



Strategies for Research-Centered Education of Architectural Designing by Examining the Research-Centered Activities of the Top Universities

Jalal Nakhaee, Mona Arab Nasrabadi

Department of Art and Architecture, West Tehran Branch, Islamic Azad University, Tehran, Iran

Received: 17 March 2019

Accepted: 24 April 2019

Published: 01 June 2019

Abstract

Today, quality of life and the existence of any state depends on the country's comprehensive system of science mainly covers two areas of education and research. From how the existence of people is in private and individual matters though problems of development and growth of each country refer to knowledge, wisdom and then the ability and influence of them. Accordingly, one of the roots of the problems, backwardness and issues of each society should be searched in the effectiveness or ineffectiveness of knowledge, education and research of that country. In fact, there is no specific training program in schools of architecture; also, it was not possible referring to the tradition and that would not be logical. What is facing architectural education and can improve architectural education in Iran is to have a flexible approach to the issue of education in the world. The most important strategy in recent years was to adopt methodologies that have had object-oriented look at the architecture, an affair that is influenced from transforming "knowledge" to "research". In this regard, it is presented the success factors of analyzed top universities and strategies according to the current state of research-oriented education of architecture (the author).

Keywords: Research-Centered Education; Architectural Design; Research-Centered Activities

How to cite the article:

J. Nakhaee, M. Arab Nasrabadi, *Strategies for Research-Centered Education of Architectural Designing by Examining the Research-Centered Activities of the Top Universities*, J. Hum. Ins. 2019; 3(2): 50-56, DOI: 10.22034/jhi.2019.80898.

Introduction

All architecture experts were agreed on architectural design teaching in the form of designing workshops (especially in Iran) as a center of architectural education, so that for example "Guak" knew designing as a central factor of architectural education, "Parket" knew it as the basis of architecture and so did "Newton" as the heart of architectural education. While at these workshop, the role of architecture's research has not attended so much and event would not marked as a new requirement of architecture in educational methods (conversion of knowledge to research). The architecture doesn't have inclusive, perfect, clear and acceptable definition today as well. Everyone has his own take on it and even professors and students are not agreed in universities (the author). This trained generation may have failed to receive effective training based on research-centrality or discretion of the particular circumstances of time.

To solve the above problems, the most important strategy in recent years has been to adopt methodologies that have had object-oriented look at the architecture, an affair that is influenced from transforming "knowledge" to "research".

Research's objectives

This article's aim was to provide a strategy based on examination of actions of world's top universities for development of research-centrality in order to meet challenges and promote strengths points of research-centered education of architectural design in Iran (the author).

Research's questions

- What is the importance of research in architectural design?
- What is the current status of research-centered education (strengths points -challenges)?
- What are the positive points of the top research-centered universities?

- How can use the strengths points of research-centered education in developed countries for teaching of architectural design in Iran?

Research's literature

The necessity of research in architectural education

The process of architectural education in Iran is dividable into two types of "divergent education" and "pious education" since early 1360 with the formation of schools of architecture in which the divergent education is expressed based on finishing certainty season and fundamentalist ruling and following declining schools of architecture and the pious education would be based in order to the new conditions of Iran that demand own independent or sometimes xenophobic education. What would be discussed on the general title of "architectural education" today is separable and recognizable in two following order:

1. Architectural education
2. Nurturing the architect

1. Architectural education

Architectural education is possible when there would be inclusive, perfect, clear and acceptable definition of "architecture" that can be taught. It is noteworthy that whether the "Renaissance architecture" or "modern architecture", when has met the consistency and has become a "school of architecture" and has set and determined and doesn't again replaced "architectural education" to "nurturing the architect" and began to repeat and teach "Renaissance architecture" and "modern architecture".

2. Nurturing the architect

Nurturing the architect is to discover and develop qualities and abilities of the student without targeting any specific shape and definition of architecture and to aim "architect" production and not "architecture" and to admit that the "architect" would create "architecture" itself. Nurturing the architect would be necessary when present architecture and today architecture doesn't have desired quality and doesn't worth to teach. In the

schools of architecture, architectural history education is paid more attention or current situation is considered and future is less surveyed as an investigable issue. While thinking about the future, particularly for today students that their life and careers are in the future is necessary. Peter Aizenman knew today's architecture form in the failure to understand the new realities, a situation that resulted retention in the old and inherited terms from history. Aizenman believed that there is alienation of modernization in all areas including philosophy, physics, theology, etc., except for the architecture. According to his beliefs, only the architecture could not become alienated or modern in deep meaning.

The duty of school of architecture at the lack of architecture

Postmodernism's sample breaker and pluralistic model is not acceptor of sustainable definitions and lasting values. School of architecture cannot make "architecture" as "Bouzar" and "Bauhaus" built. Nowadays, school of architecture should create "the architect". In other words, schools should think about nurturing the architect instead of architectural education, outfit student training with "competence" and "knowledge" and "intelligence". It can be extracted a set of general principles for architectural education programs, based on an article written by Rittela successful education program must:

- A) Nurture flexible professionals that would be adaptive to changing, uncertain tasks in the future.
- B) Emphasize to the general rules as well as economic way to organize, understand and deal with varied knowledge and
- C) Teach how to learn.
- D) Promote interdisciplinary thinking and working level to link the needs and research areas to each other.
- E) Incorporate information technology into the curriculum.

The result is that research in today's architectural education is essential. Now we deal with investigation of research in architectural design.

Table 1. Table of predisposing factors for research in architecture field.

Evolutions in architectural education	Extensive scientific and artistic fields related to architecture	Research and design linkage
- Changing traditional education to academic - Entering computer into architecture education's process - Development of higher education courses	- The relationship between architecture and other arts and sciences - Creating different specialties - Differentiation and the intersection of career and research	- Diversity of interest groups and architectural audiences - Identifying needs and turning them into designing program - The designer-master relationship

Research stages

Research and designing are common in 3 stages: 1) Before designing, 2) during designing, 3) after designing. In the first stage, designers need to increase their knowledge by answering to designing issues and determine needs of man and its issues and options. Research is formed and different branches of information are unified in during designing stage and all steps are formed from the planning and analysis of the implementation's place to its available details and the research helps to organize the plan. Finally, in the after designing stage, they are accomplished necessary reforms and the challenges of the project are met. Here, to justify initial idea for the project, it should be used information and researches.

Categorizing research

In general, research categorizes into two groups: 1) indirect research, 2) direct research. Indirect research includes 3 types: 1) Real research, 2) Library research, 3) a review on records and case studies.

Real researches formed based on personal or available experiences and information and emphasizes on deep recognition of semantic, physiological and social values. Library research includes a review on literature related to investigation design and history of projects and provides information about responding to plan's questions. This type of research is not known as a research method, but includes type of data collection. In reviewing the records of the design, available projects are discussed in terms of dealing with issues of design and use of new investigation designs, followed by the development of the project through the samples and stated opinions.

According to Mark Frankis, a case study is considered as a very authentic document and a real test for design process which shows decision and the consequences of the project beforehand and advises the designer to present the goals and policies and assists him/her to find the views of others designers on the issue under consideration. Direct research is set in the second category of research methods' types. In this type of research, research is not limited to basic investigation design of research or data collection and analysis but also it is emphasized on analysis of the implementation's places much as possible.

Quality of research

One of the important things in a study is considering its quality. Now, status of architectural design education in research category is focused on gathering information than using and utilizing the information in architectural design. In the architectural design process, it should be noted to this importance that the quality of the research should be in type that leads studies to better designing. In other words in the first place, task of the designer is to design correctly and seek most benefits from available information. About this issue, researchers such as Zube (1980-1998), Riley (1990) and LaGro (1999) has introduced architecture as an interdisciplinary character and knew increment of design's quality on the basis of applied researches in various fields. **Roles of research**

Research has two key roles:

1. Creation of criteria for the valuation of investigation design
2. Establishment of general principles to use during designing

The evaluation phase can also be used in research after f the construction process.

According to conducted researches at the University of Mississippi, this role is took place in a four-step process:

Recognizing the problem, production of the investigation design, investigation designanalysis and providing solution to designing.

The interaction stage between research and designing

It is represented an interactive relationship between research and designing in figure 1. Research is dominant in the first and last phase and artistic inspiration are seen more in intermediate phases, but overall, both the research and artistic inspiration play role in all of these stages.

Now the application of research in architectural design become clear and we examine research-centered education (the author).

Research-centered education

Not so long ago, higher education was considered as stable institution which would resist against the change.

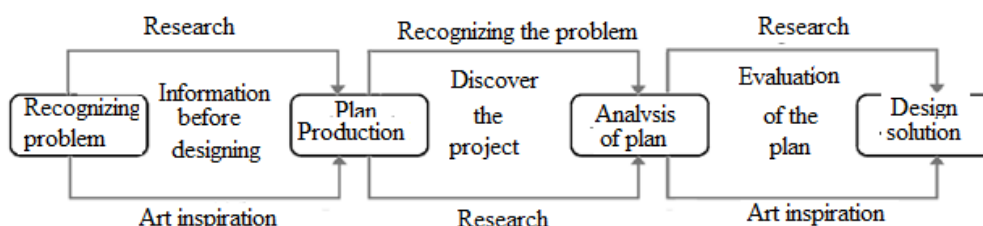


Figure 1. The interaction stage between research and designing

Universities generated roles to produce and transmit knowledge from generation to other generation based on patterns of colleges with physical establishment, resident students, face-to-face interaction between teachers and students, teaching the lecture, the emphasis on written texts. Universities are realized their true responsibility while social unrest, social development and technological progress, but lack of basic change in the executive structure and procedures. But in the mid-twentieth century, a new paradigm emerged in higher education functions in which the search for the so-called "Phon Homboloti or Newman of knowledge for knowledge" and "produce high-minded people" replaced with the view that the university should serve society and it is required to play this functionality in particular by supporting the establishment and economic activities as well as enhancing the life quality of citizens. In other words, this idea is formed that while it is needed for university to be as the conscience of society, but at the same time is essential to develop the basic functioning of the university and have more practical role in providing and enhancing the quality of life, training more qualified manpower and producing knowledge appropriate to the different cultural, social, economic and technological variations. History of technological and scientific discoveries teach us that the human race is weak in independent and creative thinking, even when it has provided environmental scientific aspects of the genesis of an idea for a long time, generally external stimulus needs to happen (Einstein) universities can provide an environment in which external stimuli act with maximum effectiveness. The main function of university has been to transfer knowledge (education) mainly exotic, imported or advisors from the past, but in research-centrality strategy contains three essential and complementary processes which includes: 1) Knowledge production, 2) Knowledge transmission, 3) Knowledge dissemination.

In this approach, the most important role of university is knowledge production; what is mentioned as a software movement in which university has voided from pure consuming, communities and organizations are feeding with scientific and intellectual sustenance. This approach was first raised as the second revolution by Henry Atzotiz. It is not the task of teaching all subjects, but also to respond to questions and access to information and new material should start by searching for learning by the students. In this approach, the duty of university is not to teach all subjects, but answering to questions and access to information and new material should start by students through searching for learning. In this approach, basic elements of education (such as students, teachers, learning environment, text and process) met new features. Student is thoughtful, active and comprehensive and not inactive and conserved, the class is not a one-way system but is student-centered rather teacher-centered. In this approach, rather than storing data of textbooks in students' memory, it is created skills for problem's recognition and solving in different fields. Research activities and its emphasis on learning principles and practices give graduated such abilities to be able to solve organizational issues at different levels. Reinforcing the critical spirit is another feature of research-centrality. This system plays an important role in development of academic skills by teaching scientific foundations of exception ability and encouraging the use of critical judgment and motivation to create potential observer and creator which students can have astute view with scientific and rational understanding of their interaction environment. Research-centered universities transfer qualities such as confidence, self-esteem, creative individualism, courage and acceptance of criticism to students. These subjects were introduced under the heading of "nurturing the architect".

The current status of research in universities compared to other countries

Table 2. The current status of research in universities compared to other countries.

	Other countries	Iran
Research performing	<ul style="list-style-type: none"> -Most supervisors have already had present subjects and have attracted research funds. -The relationship between universities and research centers with industry is strong and therefore the use of results is more tangible. -There are lots of large and strong interdisciplinary communication, advisors and consultants with many different expertise and more superior technologies for other branches. - It paid less attention to theory than research skills. 	<ul style="list-style-type: none"> - Supervisors don't help students effectively to find an appropriate topic for research and attracting funds for students is difficult. - Teachers and schools are less likely to follow the application of scientific findings in the industry. - Interdisciplinary communication is pallid and use of features between groups is more nonsense. - There is too much relying on the theoretical content.
Evaluation	It is done mainly based on the output of research and scientific findings and it is trying for an educated to achieve excellent skills as an expert person.	It is done more as the evaluation of achievement and even with four choice questions and measures surface objects.

Top universities in Shanghai and the Times Higher Education rankings based on their role in the research-centered education

Table 3. The profile of selected universities based on country and international ranking.

Name of the country	Name of the university	Shanghai's rank	Times Higher Education's rank
America	Harvard university	1	1
	Stanford	2	2
	MIT	3	
	Cornell university	13	28
	Pennsylvania state university	14	16
	University of Washington	16	13
	University of California	17	8
	University of Michigan	22	15
	Southern Illinois university	25	
Australia	Northwestern university	30	
	University of Melbourne	60	18
	University of Sydney	96	25
Scotland	Monash university	161	31
	University of Tokyo	97	
England	University of Cambridge	5	
	University of oxford	10	3
	UCL	20	4
	Imperial college London	24	9
	University of Edinburgh	53	5
	University of Nottingham	85	35
Japan	University of Sheffield	97	
	University of Tokyo	21	37
Singapore	National university of Singapore(NUS)	39	12
Swedish	Karolinskainstitutet	44	21
Canada	University of Toronto	26	14
	University of British Columbia	37	29
	MC gill university	64	19
	MC master university	89	30
	University of Alberta	123	47

Strengths points' of research-centered education at top universities

Table 4. A set of components, sub-components and the executive university/universities.

Components	Sub-components	Executive university/universities
Mission and perspective of organization (university)	Centrality of "linking between education and research" in the mission of the university	Hamshaier college (USA), Southampton, UCL and Birmingham (UK), Alberta, Ottawa (Canada), Newsaltolz (Australia), Rouskild (Denmark), Karolinska (Sweden)
Beliefs and values	Regarding to the approach of scholarship as belief and value, belief in involving students and families in linkage, belief in teaching from ascending research	Western University, Melbourne (Australia), Alberta (Canada), MIT and Hamshaier College (USA)
Learning and teaching programs and curriculum	Doing homework in the form of projects, providing caseof educational research, emphasizing on the role of search-based learning, providing learning and student-centered and flexible teaching styles, interdisciplinary development, revision courses with the aim of highlighting the linkage between education and research within the curriculum	McMaster, British Columbia (Canada), Monash, Sydney (Australia), Sheffield, Oxford, King's College London (UK), Roskild (Denmark)
Research programs and development programs	Creating independent research courses for general education, creating research basis courses, communication between research centers and curricula, joint projects and research links with other universities	MIT (USA), National University, Sydney and Western (Australia), Toronto, Alberta, British Columbia, (Canada)Oxford, Brouks, Warwick, Cardiff, Leeds (United Kingdom)
Employment policy and promotion of faculty members	Providing training courses for new faculty members, establishment of training center for graduates	Stanford, Pennsylvania (USA), Dundee, Oxford (UK), Newsaltolz (Australia)

Structural mechanisms and strategies for university	Designing university's organizational structure to amplify the linkage, creating a synergy procedure of training and research, strategies of cooperation between universities in order to strengthen the linkage, an approach to integrate education and research, support strategies for faculty members and students	British Columbia, McGill, Toronto (Canada), Edinburgh, Leeds, Newcastle, Southampton, Sunderland, Chester, Imperial College, Warwick, Dundee, UCL, Bristol, Cambridge (UK), Canterbury, Auckland (New Zealand), the Karolinska, Oumiya (Sweden), Michigan, Northwestern, Cornell, MIT, Washington (USA), Tokyo (Japan), Melbourne, Sydney, Monash (Australia), National University of Singapore (Singapore)
Development of graduates' capabilities	Regarding to characteristics of graduates	Monash, Sydney, Kourtin (Australia)
Assessment and accountability	Evaluation with performance indicators, evaluation of academic work on aspects of scholarship	Sydney (Australia), University of Hong Kong (Hong Kong)
Reward mechanisms	Awards and bonuses in exchange for a link creation	Cambridge (UK), Eilniwez, UCLE, UCLF (USA), Victoria (New Zealand), Toronto, McMaster (Canada), University of Western of Australia (Australia)
Funds and financial statements	Budget and financial resources for development of linkage	Money and credit council of higher education (England)
The role of country's system in "the linkage between education and research."	National research council support from linkage, legal support from linkage and quality assurance at the national level	National Science Foundation (US) Research Council, the academy of higher education (UK) units of academic supervision (New Zealand)
Factors affecting the market	Use of best technology of market for education and research	British Columbia (Canada)
National and international competitions	World view in graduate education, participation in national programs	Carnegie Foundation, the public affairs research council (United States), the academy of higher education (United Kingdom, Karolinska (Sweden)
Ability in education and research	Enhancing learning of students in universities involved in linkage and becoming superior in research and education	Oxford, Russell group universities (UK)
Satisfaction and motivation	Satisfaction from the university experiences by student, sense of satisfaction and retention in the organization, development of life skills and vocational skills	Sydney (Australia), the council of money and credit of higher education, Russell group universities (Britain)
Ethics in education department about "linkage between education and research."	Observance of ethical charter by faculty members	Harvard (United States)

Conclusion

In this paper, it was discussed one of educational approaches as research-centrality in architectural designing by admission of the idea of nurturing the architect instead of architectural education at the current situation and as well as evaluation of the necessity of research in architectural designing. For this purpose, it was examined the strengths points of top universities in this matter and the current conditions of research-centered education in the country and though it was provided approaches in three areas of organizational, academic and workshop as a global approach to education, structure designing (before, during and after the course of architectural designing), academic and national communication and promotion and encouragement of teachers and students which were as follows:

Guidelines for research-centered education in architectural designing

Citing the success factors of research-centrality at top universities can provide suitable

implementation solutions in architectural teaching for use in the architectural designing process.

1. World view in teaching graduate education
2. Designing university's organizational structure to amplify the linkage between education and research in architecture and creating the synergy procedure of education and researching architectural designing.
3. Planning research in architecture school chart as necessity, methods, and interdisciplinary discussions and before and during obtaining the course of architectural design based on need and level of education.
4. Turning the process of architectural design workshops from master to student-centered in three areas: before designing, during designing and after designing.
5. Funding for the realization of results in workshops, awarding rewards and facilities, create a space for involvement of families in valuating to the results of research designing, beliefs of new designers and their researches for the formation of

the new architecture path as well as supporting from professors.

6. Separation of the program of architectural design studio into given research and educational tasks, evaluation based on search-based designing, involving interdisciplinary topics in studio's objectives according to the characteristics of students.

7. Linking between architectural research centers, executive agencies, architectural users and other universities and information exchange with them and participation in national programs

8. Providing training courses for old and recent-employed faculty members and educated architects to guide the architectural design with the above matters.

Finally, the architect grew up in a research environment with the features of self-confidence, self-esteem, creative individualism, courage and acceptance of criticism can create architecture (the author).

References

Ali-khani AA, 2010. The ways of development and improvement of higher education and research in Iran by the analysis of some studies, Journal of Higher Education council of Iran, 1.

Broadbent G, Toy M, 1995. Architectural education (Eds.), Education Architects. Academy Editions, London, 10-23.

Francis M, 2001. A case study method for landscape architecture. Landscape J. 20 (1): 15-29.

Georgi-mahlabani Y, 2010. Today architectural education and the future challenges, Journal of scientific research technology education, 4th year, 4(3).

Ghoorchian N, Gafari P, Ghaneie M, Shahram S, 2014. The linkage between education and research

in the world's top universities, review study by submitting a conceptual model, Iranian Journal of Medical Education, 14.

Gibbons M, 1998. Higher education relevance in the 21st century. Paper Presented to the UNESCO world conference on Higher Education. October 5-9, Paris, France

Groot L, Wang D, 2007. Research methods in architecture, translated by Eini-far A, Tehran: Tehran University, Page 9.

Hagh-doost AA, Sadeghi-rad B, Fasihi-harandi M, Rooh-al-aminia, 2008. Teaching method of Ph.D. (PhD) in the fields of Medical Sciences in Iran and application of research-based education, Research Journal of Hakim.

Hojjat E, 2003. Architectural education and costless of values, Fine arts journal, 14.

Rittel H, 1986. Some Principles for the Design of an Educational System for Design, Design Methods and Theories, 20(1): 359-375.

Sajjad-zadeh H, Safari V, 2014. Architectural education based on research rather than traditional education, Journal of building and equipment.

Saremi-nozari A, 2008. Pathology of research in Dafoos, Journal of Danesh-entezami, 1.

Shahidi M S, Bemaniyan MR, Yalpaniyan M, 2008. The role of research in in the process of architectural designed education, Journal of Hoviyateshahr, 2.

Shakibaiey Z, Ghoorchian N, Khalkhali A, 2009. Providing a model for creation of research university in Higher Education system of Iran, Leadership and Educational Administration Quarterly, 3.

William, 1999. Financial management of universities: www.aau.dk.com.