

Evaluation and Analysis of the Approach to Interaction-Oriented Spaces in Academic Complexes

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Abstract

Researchers classified the relation of natural environment into three levels of watching the natural landscape or some pictures of nature, being in nature, involvement and interact with the nature. They believed that exposure to nature led to positive reactions from being effective whether voluntary and knowingly or unaware and indirectly. Lots of studies had been performed on relation with natural environment effects on people in recent years which revealed that it had been reduced stress and eye tedium by not only being in natural environments but also stark observation of nature and even seeing natural landscapes pictures and videos. So, the aim of the present research was to analyze some academic buildings and describe their architecture.

Keywords: University, Dormitory, Student.

Introduction

Architecture is one of the oldest arts and tactics which had been considering by human almost from the beginning of sedentarization. Each settlement belonging to the ancient and prehistoric millennia of history are as an important document of architecture antiquity. This specialty deals with the administrative and visual phenomena and problems on the one hand and on the other, with theoretical debates and artistic phenomena. Restriction in amplitudes of human's culture, knowledge and cultural phenomena in ancient times had caused a person designed, implement and even construct some parts of the building in the field of designing and construction of simple and functional structures (Bahraini, 1998). Architecture activity did not pose in some primitive, simple and little settlements even in as specialized case. Some of the members of each family constructed, repaired and retained their own settlements. The purpose of the design and construction of architectural spaces were creating the shelter and enclosed space to protect humans from unfavorable natural phenomena and risks of the animals and something like that predominantly but gradually in developed societies had resolved all or most of the essential needs of people appropriate to the circumstances, architecture spaces did not design and construct only to meet their basic needs, rather it had also considered some of the social and religious psychological needs and demands (Ardalan, 1986).

Baker Dormitory

Baker dormitory located in Massachusetts, America was designed by Alvar Aalto in 1946. General idea in Baker dormitory was increasing river lines passing in the southern part of the site. Early sketches of the plan showed that all rooms had designed to the south but the plan was changed due to lack of space. Designing the form was more based on being away from the traffic and had 43 rooms which include 22 different patterns. Facade was of rustic red brick and the whole volume of the structure was related to nature. The building had been considering handicapped movements a lot (Bacon, 1997).



Figure 1. Plan of Baker dormitory (Source: Arch Daily site).



Figure 2. View of Baker dormitory (Source: Arch Daily site).

A new dormitory for Heidelberg's students

Complex form had designed as a central courtyard which was not only played a rule to access input but also, was a position for meetings, recreation and a public space.



Figure 4. View of Heidelberg dormitory (Source: Arch Daily site).



Figure 5. Plan of Heidelberg dormitory (Source: Arch Daily site).

Istanbul university campus

This collection was designed not only on the beauty, charm and comfort but also, it was tried to be compatible with its surrounding urban environment (Bacon, 1997).



Figure 6. Istanbul complex university (Source: Arch Daily site).

Canberra university campus

The first prize in the design competition of Canberra complex university was received by this project which introduced as layered structures of building which located between the past and the future. Discipline was the main element in creation of the complexity (Zohouri-khosroshahi, 2012).



Figure 7. Plan of Canberra complex university (Source: Arch Daily site).



Figure 8. Canberra university complex (Source: Arch Daily site).

Vienna university complex

The plan was designed by Zaha Hadid and placement of 4 buildings was the basis of the project in this complex work that is while there was no agreement on the components, the whole complexity would look integrated and the reason was the profound influence of one of the main lines of a building on adjacent buildings.



Figure 9. Vienna university complex (Source: Arch Daily site).

Conclusion

Some items can be offered since the standards were as starting points or project controller in many cases.

Spatial Planning

Architectural space is required for a school of architecture will gain from the existing requirements, standards and regulations and the same samples. Specification and features of each space would be represented after whole spatial classification and investigation of main spaces and functional diagrams. Then the required areas can be calculated with respect to per capita and similar cases (Sirous-sabri, 2013). Thus, available spaces are classified. The training section included classroom and its services, laboratory, workshop and its services, backup facilities on teaching and lecture hall and its services. The educational aid section includes computer center, audio-visualization and educational workshops. The research centers contain the center of documentation and research, technical office of research and education, centers of excellence, research cores, research projects, workshops, laboratories, journals and internal seminars. The administrative section included educational administration, faculty's offices and non-educational administration. The studying section included library, journals and dissertation. The public use section included an auditorium and its services, exhibition and its services, nutrition section, health and sports facilities, green spaces, center of student's activities, print, copy and publications of its projects. The support and maintenance section included sentry and custodian, installation, parking and warehouse.

General characteristics of spaces

A) Educational spaces - Theoretical training

Classrooms must equip with audio-visual equipment. Some facilities should predict in classrooms were possibility of darken the classroom, observation the minimum distance of 110 meters between the first row of seats and the board or screen, considering the proper orientation of audiovisual devices, such as the OPAQUE, overhead, video and so on (Imami, 2013). The door width: for classes at least 110, for better transport of teaching aid spices. The class height: It depended on day lighting conditions and external factors (buildings, trees, etc.). Height of 3.25 to 3.75 was enough for a room with depth of 6 to 8 meters. In case of more than 6.5 meters depth in the room, it needed front window for uniform lighting which must be at least 1.20 meters wide and 2.5 meters height.

B) Educational spaces–Practical training

Important cases in workshop and atelier spaces were considering studio lighting, space for needed supplies of atelier, teacher's room, storage and archiving of student's works and projects. Practical training spaces of architecture were as workshop and were divided into four domains (building architecture, art history and biological complexes). Practical training spaces consist of ateliers for designing of building, village, structure, art history and urbanism (Daneshgar-mohadam, 2011).

General characteristics of designing atelier

The main spaces of atelier where designing and drawing was done can categorize into different areas. *Ancillary service' spaces of atelier (teacher's room, warehouse, locker room...)

Teacher's room: is next to the atelier for coaches to temporary storage of projects and corrections

*Circulation and communication spaces

*Main hall (designing atelier):

This space has the following characteristics:

- A hall with a capacity of twenty to forty people

- Designing and drawing tables specified for each student

C) The educational aid section

This section includes the following: 1. Educational aid workshops for theoretical and practical courses and workshops include workshop of Marquette and a hall with free plan which its interior space is based on the equipment and model workshop tools and contains drawing table, tables in various sizes, the method, circular saws and chipper, cutting plate, grinding machine. 2. Building workshop: introduction to traditional and industrial construction methods, familiarity with materials, stuff and practical exercises, familiarity with technology and new stuffs, pottery and ceramic workshops, wood and metal workshops. 3. Research laboratories: for the construction section. 4. Photography atelier. 5. Judgment's room. 6. Computer's room. 7. Graphic materials production's room. 8. Video and tape archiving and distribution of audiovisual equipment. 9. Warehouse and tools repairing. Dressers and cabinets, general mobile panels, a large blackboard, teacher's table, bulletin boards and collective training location for group correction, warehouse and possibility of darken the atelier space in order to use audiovisual equipment.

D) Administration section

The administrative department is required at any training complex and is responsible for planning, management, protection and organization of communication with people, clients and other institutions. Management, secretary, conference rooms, archives and warehouse, financial assistance, education, public relations' office, copy, accounting, admission and registration, pantry and service...

General features and characteristics in administrative and management spaces:

Administration of a higher education institution consisted of two main parts:

A) The educational administrative department (faculty's offices, based on the number of academic and non-academic experts).

B) The non-educational administrative department (an average of about 30 persons at each architecture school, space assignment for any administrative staff: 13.5 square meters and net 10 to 15 square meters. These values are for the variety of administrative sections, administrative servicing, conference room and their services. The number of staffs of architecture school (administrative, technical and faculty expert and unscientific expert) is estimated as follows.

According to the Ministry of science, research and technology's standards, there is:

One faculty per 18 to 20 students in theoretical fields

One faculty per 10 to 12 students in practical fields

In the source of program and budget (without scrutiny on courses plan of different fields), one faculty was considered per every 15 students in average.

Designing of faculty's office spaces

Faculty and administrative spaces in each group should be designed with the same educational environment. Spaces for faculty and administrative staff must design in related and adjacent areas. But staff's office space shall become somewhat distinctive as possible because administrative referral of students must not bother faculty's office. Faculty spaces especially teacher's rooms should design in relative distance from classes and crowded centers and yet not so far from classes and laboratories. Offices of charge of groups must have a direct link with secretary's room and conference room and also head of specialized groups' room must be adjacent or nearby conference room (Bahraini, 1998).

Light in administrative spaces

Natural light was necessary with climate tips observance in administrative spaces but, in the selection priority, administrative spaces were in the second level in terms of the most appropriate building front and side after classes and laboratories.

Administrative sections in architecture faculty:

- 1. Office of the president and assistances (administrative, financial, student, education and research assistances)
- 2. Educational groups section (department of architecture and urbanism)
- In other words sub spaces of this section include:

President's room, secretary's room, meeting room, rooms of assistances and their secretary, accounting room, archive room, secretariat and typing, Xerox, teachers' mutual room, general services room, educational services room, admission and registration, documents and library, office of student affairs, foreign orders affairs, publication, consultation office, extracurricular affairs, welfare-service affairs, service and pantry.

E) Libraries and learning resource centers

Library of university surely was known as the most important building of the campus, as the repository of knowledge and wisdom and absorbs all members of the university community. Library and its modern derivatives such as learning resources' center requires a central location, a prominent figure, indoor access, flexible internal facilities and a combination of open and private spaces for studying. The sheer volume and symbol importance of the library among all campus buildings define the central area of university. Library bodes on learning as lecture hall indicates teaching. Libraries are study centers and buildings that learning has priority in student-oriented style. For this reason, they convert to computer-based learning resource' centers rapidly where knowledge is stored electronically, interaction between researchers forms via computer screens, books are replaced with CD readers and magazines are available by touching a keyboard. Despite the abovementioned changes in equipment, library maintains its central location in the learning environment. Todays, the required factors are copy and sampling equipment, access to personal computers and other electronic communication means with academies and other libraries. In summary, some university's libraries have converted into media centers that are linked to a series of books and in addition, the growth in student numbers lead learning resources' center of university to convert to the form of library which acts based on something except books like video, CD reader and internet increasingly. To enter such buildings, it must be faced with computer terminals and the clamor of conversation and the noise of machines rather than the residence of the traditional academic libraries. The academic modern library is indeed shop for knowledge that students can have an access with unprecedented speed. Since the books, magazines and computer terminals are the most important ways of access to print materials of science, academic libraries have two important accessible repositories for readers that include books and magazines and computer fields. Usually between two mentioned parts, it has been standing an entering space, the information and control systems, elevators, stairs, screens and office spaces for employees. Isolation and categorization can be done horizontally and vertically.

Air conditioning

In order to create the best conditions for storage of materials and techniques, space must be free of any dust, including gas, liquid and acid and under controlled temperature and humidity, such a situation is possible only with installation the full air conditioning.

Noise pollution

Generally, it is expected to libraries as quiet places to stop external noise through proper design of building structures and reduce internal noises through the separator pages, covering systems and air conditioning where outdoor noise pollution is an issue; the library must be a building with the sealed and double glazed windows and use air conditioning completely. However, usually a library can ventilate at least through the open window sometimes and open to the outside or middle open space. The Queens building at Anglia Polytechnic University is a good example in this respect. Noise pollution is internal and become more important especially with the development of student-oriented learning that is one of the manifestations of many new universities. The best strategy is library zoning with acoustic quietness gradation and to use glass separator pages or bookshelves in order to sound separation. Carpet may be required in areas with potential noise, but is inappropriate in the parts that are used much like the avoidance control areas. Audio flooring may be required especially in domed reading rooms in older academic libraries. Sound adsorption possibility is often more important in the areas of search and study of libraries. Although the books are partly barrier to sound reflection, but the design of surfaces such as walls, floors and ceilings and use of soothing furniture play a specific role in creating a relaxed environment. Air conditioning system could weaken too much noise with its quiet buzz.

Temperature and humidity

Books, magazines and electronic media require a space with proper temperature. Where there is a lot of water vapor in the air, paper materials may be damaged by mildew or tiny worms attack and where the humidity is too low, it is possible the paper drying. So, where the antique and rare books or graphic print books are kept, relative humidity would be very important.

Structural upload

Weight of books and their accumulation in the locker means that libraries have heavy upload points. In each meter of a shelf, books have 16 kilograms weight and journals on this scale have 27 kilograms weight. In a typical library, shelves should be able to withstand the weight of 1.2 to 2.6 kilo Newton per square meter. In the compact shelf systems such as book reservoirs, loads may be significantly more. With regard to the other loads (people, furniture, shelving books systems), building structure must be able to distribute the load and tolerate cargo of 6.3 to 7 kilo Newton per square meter.

Intense radiation and Lighting

In environmental and cost perspective, it is important to maximize the use of natural light. However, it needs controlling direct sunlight to prevent the production of excess heat and intense sun exposure. Direct sunlight and daylight under certain conditions can damage some of the papers, parchments and animals skin. Slighting control is required especially in areas where there are special collections of books. Daylight also must be controlled not to cause discomfort and eye pain in order to proximity of computer screens with direct light. Natural light has advantages consists of library cost decreasing, proper environmental behavior performance and creating a satisfying and live interior space for users. The use of daylight is possible through a periphery transparent environment, skylight and interior courtyards. To maximize the reduction of light in the library, the used map should not have more than 15 meters depth from the surrounding light walls (either the outer or the inner open space). The intelligent use of natural light lead to reduce energy consumption undoubtedly, while has adequate lighting for the interior spaces.

Entrance and lobby

Before entering the amphitheater main hall, a pre space is necessary for accumulation of audiences before the event. Lack of this space causes the accumulation and congestion of students and invitees in the public and communicational spaces. The amphitheater main hall: capitation of each person would be 1.21 meters utilization of hall according to the standards of educational spaces, the hall area will be determined by production of the capacity of the hall and capitation.

Equipment warehouses

For the establishment of special equipment of projection, video screening and films storing, the space will be considered next to the projection room.

Backstage rooms

These spaces include lavatory, interview room, curtain control parts and light and sound control systems, etc. If these spaces have been flexible, they can be used to support stage activities in certain circumstances of stage development. These spaces will be calculated in proportion to the main level of each amphitheater.

Projection room

This space is the place of projector devices and films are projected to the curtains from here. One or two persons would be responsible for projector devices, changing, adjustment and film representing agent. The projection room area will be about 12 square meters. Amphitheater stages can vary according to need and based on the characteristics of each program including cultural and artistic and presentation or lecture. Some changing factors of stage status are moving curtain above the stage and decoration mounted on mobile platforms. Due to the versatility of amphitheater halls of faculties, the stage should be in a way to be responsive for variety of activities on it.

Projector room contains at least two projectors in dimensions of 60×100 centimeters, table size of 120×80 centimeters for backing and review the film and sound amplifiers room. There are independent spaces for devices such as Rektinayer, the main electrical panel of projector room and trails of hall's light and metal shelves for storing movies. There is a small room for storing batteries special for safety lighting of cinema and lavatory next to the projector room. The size of the projector room is considered with regards to size of projectors, their spacing from each other and the side walls and backing and review tables and sound amplifiers.

The walls and floor of the projector room must have the ability to resistance to fire for 2 hours. Stuffs used in the projector room for acoustic and joinery should not be combustible. The floor of projector room must be doubled to transmit audio and electrical cables and its flooring must be insulated against electricity. It is also recommended to be a fire fighting capsule or hydrant near the projector room.

Light and sound adjustment room

This space must be next to the projection room and control the light and sound of the main hall. For the stage, a separate space is considered to control strength and weakness and direction of the sound if necessary. This room size is anticipated 29 meters. Generally, the hall designed for 15 to 30 percent of full-time students, staff and faculty. Other required spaces in a multi-purpose hall are makeup room, lavatory, display, goods warehouse and other essential services (Bahraini, 1998).

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