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Explanation of Sustainable Architecture Education and Necessity for Revising its Goals at Iranian Universities

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Abstract: The goal of sustainable architecture education is to access scientific knowledge about environmental resources, ethics, values and skills in line with the objectives of sustainable development and public participation in the decision making thus in moving from the conventional architecture to sustainable one architectural education requires fundamental changes which is faced with numerous obstacles. Issues related to educational planning for sustainable architecture, including the use of natural resources, construction materials, collection and integration of building systems and multipurpose utilization and consistent with humanistic values, which these trainings in Iran are in contrast with the societal habits and are in need of coordination in management structure. Although the new goals and programs of the ministry of science, research and technology in planning for higher education are based on the decentralization and flexibility but right now, the higher education system in country is centralized and its educational programs and curricula are regulated based on the related department's approvals and decisions of the related councils. Since the large number of architecture courses at the universities of country, are in the form of architecture and architectural engineering fields. Thus the present paper investigates university courses in the following fields: Continuous Associate Degree in Architectural Drawing, Non- Continuous Associate Degree in Architecture, Continuous Bachelor in Architectural Engineering, Non- Continuous Bachelor in Architectural Engineering Technology (Applied Science), Non- Continuous Master of Architectural Engineering and specialized PhD in architecture and courses in other fields and related tendencies such as landscape architecture and environmental architecture are not included. In terms of the purpose, the present study is an applied research since it aims to provide a framework for doing practical actions about necessary plannings to hold educational programs and university courses for sustainable architecture in faculties of architecture.

Key words: Sustainable Architecture · Architecture · University Courses · Academic Programs · Higher Education

INTRODUCTION

Planning for sustainable architecture education in universities is influenced by the type of higher education system of architecture [1]. Since the higher education of architecture in Iran is affected by the policies, strategies, objectives and plans for the country's higher education system, therefore planning to develop the sustainable architecture education is indebted to quality level improvement of goals and plannings of higher education system, to create necessary opportunities and capacities to hold various programs for sustainable architecture education [2]. But the most important issue in developing the sustainable architecture education which programmers of architectural education in Iran would face is 'determination of new educational objectives' which fit with this area. Since the determination of educational objective is a beginning for any kind of planning and action toward new perspectives, thus for moving from architectural education toward sustainable architecture the necessary goals should be set in this regard [3, 4]. Thus, the first and most important thing that should be done in the field of architectural education in Iran, is to determine 'the sustainable architecture' as an educational goal for educational programs in architecture, after that approach of goals should be thought and discussed to select various approaches in accordance with the necessary needs in different regions of the country for the mentioned educational purpose [5, 6].

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Since determining the objectives of specialized training is influenced by social needs, governmental pressures and technical deficiencies of professional community, it is clear that 'sustainable architecture' will be determined as the goal of higher architectural education when the need for the development and promotion of sustainable architecture in country is explained [7, 8], thus necessity of doing specialized training in architecture leads to set the educational goals for sustainable architecture in universities of Iran. Hence the article entitled: 'education for sustainable architectural in Iran'. Subject-matters are presented on: history of academic education of architecture, educational programs in architecture, characteristics of courses and educational levels, the number of programs in universities and institutions of higher education according to levels and type of universities [9, 10]. Topic: 'how to realize sustainable architectural education in the universities of country' is in relation to setting goals and required educational planning and directly is affected by capacities and restrictions of higher education system of Iran and facilities and quality deficiencies of universities and institutions of higher education in the country [9, 11].

MATERIALS AND METHODS

The method of research was a qualitative one since a descriptive analysis of qualitative data was done to get the relevant conclusions about research subject and required information were collected through regulation, notification, application, report, examination booklets, face- to- face visiting to centers and surfing at the websites of the universities, institutes and centers related to higher education system.

About facts and figures necessary information were collected mainly through the studying of organizational reports and surfing in the relevant organizational websites.

History of Architectural Education: Based on the conducted studies and research on the history of formal education in Iran, no sign were obtained about the organized systems of architectural education before nineteenth century. Although in ancient literature and historical texts there are some references to architecture filed and teacher –student educational system but there is not enough information about the date of changes and school training of architecture [12, 13]. It can be inferred that in traditional conditions which the whole information were transferred with minor changes from a generation of architects to another one [14, 15]. Basically there was no need for what might be called academy or university. When the social expectations of the architecture were responded through this system normally remained stable and could offer a perfect architecture to the community in those days and leaves a rich architectural heritage for future generations [16]. Dar ul-Funun, was the first institution of higher education which influenced the architecture of Iran and its educational system; since in this school, foreign teachers reared students in several disciplines of science and engineering taught to them some of the technical methods related to architecture (ibid). In the year 1949 architectural education was recognized in the faculty of fine arts [17].

Then in the year 1959 the faculty of architecture and urbanism of the national university of Iran (Shahid Beheshti University) was established as the second faculty of architecture in the country and stated its work with the admission of architectural engineering students. The third program in architectural education was begun in the year 1968 at university of science and technology of Iran. The curriculum of the fine arts faculty at Tehran University was set up based on the education at French and Italian universities and educational system of architecture and urbanism faculty at Shahid Beheshti University which was affected by the educational system of Italian faculties emphasized on Iranian traditional architecture from a cultural perspective and Science and Technology University was established, emphasizing on the empowerment of human resources for the future of the country.

Courses and Disciplines of Architecture: Architectural education in Iran is planned in a variety of disciplines and tendencies in the different qualifications. In a way that for the time being 17 curricula are approved by the supreme council of higher education planning for architecture major, of which three programs are in doctoral level, nine programs in master level, three programs in Bachelor level and two programs in associate's level (Table 1).

Since universities are allowed to offer specific tendencies in graduate programs therefore, in addition to the 17 approved curricula various tendencies are also created in some the MA and PhD programs of architecture.

Sustainable Architectural Education at Universities of Iran: Utilization of conventional fossil fuels and installations is an integral part of the design process in twentieth century [18, 19]. Right now, teaching architecture and design techniques have less comprehensive process and functional and ecosystem feedbacks [20, 21].

Table 1: Educational programs approved by supreme council of higher education planning for architecture major (Higher Education Planning and Development Office, 2008)

No.	Qualification	Name of educational program
1	Non- Continuous Associate Degree	Architecture
2	Non- Continuous Associate Degree	Traditional Architecture
3	Continuous Bachelor Degree	Architectural Engineering
4	Continuous Bachelor Degree	Interior Architecture
5	Non-Continuous Bachelor Degree	Applied Science Architectural
6	Non-Continuous Master Degree	Architectural Engineering
7	Non-Continuous Master Degree	Islamic Architectural Engineering
8	Non-Continuous Master Degree	Landscape Architecture
9	Non-Continuous Master Degree	Interior architecture
10	Non-Continuous Master Degree	Environmental Architecture
11	Non-Continuous Master Degree	Energy Architecture
12	Non-Continuous Master Degree	Architectural Technology
13	Non-Continuous Master Degree	Iranian Architecture Studies
14	Non-Continuous Master Degree	Reconstruction of Post-traumatic
15	Specialized PhD	Architecture
16	Specialized PhD	Islamic Architecture
17	Specialized PhD	Architectural Engineering

major1: Design Collections

major2: Power Plant Buildings

Table 2: Course specifications related to topics of sustainable architecture in different courses of architectural education (Source: Author)

			Credits		
Course	Qualification /Subject	Course type	Numbers	Type	Ratio of Sustainable Architecture Related Courses to Entire Courses
Setting Environmental Condition I	Non- Continuous Associate Degree Architecture ---------- Continuous Associate Degree Architectural Engineering	Principal	2	Theoretical	2.8%
Setting Environmental Condition	Continuous Bachelor in Architectural Engineering ---------- Non- ContinuousArchitectural Engineering (Applied Science)	Principal	2	Theoretical	1.4%
Climate Compatible Architecture	Master of Architecture	Specialized	2	Theoretical-practical	9.5%
Setting Land Conditions	Master of Architecture	Specialized	2	Theoretical-practical	
Climate and Architecture	PhD Architecture	Principal	3	Theoretical	12.5%
Architecture and Nature	PhD Architecture	Principal	3	Theoretical	
Architecture and energy-content	PhD Architecture	Particular	3	Theoretical	
Natural ecosystems and built-environment	PhD Architecture	Particular	3	Theoretical	
Architecture and new energies	PhD Architecture	Particular	3	Theoretical	
Selected Topics in Architecture Consistent with Climate	PhD Architecture		3	Theoretical	

Sustainable architectural education at universities of Iran can be studied in two sections; academic courses and curricula which are related to sustainable architecture.

University Courses Relevant with Sustainable Architecture: A survey on title and headings of the courses at associate's, bachelor, master and PhD qualifications in architecture shows that only thing which is done in these courses for teaching issues relating to sustainable architecture is just offering some university courses which their detailed course specifications are listed in following table.

The first course that may make students of associate degree architecture somewhat familiar with the issues related to climate and energy is named 'setting environmental condition I' which about its purpose has written that: this course is provided to make students familiar with the methods of setting environmental conditions to create a favorable habitat for human being… first of all in this course an introduction is given about the role of natural factors inhibition in the human comfort and then issues related to heating and cooling, lighting and sound are discussed (supreme council of higher education planning,1996) Although the main focus of this

course is not on the issues of the sustainable architecture and content of the course has an installation approach but in different sections of its headings there are some point about the necessity of familiarizing students with characteristics and conditions of climate and natural light which seems unlikely that among the various twenty issues raised in headlines of this course teachers just consider the following two issues [22, 23].

- Site characteristics, area's climatic conditions, warm, cold, moderate, hot and dry, warm and humid.
- Types of natural and artificial light, direct and indirect [24].

If the associate's students continue their education in non-continuous bachelor program of architecture, will have a course with the same title in which climate and energy issues are considered more serious than before [25, 26]. The course 'setting environmental condition' is the only course which can familiarize the bachelor program students with the issues that are related to sustainable architecture. Currently students of both continuous and non-continuous bachelor programs take this course in which its Mechanical, electrical installations, lighting and sound sections are separated and defined in the form of another course named 'Mechanical Electrical Installations' which is introduced as a supplementary course for 'setting environmental condition', so that after learning about the installations which are related to the comfort of human beings in buildings students are also get familiar with discussions on energy consumption in buildings, Conservation and energy efficiency and use of renewable energy. The followings are the purpose of 'setting environmental condition' course which is introduced by the supreme council of planning:

This course has been developed for the purpose of determining the thermal behavior of buildings affected by the climate. In practical section, the theories presented in the theoretical part are experienced practically in the form of short experiences and developed in order to estimating the performance of climate on buildings and ultimately to provide a rational architecture influenced by climate [27, 28], general theories about climate and thermal behavior of the buildings (Supreme Council of Higher Education Planning,1998b). However in explaining the purpose of the course doing practical exercises are emphasized as well, but no practical credit is provided for and now this course is presented as a main course with two theoretical credits. In the headings of this course the necessity of learning the following topics, as the course contents are emphasized:

- Sun, Earth and atmosphere: energy sources, physical and chemical properties, solar radiation spectrum, effect of air layers on solar radiation, climate, global, regional and local climates.
- Geometry of the sun: angles of solar radiation (calculating and drawing angles), calculate the shadow mask pattern placement on building, the shade of one building upon another, diagrams of sun path at different latitudes.
- Characteristics of human and the concept of comfort in relation to environmental climatic conditions, description of the physical factors on the comfort range (radiation, temperature, humidity, air flow and cover).
- Psychometric Chart: how to analysis and use them to determine the comfort zone.
- Fundamentals of building heat transfer: conduction, convection, radiation, heat transfer power, thermal power and thermal resistance.
- Ventilation in Building: un-wanted and wanted ventilation and their computational methods.
- Thermal load estimation in buildings.
- Window glass: glass types, physical properties, thermal behavior, radiation receiving and glass efficiency...
- Heat capacity of materials: materials heat capacity comparison, different methods of energy storage.
- Mention the history of natural resource use and provide analysis for samples and methods to use active and passive energies [29].

Although there are some criticisms about the headings of this course and also the impossibility of doing practical exercises within the dedicated 34 theoretical hours to this course but 'setting environmental condition' is the only course which makes the training of the issues that are related to the sustainable architecture possible in bachelor program.

In architecture master program there is a course named 'Climate Compatible Architecture' which is related to the topic of sustainable architecture this course is an specialized one which educational program directors can present it among their course planning for architecture master program. In introducing its purposes three general ones are emphasized:

- Paying attention to the optimal conditions of human life in architectural space in which climate plays an important role.
- Paying attention to the effect of climate on architectural design as an important factor.
- Getting acquainted with identifying climate and its relation with techniques of setting environmental conditions in designing and make a living space for human being (ibid,1998a).

To achieve the above objectives the supreme council of planning has mentioned the four following topics to explain the headings of this course:

- The necessity of referring to human being and concept of comfort in climate and theories presented in this regard;
- Analyzing the manufacturer factors of climate, identifying and efficient use of them in designing architecture;
- Discussion about the effect of designing on construction of the architectural spaces and make them compatible with climatic conditions;
- Introducing the architectural works of Iran and world in which climate is considered as an important factor along with other factors (ibid, 1998a).

Due to its credit type which is theoretical – practical one, this course is thought in theoretical form of but teachers was recommended to held the lectures and seminars with the presence of experts in this field and also students do the practical exercises in the form of climatic analysis on valuable works of architecture and then represent the results in the form of written report.

Another course in architecture master grade is 'setting land conditions' although its approach is mostly on the issues related to environment and landscape but in its headings there are topics such as 'erosion and environmental vulnerability' and 'ecological capability of land' which are connected with the principles of sustainable architecture. About the purpose of this course is written that: the course 'setting land conditions' aims to deal theoretically and practically with the principles of land planning and its environmental considerations in order to use optimal capabilities of the land and prevent the side effects of the physical development on the environment through identifying the effective planning, environmental capacities, capabilities and limitations of environment to accept the civil construction project and environmental optimization methods (ibid).

Main issues in PhD program of architecture which are related to the sustainable architecture are only in the form of two courses 'climate and architecture' and 'architecture and nature'. The purpose of the 'climate and architecture' is to make students familiar with the weather and cultural features of the of Iran and construction attributes in various climates of the country. About the purpose of this course has written that:

The purpose of this course is to make students familiar with the climate in broad sense means all the areas which climate affects them:

- Same weather.
- Same cultural pattern and compatible construction [30].

About the structural content of the course three following cases are emphasized:

- Analytical discussion on weather and cultural components of climate.
- Samples presentation and analysis of different world climates including the examples.
- Analytical discussion about Climates of Iran and way of climate compatible constructing.

The 'architecture and nature' was set in order to gain the necessary insight about making architecture compatible with the ecology and the necessary knowledge for climate and nature compatible constructing. In the course objectives three following cases are emphasized:

- To get familiar with the nature as a source of inspiration and a source of architectural construction especially from architectural static and establishment aspects.
- To get familiar with the concept of energy as the most important factor affecting the life and different perspectives about how to use it.

To study the effect and interaction effect of natural and man-made environment and to get familiar with optimum utilization of nature in the constructing built- environment.

Also about the structural content of the course five following cases are emphasized:

- Morphological study of the natural phenomena of the function, establishment and integrity which lies inside them and with concepts such as article, gravity, force and statistic… and study the architecture which is inspired by these concepts.
- To study scientific theories which governing the energy concept and its various systems in nature and the coordination of these systems in the great treasure of the creation.
- To study the inhibition of passive and active energy and how to use them in the micro-and macro-scale of architecture.
- To overview the natural ecosystems in life cycle and they way of their working.
- To analytically study the examples of construction built environment along the history, their destructive or coordinate role such as the type of building materials and how to use it...(ibid).

In addition to these two courses, four other courses (without headings) are considered as special courses related to climate, ecosystems, nature and energy in approved PhD program of architecture which are chosen according to the students research and study fields. These four courses are suggested due to their relevance with a course named 'climate' (ibid).

All the mentioned courses, which are relevant with the educational programs of architecture and are widely taught at all universities and institutions of higher education in the country, are being criticized by the educational experts of the architecture. They believe these courses, which are often presented in theoretical form without holding any practical workshop or analyzing the studied samples, will not have that much effect on the students. As the students of the architecture usually do not have any information about the energy and its related concepts including recycling methods, feedback on the design, analytical software and simulation of energy consumption process and due to the absence of these aspects in working environments they have no incentive to learn them [31].

In Iran in all majors especially architecture the educational aspect of teaching is more than its research aspect, thus understanding and perceiving the functional concepts and developing the methods that are compatible with the environment and climate and cultural values do not have proper place in teaching. Although in recent years many efforts were conducted to investigate and apply traditional knowledge and create sustainable architecture but these tendencies were often personal, stylish, relied on Western models and had lack of social support. Also, environmental courses which in recent years were added to the curriculum of students, have lack of the executive areas and adequate social needs at the community –level and are not effective like many other theoretical courses.

The results of a survey on the amount of knowledge among the MA and BA architecture students, which had some courses relevant to the sustainable architecture, showed that the students familiarity with these concepts were in surface and theoretical level and didn't have any deep and practical knowledge about the principles of the sustainable architecture. The research was done through distributing questionnaires among the senior bachelor and master program students (research population) that passed or was passing their climatic and environmental condition courses in three universities namely Tabriz Islamic Art University, Bu-Ali university of Hamadan and Azad University of Hamadan (ibid).

Curricula Related To Sustainable Architecture: Education of sustainable architecture at Iran universities is done through two curricula, one the master program of architecture with a major of sustainable architecture in the faculty of architecture and urbanism at Science and Technology University in Iran and the other the master program of architecture and energy in Pardis College of architecture, department of fine arts of Tehran University. The first program has been designed as a major in master program of architecture and after being admitted to the university students can chose sustainable architecture major as one of the tendencies of architecture master program in this faculty. In describing this major has written that: sustainable architecture major on one hand tries to maximize the use of natural resources and optimize the use of new and contemporary technologies and on the other hand emphasizes on the optimal use of resources, eliminating waste and controlling environmental pollution. This major is one of the newest majors in the national and international levels [32].

The Credits of sustainable architecture were equaled according to the program approved by the Supreme Council of Planning then has been approved by the sustainable group of the Architecture and urbanism faculty at Science and Technology University in 2004 which detailed course specification in four semesters are given in Table (3).

Table 3: Suggested credits for sustainable architecture major (Mofidi, 2005)

First year /1st semester			
	Credit		
Course Name in Major	Numbers	Type	General Content
Research Method in Sustainable Architecture	2	Theoretical	Get familiar with research methods, with particular attention to sustainable architecture development
Specialized Texts Of Sustainability	2	Theoretical	Get familiar with professional texts and terminology of sustainability
Trend of Sustainable Architecture Thoughts	2	Theoretical / Practical	Theory tend and history of sustainable architecture
Setting Land Conditions	2	Theoretical / Practical	Get familiar with land analysis methods optimization of built- environment and locating activities
Climate Compatible Architecture	2	Theoretical / Practical	Climatology, Human comfort and Architecture
Total Credit:10			

First year /2nd semester			
	Credit		
Course Name in Major	Numbers	Type	General Content
Computer in architecture sustainable / Fundamentals of Landscape Architecture	2	Theoretical / Practical	Program: Chita / LT method / CFD
Environmental psychology	2	Theoretical	Get familiar with effective factors in human interaction and environment.
Philosophy of Islamic Art	2	Theoretical / Practical	
Static methods of sustainable design	2	Theoretical	Create new heating and cooling in architecture by using static systems and utilizing available energies that are in climate and natural bed.
Sustainable Architectural designing I	4	Theoretical / Practical	Design project of landscape and non-residential building. according to the principles of sustainable Architecture.
Total Credit:12			

Second year /1st semester			
	Credit		
Course Name in Major	Numbers	Type	General Content
New materials and Structures on Sustainable Architecture	2	Theoretical / Practical	Get familiar with new technology and experience to create Space and new building materials.
Indigenous and traditional architecture	2	Theoretical / Practical	Formation of Indigenous and traditional architecture in Iran.
Fundamentals of daylight and renewable energies	2	Theoretical / Practical	Get familiar with consumption of renewable energy for building-principles about use of light in architecture.
Thesis Seminar	2	Theoretical / Practical	Prepare students for thesis.
Sustainable Architectural Design II	4	Theoretical / Practical	Design project of Plex apartment complex and using dynamic systems, daylight and renewable energies.
Total Credit:12			

Second year /2nd semester			
	Credit		
Course Name in Major	Numbers	Type	General Content
Architectural Rights	2	Theoretical	Get familiar with rules and regulations related to architecture with emphasis on related regulations of sustainable development Principles.
Fundamentals of ecological and sustainable development	2	Theoretical / Practical	Fundamentals of Ecological biological systems, biodiversity and sustainable development principles
Thesis	6	Theoretical / Practical	Design project based on researches
Total Credit:10			

It is noteworthy that, Faculty is trying to approve a program titled 'non-continuous MA program for Sustainable Architecture Engineering'.

In this regard Mofidi, coordinator and the member of planning committee for Sustainable major at Science and Technology University, writes: Sustainable architectural concept mainly deals with improving the quality and perfection of human life rather than conserving the resources and maintaining the biological systems. This is impossible to achieve, except with culture-building besides correct and comprehensive educational planning in the all courses of Sustainable Architecture. The primary objective of education of Sustainable Architecture must be the respect to dignity of man, nature and the environment and then to consider the built-environment design according to the local resources and in order to increase the quality of life and meet the needs of future generations [33].

There is another curriculum named 'master program of architecture and energy' at Tehran University in the department of fine arts which is for the students who are interested in gain expertise in energy as one of the most important issues in sustainable architecture. In explanation section of department about the necessity of such new fields in architecture is written that: while planning the curriculum for this course a comprehensive view about climate and energy issues was considered. So that beside the course named 'climate and local-traditional architecture' which is mainly about the use of natural energy and energy conservation methods in traditional architecture, another course 'specialized computer' was also provided to teach the advanced specialized software that are used for calculating energy in construction and how to use high technology in this field. Some of the courses of this major namely are climate and local architecture, details of active and passive systems, setting site conditions, designing architecture and energy [17].

CONCLUSION

According to the mentioned issues about plannings it can be said that planning for sustainable architecture in Iran is facing with four major challenges:

- Lack of demand from architectural graduates and the professional community of architects.
- Lack of qualified teachers in sustainable architecture at all Iranian universities.
- Lack of equipment and facilities needed for sustainable architecture education at all Iranian university.
- Lack of educational strategies and appropriate culture of teaching for sustainable architecture education.

Based on the examples of educational objectives it is obvious that many educational programs set their educational goals to meet their needs about the lack of expertise in sustainable architecture, like what program managers in other countries has mentioned about their specialized gaps in responding social demand and committing their responsibility towards creating sustainable architecture in professional architects community of their countries or in the world. Due to the quantitative aspects of architectural education in Iran its qualitative aspects are not seriously considered at universities, thus lack of appropriate demands from architectural graduates and community of professional architects is a matter which is faced while setting goal for planning and promoting educational programs for sustainable architecture at universities and institutions of higher education in Iran.

The second issue in educational planning for sustainable architecture is that even in the case of the expected demand from the graduates and experts in architecture, there is no sufficient qualified instructors and necessary scientific staff in universities and institutions of higher education, since many instructors in architectural faculties which established in recent decades are those who have been educated at inside country universities and did not pursue their postgraduate education in an special expertise. As the only instances of sustainable architecture education in Iran are those faculties which have special committee in sustainable architecture, like the planning committee of sustainable major in the faculty of architecture and urbanism at science and technology university in Iran and group of energy and architecture in Pardis College of architecture, department of fine arts of Tehran University which their instructors have special education and scientific and executive records related to the topic of sustainable architecture. Thus, the problem about lack of qualified teachers in the field of sustainable architecture in all the universities will be a major problem in developing educational programs for sustainable architecture. It is obvious that due to the nature of sustainable architecture which is associated with various specialties and sciences its academic programs are designed as interdisciplinary or multidisciplinary in other countries. Therefore to pass their credits and obtain adequate information for advancing their researches, students can take some courses in other faculties or to get their instructors' advices in doing their researches and studies. Also some

university courses of mentioned programs are in need of special equipments and facilities and should be done in equipped laboratories and for conducting some other researches collaboration with university research centers is required. Thus programs related to the sustainable architecture are mostly held at universities which have sufficient equipments and facilities in order to hold the high qualitative courses and conduct interdisciplinary and multidisciplinary researches.

Due to the quantitative growth of universities and centers of higher education in Iran many architecture faculties are located in poor qualitative and unequipped academic environments and small numbers of faculties are in comprehensive universities have the possibility of holding interdisciplinary and multidisciplinary academic programs and also the research centers that are related to the sustainability researches environment, physics, energy which can conduct sustainable architecture researches are few in numbers. Also, most architectural faculties are located in universities which cannot provide the necessary equipment for conducting laboratory courses, thus it's impossible to hold interdisciplinary and multidisciplinary education courses and specific classes that require special equipment in many universities and higher education institutes in country. Thus, lack of required equipment and facilities for sustainable architecture education in Iranian universities, is one of the fundamental problems which is faced by educational programmers of sustainable architecture.

The fourth major problem is about educational strategies and culture of teaching in universities which is about curricula type and the quality of university courses and educational programs that are related to sustainable architecture. Educational programmers of sustainable architecture education has been emphasized on holding student-centered and research-oriented courses since sustainable architecture has a dynamic nature and develops parallel to the development of sustainable concepts, thus its related issues can't be taught through a combination of technology and knowledge therefore they courses should be dynamic and have required flexibility for growth and development and because of this reason teacher-oriented teaching strategies are not appropriate for holding educational courses. Sustainable architecture education should be done through new methods of student-oriented and student-research ones to provide an appropriate educational environment for intellectual growth of students. Since architectural education in Iran, take place based on the common educational culture of the country and most university classes and workshops are held in the form of teacher-oriented method and students just try to learn whatever their teachers teach them thus another issue that arises in the development of sustainable architecture education is the lack of cultural and educational strategies for teaching sustainable architecture education in Iranian universities.

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