdul Sattar Ibrahim, new horizons in the study of creativity, agency publications, Kuwait, 1978.

Aly Abdul Rauf, 2001. contemporary Egyptian architecture, monetary issues and creative trends, published article, Aalm Albenaa magazine,issue May, 2001.

Bater Mohammed Wardem, Kuwaiti Al-Arabi magazine, 2005. an article the installation Biusikolojy of the human mind.

Bnelaun, Marie, 1996. genius, idea, the world of knowledge chain, issue. 238, National Council for Culture, Arts and Letters, Kuwait.

http:// cas-courses.buffalo.edu/classes/psy/segal/4212001/wunatetal.htm

Dowing, P. James, Creative Teaching, 1997. Teacher Ideas Press, Engle wood, Clorado, USA.

Eisenman, Kathryn, 1992. Design Juries on Trail.

Hassan Suleiman, 2003. Journal of classes, issue (92).

Hussein Abdul Hamid Rashwan, 2000. psychological and social foundations for innovation, modern university books.

Isis Radwan, 2000. a pilot study of the effectiveness of the program in the development of critical thinking among the Faculty of Education, Ain Shams University, studies curricula and training methods, 2000.

Gibson, J., 1971. The information Available in pictures.

Lang. Jon, 1987. Creating Architectural Theory.

Magazine Wikipedia, the free encyclopedia, issue May, 2006.

Maher Moheb Steno, 1993. liylaa Mohammed al-Masri, the role of external spaces educational centers, College of Urban and Regional Planning, Cairo University, published research, Aalm Albenaa magazine, issue. 134.

Mohammed Al-Tuwaijri, 2000. Abdul Majid al-Sayed Mansour, talented, Obeikan Bookshop, Riyadh.

Reber, A.S., 1997. Dictionary of Psychology.

Reber, 1992. The New Encyclopedia Britannica.

Sadiq Ahmed Sadiq, 2004. the basic skills of design, research publication, Emirates Engineering Research.

Shakir Abdul Hamid, 2005. an era, a world of knowledge.

The world of knowledge, 2001. issue 267, a study in psychology artistic taste, issue March, 2001.

Tiseer Subhi, 1992. talent and creativity, diagnostic methods and tools calculated, scientific enlightenment House, Amman.

Vernon, 2004. The Psychology of perception.