

Novel Instruction in Architecture Based on the Theory of Fast Designing of Architectural Imagination

Jamal-e-Din MahdiNejad^{a*} - Hamidreza Azemati^b - Ali Sadeghi Habibabad^c

^a Associate Professor of Architecture, School of Architecture & Urban Design, Shahid Rajaei Teacher Training University, Tehran, Iran (Corresponding Author).

^b Professor of Architecture, School of Architecture & Urban Design, Shahid Rajaei Teacher Training University, Tehran, Iran.

^c Ph.D. Student of Architecture, School of Architecture & Urban Design, Shahid Rajaei Teacher Training University, Tehran, Iran.

Received 14 February 2018; Revised 22 December 2018; Accepted 23 February 2019; Available Online 21 December 2019

ABSTRACT

In the process of architectural expression, the idea delineated in the mind by the architectural expression tools should have qualities rendering its implementation feasible in terms of the proportions, volumetric properties, and spatial relations and so forth. The weakness and slack in delineation are one of the barriers to the mind's creative stream. The university students should know the methods of rapid, easy, correct and eventually systematic offering of the ideas so that they can be able to bring about innovations and creativities in their sketches and plans. This helps them confidently and peacefully deal with the plan's idea and its perfection in the process of architectural designing. The present study seeks to empower the architects in creating a suitable pattern for responding to the power of imagination and improving the designing process in the instructional works and even in their daily professional tasks. The study population of the present research paper included the architectural students in the lesson "architectural expression 2". The study sample volume consisted of two 54-individual groups one from the country's mother university as the control group and the other from the country's intermediate universities as the test group. The study method of the present research paper is semi-experimental because the independent variable is manipulated in the present study and, at the same time, there is a control group. The information-gathering method in the area of architectural perception and expression is a reference to the credible library sources the scientific part of which is presented to the students. The test and the evidence groups' students are examined in two stages in the course of the semester. The results obtained from the present study can corroborate a novel method of architectural instruction with an emphasis on the theory of rapid designing of architectural imagination following which an appropriate pattern would be offered for enhancing the qualitative level of architectural designing instruction.

Keywords: Architectural Instruction, Architectural Imagination, 3D Imaging, Novel Instruction.

* E_mail: mahdinejad@sru.ac.ir

1. INTRODUCTION

Since the quality of architectural expression exerts a large deal of effect on the course of architectural ideation and the stages of its creation, the present study has been conducted to deal with the quality of an architectural idea's expression for the university students and architects. The present study aims at exploring the quality of an architectural idea's expression for the university students and architects. Many books have been offered in the area of architectural expression under the title of rendering techniques in architecture but most of them have solely dealt with the delineation and coloring of the objective subjects through taking photos of the existent buildings and environments whereas the architectural sketching is a process of ideation sourced of the internal perceptions of the sketch designer. The designer should complete his or her mental plan by acquiring the information required about the subject and take measures by taking advantage of pictorial expression for depicting his or her idea. The current research paper aims at enhancing the designer's ability in the area of creative ideation via strengthening the ability of offering and expressing imaginations, i.e. simple, correct and brief depiction of the architectural idea within a very short period. Fast designing (architectural sketching) is not like a graphical design or a painting work with the completion of which it can be stated that the designing work is finished rather when an idea is delineated in the mind and expressed through an architectural means in the process of architectural expression, it has to feature qualities rendering it implementable in terms of proportions, volumetric properties, spatial relations and so forth. Therefore, observance of perspective principles in volume, determination of the correct view angles and the relationships between the idea and the plan's subject are of great significance in the sketching. On the other hand, since the ideas instantaneously form in the mind and because they are volatile, the speed of expressing the ideas is also important in the designing process besides the observance of the abovementioned cases. The weakness and slowness of delineation is a barrier to the creative mind's stream. In order for the students to be able to make innovations and creativities in their sketching and planning, they should know the methods of fast, easy, correct and finally systematic presentation so that they can deal with the plan's idea and its completion in the process of architectural designing with self-confidence and peace of mind. Thus, several points have to be taken into account in this regard:

A) Speeding and verifying the architectural sketch through making use of designing perspective method (metaperspective) is the method falling somewhere between the free hand designing and geometrical

designing of the landscapes and panoramas.

B) Recognition of the alphabets and regulations of drawing basic volumes and shapes (Platonic volumes).

C) Recognition of light and the process of shade forming as well as the application of color in the architectural expression.

By selecting a fast and accurate method of idea recording, the architectural expression process can be made fast, accurate and strong enabling the facilitation of the plan's ideation course. Due to the same reason, the designers who have a high power of visual expression usually present stronger ideas and the weaker designers essentially lose the ideation opportunity due to their non-domination over the pictorial expression. The necessity of a suggestion for a "fast 3D imaging process based on architectural imagination" is proved in that the authors could not find any independent and comprehensive source in regard to the present study's subject.

2. STUDY METHOD

The present study uses a semi-empirical research method because the independent variable is manipulated in the current research paper and, at the same time, use is made of a control group. But, since the author does not control the testees' selection, the study method is semi-experimental. The information gathering method is in such a way that parts of the instructional data which are both theoretical and practical is presented to the university students and the evidence and test groups' students are subjected to an examination in two stages during the semester.

In order to collect the information, the following instruction stages are taken:

1) Explication of the method of perceiving and expressing the volume and combining them with the methods of cross-section, dimensional change, appending and instantaneous access of the designer to the plan-test idea. This stage includes the university students' perceptions of platonic volumes and the ability of selecting and combining them proportionately with the designing subject's volumes.

2) Instructing light, shade and color and fast investigating, analyzing, summarizing and application of them in various kinds of architectural-test volumes. This test includes the university students' ability in the rapid application of light, shade and color in the designed volume.

3) Teaching interior perspective and method of offering horizontal and vertical cross-sections as well as the graphical combining of all the expression instruments such as external and internal perspectives, plan, diagram and so forth in the final sheet; the test in this stage includes the university students' ability in performing the abovementioned cases.

2.1. Study Population and Study Sample Volume

In this study, the study population included 150 students majoring in architecture in the state universities of Tehran (architectural expression lessons 1 & 2) during the 2017 academic year. The study sample volume was selected equal to 108 university students based on Morgan's table with one 54-individual group from mother universities in Tehran (architecture faculty, fine arts campus, Tehran University) as the control (evidence) group and another 54-individual group from one of the intermediate university in Tehran (architecture department, technical and professional faculty of Dr. Shari'ati University, Tehran Branch) as the test group. Notably, these students had chosen architectural expression lesson 2 at the same time with the lesson on "perspectives". It is evident that if this test is held for the senior students, the proposed method will be found more successful based on the authors' experience due to their higher mastery after passing the "perspectives" and "architectural expression" lessons.

3. STUDY LITERATURE

The commencement of the architectural instruction can be possibly attributed to the time at which the possibility of transferring the human concepts and experiences was created for changing the natural environment (Mahdi Nejad & Sadeghi Habib Abad, 2015, p. 18). Such an ability has always taken its evolutionary path under the influence of the mankind's scientific and technical findings and it has been influenced by the cultural, social, political and economic changes in the course of history and caused diversity and numerosity of the instructional methods (Kazemi, Sattari Sarebangoli, Mohammadzadeh, & Gharibpour, 2019, p. 2).

Designing instruction can be divided into two periods of traditional and academic teaching. The sure thing is that the information related to the architectural planning was transferred by the professor to his or her student(s) in practice for constructing the intended buildings in such a way that the materials and masonries and their dimensions, the properties of the building's form as well as the audience's needs were transferred in the course of buildings' construction and production in empirical (practical) form or the so-called chest-to-chest manner.

"The traditional and common designing process that relied on the magical power of creativity, innovation and artistic designing sense was not anymore envisioned as a reliable and suitable process with a range of the plan's vast effect on the mass production. The users of the designing product found themselves rightful to supervise the designing process and/or at least ensure that this process is legal and appreciable. In response, this necessity was once the suggestion of a logical, scientific and systematic suggestion for designing the

main concern of the preliminary designing theorists during the 1960s and 1970s. They did their best to resolve the daily increasing complexities of designing issues in the industrial era for it had transcended beyond the hedges of a given profession and had become an interdisciplinary matter" (Nadimi, 2008, p. 95).

In Iran, it was with the establishment of fine arts faculty in 1941 that the academic instruction of architecture was begun. "The gradual formation of the first architectural school during the late 1940s set the ground for the forgetting of the traditional methods of architectural instruction and the academic architect took the place of the traditional architect. In this evolution, the traditional architect who was him or herself the designer of the structure and space and constructor of the architectural work was driven out of the arena and/or became the executor of the enlightened architect's ideas under such titles as bricklayer, mason, plasterer and so forth" (Hojjat, 2002, p. 27).

Architectural instruction is directly associated in the developing countries with the extents of cultural awakening and self- Self-awareness of these communities. "Architects are the pioneers of the society according to the definitions by enlightened minds and culture-builders and play a particular role in the communities' movements for constructing civilization" (Einifar Personal Interview, 8th of May, 2018). "Architectural instruction can be attained in three areas of purification, education and philosophy; the seminal ranks of architectural instruction should deal with the purging and fostering of the pupils' minds and talents so as to pave their way for taking the next ranks (acquiring of knowledge types and perception of architectural discretions). Such a discipline signifies the permanent interaction between the professor and pupil and curriculum and it has to be constantly revising, criticizing and supplementing itself at any single moment" (Hojjat, 2002, p. 28). Nowadays, many of the professors of the architectural schools and students demand up-to-date methods for instruction so as to get organized the 30-year disorders after the emergence of the modern movement's principles and render prosperous the architectural school once again. In between, instruction of the basic lessons finds twice as much importance for its playing of the most significant role in pupils' consideration and perception of the architecture and fostering of their capabilities for achieving skills and creativities (Ibid, p. 31). The importance and sensitivity of architectural instruction in contrast to some of the other expertises lie in the idea that simple measures cannot be taken in such study fields as natural sciences or technical-engineering fields for transferring the professional knowledge and experiences (Mahdi Nejad, Saleh Sadeghpour, & Najjari, 2019, p. 696).

Architectural instruction method was changed during the past century from a one-to-one method, i.e. professor-student, towards the recent methods and problems came about in our architecture since we have

been taught architecture based on a western method and in a western environment. Even change was brought about in the aesthetical concepts with the well-known expression of machine beauty somehow reflecting this method of thinking. The first criticisms of modern thinking and subsequently modern architecture began in the 1950s. Now, modern slogans are being voiced but the recognitions of the world and human beings are generally imperfect. At present that we have left that period behind, some of the individuals even believe in designing through intuition. In the current era, architecture is influenced by various factors, including anthropometry, logonomy, psychology and ecology (Einifar, A., Personal Interview, 8th of May, 2018).

3.1. From Idea to Form in Architectural Designing

Eidos means the ability to see. It has been taken synonymous in Persian to "Didar" (Panahi, Hashempour, & Eslami, 2014, p. 27). "Idea is derived from the Greek word "Eidos" that means the ability to see and also a visible object. It first appeared in Plato's propositions. Plato believed that the world's phenomena are various forms of the manifestation of the ideas or eternal and absolute forms" (Williams, 2000, p. 211). Architecture has always been dealing with various issues and the factors influencing a project's formation are countless. In between, the primary task of architecture is finding a unique essence and the main problem of each project is finding an answer based on a robust idea. It is in this way that the idea is produced. It is natural for numerous ideas to be formed at the beginning of the work or in the course of the designing task due to the numerosity of the problems confronted by the architect. Here, the architect's role is prioritization of the ideas based on the most primary problems and purification and blending of the micro- and macro-ideas for reaching a coherent structure. In the meantime, use can be made in the stage of designing the project's details of the ideas that are in proportion to the plan in whole and parts. Although it is of a great importance to have strong ideas in the architecture, the mere possession of good and creative ideas is not sufficient for reaching a favorable architecture for architecture is an order that amalgamates concept and experience, mental image and application and structure and it is also the locus of combining the distinctions (Panahi, Hashempour, & Eslami, 2014, p. 28). Architecture and its space have always been directly associated in the course of history with an actualized dream, meaning and concept (Mahdi Nejad, Azemati, & Habib Abad, 2019, p. 59). And, every spatial content is accompanied by a method of living, a method of recognition and even a method of presence (Mahdi Nejad, Azemati, & Sadeghi Habib Abad, 2019, p. 49). "Besides being innovative, a good architectural idea should have other capabilities so that

an optimal and persisting architecture can be attained of this idea" (Broadbent, 1994, p. 112). The process of transforming an idea to form predominantly occurs via converting a descending hierarchy of illumination to philosophy then to science and finally to knowledge (Eslami & Ghodsi, 2013, pp. 79-96). "Idea transformation to form is one of the most important parts of architectural designing. The transition from idea to form is as important as the very ideation" (Krause, 2003, p. 1). Transformation of an idea to form depends on two main conditions: the formability of the designer's seminal ideas, skill and knowledge and transformation of them to form. The important point in transforming an idea to form is the idea's formability and, of course, such an ability is not what that could have spontaneously existed. The formability is related both to the idea and the mentality of a designer's creative mind that can identify formability beyond the prosaic or vague appearances of the studied issue and the routine phenomena. "The thing that remains of architecture and establishes communication with the space users is form and not the idea"; but, nowadays, many of the important works have dealt with the showcasing of an architectural idea more than paying attention to the aesthetics and processing of form and this is why they often seem rigid and schematic. In such works, forms serve ideas and become diagrams for displaying them. The unsuccessful experience of such an architecture is indicative of the idea that paying attention to the idea and form simultaneously in architectural designing can lead to the creation of brilliant and persistent works.

3.2. Designing Theme

The concept "designing theme" was first proposed in the 17th century in France's royal academy that was later on changed of its name to the school of fine arts in 1819 (Ruan, 2010, p. 452). A group of individuals believes that the creation of a perfect designing theme is neither possible nor necessary (Fredrick & Fredrick, 2007, p. 16) and another group believes that everything should be taken into consideration in an ideal designing theme and that all the aspects of a building from the general configuration and structural system to the form of the door's handles should have been taken into account (Hadiyan & Pourmand, 2017, p. 76). Paying particular attention to designing theme is of great importance. The choice of designing theme in the designing process is amongst the cases dealt with by many researchers in a large number of research works (Steadman, 2008, p. 82; Caskin, 2010, pp. 170-188; Bayazit, 2004, pp. 16-29; McGinty, 1979, pp. 208-235; Nagai, Taura, & Mukai, 2009, pp. 648-675). A sample of a designing theme has been shown in Figures (1) and (2).



Fig. 1. An Example of a Designing Theme for a Commercial Building within a Short Period

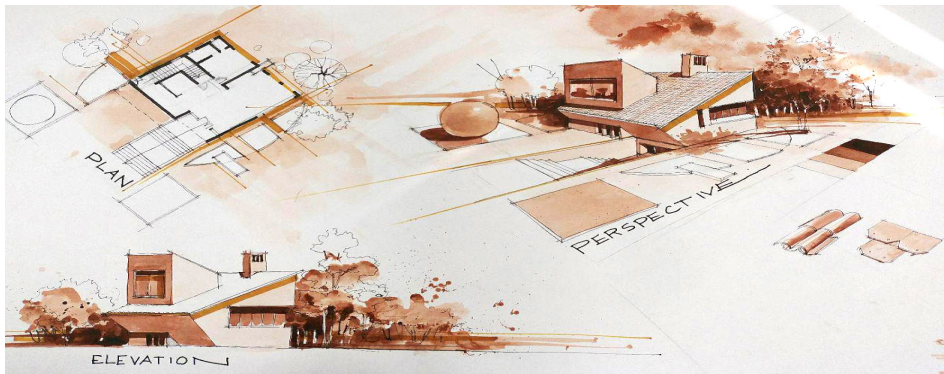


Fig. 2. An Example of a Designing Theme for a Residential Villa within a Short Period

4. THE EXTENTS OF THE ARTIST'S MIND AND FORMATION OF THOUGHT

Having mental independence and not being dependent on any artistic style and method and, in the meantime, discerning the method of the mind's functioning are enumerated as the most important indices of creativity and genius in every artist. The mind should not be contaminated with every pattern and principle posited by various individuals and schools. Such discussions need analysis and a correct inference of the intellectual and scientific processes that would otherwise impose an extra constraint in addition to the common concerns of every society to an artist following which s/he would be demanded to think in that specific style. So, it can be concluded that the mind seeks freedom in its internal nature and it has to be approached with the instruments and data it provides so as to achieve a dynamic interaction that, in confrontation with the novel ideas, can preserve its general principles and simultaneously come up with a proper analysis. This is a movement from inside towards outside that rejects the governance of any principle and opinion on the mind. Every artist has a specific style for designing and s/he is inspired by the various elements and events in nature.

5. EVALUATION OF THE WORKS OF STUDENTS FROM EVIDENCE AND EXPERIMENTAL GROUPS AND THE EVALUATION SCALES

The works of the evidence and experimental groups' students were collected and evaluated in two stages in such a way that the students' rate of creativity was assessed in designing the architectural volume, observance of perspective and theoretical foundations according to the suggested climate, accuracy of the designed work and relative observation of the buildings' lighting shading and coloring technique based on a common question proposed by the authors. All of the abovementioned cases were evaluated according to the students' academic degree (preliminary lessons) by the professors of the lessons "environment perception and expression", "architectural expression 1 & 2" and also "designing preparations" as outlined in Tables (1) and (2) in such a way that the professors' scores were received in separate and average marks were calculated; the reviewers did not know anything about the project's goals so their marks are solely based on the contents of evaluation of each of the 108 evidence and experimental groups' sheets. The following sections give a summary of the evaluations.

5.1. Explication of Evaluation Scales

- 1) Observation of Perspective: The accuracy of delineation is in terms of point; observer, escape points, proportions and observance of the distances are important.
- 2) Observation of building technique: The issues related to the building's stability, apparent skeleton, masonry and application of them in offering architectural volumes are intended.
- 3) Observation of the theoretical foundations: Combination and general form of volume according to the corresponding climate such as observance of gaps and consideration of the factors that cause air circulation in the building in the temperate and humid climates and overall personality of the building with a glance at the hotel construction subject; in other words, the building's form should match and conform with and to its application.
- 4) Observance of lighting and shading: In the general volume, the route of the light source is clear and the shades are to be formed based on the light's angle of irradiation.
- 5) Painting: Observance of coloring in terms of the light source's angle of irradiation and its effect on the personality of the selected colors and application of the paints in proportion to the proper harmony and contrast are intended.

5.2. Offering a Common Question to Evidence and Experimental Groups' Students

In this stage, two samples of the works by students from experimental and evidence groups were received. The first sample incorporated the works that were collected based on the question posited by the authors. The following parts present a summary thereof:

Question: use two cylindrical and cubic volumes for designing a hotel on the shoreline of the sea in the north of the country; to design the volume and form of the building, you can take advantage of the principles of volumetric combination such as volume cross-sections, changing of the proportions and dimensions and appending methods.

Project's Demands: 1) volume analysis diagram; 2) plan; 3) perspective; 4) lighting and determination of the shades; and, 5) rendering.

Time of delivery: at most four hours (one sketch in a session)

The second sample: the works that the authors received from two ateliers wherein the experimental and evidence groups' students were exercising the architectural expression lesson.

The scales of the works' evaluation: observance of perspective in free designing, observance of lighting and shading regulations, application of color, an exertion of the theoretical foundations and observation of building technique during architectural sketching were intended; each of these was scored from zero to 100. The answer sheet was provided based on the various reviewers' average scores.

Table 1. Sample and Part of the Subject Evaluation: Use of Cylinder and Cube for Designing a Hotel in The Shoreline of the Sea in the North of the Country, Experimental Group

Sketch no.	Perspective Observance	Building Technique Observance	Theoretical Foundation Observance	Shading and Lighting Observance	Painting Observance	Sum	Average Score
1	92	85	90	83	96	446	89.2
2	95	98	95	90	95	473	94.6
3	70	80	80	70	70	370	74
4	80	80	95	75	82	412	82.5
5	95	98	80	93	95	461	92.2
6	93	95	97	92	90	465	93
7	98	90	95	93	98	474	94.8
8	90	70	70	74	70	374	74.8
9	88	70	90	76	80	404	80.8
10	85	60	70	70	78	363	72.4
11	95	80	85	93	90	443	88.6
12	85	90	85	85	85	430	86
13	95	90	95	82	80	442	88.4
14	75	60	90	80	75	380	76
15	75	85	95	90	94	439	87.8

Table 2. Sample and Part of the Subject Evaluation: Use of Cylinder and Cube for Designing a Hotel in the Shoreline of the Sea in the North of the Country, Evidence Group

Sketch no.	Perspective Observance	Building Technique Observance	Theoretical Foundation Observance	Shading and Lighting Observance	Painting Observance	Sum	Average Score Based on 100
1	30	70	50	40	20	210	42
2	20	15	60	5	20	120	24
3	10	20	10	4	5	49	9.8
4	20	60	70	75	10	235	47
5	30	60	70	25	5	190	38
6	30	70	80	20	77	277	55
7	40	50	20	20	14	144	28
8	20	30	20	20	20	110	22
9	15	40	40	12	5	112	22.4
10	10	50	40	10	10	120	24
11	40	40	40	20	68	208	41.6
12	40	60	70	10	17	197	39.34
13	70	70	40	20	15	215	43
14	70	70	70	40	70	320	64
15	20	60	70	25	15	190	38

6. RESULTS AND STUDY FINDINGS

In this section of the article, the primary and secondary study hypotheses are investigated and analyzed according to the collected data.

6.1. Hypothesis A

In order to investigate the hypothesis “A” indicating that “a method can be invented for the students to be able to use perspective during designing” or indeed have a correct 3D imagination of the preliminary architectural idea and, on the other hand, recognize the light, shade and color offering in a simple manner and consideration of the scientific basics and implement these in the corresponding volume, it was transformed into a secondary hypothesis so that it can be readily analyzed and explicated.

Secondary Hypothesis A-1: the group of students who participated in the architectural expression classroom wherein they were provided with modified fast designing instruction was found more successful in comparison to the group of students taking part in the architectural expression classroom wherein other methods were used for teaching the techniques of perspective implementation.

Secondary Hypothesis A-2: the group of students who participated in architectural expression classroom based on modified fast designing instruction method was found more successful in comparison to the group taking part in the architectural expression classroom wherein other methods were used for teaching

analysis and the application of lighting and shading in architectural work presentation.

Secondary Hypothesis A-3: the group of students who participated in the architectural expression classroom based on the modified fast designing instruction method was found more successful in comparison to the group taking part in the architectural expression classroom wherein other methods were used for teaching painting and application of colors in presenting architectural works.

In investigating the secondary hypothesis A-1 indicating that a method can be invented for the students to be able to use perspective in their designing works and indeed have a correct 3D imagination of the preliminary architectural idea, it was found that obtained t-value (7.303) is significant at a 99% confidence level.

So, it is inferred that theoretical perspective cannot be used for expressing the preliminary architectural idea because delineation of volume based on theoretical perspective needs the cross-sections of the plan and precise architectural information with none of these data being available during the preliminary designing of the architectural idea and, on the other hand, designing is not acceptable without technical rules. Therefore, the use should be made of regulations enabling the designer to, meanwhile enjoying freedom in designing the architectural idea, take into account the dimensions and accuracy of the design work. The metaperspective regulations help the university students pay attention to all of the factors related to a designing technique

in the architectural designing process and, in the meanwhile, be completely free in creativity and invention. In similar researches, university students are usually asked to gather around in a place outside the studio and practice sketching. Although we do not absolutely reject the sketching exercises, such factors as creativity and invention are forgotten in sketching because the students see and draw and, on the other hand, the perception based on sketching is even in need of metaperspective information.

In an investigation of the secondary hypothesis A-2 indicating that a method can be invented for the students to be able to recognize the process of offering lighting and shading in a simple way and consideration of the scientific foundations in the intended volume during the designing process, it can be discerned that since t-value (14.959) is significant at a 99% confidence level, the null hypothesis is accordingly rejected meaning that the experimental group has been more successful than the control group and it can be inferred that the preliminary ideated architectural volume for expressing and lighting is the best method of analyzing lighting and the process of shade formation because in this method analyses are carried out after determination of the light source (in terms of height and irradiation angle) and according to the position of light and shade volumes in an A, B, C and D form so lighting is conducted based on a predetermined program and the volume's shade is set and offered using metaperspective information. In similar studies, students have usually been working in the atelier environment and/or outdoor and their objective perceptions and recordings have been subsequently analyzed. Although the authors of the present study do not reject objective perceptions, it is known that there are tens of different shades and half-shades in nature and each of them should be defined, described and summarized. Lighting and shading can alone take all the sketching time in case they are not simplified.

6.2. Hypothesis B

Hypothesis B indicates that the theoretical lessons in the architectural study field, including the theoretical basics of architecture, architecture-human-nature, and contemporary architecture should have a direct or indirect effect on the students' designed works so a logical and correct method should be used so as to attain better designing results. Next, in order to reach a better understanding of and find a proper answer to the Hypothesis B, it is transformed into secondary hypotheses so that it can be analyzed and explicated in parts.

Secondary Hypothesis B-1: the group of students taking part in the architectural expression classroom wherein they were instructed based on the modified fast designing method was found more successful than the group of students who participated in architectural

expression classroom based on the other methods of applying the aforementioned lessons during the designing assignment.

In an investigation of the sub-hypothesis indicating that "a method can be invented for the students to be able to take into consideration the theoretical lessons of architecture, including theoretical architectural foundations, contemporary architecture and human-nature-architecture during their designing work", the obtained t-value (7.408) was found significant at a 99% confidence level so it can be inferred that the expression of the preliminary architectural idea cannot be done for reaching a relatively ideal plan without paying attention to the architectural theoretical foundations in a designing work; that is because the use should be made of forms that enable the application of the meaning and function extracted from the theoretical architectural methods considering the intended function and meaning. The ease of using the method proposed by the present study's authors helps the students have enough time for dealing with the theoretical issues and make considerable use of them in architectural volumes. In similar studies, the students fall short of achieving the theoretical architectural concepts and foundations due to the slowness of the method and insufficient knowledge about the expression and presentation but they also even find no adequate time for delineating the maps of a clear-cut and simple building and the sketching time reaches its termination point very quickly.

6.3. Hypothesis C

In an investigation of the Hypothesis C indicating that the lessons related to building technique, including technical designing, elements and details of the building, recognition of the constructional materials and domination over the pictorial expression should be taken into account during designing, it was found out that designer's paying of attention to the instructional materials should be corroborated so that the designed product can be more consistent with the implemented work. The aforesaid hypothesis was divided into several secondary hypotheses as demonstrated beneath:

Secondary Hypothesis C-1: the group of students taking part in architectural expression classroom wherein use was made of fast modified designing instruction was found more successful than the group of students who had been taught architectural expression based on the other methods in regard of the building techniques.

In an investigation of the secondary hypothesis C-1 indicating that the lessons related to the building technique, including designing technique, elements and details of the building and recognition of the constructional materials should be taken into consideration during designing, the obtained t-value (6.056) was found significant at a 99% confidence level so it can be inferred that architecture is not a 2D subject so that the entire goals can be accomplished

following the designing assignment's completion rather the architectural sketches should be practically implementable in reality. The precision of the authors' proposed method of designing based on metaperspective and selection of Platonic (basic) volumes and application of such techniques as the cross-section, dimensional changes and appending enables the achievement of a plan with an acceptable geometry that can be expressed within a very short time. In similar studies, due to the non-observance of the technical issues in designing, a huge change is usually created in the plan after measuring based on a proper scale that it is found totally different from the initial plan so the precision should be so high in technical issues as well as in observing the selected materials in a building during the designing work that the real stages of implementation can be rapidly seen during designing and sketching beforehand.

Secondary Hypothesis A-1: the group of the students who participated in the architectural expression classroom based on a fast modified designing instruction method was found successful in comparison to the group of students who took part in an architectural expression classroom based on other methods of teaching perspective technique and implementation in designing works.

Secondary Hypothesis A-2: the group of students who participated in the architectural expression classroom based on modified fast designing instruction method was found more successful in comparison to the group that took part in the architectural expression classroom wherein other methods were used for teaching analysis and application of lighting and shading in architectural work presentation.

Secondary Hypothesis A-3: the group of students who participated in the architectural expression classroom based on the modified fast designing instruction method was found more successful in comparison to the group that took part in the architectural expression classroom wherein other methods were used for teaching painting and application of colors in presenting architectural works.

Secondary Hypothesis B: the group of students who took part in the architectural expression classroom wherein they were instructed based on the modified fast designing method was found more successful than the group of students who participated in architectural

expression classroom based on the other methods of applying the instructional materials pertinent to the architectural theoretical foundations' lessons in designing work.

Secondary Hypothesis C: the group of students taking part in architectural expression classroom wherein use was made of fast modified designing instruction was found more successful than the group of students who had been taught architectural expression based on the other methods of applying the principles, elements and details of building technique in designing.

7. CONCLUSION

The material expression of an idea needs various information and instruments and it is instantaneous so solutions should be offered that they can be recorded with the required speed and precision and they can be given a material manifestation with the lowest damage. So, in this period, a method is envisioned more optimal that features higher accuracy, summarization and speed. In this study and first stage, the basic skills were proposed in free-hand designing method so that the students can seminally see the objective subjects and pay attention to the designing process and finish sketching within a short period; watching, describing, interpreting and analyzing and eventually evaluating and judging the objective subjects along with designing strengthens a sharp vision and look in the university students during designing. Designing of the objective subjects can be an exercise and introduction for the difficult time of architectural creation of the mental ideas. In a real sketching work, the exchange of feelings between the past times' architectures through architectural works and today's university students cannot be actually ignored. The examples offered in this instruction method as well as the collecting of the work samples of the students and offering them in this study per se bring testimony to the claim that the 3D expression and depiction of the architectural imagination can be rendered so much speedy and exact that no creative mind's skipping could occur so that the road can be paved to the formation and processing of the plan's idea. Figure (3) illustrates the proposed pattern and the effect of the process introduced in this article.

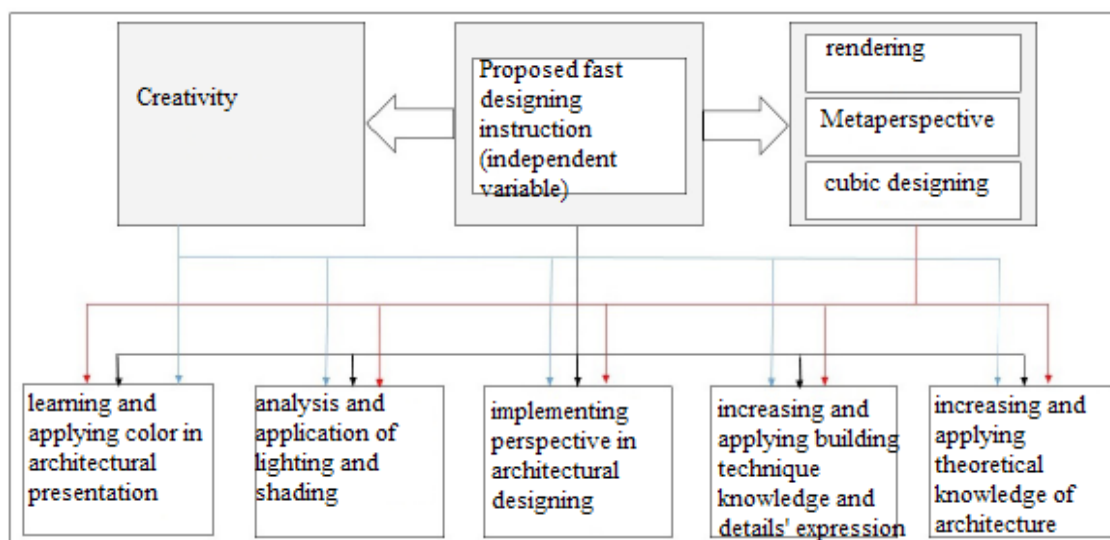


Fig. 3. Summing the Information, the Effect of the Study's Proposed Method on the Architectural Instruction and Expression

REFERENCES

- Bayazit, N. (2004). Investigating Design: A Review of Forty Years of Design Research. *Design Issues*, 20(1), 16-29. <https://www.mitpressjournals.org/doi/abs/10.1162/074793604772933739?journalCode=desi>
- Broadbent, G. (1994). Design in Architecture: Architecture and the Human Sciences. Wiley, Chichester, United Kingdom. <http://www.openbibart.fr/item/display/10068/1161890>
- Casakin, H. (2010). Visual Analogy, Visual Displays, and the Nature of Design Problems: the Effect of Expertise. *Environment and Planning B: Planning and Design*, 37(1), 170-188. <https://doi.org/10.1068/b35073>
- Frederick, M., & Frederick, M. (2007). 101 Things I Learned in Architecture School. Cambridge: Mit Press. http://thuvinso.vanlanguni.edu.vn/handle/Vanlang_TV/1718
- Hadiyan, M., & Pourmand, H. (2014). Concept in Architecture; A Necessity in Design Process and Challenges of its Education in Architecture Colleges. *Journal of Applied Arts*, 3(4), 73-80. <https://www.magiran.com/paper/1518083?lang=en>
- Hojat, I. (2002). Creative Education. Experience, *HONAR-HA-YE-ZIBA MEMARY -VA-SHAHRSAZI*, 18(1), 25-36. <https://www.sid.ir/fa/journal/ViewPaper.aspx?id=5277>
- Islami, S.G., & Ghodsi, M. (2013). An Islamic Approach to Designing a Structured Model in Education of Architecture. *Kimiya-ye-honar*, 2 (7), 96-79. URL: <http://kimiahonar.ir/article-1-84-fa.html>
- Kazemi, E., Sattari Sarebangoli, H., Mohammadzade, R., & Gharibpur, A. (2019). A Study of the Quality of the Learning Preliminary Designing Architecture (2) at the Faculty of Fine Arts, University of Tehran. *Technology of Education*. http://jte.sru.ac.ir/article_1078.html
- Krause, J. (2003). Reflections: the Creative Process of Generative Design in Architecture. In Generative Arts Conference, Milan. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.492.1983&rep=rep1&type=pdf>
- Mahdi Nejad, J., & Sadeghi Habib Abad, A. (2015). The Role of Visual Perception and Creativity in Training Architects. *Technical and Vocational Education*, 1(4), 17-24. http://jorie.sru.ac.ir/article_395.html
- Mahdi Nejad, J., Azemati, H., & Habibbad, A. (2019). Ranking of Spiritual Tranquility Indicators in Traditional Mosque Architecture Based on Perception of "Sense of Spirituality" Using "VIKOR" Method. *Journal of Ontological Researches*, 7(14), 59-82. http://orj.sru.ac.ir/article_1007_en.html
- Mahdi Nejad, J., Azemati, H., & Sadeghi HabibAbad, A. (2019). Investigating Sacred Architectural Values of Traditional Mosques Based on the Improvement of Spiritual Design Quality in the Architecture of Modern Mosques (Case Study: Traditional Mosques in Iran). *IJAUP*, 29(1), 47-59. URL: <http://ijaup.iust.ac.ir/article-1-474-en.html>
- Mahdinezhad, J., Saleh Sedghpour, B., & Najjari, R. (2019). Construction and Validation and Standardization of the Questionnaire for Socialization in the Traditional Iranian Bazaar with Approaching to Learn of Traditional Architecture. *Technology of Education*, 13(4), 695-708. http://jte.sru.ac.ir/article_979_en.html
- McGinty, T. (1979). Concepts in Architecture. Introduction to Architecture, McGraw-Hill, New York, NY, 208-235.
- Nadimi, H. (2008). The Design Process. *Sofeh*, 9 (29). <https://www.sid.ir/fa/journal/ViewPaper.aspx?ID=91230>
- Nagai, Y., Taura, T., & Mukai, F. (2009). Concept Blending and Dissimilarity: Factors for Creative Concept Generation Process. *Design Studies*, 30(6), 648-675. <https://doi.org/10.1016/j.destud.2009.05.004>
- Panahi, S., Hashempour, R., & Islami, S. (2014). The Mind Architecture, From the "Idea" to the "Concept". *Hoviatshahr*, 8(17), 25-34. <https://www.sid.ir/en/journal/ViewPaper.aspx?ID=408213>
- Ruan, X. (2010). What can be Taught in Architectural Design?—Parti, Poché, and Felt Qualities. *Frontiers of Architecture and Civil Engineering in China*, 4(4), 450-455. <https://link.springer.com/article/10.1007/s11709-010-0098-y>
- Steadman, P. (2008). The Evolution of Designs: Biological Analogy in Architecture and the Applied art (A Revised Edition), Routledge, Oxon. <https://philpapers.org/rec/STETEO-46>
- Williams, J. (2000). Deleuze's Ontology and Creativity: Becoming in Architecture. *Pli: The Warwick Journal of Philosophy*, 9(1), 200-219. https://plijournal.com/files/williams_pli_9.pdf

HOW TO CITE THIS ARTICLE

MahdiNejad, J., Azemati, H.R., & Sadeghi Habibabad, A. (2019). Novel Instruction in Architecture Based on the Theory of Fast Designing of Architectural Imagination. *Armanshahr Architecture & Urban Development Journal*. 12(28), 113-123.

DOI:10.22034/AAUD.2019.97365

URL: http://www.armanshahrjournal.com/article_97365.html



