

Basic Principles of Designing an Educational Space with an Approach to Promoting the Quality of Study Space by Investigating Case Study of Bauhaus School

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Abstract- Education plays a decisive role in promoting the level of knowledge, development and improvement of the culture of each society. Flourishing, creativity and innovation are three very valuable and remarkable words in today's world, and the promotion and development of each country is due to the same factors. The growth and emergence of creativity depends on factors other than intelligence and talent. Those who succeed to learn science, technology and arts at higher education institutions and universities approximately have spent one fifth of their life in educational environments. Research shows that one of the most effective educational factors in modern education is the quality of architecture in learning environments. In the new education system, educational spaces in schools are not considered as dull and insensitive environments that are ineffective to the learning process, but are viewed as a living, dynamic, and highly influential factor in the quality of educational activities of students. In this approach, the education of students is not only influenced by the teacher's words; hence designing the spaces with Iranian-Islamic identity, observance of standards and qualitative attributes, as well as paying attention to the psychological and physical characteristics of users of different ages are regarded as crucial and influential factors in raising the quality level of learning environments. On the other hand, attention to functional attributes, aesthetic principles and fundamentals in designing of educational physical spaces, in addition to meeting the physical and mental needs of users, will boost and foster their talents and creativity. Therefore, in this research with library and field studies, the necessity of having proper educational spaces and conforming to the values and principles of the society, which is one of the effective methods in benefiting from material and human capital, has been discussed.

Keywords- Education, Flourishing, Creativity, Innovation, Aesthetic Principles and Fundamentals

I. INTRODUCTION

The space structure is very simple in appearance and very complex and profound in reality. Evolutions in the history of architecture reveal developments in the culture, thinking and

encounter of man with his environment. The valuable works of the past in Iran's architecture have enduring qualities and values that reflect the deep and comprehensive thinking and vision of their creators. It should be noted, however, that the complexity and multidimensional nature of education and construction of educational centers that have physical and spatial dimensions, visual and perceptual qualities, aesthetic aspects, environmental and climate aspects, technology issues, etc., require collaboration of experts in a system-based and system related organization [1]

Educational spaces need to be able to meet the needs based on changes in educational patterns because along with the advancement of technology, the demands of students and teachers change as well. So the educational spaces should be able to provide this flexibility and to be responsive to sustainability over time. The need for flexibility in educational spaces can be categorized into functional, social, psychological and economic groups. Therefore, the need for adaptation to psychosocial and social issues requires more flexibility in educational spaces. The flexible pattern of a learning environment is the education process and the form of the learning environment, both the living space and the way in which the space is created. Several functions of seeing a space, as well as the possibility of its integration, differentiation and extension, are among the most important factors in designing of a flexible pattern. It is possible to study flexible patterns in various dimensions including macro-scale, in adjacent and integration with other elements and functions, and in creating a desirable city-like image that strengthens sense of belonging, identity, self-esteem and honor in a student. On the intermediate scale, the organizing of components, the number of classes and the type of communication spaces in the educational environment that respond to today's new and dynamic learning, and the advancement of technology and its speed in recent years, and in a micro scale, in the accuracy of the action depends on the choice of form and form of educational components, furniture, scale and details so that they have positive sensory perceptions in accordance with different uses that may have over time [2].

Education is influenced by space, and in the designing process of school, the main goal is to create sustainable schools with Iranian and Islamic identity that symbolize the culture of

society. The most important factor that can express the Iranian-Islamic identity is sustainability. Sustainability is defined in the form of beauty, strength, performance, technology, saving in construction, fit with the environment and relying on Iranian-Islamic values; in other words, school architecture is an instrument for the immortality of Iranian-Islamic civilization. While the architecture of schools during the contemporary era has created memorable spaces, but in most cases linear and uniform spaces were formed that often lacked Iranian-Islamic identity. According to the education experts, these schools are set of dull and apathetic spaces and do not provide a suitable basis for students' mental and behavioral interactions and activities [3].

It should be noted, however, that educational spaces play an essential role in the social and cultural structure of the community. On the other hand, educational system is one of the most important and effective factors in the promotion and development of children and adolescents. Rapid population growth, migration and displacement throughout the country have led to urban growth and change in resettlement of residents in residential neighborhoods. Changing population density has caused not only housing problems but also problems in providing urban services such as commuter networks, facilities system and educational spaces. Private land ownership and the lack of land and sufficient space to create new schools and the development of existing schools have faced urban areas with shortage of spaces. In addition to the above mentioned issues about the sustainable urbane development in order to provide sustainable spaces, educational services must establish appropriate coordination and location with the city's texture and landscape. With the establishment and proper adjacent, one can set up an educational environment as a disciplined organization with a desirable quality that has the features and consistent principles with that set. In this regard, in this study, considering the importance of education and rich history in Iran, firstly the history of school developments in Iran, new education, the impact of education goals on the performance of educational spaces, the role of the physical environment in the dynamics of modern education, the definition and the role of creativity in architectural design, factors affecting creativity development, and etc. are taken into consideration to provide appropriate data for initiating research and formulating ideas for the desired design.

II. MODERN EDUCATION

The educational system as an institution responsible for the education of children and adolescents plays a significant role in establishing the link between culture and the progress of society. To this end, as one of the main pillars of cultural development it is very necessary to come out of this strictness and inertia and to conform to the basic needs of the modern society. Education should be regarded as a process by which a person learns how to express his/her beliefs through various experiences, communicate with the community and ask the world to answer his/her growing needs in reaching to perfection.

The existing relationships between school and community, inadequacies in educational programs, inequities that are rooted in existing the social systems among students of a country on the one hand, and between students of the same country as compared to the students of other countries, has led to doubts about the basic principles of conventional education systems that assume all schools and their approved programs as the sole source of education.

The existence of intensive teaching hours, the provision of similar materials and the monotonous and routine teaching methods will lead to a loss of sense of initiative, creativity and destroy the spirit of innovation in students. The United Nations Educational, Scientific and Cultural Organization, UNESCO, has been studying these issues for the next century and has warned that if educational systems operate in their own way, there is a danger that educational goals will be unrelated and unbalanced to the goals of the next century and new global unions. To this end, major changes are taking place in the national, educational and educational systems across the globe and in all countries without exception.

Earning high level skills, gaining knowledge and understanding through experience and experimentation, research and development of information, innovations, diversity in educational methods, individual training and group decision making, attention to individual and group needs, face-to-face issues and immediate resolution through knowledge and thinking, the use of knowledge and advanced technologies in education, distance education, the widespread use of computers and the internet information network, and etc will be features of education in the future. Obviously, in the tomorrow world and in this field of competition, those societies will win that accept to go under these transformations in all fields and adapted them to their culture [3]

III. THE EFFECT OF EDUCATION OBJECTIVES ON THE FUNCTIONING OF EDUCATIONAL SPACES

Each society predicts its goals and objectives for its educational and pedagogical settings. For example, the school should be able to develop healthy, knowledgeable, thoughtful, creative and competent people so that they form the cornerstone of a desirable society and provide the context for economic development and social growth. If the educational system of a country looks at "creativity" as a criterion for growth, then it is necessary that the conditions for creativity to be developed from childhood.

The prerequisite of the "creativity" is to use open space architecturally and supportive method educationally as a pedagogical method.

Traditional spaces with fixed benches ... as behavioral sciences experts stated lead students to obedience not creativity and imposing punishment increase fear of mistakes and hinder the courage that is needed for innovation; Therefore, this reflects on the student's innate desire for curiosity, explore and discovery, and insists on using all the physical possibilities of the environment to distort his mentality [3]

IV. THE ROLE OF THE PHYSICAL ENVIRONMENT IN THE DYNAMICS OF MODERN EDUCATION

The primary form of education from the very first years in most countries, and especially in Iran, has been against the strengthening of the spirit of investigation and curiosity, and has been the enemy of curious and exploratory spirit of its audience. The primary education system has not working to educate students, but has attempting to be informed of the research of others. This quality goes beyond the curriculum to the physical environment of education in current schools.

The education environment in the current school is inherently created according to the classic principles, the infusion of information and knowledge into mind, and has not been designed to look for new material and therefore from the very early age of childhood has accustomed the mind uninterested to research. This laziness of the mind itself appears to be reluctance to research at an older age. Our schools are based on two assumptions: "Understanding merely involves listening and learning to the product to memorize it." In this environment, the basis of the work is education and hence less development can be achieved. During this training, the teacher's speech is organized by textbooks. In order to achieve such a situation, in fact the teacher is decision maker, and students are arranged in the classroom on one side toward the teacher. In the educational process, just speaking and listening as two parts are joined together, and therefore the search and discovery of the concept of observation and experience are out of order and the necessary tools and facilities are not found in the class. In addition, other school spaces other than classrooms, such as corridors, courtyards, and so on, are by no means sprightly spaces and fitted to the users' spirits.

In recent decades, the discussion of the new education environment has changed the system of primary form of education in some developed countries and pursues two major goals.

- First, human beings must grow beyond a store of information and recitations, and develop to be an dynamic and explorer mechanism.

- Secondly, the aspect of development should be as important as the dimension of education, and in this way, in addition to the mind growth, the evolution of his personal and social personality should also be considered. This debate is a kind of new educational thinking that recognizes human innately willful and eager to learn.

What encourages this desire and directs it, or represses it, and even provokes adversaries to learning, is the educational environment.

According to advanced psychological ideas, the human mind is naturally explorer and even without the use of extrinsic agents, such as punishing and encouraging, tends to seek and discover. Based on these findings, the human soul is a mass of questions and ambiguities that leads him/her to research and learning tirelessly. Based on this, the atmosphere of modern education and the nature of the students are quite similar, and it

seeks to guide his/her explorer force and researcher soul towards the desired knowledge.

In this way, in a progressive learning environment, the student takes responsibility for his or her teaching, and strives to collaborate with other students and with the help of teacher is led to research, experiment, test, learn, create, and innovate. This is the phenomenon that today is known as the "student-centered" learning environment, in which one is educated by the whole environment and with all its facilities, not just by the teacher.

The first feature of this environment is the diversification of the factors and methods of education that provide a very large opportunity to serve the tools and educational equipment. Many of knowledge are perceived to be better and more durable in terms of objective observation and tangible experience than to describe and hear.

The second feature of this environment is that education is considered to be a collective and a collaborative effort. In this way, during the learning process, the social character of a person also grows and makes him more ready to participate in social activities.

The third feature of this environment is that research is as important as the final outcome, and the way it is investigated and the method of analyzing a problem is as effective as the answer itself in an learner's mental development.

Physically, the most important issue in such educational spaces is to break the line of view of the teacher and the disciples and create space for communication between individuals. For this purpose, the design of arranging students against the teacher is eliminated and, of course, linear rows are known to violate the student's morale. Research and experience are a collaborative effort, and therefore the classroom and school environment is designed for student group interactions and the creation of a constructive communication opportunity between them. Training in this environment requires education and reaction, and sometimes it is necessary for the teacher to guide and direct the student in a close distance.

Research, experience, discovery and initiative in this environment are the main goal of education. Psychologically, a dynamic and creative educational environment has attractiveness that is consistent with a soul full of child and adolescent joyfulness, and its sense of space. Learning is not for the child to join the adult world, but as a mental and emotional recreation. An environment that does not have the power to trigger excitement and perception cannot result in the growth of exploratory and creative power [4]

V. LOOK AT CREATIVITY

Since doing anything based on creativity will have a more valuable result, knowing creativity, defining features and defining its characteristics is an appropriate prologue for any action. But the point here is that there has been a number of definitions of creativity and expressions so far that, of course, none are entirely rational and complete. Each of these

definitions or explanations must be extended to cover all aspects of the concept in the name of creativity [5]

It's possible to divide expert opinions about creativity into two categories:

- Creativity is synonymous to problem solving or creation
- Creativity is a tool to solve a problem or increase

Therefore, in the following table, the definition of creativity is presented in a concise way, depending on the idea of each author in relation to the purpose of the present research.

TABLE I. CREATIVITY DEFINITIONS [6]

Definition of creativity	Author
Vernon defines creativity as follows: creativity, the ability of a person to create ideas and theories, insights or new and innovate objects, reestablishment in the sciences and other fields that are considered by the experts as innovative in terms of Scientific, aesthetics, technology and social value.	Hosseini, 1378
Creativity is a process that is the result of a personal work and is accepted by a social group at a time as something useful and satisfying.	Budo, Khanzadeh, 1358
considers creativity as utilizing mental abilities to create a new thought or concept. Innovation is the application of new creative ideas that can be a new product, a new service, or a new solution to doing things.	Ali Rezaeian, Principles of Management in Education, 8th Edition, Tehran, Arasbaran Publishing House
Creativity refers to the ability to find unusual and high-quality solutions for issues.	Michael Aisenck, 1379
Creativity has been adapted from its verb, create and beget, and Creator is a person with new ideas and opinions. Creative is one of the main traits of god and creativity is the force that leads to the production of exquisite forms.	Dehkhoda, 1347

VI. CREATING LEARNING ENVIRONMENTS WITH IMPROVEMENT OF SPATIAL PERFORMANCE

To illustrate this section, you can refer to a library called the Heart of School Learning. In today's developed countries, the role of the library and the relationship of the library with education in terms of technology and sociology has been studied and based on this research, it defined a certain definition of this word among the classes of communities, and then, the purpose and methods of learning in the library analyzed and evaluated, and clearly found that libraries occupying only 5% of the physical space and had a 77% impact on making students to think about learning.

It should be noted that the purpose of library design is not to create boxes or rooms or cages for keeping books, but also to create a space that is in continuous communication with school and students and to emphasize study and learning as two interactive principles. With that in mind, the library should be designed as a pleasant and inviting space for studying.

So in learning environments, creating a library of space for bookkeeping, educational videos and audiovisual cameras, individual and group study space, cafe, free space and

relaxation, and the use of soft and comfortable sofas and flooring it and also uses warm colors and bright colors, the use of warm texture to create a cozy and comfortable atmosphere, appropriate lighting in space, the use of circular or elliptical shapes to excite parts of the library for various activities such as study with open shelves, group tale telling, drama performances and more is very important.



Figure 1. Library in Learning Environments [3]

VII. CONSIDERING THE SYSTEM OF GROUP EDUCATION

Architects in sociological and psychological studies found that by creating workshops in the library and other educational spaces in areas such as experimentation and practical experience of learning subjects, artistic activities, learning foreign languages, learning to work with computers, providing entertainment and whatever that is effective in creating a freely evolution in the growth and development of human personality and in identifying their talents, they will be able to create an active and dynamic atmosphere for raising the level of learning and its quality. In such environments, most of the training is indirectly and in the form of group training. Places with such characteristics will attract learners to perform collective and group activities, and thus, the school as an environment for activating students to the concept of research will be able to create an active, mature, and dynamic environment. Creating places such as painting workshops, science, maths, etc., if these types of workshops are group based, they can awake the need for collaboration, the intellectual growth, and self-development in students. In these workshops, it's best to look at the personality, the physical, mental, emotional and social conditions of the students.



Figure 2. Workshops [3]

Extrovert audiences tend to be more team-oriented. But introverted and shy audiences prefer to work alone. For this purpose, in many schools, part of the workshop is dedicated to individual workshops, where students begin to work and their talent and creativity flourish. Painting workshops have a very important role in raising skills, self-actualization and confidence in children's lives.

VIII. SCHOOL AND ITS SURROUNDINGS

"Louis Kahn" defines the school term as "all places where people use them to supply their demands for learning" is called school and these places are not just for learning and acquiring ideas and beliefs, but are also being used for understanding and perceiving the reasons of existing everything and the reciprocal occasions and the relationships between man and nature." "Walter Gropius says," If educational environments are to be effective areas for future generations, the environment and its buildings should be creative, not imitated. A stimulant environment for freeing thought and creative expression is just as important as teaching. "

In general, the quality of the environment in which the individual learns; that is, factors such as space, color, light, sound, ventilation, and, in general, the amount of pleasure he gets from that space is affecting the quality of learning. The environment acts as a living and dynamic factor in the quality of educational activities. The doors and the walls of the school speak to children and young people. Long and thick walls, tall corridors create a sense of imprisonment and repression in child, and on the other hand, a flowering and verdurous environment and perfectly clean classrooms with proper color suggest calmness and vividness.

Of effective educational factors in modern education is the condition of school architectural spaces, teachers, educational management, family, books, students, teaching methods, and etc. that are usually considered effective in the process of learning. The school should be established on a flat ground and be located in the vicinity of neighboring buildings, in a way that it gives the possibility of moving and displacing and consequently ventilating the proper air of the space.

The significant changes that have taken place today's in school policy and planning are as follows.

- In the past, instruction was based on standard books and classrooms, but today educational methods have changed the design of schools. The beneficial use of new teaching technologies in schools has created a lot of flexibility in creating spaces. For example: creating many special spaces that cover a variety of artistic, scientific and cultural issues.
- In the past, the design of buildings was rectangular block designs, but today there is a large variety of school buildings. This variety includes a variety of specialties such as vocational schools, music schools, and so on.
- In the past, there were large scale classes with a capacity of about 37 students or more, but today teachers and families are demanding less class sizes and their capacity is for better education for students.

IX. EXAMINING A CASE STUDY FROM BAUHAUS SCHOOL

Walter Gropius founded the Bauhaus School in Weimar in 1919 with the integration of the academy of Fine Arts and the School of Arts and Crafts. In his first statement, he combined William Maris comment on the elegance of handicrafts with the idea of the unity of all arts (with the priority of architecture), and rejected the dissociation of the decorative and applied aspects of the arts. Later, in 1923, he emphasized the importance of the artisan designer in large-scale industrial production, which was regarded as the main principle of Bauhaus's teachings. Subsequently, Bauhaus workshops became prototype manufacturing labs for machine manufacturing, and many products from these workshops (in particular tables and chairs, textiles and electric lights) were put in the factory production line with agreement of industry owners. The quality of the material was of line and shape refinement. Bauhaus moved from Weimar to a new location by designing a number of new buildings in Dessau (a result of group work by Gropius, teachers and students).



Figure 3. Bauhaus School

A. Plan

It seems that the plan itself to be inspired by a question mark whether it is appropriate to the type of work that is done at school. The classes are rectangular and the administrative and classrooms are close together and have a circular and linear and longitudinal space that has a long path, but this problem has been addressed with making two staircases on both sides and provides better circulation. But there is no main hall where the main divisions take place, the corridor performs instead of the main corridor and seems to have a smaller width that is likely to be problematic when entering and leaving, and the library and study room are behind the school and more in the corridors and located in silence away from the street and is considered the right place for it. The plan shape of the straight lines is cross-shaped (horizontal and vertical), which leads to square and rectangular formation and in general gives a balance and stability of comfort, which means that the environment is a quiet and usable for education.

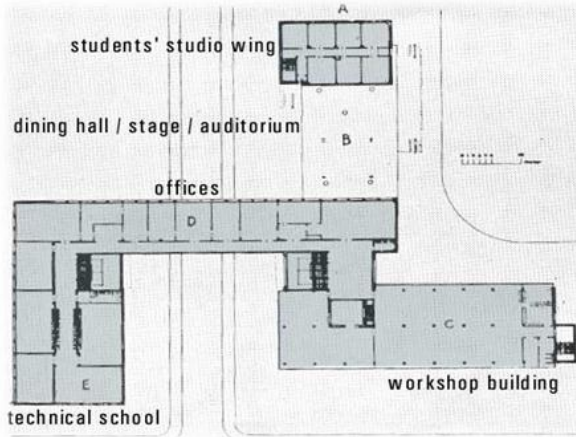


Figure 4. Bauhaus School Plan

A hard volume consisting of a combination of square and rectangular cubes at different heights, and like the shape of a square that gives stability and relaxation, and in the view, despite the use of vertical lines, the horizontal lines are used that show themselves but because vertical lines are repeatedly and closely spaced, they create horizontal lines naturally, and each training space requires a window that overlooks the outside. The light that reaches the educational space must have at least 20% of the floor space that is well-suited in this building.



Figure 5. Bauhaus School Volume

B. Climate

Considering the green trees and the roofed houses around the building, it can be recognized that the climate of the region is highly rainy and may be cold and according to the materials that seems to be concrete is used to be proportional to the climate but the color itself, which is white, does not absorb light, because the climate is probably cold it would be better to use dark or warm colors, which, along with the rough texture, absorbs light, and it would be better to have the ceiling in form of gable, but the dark color of the ceiling is appropriate because it acts suitably for absorption heat and evaporation of the remaining water.

C. Color

The colors used are white, black and gray, which is examined in terms of climate, but white indicates innocence, cleanness, youthfulness and perfectly fitted with the work, and the black color is used only on the roof, without any visible facade. It is not visible because it has a contrast with the white color, so it is best not to be seen and the color of the tint was only made in a particular volume and the designer probably intended to display the volume separately.

X. RESULTS AND CONCLUSION

In general, educational planning includes goals such as providing solutions for creating flexible learning spaces and the use of effective components in designing educational spaces should be taken into consideration by the designers. In fact, the goal is to create an optimal space for training and learning. The nature of educational spaces is a unique pattern requirement for research and the creation of an appropriate reaction to education. Provided that there is a consistent and continuous interplay between the three principles of education, student and the educational environment. Since then, in learning environments, attention to interior design characteristics has been raised not only in terms of improving the quality of the environment but also as an instrument for raising the environmental impact on users' behavioral characteristics, and many schools and educational spaces have been transformed from integrated education into individual training and small groups of students, so the need for schools with more open plans has become more conspicuous. Therefore, in the present study, considering the parameters of the physical environment of schools, creativity and the improvement of spatial performance in it, as well as the type of educational system and the improvement of the quality of the school system, the importance of the effect of the type of activity in the educational environment in the design of the environment and its space was studied.

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