Interpretation of Information into Knowledge in Design based Education: the roles of teachers, students and librarians

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Abstract **— Architectural education is one of the design based education system. Its objective is to enable architectural students to develop their design skills while teaching them the basic principles and how to approach to a building design. The design studio which is the core process of the architectural education combines all relevant information derived from various disciplines and interprets them into knowledge. Then the students can create an architectural design of a building. Libraries are the essential information resources for the education system. The aim of this paper is to examine the role of the teachers, students and the librarians in the design based education in terms of obtaining, understanding and interpreting design related information into knowledge.**

Keywords – information; knowledge; design; education; teacher; student; librarian.

Introduction

The design is a creative process in which an object is produced theoretically. All design activities such as organizational, architectural, engineering and manufacturing are involved in the whole product design process. The theoretical, theoretical-practical and practical courses are the main resources of architectural design based education, and fed by different but interrelated disciplines e.g. architecture, engineering, art, sociology. The design studio which is the core process of the architectural education combines all information derived from those of various disciplines and interprets them to knowledge.

A clear definition of the roles of the people who are involved in architectural education is necessary to be able to reach and understand information on various subjects; then to relate it to the building and user; and to interpret this information into knowledge and to use that knowledge to create an architectural design piece.

The basic structure of the design based education and the role of participants are briefly explained in the first part of this paper. Second part indicates the function of the university libraries and the obligations of librarians. In third part, the teachers, students and librarians are related to each other in the design based education in terms of obtaining, understanding and interpreting design related information into knowledge.

1 Design based Education

The things that meet people's needs are either those that naturally exist on the earth or those that are produced by people themselves. Any product cannot exist without being designed and manufactured. Some people design for others, and some other people bring those of designs into physical existence.

Professions describe the involvement of people into design and manufacturing process. Therefore those professions require specialized study and considerable training on product and process related professional fields. Specialized study and training defines the education system which covers the methodology of teaching and learning that specific skills.

Acts and Actors in Design based Education : teaching and learning the design

Architectural education is one of the basic design based education system. The objective of this system is to enable architectural students to develop their design skills while teaching them basic principles

Although in teaching and learning process teachers and students play active role there is another hidden group of people that provides access to the resources of the courses. Librarians are in this group.

The Acts 'courses'

The courses in the architectural education can be classified according to their structure and contents. They can be identified as theoretical, theoretical-practical and practical courses in terms of their structures which indicate the basic way of teaching and learning process. The courses can also be grouped in terms of their contents under these headings:

- theory /fundamentals of architecture, theory of buildings, ergonomics, theory of town planning, etc./

- building science and technology /construction, building materials, architectural structures, structural engineering, building services, building physics, etc./

- history /history of art, history of architecture, history of town planning, etc./

- environmental and social studies /environmental control, landscape studies, lifestyle, user satisfaction and well-being, cultural studies, global and local issues etc/

- practice management /codes and standards, project management, construction management, facilities management, etc./

- design /basic design, design methodologies, developing design ideas and concepts, architectural design and alternative solutions, design appraisals, structural design etc./

As it is seen those of courses are compilation of various but interrelated disciplines. Their common purpose is to feed the architectural design studio.

The structural and contextual characteristics of those of courses indicate significant characteristics of the architectural education. Being a design based education architectural education [1] does:

- consist similar and dissimilar elements /heterogeneity/

- relate those of elements and brings out various new elements /connectivity and multiplicity/
- define and adopt those of new variants /a-signifying rupture/
- deal with visual communication /cartography and decalcomania/.

The courses carry one or two of these characteristics, too. However, reflection of all of them is seen on architectural design studio. The essential information derived from those of various disciplines is combined and interpreted into knowledge in the architectural design studio. Then students become enable to create an architectural design of a building and present it in a visual form. Therefore, design studio and the architectural design are complex matters because of the heterogeneity and connectivity; and uncertain because of multiplicity and a-signifying rupture characteristics. They are also unique because every design differs then the other; and value-conflict because it is open to personal judgments [2].

The Actors 'teachers and students'

There are two types of teachers in architectural design education. The first group follow a determined text of which mainly a theoretical course e.g. history, codes and standards. They are specialized on their own fields and focus on their own subjects. The second group gather and interpret the subjects into a form that can be used in architectural design e.g. theory of buildings, theory of town planning and construction, and they are mainly design studio teachers. Design studio teachers are specialized on architectural design. They give enough space for all design related subjects, and systematically help the students to transfer them into their mind. While the first group of teachers 'teach', the design studio teachers 'teach' 'discuss' and 'guide'.

The architectural students have two duties in terms of studying in a design based education system. First, they are required to learn the determined subjects. Then they are expected to extend their knowledge, and use it to develop their own design skills. However this is not a linear movement. Students have to educate themselves and develop their design skills while learning what design related subjects are. Most of the time they do the design work before they know what to learn in terms of what architectural design is. So they do the design while learning, they learn what to learn while designing. This process requires a systematic guidance. The guide in this work is the design studio teacher.

The Activities 'teaching and learning'

Information is essential to figure out what the problems actually are and how those of problems can be solved in architectural design. However, because the design is a complex, uncertain, unique and value-conflict matter it is not enough to provide only information to find an architectural solution. Information needs to be interpreted into "knowledge", since the knowledge is defined as "... a justified personal belief that increases an individual's capacity to take effective action..." [3], "…cognition, intellectual discovery, explanation and understanding"[4-6]. Translating information into knowledge and developing a designer's mind require systematic discussions on awareness, perception, reasoning and judgment.

In the architectural design studio, students usually expect teachers to teach them all "information". On the other hand design studio teachers expect students to translate "information" into "knowledge" and develop their design skill. When the teacher is too busy with teaching "information" they cannot find enough time to guide the

student in terms of developing his/her mind as a designer. Besides, if the student is too busy with learning all "information" in the design studio he/she cannot find enough time to develop his/her own design capacity and cannot make an effective decision.

Then, teachers should keep the balance between teaching "information" and interpreting information into "knowledge". And students are required to extend their knowledge by receiving extra information from the outside of the design studio. The texts of the courses are full of information. Also some other resources provide useful information to the teachers and the students. Those resources are available in different forms and stored in libraries.

2 Access to Information : University Libraries

Libraries are the essential divisions of universities. In a modern and developed library users can get access to necessary information in various formats and from various sources.

Acts and Actors in University Libraries : providing and reaching information

The existence of education requires teaching and learning process. Information on subjects is the basic input of this process. The requirement of the existence of information necessitates collecting, storing, providing and reaching this meaningful input [3-6].

The Acts 'collection'

The collection of a university library refers a group of informative items which were brought together for supporting teaching and learning. In the traditional sense a library collection is consisted of books and periodicals. However, as information storing progresses, now many university libraries carry variety of resources such as maps, prints, microfilm, microfiche, audio tapes, CDs, LPs, video tapes and DVDs, and provide facilities to access CD-ROM and online resources /internet, databases/, and any other form of art and media besides books and periodicals [7-9].

The Actors 'librarians, students and teachers'

Users of a university library can be grouped according to their relationship with the library. Librarians are long-term permanent users who provide services for teachers and students to find and reach information. The readers -students, teachers, researchers, and the other people who intend to use library resources- are short-term temporary users of the library who need information to fill the gaps in their study.

The Activities 'needing, finding and reaching information'

The existence of the education and library defines the activities within the library as well. The activities in the library are

- education which is fed by "information" / needing information
- collecting "information" / finding information
- teaching and learning need "information" / reaching information.

Teachers and students are sort of clients since they seek information within the library, and are like customers because they use the goods and services of the library. While they seek information and use the facilities within the library they also require assistance of librarians. This requirement is usually limited with the routine obligation of the librarian. The routine obligations of librarians are [7-9]:

- to search and obtain the resources which contain required information,
- to arrange them in terms of being accessible for the other users,
- to inform the other users about the available resources,
- to help and guide the other users in terms of using the facilities in the library,
- to provide specific resources to the teachers,
- to find the required specific resources which are not available in the library from other institutions,
- to bridge the gap between the teachers and students in terms of obtaining information related to the courses /reserving some materials for the courses according to the teachers instruction/.

However, librarians learn, use, teach and extend their knowledge about the facilities of their library as well as helping the other users. Besides the traditional sense of librarianship with the development in information technologies, librarians, also, trained and educated to deal with [7-12]

- research methodologies,
- navigating topics of interest for their readers,
- referring to other resources than the existing library resources,
- suggesting appropriate reference to reach information,
- developing, supervising and contributing seminars on research for their readers,
- analyzing enormous amount of information with a variety of electronic and digital tools, and
- managing access to those of electronic and digital tools,

The advanced abilities and skills on research and access methodologies of the librarians are missing while they are only requested to find a book or other material within the library.

3 Interpretation 'from information to knowledge'

Information 'from Design Teachers' - Knowledge 'to Architectural Students'

In architectural design education information-filled courses are taught by the teachers; students take the courses to be informed about the design related subjects; and information is transferred into knowledge in design studios.   In this transformation design teachers teach, discuss and guide the students. Students receive, understand and evaluate information. Then they become into position to make a design decision. Making a design decision by using processed information in mind is the situation that information becomes personal knowledge. The design studio is combination of the theories and practical work. So that, students are required to show their theoretical architectural design on drawings, models, computer graphics, etc. Figure 1 shows the educative flow within the architectural design education.
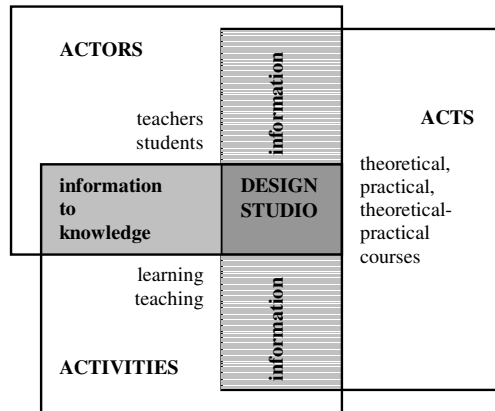
Figure 1 – Information flow within the architectural design education

Information 'from librarians'-Information 'to Design Teachers & Architectural Students'

In the university libraries librarians provide access to tremendous amount of information via many resources. Teachers receive information to extent the contents of their courses or sometimes order resources containing information to support their courses. Students reach information to extend their knowledge on subjects related to the courses. This process is a basic information flow between librarians, teachers and the students. Figure 2 shows the information flow within the university libraries.
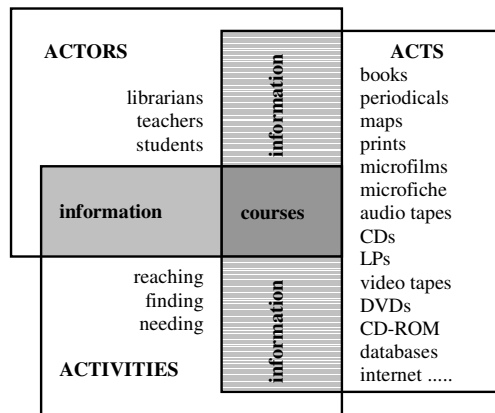

Figure 2 – Information flow within the university libraries

Information from 'librarians' to 'Design Teachers & Architectural Students' - Information from ' librarians & Design Teachers' to 'Architectural Students' -

Information from 'Design Teachers' to Knowledge to 'Architectural Students'

In design studios, excessive demands on teaching and learning all design relevant information can cause interruption in developing a design skill for the student. Design teachers can turn into only information provider; students can be over loaded with information. Then discussing and guiding abilities and skills of the design teachers miss; and it is unlikely to develop a design decision making ability of the students.

On the other hand, librarians can provide more advanced services then providing access to limited resources. They can teach and guide how to use the advanced tools; reach enormous amount of information; and analyze and focus on relevant information.

Using the advanced abilities and skills on research and access methodologies of the librarians can lighten the "teaching information" load of the teachers. Then teachers and students can find enough space to develop an approach to interpret information into knowledge. Figure 3 shows conceptual relationships between the design teachers, students and librarians in terms of transferring information into knowledge.
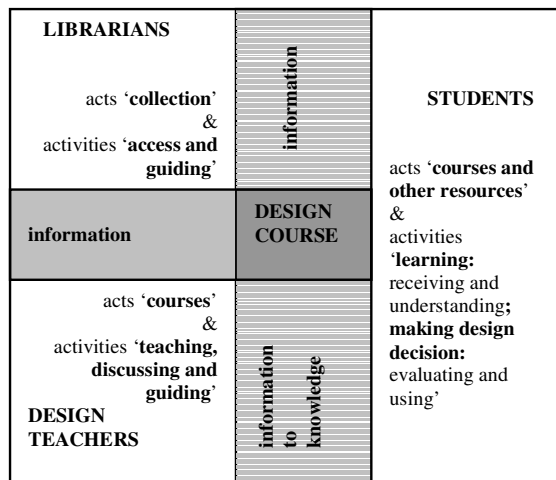
LIBRARIANS acts 'collection' & activities 'access and guiding'	information	**STUDENTS** acts 'courses and other resources' &
information	**DESIGN COURSE**	activities 'learning: receiving and understanding; making design decision: evaluating and using'
acts 'courses' & activities 'teaching, discussing and guiding' **DESIGN TEACHERS**	information to knowledge	

Figure 3 – Triangle of the educative flow 'from information to knowledge' in design education

4 Conclusion

Developing and architectural design skill necessitates relevant information to be interpreted into knowledge. The texts of courses and other resources provide enormous amount of information. However reaching this information is not enough to make a design decision. The design relevant information needs to be understood, evaluated and used. At the end students should have their own knowledge, and use it in their architectural design. Then the students can develop a design approach; and their design can become a unique piece not a copy of the other works. This process is realized in the design studio under the guidance of the design teachers.

The design teachers are supposed to give enough space to teaching information, discussing the students' approaches and supervising the design decisions. Teaching information does not mean accessing to all relevant information. It means teaching the basic principles of how to design; how to evaluate design related issues; and how to define the problems and to seek the solutions.

Therefore, it becomes necessary to receive a professional help in terms of having access to design relevant information. This help can come from 'teaching librarians' [11-13]. Placing some educative seminars on given by those teaching librarians can make students self-efficient in terms of seeking, finding and reaching relevant information. It also enlightens the design teacher's load in terms of providing all design related information to the students.

Acknowledgment

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