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An Inquiry into Teaching the Perceptual Effects of the Measures to the Students of Architecture

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Abstract

This paper investigates the “increasing level of consideration among students about the effects of environment’s perceptible dimensions on human’s mind”. Firstly, to recognize the topic, with a review in architecture and psychology, it seems that perceptible dimensions in environment have great effects on human’s mind. It is noticeable that mentioned effects are studied in combining format with other constructive elements such as shape and etc. To facilitate access, in first part of a classified information covering different effects of dimensions on human’s feeling and perception are provided to use it to form the educating criteria and to enter in educating architecture. Moreover to determine suitable method of education of basic students related to subject of issue, with investigating related theories about educating methods and referring to expert’s ideas about basic education of architecture and consequently considering their ideas it seems that: with providing opportunities in the form of “students’ guided attendance in environment by moving from instances to concepts” it is possible to simplify learning procedure among basic architecture students using various formats of Learned-Centered Instruction training method. The methodology of this research is based on Deductive-Qualitative approach. Analyzing professors’ interviews is performed to recognize the principles, by accurate coding and combing results, and finally codification an educating format for answering this research’s concern.

Keywords: Dimension, Perception, Basic education, Architecture, Learning.

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Introduction

Referring to my educational experience in design ateliers I have seen that:

Students don't have enough concentration and attention to the outcomes and results of measures in design process. In this regard in order to understand the subject better we refer to the students in design workshop in Zanjan University and do a survey. Doing this survey we found that students in determining appearance measurements pay more attention to external constraints such as program, behavioral, and skeletal forms such as site measurement, users number and…they pay less attention to internal constraints such as perception and perception intuitive forms.

Now based on what expressed in damage description, the main research question is as follows:

What should we do in architect training that students pay more attention to measurements results and outcomes of design process on audience mind while selecting and determining physical measurement?

This research is done with the aim of providing arrangements and suitable educational design in order to facilitate learning and internalize concepts related to conceptual form of measurements in architecture students so that the students could use them in design and architecture ateliers. In this respect a suitable educational design should be done. Cruickshank, Jenkins, and Metcalf (2006) define educational program or design as follows: A process in which teacher decides to (1) train what, (2) train how and (3) determine how the students were successful. Therefore this research at first studies the concepts in perception of measurements, then interview with experienced professors of Tehran and Shahid Beheshti Universities and then analyzing the interviews and exact encoding and combining the main results it studies the way of learning this subject by architecture students.

Literal definition of measure and explaining the related concepts in architecture

In Amid Dictionary measure means amount, scale and module. It means what we can measure by and it means value and degree (Amid Dictionary, 1995: 286). In Dehkhoda Dictionary measure means scale and amount of everything. And it means value, limit and scaling (Dehkhoda Dictionary, p. 343).

In this thesis measure is used as dimensions and physical amount and architecture look. Among relative terms in architecture, size and dimension is considered

Proportion is a subjective value and it can be studied related to shape. Proportion in architecture is a ratio which is indicative of relation between two or more measures (Greuther,

2009: 360). In this way we can determine mathematical and geometrical proportion. Proportion indicates that what proportions are there between different measures, while scale shows the real measures.

Real measure always is related to supervisor. In other words scale indirectly informs us of building measure proportion to supervisor (Greuther, 2009: 368).

The effects of tangible measures on human mind, effective concepts and factors

Any design in architecture requires decision making and manipulation in environment measures and dimension and the decision making related to length, width and height of environment elements is to obtain qualities which the designer considers in his goals. It is obvious that architecture as a coherent system has always direct relationship with human and the measures in this system has different effects on human mind and body. In order to know these effects exactly, some parts of qualitative and quantitative researches in different areas study this subject.

According to this we should say that any decision making regarding measures determination in architecture design requires knowing and using principles, rules and concepts which are determined in different researches, we and referring to results we can classify the subjects into two categories:

(A) Principles and standards regarding measures effects on human body, measures determination for shaping activities and performance: the minimum width of corridor, the entrance height, etc.

(B) Principles and rules regarding measures effects on humans feelings and perception and consequently the effects on activities continuation: wideness and constriction and their effects on openness and closeness, largeness and grandeur and the lack of environments measures perception and feeling lonely.

Based on the research approach we tried to present a geography of information based on literature and existing theories in perception and environment psychology with respect to measures and their effects on human feelings and perception so that we could use this information in educational content related to the subject in architecture training.

Perception

Environment perception leads to environment recognition and shapes human behavior in the environment. Behavior is a kind of objective response to perception as a mental process in the environment. The fact is that in order to convert objectivity to mentality and consider it as behavior and evaluation criterion, it is necessary to pass an intermediate stage which is

perception. For this reason the researchers endeavored many years to identify the complex and mental process of perception.

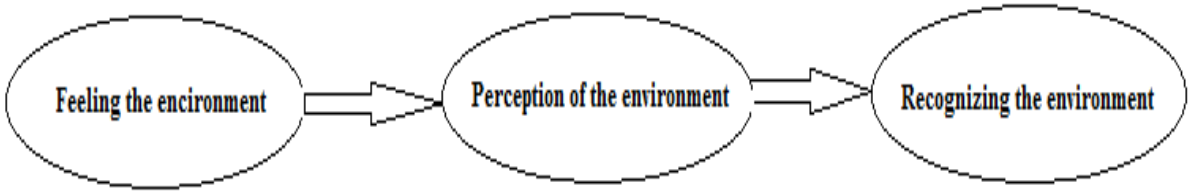

Figure (1): the process of perception and recognition of the environment based on three steps of feeling, perception, and recognition (Shahcheraghi and Bandarabad, 2015: 141)

Theories related to perception have a long history: Experimental psychologists believe that perception is an educational matter elicited from last experiences, Gestalt psychology consider it a product of human neural system under emotional state. Also according to rational philosophers' wisdom is the basis of perception and according to empiricist philosophers feeling is the basis of perception.

Islamic civilization philosophers consider degrees for perception. The first degree of perception is sensory perception which is obtained by senses. The second degree is imagination which is the remaining impact of perception in the mind. The third degree is wisdom which is obtained as a general sense after perception of small aspects in the mind (Shahcheraghi, 2015: 126).

Different sciences such as geography, physics, psychology, sociology, biology, anthropology, aesthetics, epistemology, ecology have different theories regarding perception which in all of these theories there is essential relationship between perception and feeling. In other words feeling is prerequisite of perception in a way that at the end of 17th century it is believed that the perception of all sciences is through feeling not another source (Bokharayee, 2014, annex 2, p1).

Perception does not occur easily and it is not straight and free of ambiguity. It is a flow that is affected by many factors. We can find some of the factors in the environment and some of them are found in the person (ShahCheraghi and Bandarabad 2015: 176). In fact perception is a stage between feeling and environment recognition. Feeling is an external mechanism. Recognition is an internal mechanism. Perception is a stage between these two external and internal mechanisms. For this reason some part of perception which is based on facts from the mind and environments has a similar process between persons. But some parts of perception which is based on persons brain and mind processes is fully personal and unique

(Shahcheraghi and Bandarabad 2015: 176). For this reason two persons cannot understand an object in the same way. This subject could be about distance of building from you and path length which you are walking or even temperature of a room which you have disagreement about it.

It should be noted that numerous researches have been done regarding the effects of environment measures on human perception by experiments on different statistical societies and in different environments. Some parts of these researches have been mentioned in the appendix.

Table (1): perceptual aspect of the sizes and measures (reviewing the literature of Rudolf Arnheim and Jörg Kurt Greuther, two pioneers of art psychology and architecture fields)

Dimensions and measures of a building unit	**Dimensions and measures of the space between the buildings**	**The measure of space between the observer and the building**	**The limitations and quality of observing the measures**
1- • Smallness and largeness of building size	1. The space and level of strict	1. The size of open spaces in the vicinity of the building	1. Perspective and how to see the sizes
2- Interaction between the building and bed sizes	2. The distance between the buildings and correlation relationshp	2. The ratio of building's sizes to the observer	2. Stable perceptions of measures in human's mind
3- Horizontal and vertical proportions of the building	3. The ceiling height in the sky		3. size limitations of human's vision
4- Measures of building's components			4. the distance of human vision

Dimensions and measures of a building unit

- Smallness and largeness of building measures

-Whatever the object is smaller or bigger, it causes less or more awe and it changes supervisor power balance.

- Smallness or largeness of an object causes lightness or weight feeling (Arnheim, 2009: 164)

- Building and floor measures

- Harmony between building measures and environment measures avoid disorder, mess and visual tension.

- Contrast in measures and building index compared with environment leads to being marker and orientation.

- Horizontal and orthogonal proportions

A) Height measures (visual height)

- Due to earth gravity, rise is heroic liberation. And height gives a symbolic greatness.

- Rise is lightness from the weight, or lightness and separation from the earth and it is aspect of passing from material territory and entrance to empty territory and space.

- As drilling under the surface means involving in the material, height means material stop and attaining to unlimited prospect and lighting territory.

- Gravity makes vertical direction excellent as standard direction and reinforces standing sense. Therefore most of the buildings stand (even when width is more than the height). For instance symmetrical view even when it is horizontal reinforces vertical direction (Arnheim 2009: 62).

B) Horizontal measures

- Horizontal surface is the only surface that human move freely without rise or fall feeling. No direction on the earth surface is excellent than the other directions in terms of space.

- Horizontal directions explain objective world of human action. In a certain case all horizontal directions are equal and they form infinite plane.

- Life in horizontal style increase interaction and free movement from one place to another, it provides ease of development and freedom media.

-deep rooted building increase link with the earth and create a sense of belonging to the earth

- Belonging to earth is not only mentioned through infiltration in the earth by right angles but it is also mentioned through parallel.

- Fully horizontal buildings such as farm houses induce sense of sleeping on the earth.

C) Horizontal and vertical measures balance

-In early renaissance buildings which their view has proportions near to square, perfection are felt.

-with respect to eyesight, even in square buildings, elongation in vertical direction is more than horizontal direction. Therefore the square width should be more than its height so that their sides seem equal. Such a building reaches to an ideal balance between perfection and its good bearing on design bed.

-Symmetry produces Static Square, while rectangular proportions destroy balance and create mobility.

-Proportion near to golden proportion besides giving perfection and elegance to the shape, it allows the shape to establish in place and gives internal tension to it.

- Buildings components measures

-It is easier for human mind to treat buildings independent and separate and studies one thing at a time.

- According to Marx Wertheimer we should look at it from the above, it means we start from the total and see every element in its background.

-As long as we look from the bottom and bit by bit, we cannot see chaos. And certainly with this approach discipline is hidden.

-Hierarchy in different dimensions and scales of building components is among the 15 factors that create discipline and vitalize space and it is mentioned by Christopher Alexander. These factors are not only seen in visual features of artistic works but they are seen in nature laws.

Measures dimensions of space between buildings

- Between space and closeness degree

- As the distance between two buildings increases, the space between them becomes less and weaker. On the contrary as the distance decreases, the space between them becomes richer and denser. The supervisor feels density and lack of density in the middle of two buildings (Arnheim, 2009: 29).

- If the intermediate space is deleted, two buildings find unity so that the smaller building is seen as an attachment to the bigger building. On the other hand much distance destroys all relations between two buildings.

- The intermediate space is understood as height difference between two buildings. If the width of this space changes and the buildings become nearer or farther, the gradient between their height changes and the contrast between two buildings is understood differently.

- Large dimensions of an empty space and disparate proportions and disorder of around buildings measures destroy closeness and supervisor perception protection.

- The height of the buildings that shape the street affects its passage state. But height depends on the width and the width shapes the street character. Architecture needs a space for

breathing. If the street is too narrow, the middle space is tightened unpleasantly and tightness occurs.

- Street channel is only made by around walls. When the street width is further than the visual fields, the vacancy sense is occurred.

The distance of the buildings and correlation

- As the distance between buildings increases, the density of the middle spaced decrease and sometimes is omitted totally. We don't feel any relations between buildings. We can say that the space between them is empty. Vacancy can be considered a state which its spatial features are not under the control of around objects. When two objects face each other in the middle space, and complete each other, the density of the middle space is more than when two objects are independent.
- Vacancy is not exclusive to the lack of material. Perhaps there are spaces which nothing is built in them but they are under the perceptual forces and they become dense.
- The vacancy effect occurs when around forms for instance edge size does not impose a structural system to the surface and wherever the supervisor stop, he finds himself in the previous location and there aren't any spatial coordinates and there are no source for distance determination. Therefore the supervisor feels lonely.
- If a person finds himself in a place such as a city square or a large museum hall which does not define his spatial location, the supervisor wandering state intensifies.
- When we look at a picture of a row of similar objects which are different in size, the smaller objects seem in farther distance (relative size) (Pakzad and Bozorg, 2015: 117).
- If an object is placed in a way that it prevents seeing some part of another object, the covering object seems nearer (covering) (ibid).
- Among similar objects, those which are located higher in the picture are seemed farther (relative height) (ibid).

Sky ceiling height

- Visual field not only spreads in horizontal dimension but also in vertical dimension.
- Perception of ceiling height is due to the interaction of around buildings height with floor extension (length and width). This perception of building height in interstitial spaces is affected by around height. Generally the height of any surrounded square is triple or quadruple of the height of the tallest building in that square.

The distance of supervisor and building

Adjacent open measures of building

- In order to understand everything as it should be, the supervisor must stand in the right distance and pay attention to the forces field. With this respect two subjects of building height and the simplicity of appearance richness are of importance.
- Too simple view can be watched from the near while the view which has richer volume and polish has more deduction power and it requires the supervisor to go farther and stand in the right position (Arnheim, 2009: 42). So as we have more distance from the building, the perceptual forces power decreases.
- The building should have necessary measure qualities for different supervisor distances; the visual continuity of measures causes identification with building.
- If human wants to have a functional interaction with a building, he could have identification with it by visual continuity. If a whole building is regular, it could communicate with the supervisor by making a spectrum of measures. Thus some of the measures are too small to communicate directly with human body. (Arnheim, 2009: 177).

Building measures proportion to supervisor

- If there is no start and end to measures perception, and there are no spatial coordinates or source for distances determination, the supervisor feels lonely.
- In a region that tall buildings aggregate, the height is out of sight of pedestrians. And there is a scary closeness.
- If we want to study a building generally and in components, disproportion of human and building causes obstacles. Human and building have interaction, so human should assimilate himself and building in a perceptual continuum.
- If building measures are determined relative to supervisor scope in a way that the supervisor is dominant on the totality, it increases supervisor communication with building and he can examine the building.

Limitations and qualities of viewing measures

Perspective and how to see measures

- As the spectator move around object or the object is in front of his eyes, he sees a regular series of picture that fades gradually. Solidarity of this series facilitates its identification.

Perceptual stability of measures in human mind

- The size of an object is corrected in the mind according to its distance from the viewer. This means that we perceive the size of an object equally in any distance from us.
- Environment visual stimulation gives distance evaluation possibility to us and the distance recognition helps us to perceive the real size.
- Our eyes comparing the objects with their background receive the objects features. And the background patterns affect our perception or perception error (Pakzad and Bozorg, 2015: 147).

Measure limitation of human scope

- The objects that are placed in general human scope are seen in general (Sadeqpay, 2015: 166).
- The objects that are placed in partial scope are seen clear and vivid with all their details.
- Human only sees the objects that are in his scope and in fact, their distance to eye is less than 3500 times of their height.
- If human wants to look at all view parts, he turns his head to look at whole view. In these cases human eye not only pick up visual image but also panoramic image (successive and continuous).

Human viewing distance

- As the spectator looks at the view from nearer distance, he will have smaller scope and more details. But as he looks at a view from farther distance, he will pay more attention to more parts of the view but generally and without attention to the details (Sadeghpay, 2015: 167).
- If the ratio of the building height to viewer distance to building is equal to 1 to1 (under 45 degree angle) we pay attention to view details.
- If the ratio of the building height to the viewer distance to building is equal to 1 to 2 (under 30 degree angle) the view is seen overall with its details.
- If the ratio of the building height to the viewer distance to building is equal to 1 to 3 (under 18 degree angle) the building is considered as a complex with its around buildings and we pay much attention to the relation between view and its around buildings.
- If the ratio of the building height to the viewer distance to building is 1 to 4 (under 14 degree angle) we pay attention to the skyline.

Conclusion

The information presented is the result of review of the literature related to the subject that studies exclusively the impact of measures, scale and proportions on human perception and feeling. Undoubtedly the lack of attention to each one in design leads to optimal qualities loss. Now with respect to importance and wide range of the subject and the necessity of paying attention and using them in design, this research studies the training way and increasing the students' attention in architecture training. Regarding this in the next section referring to expert professors opinions we try to reach to specific educational framework to determine methods and relative concepts education.

Survey of professors of architectural education foundation

As a definition education is called activities which are planned by teacher with the aim of making learning easy and it flows as interaction between teacher and one or more students. Brown and Atkins (1991) define education as providing opportunities for students to learn (Seif 2015: 35). In this way and in order to determine methods and finding relative concepts education, the main part of this article seek to find answers of experienced professors of architectural education foundation. In this way the main professors of Tehran and Shahid Beheshti University are asked questions.

Questionnaire description

At first based on research literature and in order to have answer for the research question, interviews based on worksheet containing two main questions were planned.

In order to facilitate learning and increase architecture students attention to the effects of environment measures on human mind:

1. Which concepts should be trained?
2. What are the effective teaching methods in this subject?

It should be mentioned that the questions are designed generally to collect more domains of the information obtained from professors' opinions and we try to make the answers of the following questions clear by six party talks and a semi structured interview.

- What is the importance of studying measures and related concepts in architecture, scales and proportions in architecture foundations?
- How the professors study the subject?
- What is appropriate educational content for students learning and attention to perceptual effects of measures?
- Are educational methods focusing the responsibility of professor or students?
- What are effective educational techniques in order to facilitate students learning?

The findings obtained from survey

In the interviews done except one of the professors, the answers were focused on learning methods and specific structured content is not referred in the answer to question 1.

But regarding learning methods mentioned in the answer to question 2 studying all professors' answers the common point is that:

Learning should be student focused and it should be done exploratory and through observation and real experience.

Regarding this some part of professors opinions are as follows:

- According to our education thesis we don't teach the concepts directly but we train students in practices how to reach to this (Hojat, 2016).
- We should bring the students to touch the measures objectively and to judge (Hojat, 2016).
- For instruction and conveying the subject to students, it should be done practically. We should bring the students to field trip involve them with the subject.
- Space experience by students is more preferred than direct education and writing (Mahmoudi, 2016).
- We should move from application to concepts and teach students how to see.
- Field work is too important in foundation education. The students should be present in atmosphere and touch the atmosphere effects (Karbasi, 2016).

  Comparing the obtained results from professors answers with theories related to educational methods, it is determined that:

  Learner focused education is an appropriate method in answer to worksheet questions.

A. Referring to educational literature learner focused education is mentioned versus teacher focused education. It is an education in which learners take the responsibility of understanding and perception (Seif, 2015: 430). Another name of learner focused education is indirect education. According to Fetsco and McClure (2006) indirect education is used by teachers who prefer to elicit the content from the student. For instance these teachers provide students with information and experiences and help them to conclude by themselves.

B. The professors intended method in learner focused education is exploratory learning. In exploratory learning the teacher doesn't teach the subjects directly, but persuade them to explore and create knowledge by themselves. For instance a teacher who wants to teach a problem solution to students, just give them the problem and provide conditions for them to

find problem components, the relationship between components and the solution. Jerome Bruner (1960,1966) one of the major advocates of exploratory learning defending his suggested method says that " we teach a subject not to produce live libraries about that subject but to persuade the students to think, to see the subjects as historians and to participate in gaining knowledge process. Knowing is a process not a product (Seif, 2015: 546).

C. The objective presence and environment observation are mentioned as exploration method.

According to Kolb theory which is mentioned in his famous book experience learning (1984), experience plays a great role in learning. Kolb in this book defines learning as a process by which knowledge is made through experience transformation (Seif, 2015: 277).By experience he means balance between learner and his environment.

Kolb theory regarding the pattern with its experimental cycle is described as follows (figure 2): At first objective experience is the basis of observation and thinking. Then this observation and thinking take the form of concepts and abstract generalization. Then we can elicit directives from these abstractions. These directives can be considered as theories which guide actions and they can be tested in new objective situations and as a result new objective experiences can be earned. This cycle could continue (Lee and Davis, 2007).

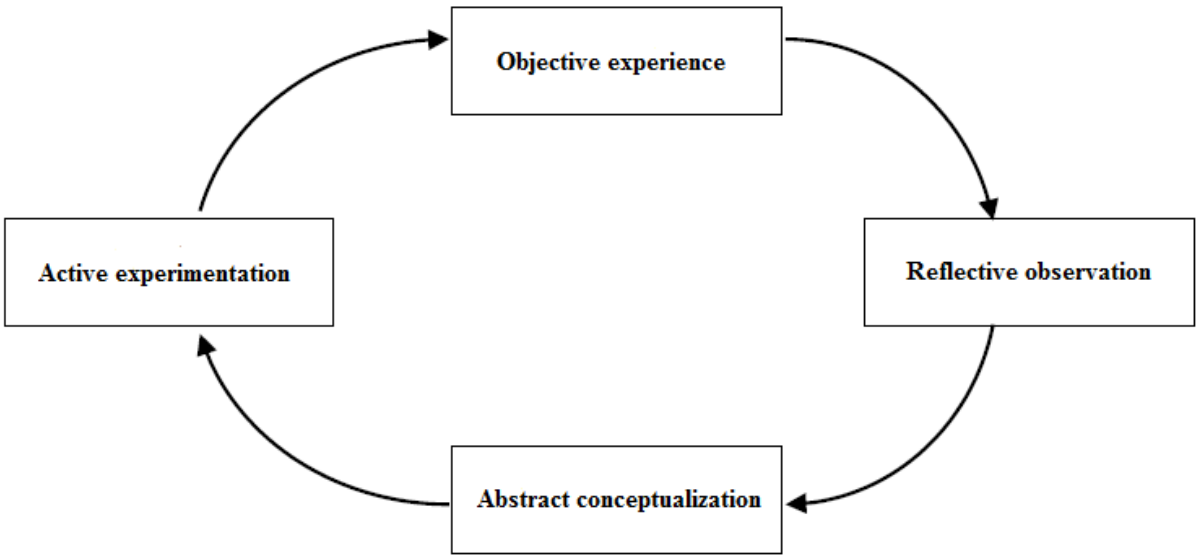

Figure (2): the cycle of experimental learning (Seif, 2015: 277)

Conclusion and grouping of answers in order to reach to an educational application:

This research seeks to facilitate students learning in the subject of mind and perceptual effects of measures. With respect to this referring to literature in environment psychology, the related concepts and factors with measures perception is elicited and classified and referring to experienced professors opinions in architectural education foundation we seek to determine educational application for reaching the answer of research question. Accordingly professors opinions are classified according to exploratory learning theories and through empirical observations to obtain an explicit educational framework in order to facilitate students learning.

- Actions before education:

A). intention and goal determination:

At first we should define format and goal (Hojat, 2016).

B). choosing problematic or puzzling situation

- Arising question in students mind and persuading him to find the answer (Mahmoudi, 2016).

- Mentioning bad and challenging instances, this question is raised in students mind that what is the correct answer? (Hojat, 2016)

- Education for learning

A).by fieldwork and observation:

In order to teach and convey the subject to basic students, the subject should be done practically. We should bring them to field trips and involve them with the subject (Alayee, 2016).

The students should go in the heart of examples and samples and sit and look and write (Navayee, 2016).

B). Preparing learners and explaining exploratory methods.

- We should talk to the students in the simplest and most understandable way (Navayee, 2016).

- We should explain to the students to pay attention to the measures and their qualities (Alayee, 2016).

- We should mention the necessary instructions regarding measures observation and estimation (Navayee, 2016).

C) Presenting a challenging situation-attention stage: space experience, touching situations and sensory registering

We should provide situations for the students in which measures and their effects are dense and challenging (Karbasi, 2016).

D) data collection- retention stage

- Always estimate and observe measures (Navayee, 2016).
- Judge the measures according to events and scene components (Navayee, 2016).
- Evaluate measures in proportion with each other (Navayee, 2016).
- Seeing should be combined with taking notes and cabriolet (Navayee, 2016).

E) Hypothesizing and explaining

Measuring should be done for creating quality (Chehel Sotoon pool measure for reflection) to learn that measures are available to architect not architect is available to measures (Alayee, 2016).

F) Exploration process analysis

Referring to children's feeling and its reason which measures can be one of the factors (Karbasi, 2016).

- Actions after education

Reinventing and assessment stage

- Design in challenging situations

Design in too limited and small spaces (Navayee, 2016).

- Changing mind qualities through manipulation of measures.

We can specify a feeling for instance humility, and prepare pictures and freezing the other factors and changing dimensions we want their quality effects from the student.

- Using design techniques and learning tools

We must exit the plan and be in perspectives (Karbasi, 2016).

Cross section design and using human in them is too effective.

Making maquette and seeing proportions and simultaneous work of eye and hand

Represent spatial qualities before finalizing by drawing diagrams with human presence (Mahmoudi, 2016).

Design the space according to human movements (Hojat, 2016).

Conclusion

Identifying the pathology which is carelessness to measures perceptual effects on mind in measures shaping and decision making in design of architecture students of Zanjan University, this research aims to present explicit application and pattern regarding resolving the pathology by studying the subject and referring to experienced professors' opinions of two major universities in architecture.

In the first part of the research studying available sources it is determined that measures and dimensions shaping which is accompanied by two concepts of scale and proportion in architecture has diverse and wonderful effects on mind. It should be mentioned that this subject in existing literature is studied in a combined form with other components such as shape.

In this research for easier access the concepts related to measures perceptual effects on mind are elicited and classified as separate geographic information from theories and researches done. Of course this collection is done in the author time limit and ability and undoubtedly a domain more than the subject is shaping and updating in different researches.

In the second part of the research in interviews the answers are focused on learning methods and a specific and structured educational content is not mentioned. Of course every professor mentions a window of the subject for entering education and it is emphasized that learning and recognition of different dimensions is the student responsibility.

Analyzing and comparing professors' opinions and answers it becomes clear that all the professors emphasized on students focus in learning or learner focused education. With this respect Dr Hojat emphasized not on concepts education but on training students' explorer view. The other professors mentioned examples and expressed that persuading student's explorer spirit and providing opportunities, the student elicited the concepts using objective experience and perception. For instance stressing the process from examples to concepts Mr Navayee emphasized on guiding and helping student to observe measures and judge them in comparison with environments events and life.

At the end and in response to research question it is determined that we can enter the subject from the window of one of classified concepts and provide opportunities such as guided presence of students and their encounter with measures and dimensions and passing from examples to concepts. We can facilitate learning in architectural education foundation students

References

Alayee, A. (2016). Answer To Research Questions in Interview And Meetings.

Amid, H. (1995). Amid Dictionary, Tehran: Tehran, Fourth Edition.

Arenhime, R. (2009). Architectural Forms, Translated By Qayoomi Bidhendi, M, Tehran, Organization Of Study And Compilation Of Humanities Books.

Arenhime, R. (2014). Art and Visual Perception: Psychology of Creative Eye, Translated By Akhgar, M. Tehran: Organization of Study and Compilation of Humanities Books.

Bokharayee, S. (2014). Architecture and Spatiality: Sequence of Related Spaces to One Episode in Emotional Sense of Spatiality, PHD Thesis of Shahid Beheshti University.

Christopher, A. (2011). The Nature of the Order (Live Structures in Architecture), Translated By Sabri, S. Akbari, A. Tehran: Parham Naqsh.

Dehkhoda, A. (1998). Dehkhoda Dictionary, Under Supervision of Moeen, M, Tehran: Tehran University, Second Edition.

Greuther, Y. C. (2009). Aesthetics in Architecture, Translated By Pakzad, J, Tehran: Shahid Beheshti University.

Hojat, E. (2003). Architecture Education of Worthlessness Values, Fine Arts, No 14.

Hojat, E. (2014). Architecture is in My Heart, Tehran: Yaqmayee.

Hojat, E. (2014). Buildings Talk with Me, Tehran: Yaqmayee.

Hojat, E. (2016). Answer to Research Questions in Interview and Meetings.

Karbasi, A. (2016). Answer to Research Questionsin Interview and Meetings.

Lawson, B. (2005). How Designers Think: Disambiguation of Design Process, Translated By. Nadimi, H. Tehran: Shahid Beheshti University.

Mahmoudi, A. (2016). Answer to Research Question in Interview and Meetings.

Navayee, K. (2016). Answer to Research Questions in Interview and Meetings.

Pakzad, J. & Bozorg, H. (2015). Environment Psychology ABC for Designers, Tehran: Armanshahr.

Sadeghpay, N. (2015). A Look to View, Tehran: Shahid Beheshti University.

Seif, A. (2015). Modern Educational Psychology (Learning Psychology and Education), Tehran: Doran.

Shahcheraghi, A. & Bandarabad, A. (2015). Surrounded in the Environment: Environment Psychology in Architecture and Urbanism, Tehran: SID Tehran.