



Sustainable Architecture in Educational Space of Iran

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Paper Reference Number: 07-02-6035

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Abstract

With the rapid development of modern world, it is totally considerable to receive attention environment, saving fossil fuels and sustainable development, so there are global concern about energy conservation, keeping land and environment, reducing the use of fossil energy coexisting with natural and climate conditions in architectural and urban design.

Nowadays one of the most important energy consumers is educational space all around the world and my country is no exception, that's why, the aim of the present essay is to start to provide such information to promoting energy efficiency and improving quality of life as well as quality of the environment in this space. As far as traditional architecture of Iran is a good example of a remarkable sustainable that takes many new concepts in new world. As a result, this topic compared two educational space in present and past. Of course it goes without saying that we can enjoy the benefit of old suitable techniques in our constructions. This study has been used analytical-comparative methods and library search to analyze the traditional and modern schools in Iran.

To put it in a nutshell, we would like to asserts the importance of sequencing specific spatial, pay attention to social and cultural situation, adapt to the environment and climate conditions, and create special physical architecture in design, therefore using this matter is no longer just a dream but a reality and it heralds a new dawn for the sustainable earth.

Key words: sustainable development, educational space, traditional architecture, modern architecture

1. Introduction

It is well-established fact, Consider issue of context and related to environment surrounding are so important point in sustainable development and architecture.

The controversy part of this issue is how to execute of interaction and kind of innovations about sustainable school.

On the other hand, for a long time, our predecessors have used of special skills, specific rules, techniques and effective use of energy and natural resources, particularly solar and wind and coordinate it with the climate while nowadays this subject is brought oblivion.

These measures not only in the field of environmental sustainability, but also in other aspects such as social and economic aspects are obviously.

Contemporary society is experiencing a kind of architecture that has been rapid transition from a traditional society to a modern society.

While not thought about it and has not developed a plan for the future. Like many other countries, the main challenge will be faced with the problem of identity crisis in future.

Hence, so many of the architectural features have been forgotten in the conservation of national resources and welfare of its residents.

In today's world, we are facing energy shortages and it is clear that approach of Sustainability architecture is only possible solution that looks to existing problems of the present and the future. In this regard, this subject debates the use of fossil energy and other forms of non-renewal resources, access and use of energy, particularly renewable energy.

The architects and designers should improve situation of use of renewable resources (solar, wind, water) and fossil fuels by optimal architectural and designing in first step for development of future.

So as to, this paper tries to demonstrate value of architectural art at school, that's why; it is one of the most consumer spaces in our country. Of course it goes without saying that we can enjoy the benefit of old suitable techniques for our construction in future.

2. Sustainable Development and Traditional Architectural of Iran

Nowadays, sustainability development is one of the most important subject and common issue in international level. Environmental organizations in the world especially UN agencies involve in this topic.

The report popularized the most commonly used definition of sustainable development: "Development that meets the needs of current generations without compromising the ability of future generations to meet their own needs" (WCED, 1987).

The developed countries acknowledge the responsibility that they bear in the international Pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources.

Sustainable development activities related to construction is called stable building.

Construction is one of the greatest social and economic sectors that plays important role in changing natural environment and is known as a key of global sustainable development.

The most principles of classification of sustainable architecture are:

1. Conservation of energy
2. Coordination of climate
3. Reduce the use of new resources
4. Meeting the needs of residents
5. Coordination with site
6. Holistically (Zandiyeh, 2010)

The value of any architecture space depends on accordance with its particular climate region.

Climate design is a way to reduce the use of energy in building and is known the first line of defense against external climatic factors.

In all climates, buildings have built according to the principles of climatic design that can use natural energy and reduce apply mechanical heating and cooling.

The design of such buildings due to the high cost of heating fuels, emphasizing the use of solar heat is utilities. Many climatic design techniques such as insulation or underground building can reduce heating and cooling cost. When natural ventilation is used with other techniques can be provide a comfort conditions in the hot summer months easily.

Building based on the factors of climate, weather not only good performance but also provides a healthy and beautiful human space.

Iran is one of the few countries in the world as which has a very diverse geography and climate and diverse environments. In some cases the temperature difference between the two areas is more than 35 degrees and so on architectural structures and the wide variety of different areas of the country have formed and due to they can identify how geography and climate the can precise understanding of on aid architecture.(Kasmai, 1989)

It is an obvious fact that this special Geographical and climate with Intelligence of our proceeds create unique architecture.

As a matter of fact, Iran's traditional buildings in architecture art and construction field have been formed with emphasis on natural resources. Therefore in this building can be seen the best examples of sustainable architecture with all the desirable properties such as develop appropriate with the nature, Save on local resources, effective, and proper ways to survive, including Subterranean , Wuthering And artistic landscape of water plants, air conditioners to soften, creating gardens and courtyards in the garden.

3. Traditional Schools of Architecture

Architectural spaces are the physical phenomenon which displays many cultural and social features of society, and also its civilization. The vast majority of traditional spaces are built on accommodating human needs and the natural and environmental condition. (Kasmai, 1989)

Traditional architecture accommodates with climate, using environmental resources and energy, and creates a moderate relationship between man, nature and architecture. It also presents an interesting living pattern. (Emani emadi, 2008)

Traditional and indigenous architecture thinking values human, considered him as an alive, dynamic, thoughtful, dependent nature and demanding Environmental conditions, and also make him to realize nature of environment, diversity during the year and different times of day and night accurately to create and build a proper physical spaces as much as possible the time has come. Thus it's important to understand this kind of architecture.

Traditional architects build public and religious building that revives a spiritual tradition which adds value to indigenous architecture.

Traditional schools which place in traditional context of Iran in terms of location have specific orientation. Proper orientation of buildings due to the motion of the Sun in the sky and optimal use of solar thermal energy in different seasons of the year. (Ghobadian, 2010)

These buildings valuable element is their yard. The yard is an unbroken part of Iran architecture and depending on climatic, cultural, traditional and religion conditions is used in a variable architecture styles. By inception of school, yard has always been a sign of its architecture.

The yard is used in different forms in Iranian schools, which include:

1. Privacy as a sign of ownership
2. The unifying elements in a school
3. Connecting several spaces at school
4. Green and lively environment for residents and students
5. As an artificial fan to pass appropriate winds through
6. An important element to organize and division of area into different parts
7. As a safe quite space for discussion and academic group (Zandiyeh, 2010)

And local people occur public and social affaires, specially celebrities and mourning. Green surfaces in central courtyard due to reduce reflect of the sun's rays, preventing ambient air temperature getting higher. Also full leave tree's and their shadows help to reduce sunflo

surfaces and walls in the courtyard. Sometimes these trees play the role of windbreaker. Evergreen or deciduous tree selection depends on the climate.

Pool of water in the middle of the courtyard for moist air, creating a good visual and sound. Sometimes using water jets inducing a sense of calm. These are the small sample of usages of water in Iranian schools. (Zandiyeh, 2010)

For example, in hot and dry climates, evaporation can reduce temperatures. Evaporation of water in an enclosed area space depends on relative humidity of the air and temperature of the water. The ancients were well aware of this. (Ghobadian, 2010)

Also, most of the daily activities of the school was carried out inside the porch. Because in verandah the ventilation was good and it was in the shade.

Mostly, around the yard there was a large and high verandah, in order to control sunlight and air.



Fig 1: Sadar School, Isfahan



Fig 2: Chahar Bagh school, Isfahan

The use of ecological materials provides appropriate thermal capacity that it is one of the technical ways of the regional climate in architecture schools in Iran and so on they can reduce cost of transportation.

A good example of such a school in northern is Gorgan's Emadieh school that was made by wood. In central region of Iran there is Yazd's Ziaeye School that was made by desert soil with clay and brick.

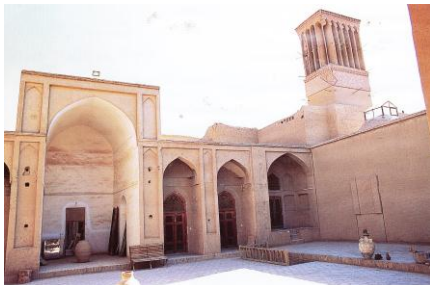


Fig 3 Ziaeye school, Yazd



Fig 4: Emadieh school, Isfahan

With an overview of the outstanding schools we find that the Iranians have long been familiar with the insulation and using building materials available, increase or decrease in the thickness of the walls of buildings made minimum heating and cooling and this is a manifestation of civilization in ancient Iran and Iranians.

Insulation in summer causes less heat into the building and in winter it prevents from existing heat and entering cool.

Insulation is one of particular importance features in the traditional architecture of Iran.

Hence there isn't roof covering both flat and curved architecture that is not two shells. With This method, in addition to lights the roof, it prevents from transmission heat to inside. These factors that were used in the worth buildings of architecture that Try to make a good space for living and studying..

On the whole, elements of sustainable schools are:

- Community-based planning
- LEED (leadership in energy and environmental design) and CHPS (collaborative for high performance school)
- Integrated design
- School as a campus
- Environmental curriculum
- Flexibility for multiple uses
- Water efficiency
- Energy efficiency
- Resource efficiency
- High-performance learning spaces
- Daylighting
- Improved air quality
- Thermal comfort
- Improved acoustics
- Commissioning (Gelfand, 2010)

4. Contemporary schools of architecture

Needless to say, during the last half-century, developments of civil society have created to need to expand public education.

As a result, many schools were built throughout the country in which technical standards and an environmental consideration is at the lowest possible level. Above all, the atmosphere within the school emerged with no constructive role in supporting the education of children and adolescents.

Built by the government with the aid of charitable funding, about 1500 schools pay no attention to quality of education; such schools are designed and built every year. out of 15 million students, 9 million study in two-period schools. Solving this problem and eliminating all two-period schools would cost 210 trillion Rials (US\$21 billion), which has not been allocated. However, the Iranian news agency announced at the start of the new academic year that 31 percent of new schools, in mobile and semi-mobile types, will be formed in tents and Kapars for 53 thousand students.(Irvani,2010)

Nowadays, the reality is that education under prevailing conditions- considering the high capacity which had previously existed in Iranian education and school design – is very weak in the quality of resources training, whether in management or education levels, and in school architecture.(Irvani,2010)

Although excellent designs based on the needs of students and adapting the learning environments with new training methods and educational technology have been the task of this institution, several designs of schools that have ignored the climatic characteristics and style of architecture of a region were constructed by this institution. Most of the schools produced by this institution in different areas and cities with different climates and needs have

the same physical shape. The definition of each space in school has no identity, only the classroom is important. Because it is the place where "learning" happens; the courtyard in school is valued the least. There are no specific differences between the design of public and private, disabled-children, and new village schools. They are all patterned after the same classroom-based model. (Irvani,2010)

This *cells and bells model* is the common model for controlling children the corridors provide the adults with the most "control." Students leaving the classrooms have nowhere to go because the courtyard and the whole building are easily controlled. In schools there are no spaces like semi-open space of the balcony in the old schools. All educational activities are performed only in the classroom, sciences labs and sport halls. (Irvani,2010)

In fact, the lack of collaboration between architects, planners, employers, parents, teachers and especially the children has led to the same projects to being created without any innovative concepts and ideas in the process of designing.

It is necessary to pay attention climatic conditions, in various stages of design, especially in buildings that use by man directly. As it is quite noticeable, there are two direct about this matter: the first: increasing the quality of welfare and health in indoor and the second: fuel saving devices that control the temperature of the environment.

Different structures have different effects from climatic conditions to depending on the prevailing economic resources to build them. Also different climates with different weather conditions have diverse effects on the structure. In this situation there are good performance and more accurate for students.

It should be noted that the thermal conditions within the physical comfort of heating and cooling installations and minimum consumption of fossil energy is created by use architectural techniques and design climate ways in educational spaces.

5. Conclusions

In conclusion, this problem is a very difficult one to address but we should make every effort to do so. Unfortunately, pattern of structure of contemporary school is intimate of Western school without regarding our culture and climate by enlightened and modernism.

From that time until now, despite of rapid development of content and education planning in recent years in Iran, but this trend have neglected the physical construction.

As matter of fact, common pattern of contemporary school is unqualified and there is no improvement to compare the past century. Eventually, our current schools of architecture have not included both valuable culture and a creative comprehensive about education. This architectural is a boring design that tends to repetitive model instead of present novel model and creative construction.

One of the main purposes of the design of structure, particularly school buildings is climate and student comfort. School climate design criteria should pay attention to people tradition, the feature of building in the past and etc.

In the past thirty years, we have seen schools which have been designed and constructed throughout the country with regard to our varied weather and climate, but unfortunately they follow limited models of school design. These are the "box" model and the classroom-based model, which have dominated Iranian school design for over 100 years without regard to changes in education philosophy.

In recent years, because of the increasing diversity of materials and quality construction, the structure of schools is better and more beautiful than in the past. But no changes have been

created in the classroom-based model and "cells and bells" model planning for most control over students in schools. This repetition of similar models and patterns is because we have gone away from Iran's unique cultural and architectural contexts and forgotten their principles. The state-centralism in Iranian organization of school has led to models and patterns which reflect nothing except the desire to build a school whose only aim is building a shelter for a number of students who will all learn the same thing at the same time in the same place for several hours each day.

As a result, we have lost creativity and innovation in management and design of our schools. Unfortunately, low budgets for research and study, less than those in other advanced countries, is another problem in this system in Iran.

Unfortunately, funding for research and study on the design of low-cost schools, according to dedicated in developing countries, and other problems in the system is

We understand that creating the whole changes and rebuilding in existing schools or constructing a new school with new approach in Iran is impossible or at least easier said than done. These changes require the assistances of all people such as architects, planners, teachers, students, parents and importantly state organization of school that accomplish renovation, development and mobilization in Iranian learning environments.

We hope that in the near future designers and planners will develop new innovative schools that will enhance the quality of educational environments.

Acknowledgements

The authors gratefully acknowledge the support of Mazyar Saffar Gharoni

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