

Assessing the Effective Factors on Judging Architectural Design Projects of University Students

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ABSTRACT: Since nature of architecture is quite different from that of other fields of study, the criteria used for judging projects in this field continuously undergo some changes. On the other hand, because of the undeniable role of human factors in judging the projects, there is always a percentage of deviation from the standard given the interests of the judging committee. The standards of judging architecture projects can be divided into these general classes: idea, process and technical issues. The standards of judging architecture projects can be classified as such: Selection, placement, relations of function, form, volume, internal arrangement and circulation; Considering the studies, analyzing and planning the body of the project; Considering the substrate of the project and recognizing the facilities and their limits; Engineering of the project: considering the relationship between technical knowledge and designing; Using imagination, innovation and creativity when it comes to the idea of the project and the quality of developing this idea; Providence: flexibility and variability of the design in the future; Being aware of the factors affecting the formation of the design (moral, tribal, and cultural); Being practically logical and realistic, paying attention to the applicableness of the design and its compliance with the topic; Taking into account the technical principles, structural systems and machineries; Graphic (visual) and oral (introduction and defense) presentation method. Reviewing previous studies that have focused on different methods for judging student projects shows that we can divide these methods into the following classes: Evaluation by the professors (throughout the project); Group display of the works; Evaluation by the classmates; Personal evaluation; Traditional methods of judgment; Written judgment of the professors; Evaluation by the professor (regarding the completed project).

Keywords: *Architectural design, Judgment, Criterion, Pattern of evaluation of the design*

INTRODUCTION

The purpose of teaching architecture as a part of higher education is to train the professional and efficient force to move towards fulfilling the determined objectives related to the architecture of people in the societies and to promote the quality of people's life and welfare. Teaching architecture has been especially systemized at various levels due to the professional position and role of the architecture in designing the human environment, and unlike most existing university fields, it requires a special process and method. Finding an efficient and suitable educational method for preparing the students to be effectively present in the professional area of work is a clear sign of success on the part of the education system. Nowadays, we see that most of the graduates are inefficient when it comes to their professional area of work

after being graduated from the university. One of the main reasons for such issue is the incompliance between theoretical educations and practical education; or on the other hand, it can be because of the fact that the relationship between science and action is weak (Nourani pour, 1993, 308). The studies conducted in this regard are also indicative of this issue (Litkahi et al., 2008, 15). However, in addition to the content of courses and teaching methods, most of the subjects associated with the matter of architectural education have always been especially involved in this matter as a subsequent of this view. One of the most important issues in this regard is the evaluation and measurement of the accomplishments of the student in association with their designs; because the students' understanding of how their projects are judged and also the important role of judgment of projects are part of the students learning process. Certainly, the process of teaching

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architecture will be completed when the criterion and index of evaluation and judgment of architecture project are based on purposeful methods and clear frameworks, so that the academic improvement of the students would be evaluated by professors by relying on accurate criteria and indexes and so that the students would be able to control their works based on specific criteria and have an accurate measurement of their work and where it stands. Although, the first difference between teaching different fields of art, including architecture, and other fields of study is that there is not just one way to come to the desirable results and there are different ways for it (Roberts, 2006, 167-181). Therefore, there is a shortage of clear and flexible criteria that would act as a basis for evaluations and judgments; however, by recognizing and criticizing the existing criteria, methods and processes can reveal more adequate solutions for the evaluation of students' design projects.

The evaluation of architectural designs, in the respect of getting information and total awareness of student's academic improvement and their practical and scientific skills and their social-behavioral abilities is associated with the completed process of architectural design. But it is better for the students to take part in the judgment of their own projects, in parallel with the overall judgment which is usually done by the professors regarding the academic improvement of the student and this matter can be considered as the last stage of the educational process of architecture (Karimi Moshaver, 2008, 407). This article has aimed to review the judgment methods of architectural projects and to evaluate students' designing ability in the respect of reinforcing and promoting the quality of teaching architecture by overviewing the conventional methods. This article also proposes a theory based on accurate methods of judgment and evaluation to the professors and students, so that the final evaluation would clarify the practical and scientific ability of the student, and find the least error as possible, so that this step can be used as the last chain of higher education. Therefore, by reviewing and recognizing the criteria, indexes and methods of judgment of the students' designs, we could benefit from some tools for measuring the process of teaching architecture. To this end, firstly, some definitions of evaluation and judgment, their characteristics and dimensions will be presented and then these concepts will be reviewed in terms of architectural projects and finally, a model will be proposed for the judgment and evaluation of architectural designs.

Importance and Necessity of Reviewing the Issue

The importance of evaluation and judgment in architectural design can be associated with the following criteria: Today's students are in fact the designers of tomorrow's living environment. By evaluating their current designs, we will understand whether the required issues for future designs were accurately passed on to them or not. Thus, they will show the shortcomings of their curricula, and some steps can be taken in the respect of improving their curriculum and promoting their

designs with a purposeful manner.

Teaching architecture as a field of study in higher education as the highest level of the education system is considered as the most important sign of the dynamicity of each society and one of the principles of its improvement and therefore, the quality of its function has a significant effect on the process of social, cultural, economic issues and etc. If we believed that the current situation of the profession of architecture in the Iranian society is affected by the system of higher teaching this field, it would seem that the current process of teaching architecture can't fulfill the professional needs of the students and curricula used in this field are not compatible with the needs of the society as needed; although most of the works of the graduates in the professional area does not have the desirable quality (Mir Riahi, 2006-a, 102). Although weakness of the method and the content of the architecture curriculum is effective; but if more logical and principal methods are applied for evaluating students' expertise in relation to the design, the shortcomings of design become clearer and it will be easier to come up with more suitable solutions for solving them, and more realistic curriculum will be developed and there will be a more accurate relation between the learning environment and society's needs. By considering the central role of judgment in the architecture curriculum, if the type of judgment and its tools are not specified and the atmosphere dominating criticism or judgment is not provided, the possibility of unsuccessful entrance of personal interpretations or irrelevant requirements with educational purposes will disturb this judgment and will ruin the chance of growth and development of students' talents; whereas, if different judging standards are known, the gradual qualitative and quantitative growth would be possible which would lead to the expansion of the specialized understanding in the educational system of architecture and its method will be represented (Mahdizadeh & Mardomi, 2008, 493).

Since the quality of the designs of students can be expressed based on their skills and what they have learned at various levels and the different strategies they have adopted, judgment is especially complex and it makes this matter difficult to some extent. In this case, not only the results, but also all of the occurrences of the education process are evaluated based on students' findings and what they have learned and the approach they have chosen to solve their issues, which is in compliance with the concepts of their evaluation or ranking in comparison with each other, given the fact there are a large number of students (Same & Izadi, 2014, 2).

If the student knew the criteria, their attempts would be focused on more specific purposes. The student will be able to take effective steps towards the process and formation of the ultimate result cautiously. At the same time, the students look at specific values, principles and criteria with a critical view and became skilled critics in the presentation of educational evaluation and criteria in this way and expand and develop their criteria for evaluating their activities throughout the production and creation process. On the other hand, the professors compare

their improved standards with the educational purposes, measure it and use it.

Simultaneous judgment and evaluation puts emphasis on a sense of commitment and mission which focuses on considering the purposes of an accurate education in the respect of providing a specialized and efficient human force, in addition to requiring architectural works with the desirable quality. There is a belief that does not only limit the passing of concepts to the frame of education, but it expresses that since judging is one of the tools of both judgment and education (Wade, 1977, 15), an important part of education is motivating the learners which will be realized in the process of judging and criticizing students' works. Dinham believes that one of the main principles of education is judgment, and judging students has two more advantages beside the possibility of gaining experience in the general judgment meetings: one of them is to create a critical atmosphere for the students for them to learn how to design better and the other one is for them to face other opinions in addition to their own imaginations (Dinham, 1986, 5-51). Therefore, judgment is also an educational tool. The principles of judging criticism make some developmental changes in the principles of criticism; because it is a tool for judgment as well as being an educational tool (Otto, 2005, 234).

Literature Review

In this section, to review the information sets, which is recorded in various forms regarding the issue of the criteria of judging the projects architectural design and evaluation indexes of the projects and establishes a conceptual relation with specific research subjects in this respect, the issue is accurately expressed and its basic realm is determined with the help of previous researches. In similar cases, various attitudes have affected their development, and are now unavoidable when it comes to facing many opinions in this regard. Also, being aware of the literature and coming to a general conclusion about all of the different perspectives that have been used contributes to determination of situational coordinate towards the background of the issue before any kind of studying attempts, and then to taking steps towards expanding it. The table below shows similar researches, including university researches and documented studies. The summary of the recommendations extracted from academic studies have been presented in Table 1.

The summary of the judgment criteria of the projects of architectural design and evaluation indexes of the projects, which have been mentioned in details by their creators in numerous books and articles and have been discussed and analyzed frequently in the relevant research topics and have been named as the basic aspects which shall be considered in the evaluation of the projects of architectural design, has been provided in Table 2.

MAERIALS AND METHODS

In the process of the present study, firstly, it has been attempted

to identify, express and then develop some principles and frameworks for the judgment of architectural design. In the early stages, by relying on the theoretical literature of the issue and reviewing the recommendations extracted from university researches and studying the criteria of judgment of the projects of architectural designs introduced in the relevant texts and evaluation indexes of the projects of architectural designs which have been discussed and reviewed before and also with a field study composed of observations and questionnaires filled out by architecture professors working in different universities, with an approach based on a logical argument, it has been attempted to recognize and organize the criteria and indexes of judgment and then weight each of them in the process of evaluation and judgment of the architectural design by considering their characteristics. Ultimately, this ends with the proposal of a model, which expresses the evaluation indexes and criteria and the effect of each of them in judging the projects, in addition to putting emphasis on the role of evaluation methods (framework of judgment and evaluation) in the process of designing and education.

In the respect of reviewing this issue, the present research, which is a correlational – descriptive research, was developed with the purpose of describing the current situation and contributing to the development of necessary criteria in the decision making and evaluation process of the architectural designs of the architecture students. In this research, it has been attempted to find appropriate answers for the following three questions and in the meantime, to explain the importance of developing criteria and indexes for judging the projects of architectural design, and the necessity of developing the programs, methods and politics, in order to evaluate and measure the rate of designing skills of the students with the help of analyzing the content, finding the key points of group-oriented meetings, the open interviews and central questions of the research.

By summarizing the research, it has been attempted to give some responses to the following questions:

Are the works presented by the students evaluated based on some specific criteria and indexes?

Have the weighing and evaluation criteria and indexes already been developed in the measurement and judgment process?

Are the evaluation methods (framework of measurement and judgment) explained to the students in advance?

And the evaluation indexes and criteria of the projects of architectural designs and possibility of developing systematic mechanism for evaluating architectural designs of the students will be introduced and explained in details as the article goes on. It is clear that such findings can be contribute to a purposeful programing of teaching architectural design.

The Theoretical Framework of Research

Previous documented reviews and the analyses which have focused on the collected information (questionnaire,

observations, etc.) indicate that the essence of any kind of evaluation and judgment is based on this belief that there is a basic sample, pattern, rule or principle in the world of architecture based on which the quality or successfulness of the building is measured. This basis (which we call a judgment tool) might be quite physical or material or it can be physical and cannot be measured (Otto, 2005, 49). Also a judgment tool might be a lot more general than visual issues related to the physic of the building and it can be like a motto or a statement; for instance, “form follows function”. It is clear that evaluating a building based on vague and unclear tool is a lot more difficult than evaluating it based on quantitative and physical tools (Same & Izadi, 2014, 6). Given that indexes in judgment depend on both process and content of the ultimate project obtained from the design and each of these issues have separated variables, basically the judgment tools should be in either of the two following categories:

Index: index means an indicator or a determiner. It is an informative tool for policy and decision making which is used while evaluating the rate of improvement towards development. Indexes are qualitative and quantitative meters which are formed based on the available information and are used for evaluating the changes of a thing during the process (Tabibian, 2002, 50). A scientific visual index is one of the features of a system. This feature is our imagination and interpretation of a feature which has been measured or observed in a specific process (Gallop, 1996, 102). Generally, the indexes are used in order for evaluating (measure) a process, monitoring, controlling, leading, supporting or developing it. Evaluation is the measurement of a quality in one thing through calculation by using an external index such as meter. Thus, it is a kind of measurement rather than judgment. In this method, it is expected that persons reach a specific level of the predetermined standards (Seyf, 2010, 89). Evaluation as a part of teaching architecture is the measurement of improvement of each student in the designing process based on the curriculum.

Criterion: Meyer has its roots in the word Ayar which makes recognizing pure from impure and judging whether things are accurate or inaccurate possible. Although criteria do not give us a certain realm or an accurate borderline, but by clarifying the basic indexes of a phenomenon, it makes presentation of a good definition and capability of evaluation possible. In fact, recognition criteria are not only tools for selecting works among the available phenomena, but they are also principles for identification and judgment and help us recognize a phenomenon as a valuable thing. In fact, these criteria express the necessary conditions which specify the difference between some phenomena and others and give them a special nature (Rahimzadeh, 2009,133). Although criteria are formed in the process of the research, but they might go through some changes throughout the process.

Evaluation, research and review in terms of the hidden talents of a thing for achieving an internal criterion for comparing two things. Thus, the evaluation of the research in terms of values and comparison is based on the criteria and ranking and judgment are important in it. In this method, the performance of the persons is compared with one another and not a specific predetermined criterion (Seyf, 2010, 90). The word evaluation generally refers to the determination of value, quality, importance, rate, degree or conditions of a phenomenon and judgment about it (Bazargan, 1995, 52). It is a systematic process for collecting, analyzing and interpreting information with the purpose of determining the rate of fulfillment of the purposes (Gray, 1991, 6). The evaluation and measurement processes are generally composed of three steps:

- Determining the indexes or criteria of the preference of the issues based on the determined purposes
 - Measuring the differences between the issues based on the defined criteria
 - Coming up with conclusions and determining the superiority of one of the two issues (Mortazavi, 1995, 295).
- In fact, the ultimate purpose of evaluating the determination of

Table 1: Summary of the recommendations extracted from academic researches.

Row	University	Recommendations about the evaluation of projects
1	Utah	Proving the sufficiency of the combination of site, program, content and foreground, structures, codes, materials and system through drawings, graphic description, professional introduction, and oral representation.
2	UNSW	The strength of displaying the work, spatial composition, innovation and imagination, considering the projects goals in terms of concept and field, explanation and description of the projects, using technological aspects, sound processing of ideas.
3	Illinois	Control systems of the environmental condition, the idea of the project, graphic presentation, application of the materials, function program, moving from research to the design, spatial quality, structural systems, oral presentation, web design, beauty of the project, shape of the building.
4	Hartford	Basic knowledge, presentation (oral, written, and graphically), the idea of the project, how the idea is developed and defenses.

Table 2: Criteria used for judging architectural design projects and project evaluation indexes.

Source	criteria of the judgment of the projects of architectural design
1 MirRiahi Saeed Soffeh Journal 43th issue	<ol style="list-style-type: none"> 1. Methods of study and physical programming of the project 2. Analysis of the substrate of the project and recognition of the facilities and limitations 3. Innovation and creativity in the idea of the project 4. Considering the technical principles, fundamental and structural systems 5. Awareness of the effective factors on the formation of the project (moral – cultural, social, economic, climatic factors and etc.) 6. Quality of the nourishment of the idea 7. Correlation between the theoretical principles and project 8. Clearness of the documents associated with the project 9. Considering proper executive processes and methods with the profession 10. Method of timing and oral presentation of the project (Mirriahi, 2006-a, 108)
2 Fatemeh Mahdizade Seraj & Karim Mardomi The third conference on architecture training	<ol style="list-style-type: none"> 1. Generation of ideas and creativity 2. Function and communications 3. Environmental and climatic convergence 4. Spatial beauty, definition, and proportion 5. Architectural form and plastic 6. Engineering of project 7. Studies, analyses 8. Being realistic and having a practical logic 9. Imagination and providence 10. Active presence and alignment with the class 11. Presentation and displaying ability 12. Looking at history (Mehdizadeh Seraj & Mardomi, 2008, 505)
3 Catherine Anthony (Referrees of design in testing level” (Anthony, 1991	<ol style="list-style-type: none"> 1. Idea of the project is an imagination which is expressed about the totality and a specific issue in the frame of the idea of the desig. 2. Moving from research to the design (integration of research and design, findings and recommendations which are considered in behavioral and environmental research obtained from the project. 3. Design of the site (project of site development): what is meant by it is the attention paid to the available texture and composition of buildings and proportion of the outer spaces and readability of the input and the rate of directing car paths and discharging surface waters and passages and coordination with the shape of the ground. 4. Functional designing and planning of circulation, movement, entrance, organization of the activities, perception and understanding of the needs and their connections with each other and functional proportion between surfaces and volumes. 5. Special spatial qualities are organized in a way that spatial meanings and their function and role is obviously clarified. 6. The shape of the building and the proportion of the mass of the building with its function and substrate. 7. Beauty of the project, beauty in the sense of “being good” and what is meant is the creation of a work with aesthetic and artistic aspects. 8. The structure of the attention paid to the structural elements, holders, openings, and the ratio between the sizes of the structural components. 9. Using proper materials, materials in whose substrate the building is built, and also the relation of materials with the static system and shape and idea and project and expense and maintenance. 10. Adjustment of the environmental conditions and the ability of recognizing and solving the environmental problems existing in the mechanical and electrical facilities and location and paying attention to natural energies and the ability of combining these two together. 11. Oral expression of the ability of presenting the project orally and by using accurate words and organizing the intellectual process and the ability of responding to the questions. 12. Logical relation between the map, resolution, quality, completeness and readability of the drawings, depth of the details and display of the skills related to graphic connections. 13. Presenting the model, displaying skills,, designing a model in the required scales. (Mirriahi, 2009, 64)

quality and the rate of effectiveness of a program or a project is assumed and therefore, educational evaluation also means becoming aware of the quality of the education process and reviewing the rate of compliance of the activities of the defined program with the educational purposes. Educational evaluation makes comparing the rate of compliance and convergence of the available curriculum and the defined purposes of education in the ideal mode possible (Nourani Pour, 1993, 308). Complexity of this process in weighing qualitative and abstract availability such as projects, programs, structures and organizations becomes more apparent; because determination of the rate of valuableness and efficiency of the intangible and qualitative structures requires more sensitivity (Raesdana, 1991, 44). The criteria and indexes that have an impact on architectural design are variables through which the qualities of the proposed project and the process of its obtainment are defined, described, analyzed, reviewed and judged and are always present in the design and are obtained from the design – architecture itself. (Table 3)

In the literature of evaluation of design, two models or approaches can be recognized for the evaluation of the project: objectivist approach, interpretive approach.

Objectivist approach: this approach firstly considers the values of the project to be written like an object and it considers the judge as the subject or the apprehender; a person who discovers and recognizes those values. In the framework of this approach, it is believed that practical experience can be reformed by storing some lists of criteria and developing regulations. All of the attempts for the development of construction rules or standards are based on this approach. Nonetheless, they say

that evaluation of the design can be sufficiently objectivist and there are no certain factors or standards for criticism in the design workshop.

Interpretive approach: this approach considers objectivism to be basically impossible (Snodgrass & Coyne, 2006, 119). Now, if we accept that evaluation is something subjectivist, and consider objectivism as something impossible, evaluation will only be indicative of the personal belief of the judge and the problem is that absolute subjectivism might end in chaos. In such field, this question is mentioned: how can fair judgment be possible? This is a riddle which is always faced by the judges of architecture projects.

The second approach, as it can be understood from its name, considers project judgment, including architecture projects, as something interpretive and dependent on the subjectivity and mindset of the judge by putting emphasis on its value and qualitative aspects. This means that based on this perspective, the relationship between the project and its judge is like the relationship between the text and the reader and meaning neither lies in the text nor in the judge (reader), but it is manifested in the interaction between the two. In this approach, the main emphasis is on the subjective understanding of the values of the project. This subjective understanding is mutual among professional experts like the interpretive community. In this perspective, the rules are never that cleared to tell the judge what to do about what and therefore what the judge has learned from the past cannot be expressed in a series of rules. The determined criteria and rules are also interpreted and used in each kind of evaluation by the judge and with his/her subjective knowledge of his/her previous experience.

Table 3: Evaluation indexes of the process of architectural design and evaluation criteria of the project as the outcome of architectural design.

Evaluation indexes of the process of architectural design	Evaluation criteria of the project as a result of architectural design
Absorbing and understanding information and the ability of analyzing and presenting them.	Function, form, internal arrangement, and circulation.
Being aware of various designing methods and processes.	Considering the physical programs, analysis and studies of the project.
A dynamic and explorer mind in the research process of the project.	Considering the substrate of the project and recognizing its facilities and limitations.
Considering executive methods and process in proportion with the profession.	Project engineering: observing the relation between technical knowledge and design.
Method of timing and oral presentation of the student.	Imagination, innovation and creativity in the idea of the project, the project itself and quality of its nourishment.
Written evidences of the previous architectural designs and practices.	Providence: rate of flexibility and changeability of the project in the future.
A constant presence and participation in the sketches and studio programs.	Being aware of the effective factors on the formation of the project. (moral, climatic, cultural and etc.)
Loyalty to a specific design process.	Being practically logical and realistic, ability of being executed and compliance with the issue.
The relationship between the purposes of the project and theorization in the project. (Sameh & Izadi, 2014, 7)	Considering the technical principles, structural systems, equipment, and etc. Methods of oral (introduction and defense) and graphic presentation. (visual)

By ignoring the nature of the differences in the foundations of these two approaches, which is not discussed in this article, it seems that each of these two are concerned with an aspect of different aspects of design. If we want all aspects of the design evaluation, which has multiple aspects, to be considered and fulfilled, it is recommended and maybe necessary to use both approaches. On one hand, designing has artistic, aesthetic and cultural aspects which require a perception and evaluation which are quiet valuable and qualitative; on the other hand, it has engineering and physical aspects which require accurate measurements and an objectivist and quantitative look which is what the legal institutions and their trusted consultants use in the measurement and evaluation of the design. Often, it is based on these quantitative aspects that the frame of the standards and construction rules are developed and applied: aspects such as observation of the strength and stability of the structure and compliance with the climatic conditions and careful energy consumption and observation of the determined limits in urban and national documents. Wherever qualitative evaluation is used due to some reasons (for example about the important buildings or architectural competitions), inevitably in addition to quantitative measurements, the responsibility of the ultimate evaluation of the work is given to the experts. In fact, the second approach or model is used which is based on the subjective understanding of the expert or in other words the interpretive community of the architecture profession (those that are especially engaged in the interpretation are referred to as the interpretive community. Members of such communication have a mutual understanding which has been learned in practice an enables them to go further than the application of only the learned rules and regulations and respond to the evaluation situation immediately and without the need to think by recognizing its most basic aspects).

John Cuise in his reference of educational research at a glance to the evaluation states: "Evaluation is an activity that specifically is applied in the qualitative and abstract entities such as projects, plans, structures and organization." "Evaluating is: a kind of giving value to something or usefulness of something" (Ghourchian, 2000, 17). In Jobst's new point of view the evaluation is a process in which levels of desirable decision are determined, namely results of the evaluations, the type and circumstances of decision-making are made clear (Hosseininasab, 1993, 33). Educational evaluation is to obtain a full information and awareness about the educational progress. In other words, it is the specialized knowledge evaluation of graduates, scientific and practical skill and efficiency of alumni and their social-behavioral formation in relation with labor market of field of study that in the field of architecture can significate the measurement of capabilities of the architectural design (Mohammadi, 2009, 117).

According to the engineering education process so far, teaching of the faculties of engineering in many countries of world focuses currently on the students' mental development and is dependent to the knowledge transfer. Teachings are

not well-proportioned to the needs of new era and advanced technologies and do not emphasize much on individual and interpersonal skills and on the skills of system development, namely being involved in all stages of product's life cycle, process and system (Motahari Nejad et al., 2012, 268).

Intervening Factors in Realization of the Educational Goals

Factors such as the role of supervisor, the score and degree of architectural design, architecture subject and composition of the jury in achieving the goals of evaluating the architectural design projects are considered as intervening factors (Mohammadi, 2009, 128). Scientific or social position of supervisor, his intellectual and philosophical tendency influence often the judgment criterion that should be based on students' academic and professional ability and even make the judgment of jury to take sides. Even the selection of subject of projects especially the theses is subordinate to the selection of supervisor. In examining the ability of professors by students the items of statements of management and ability to maintain order in the classroom, amount of the practical skills in the workshop and laboratory courses, the amount of participation and supervision of projects and student theses, mutual respect and social behavior with students, connection of examination with the presented course materials and covering the exam questions to the chapter headings of courses put forward as the most important characteristics of the performance of professor in teaching (Mahmoudi Sahebi et al., 2013). His other tasks such as providing the general framework of course, explaining the educational objectives, providing content, designing the learning activities, carrying out continuous evaluations and providing feedback, attention to the individual differences and creating and guiding the discussion are used often in order to develop the interaction and help to shape knowledge in the learners (Seraji et al., 2014, 37).

Recognition of the professional-scientific skills and the specialized knowledge of students imply a perception of the cultural sensitivities, its consequences and considered values of graduates. Evaluation of architectural projects should be done in a manner that the influence of the disordering factors such as the social-political atmosphere relations was minimized and only the scientific and practical and professional criteria are taken into consideration (Mohammadi Belyan Abad, et al., 2009, 132).

Based on the conducted studies and investigations on the educational evaluation about the criteria and method of judgment of students' architectural design work, items and axes that are of importance in the field of educational evaluation are mentioned below:

Structure of teaching and method for organizing and presenting courses and projects are the factors that in evaluation have a decisive influence. It is necessary that every faculty due to its field gives weight to the above factors and announces some coefficients for its desired indicators. Finally the preparations should be considered in the arbitration process of architecture

projects, so that the credit of indicators is increased as much as possible and somehow is become so stable that the quality improvement of the educational process of graduates and realization of the real mission and objectives of teaching programs are realized. Also making the arbitration criteria transparent, the continuous evaluation of students during the years of education and creating a new culture in the use of computers as well as a continuous relationship between professor and student are effective in the field of improving the evaluation indicators. The following table presents a summary of topics listed as the known working procedures and indicators of a realistic assessment of architectural design. (Table 4)

RESULTS AND DISCUSSION

Statistical Population of the Research

The statistical population of the present study has been composed of 25 faculty members of the architecture department of the Islamic Azad Universities of Mahabad, Urmia, Tabriz, Sanandaj. The age range of the subjects was between 30 and 50 years. Ten of these professors were female and eight of them have graduated state universities. Eighteen of them had Ph.D. and thirteen of them have previously done studies related to the topic of the research.

Architecture Evaluation Patterns

Whenever evaluation of architectural designs is mentioned, the presence of a kind of idealistic features is assumed for desirable architecture; and we measure the project by comparing it with these features. In fact, these idealistic features are the mutual “criteria” of the experts. It is possible that these criteria are

mentioned in the frame of approved and written rules or remain in the degree of the mutual subjective knowledge of the technicians. In other words, project evaluation, just like any other evaluation, is comparing “what is” or the available project with “what should be” or the ideals.

Vitruvius model: it is one of the oldest recorded responses to this question is the three-dimensional Vitruvius model which has become the inspiration source of the theoretical principles of architecture since then and it has also maintained his status for many theorists. These three dimensions, i.e. strength, efficiency and beauty, in fact, introduce the responsibilities of the building or architecture as follows: providing a strong and persistent shelter against destructive and corruptive forces of the human and natural environment – fulfillment of the practical needs of the human life – fulfillment of man’s moral need to have a delightful and beautiful environment. Today, these three are supposed to provide mental and physical safety and peace for man. There are also other recommendations for expressing what the responsibilities of architecture are and therefore specifying its aspects which can be evaluated. Prasad believes that quality of design is measured by how much the desired totality has been obtained which goes further than the components (Prasad, 2004). He believes that the quality of design is obtained when all three qualitative aspects, i.e. application, structure and effectiveness (a kind of interpretation of the three dimensions: efficiency, strength and beauty), work together, like overlapping fields. Best work is done when the quality reaches its peak in all these three aspects. (Fig.1)

Table 4: Known working procedures and indicators of realistic assessment of the architectural design.

Index group	Evaluation indicators	Working procedures and related remarks
1	Personal Assessment	Assessment by the student himself based on the aforementioned criteria and indicators
	Assessment of Classmates	Assessment by the classmates of student based on the aforementioned criteria and indicators
	Assessment by teacher	Assessment by the professor based on the aforementioned criteria and indicators and criteria contained in teaching chapter heading and amount of attainment of the goals set transparently
2	Written evidences	Use of the student’s academic documents and records, his scientific and practical and his knowledge-based ability
	Design process	Method of developing idea and movement from question to answer and getting close to the final design
	Plan as a goal	Achieving the design goals, site design, planning the operations, creating the spatial qualities and aesthetic concepts and form, control of environmental conditions, fabrication technology and foresight
3	Making the criteria transparent	Announcing explicitly the assessment criteria and indicators with mentioning the full details away from deviation
	continuous assessment	Continuous evaluation periodically, interim deliveries stage by stage, providing sectional feedback
	Interacting with Computer	Use of software related to design and communication of the teacher and student according to up-to-date science



Fig.1: Three-dimensional Vitruvius model, the oldest evaluation criteria of the project.

Recently the “Construction Industry Council” of England has developed a tool for measuring the quality of design: Design Quality Indicator: DQI. The basis of these tools is in fact the three-dimensional model proposed by Vitruvius but the source dimension has been added to it (financial, temporal, natural, and human). DQI is the origin of many discussions among the beneficiaries of the field of construction and it also has weaknesses in terms of method.

Broadbent Model: one of the recommended models for evaluation of architecture, which has been common for years, is the five-dimensional Broadbent model (environmental impact – economic performance – cultural symbolism – environmental filtering – fit of spaces to activities). He firstly proposed this in the 1977 edition of the design in architecture book and considers it to be currently updated. In this mode, the Broadbent model mentions five applications for architecture; which can be considered the evaluation criteria of architecture. These applications are:

- A) Responding to human activities, proportion of the spaces with behavioral patterns and activities of the social and individual life of man;
 - B) Protection against disturbing factors and environmental harshness, protecting man’s living spaces against climatic and atmospheric adversities and mischievous animal and human encroachment;
 - C) Cultural symbolism, building’s significance for all of those who were in relation with it;
 - D) Economic function, justifiability of the expenses of construction, management, reparation, and maintenance of the building;
 - E) Environmental effectiveness, controlling building’s negative impacts on the natural environment and adjacent buildings.
- Among the five applications proposed by Broadbent in the model, “cultural symbolism”, which is indicative of the significance of architecture, is more related to the qualitative aspects of architecture compared to the other applications. Relatively, it also relies on the collective agreement of the technicians most of all. In the responses of the respondents, this matter also becomes prominent. (Fig.2)

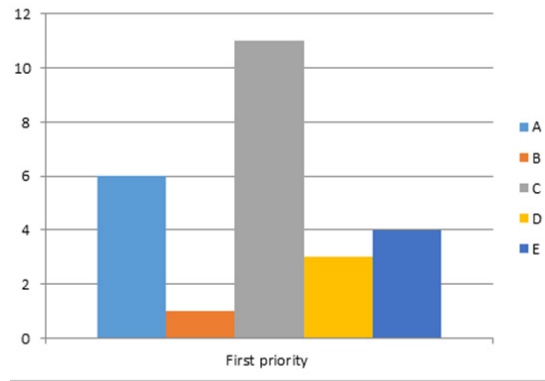


Fig.2: Evaluation criteria of architecture

Janet Marcus Model: (evaluation and measurement of the students’ design in art workshops): in this research, in order to evaluate the projects of architectural designs, two methods have been offered for evaluating the works of students:

- a) Student-centered method, in which the creativity and innovation of the students and clearness of the issues are mentioned given the mental, emotional and sensational processes of the student in the design and therefore, student’s creativity and innovation are some of the most important items which shall be considered in the evaluation criteria.
- b) Professor-centered method, in which educational purposes, programs and criteria determined by the professors are the main criteria of the evaluation of the student projects. The combination of these two methods can improve the evaluation methods of the projects of architectural design, since the combination of these two methods enables the students to moderate the measurement criteria of the creative process of their designs by considering the evaluation criteria of the professors and professors also measure students’ improved criteria based on the determined educational purposes (Mirriahi, 2006-b).

The reviewed statistical population showed more tendency towards the student-centered evaluation and the professor-centered method is not that much favored by them. (Fig.3)

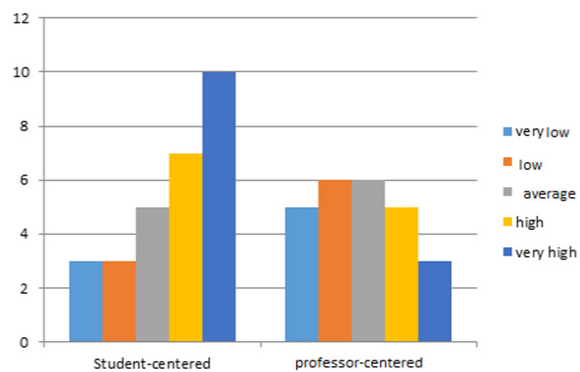


Fig.3: Student-centered evaluation and the professor-centered method.

Hause's model (objectivist and intuition-oriented educational evaluation design): another one of the researches done regarding the evaluation criteria, the evaluation criteria are divided into two groups: objectivist (utilitarian) and intuition-oriented (pluralistic) evaluation approach. The utilitarian approach considers the general impacts of a curriculum as its value (Mirriahi, 2006-b). In other words, according to the utilitarian approach, what has most advantages for people is the best (Worthen, & Sanders, 1987, 50). Therefore, in evaluations depending on the utilitarian approach, by using the mean scores of the test or other indexes, the general accomplishments are emphasized. In the intuition-oriented or pluralist approach, the value of curricula depends on the impact it has in each and every person not on most of them and in other words, individual feelings and achievements are considered as accurate criteria (Worthen, & Sanders 1987, 63). Due to this matter, this is also called a subjectivist approach. In this approach the group of judges and evaluators prefer the data obtained from the specific interviews and opinions of the participants of the program or the project to their quantitative and numerical results. In fact, in this evaluation model, experts are not trying to find indexes such as mean and medium; but they collect the weaknesses or shortcomings of the factors in educational process or procedures (Nourani Pour, 1993, 308). Hause believes that moderating the judgment criteria and giving weights to them in this approach is mainly based on intuition and therefore, the value of a curriculum depends on the values and perspectives of all of those who judge the program (Shoarinejad, 2005, 524). Those who have responded to the questions associated with this issue have shown more tendency towards the evaluation of educational process rather than general impacts of individual's general benefits and evaluation. (Fig.4)

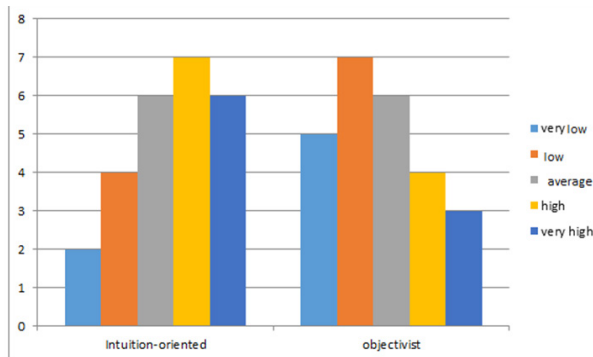


Fig.4: Objectivist and intuition-oriented educational evaluation design

Tyler's model (education evaluation): the evaluation model proposed by Tyler is seeking to extent to which the educational purposes have been fulfilled (Fig.5). According to his perspective, there is a significant difference between purpose and performance and the evaluation shall be repeated by eliminating other shortcomings. In fact, his purpose is to express and define the steps of evaluation which is recommended as follows:

- Determination of general purposes and purposes of the research;
- Classification of the purposes;
- Behavioral expression of the purposes (measurability);
- Finding situation which can lead to the fulfillment of the purposes;
- Preparation of measurement methods;
- Collecting data related to the performance of the learners;
- Comparing data related to the performance with behavioral purposes.

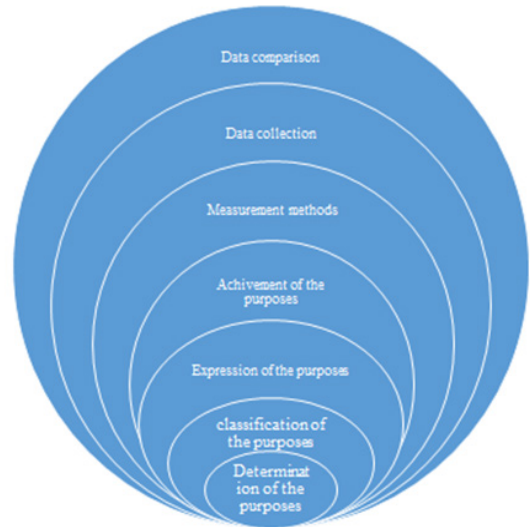


Fig. 5: Tyler's educational evaluation model

Worthen and Sanders have also confirmed this model and believe that this model is scientifically acceptable and easily measurable by the evaluation experts (Worthen & Sanders, 1987, 63).

Gary's Model (basic components of evaluation): L. R. Gary, in the educational evaluation and measurement, express that other than the selection of the model, evaluation has the following components in all cases:

- Determination of purposes and intentions;
- Selection or preparation of measurement tools;
- Determination or selection of suitable strategies or methods for the fulfillment of the purposes;
- Steps of execution and application;
- Analysis and interpretation of the obtained results.

Gary states that despite the differences which might exist between the terms, components and steps mentioned above and also their rate and level in various levels, the basic process of the execution of the evaluation is similar in all of them (Raesdana, 1991, 44).

In the conducted research, the obtained results are indicative of a special attention paid by the teachers to the determination of the strategies of fulfilling of the mentioned purposes and also the adopted procedure and the execution process of the design. And also, the emphasis on the analysis and interpretation of the

obtained results by the students is not serious in the evaluation. (Fig. 6)

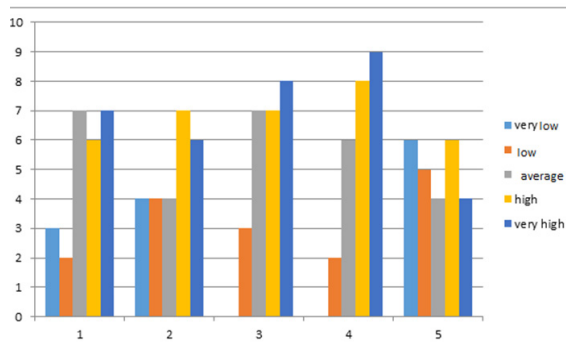


Fig.6: Basic components of evaluation

Necessity of an overall and general view in evaluation:

If we want to have a comprehensive judgment in the final judgment of designs, we require a more value-based and overall view which goes further than these models. Lawson believes, "since many variables cannot be measured with a criterion in the design, most of the value-based judgments seem to be inevitable" (Lawson, 2005, 91). A single reliance on quantitative evaluations, which is based on standards, disturbs the ultimate judgment. "using the standards leads to disruption of the good purpose of different preparation in various conditions" (Lawson, 2005, 87).

According to Lawson, "good design qualities are not included in the quantitative standards... but the series of specific quantities as conditions is another issue which is not justified by the results obtained from its design" (Lawson, 2005, 88). Although writing regulations and developing standards is only possible when measurement is possible and writing a regulation for quality is basically very difficult.

CONCLUSION

The criteria of the judgment of the projects of architectural design can be classified as follows:

- Selection, location and relation of function, form, volume, internal arrangement and circulation;
- Considering previous studies, analysis and physical planning of the project;
- Considering the substrate of the project and recognizing the facilities and their limits;
- Engineering of the project: considering the relation between technical knowledge and designing;
- Using imagination, innovation and creativity in idea section of the project and the quality of its development;
- Providence: flexibility and variability of project in the future;
- Being aware of the effective factors on the formation of the project (moral, tribal, and cultural and etc.);
- Being practically logical and realistic, applicability and compatibility with the topic;
- Considering the technical principles, structural systems,

machineries and etc;

Graphic (visual) and oral (introduction and defense) presentation method;

By reviewing the previous studies which have focused on different methods for judging student projects, it is shown that these methods can be divided into seven groups:

Evaluation by the professor (throughout the project): in this method, student's project is evaluated by the professor in all of the stages of the design individually and this process is done periodically from the beginning to the end and in all of the stages of design (this method is the common method in the architecture departments of our country).

Group presentation of the works: in this method, the works are hung on the wall and judged as a group with the presence of the student, the professor and other students in the class and sometimes professors and guests from outside of the class also participate in the judgment process.

Classmates' evaluation: in this method, after the process of designing ends, the project of the student is evaluated by his or her classmates and this evaluation is presented in written form by his or her classmates.

Personal evaluation: in this method, the students' completed project is evaluated and criticized by the students themselves in a written form.

Traditional judgment method: in this method, the basis is the judgment of students' graphic and oral explanations about the completed projects which is usually done by a group of experts including the project professor, other professors of the faculty, students, other guests and with the presence of the classmates of the student.

Professor's written judgment: in this method, a deep criticism is written by the professor assigned to the project regarding the completed project.

Evaluation by the professor (regarding the completed project): in this method, the professor and the student discuss and evaluate the completed project with oral and graphic explanations. Among the methods above, the first and the last methods are the most accepted among them. In fact, students consider a two-person discussion and judgment as the best method for evaluating their projects in which the first priority is the review of the ultimate project and then the second priority is the review of the project done by the professor in the process of the design. In this method, after the process of design ends, student's project is evaluated by his or her classmates and this evaluation is presented by his or her classmates in written form.

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