The Formation of an E-based Interactive Digital System in Architectural Education: The ADA Platform

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Abstract—This paper focuses on editing the components of architecture education and specially the experiences of design studios in the framework of the principles of constructivist education. For this purpose an e-based platform, ADA Platform is proposed to integrate traditional environments and digital environments of architectural education. In this study, the basic components of this platform is established.

Index Terms—Architectural design education, Digital Studio, Distance education, e-learning.

I. INTRODUCTION

Nowadays, it is inevitable to use interactive electronic media which is created by the opportunities of information and communication era, in architecture education. This study emphasizes the integration of technology in architectural design experiences and learning activities. Learning environment should be designed [1]. In the context of its content and processes, the aim of this research was to form a digital platform which integrates the application of ‘distance education’ [2] from the internet with the use of “digital studios” inside the campus and “virtual design studios” on the www in the field of architecture. The proposed system is named as ‘ADA Platform’ which can be briefly identified as ‘e-based Architectural Design Academia’.

A. The System of ADA Platform

ADA Platform is formed in three main sections (See Fig.1):

1. Interactive Digital Design Studio (IDDS): It is the main element of the platform. It offers the opportunity of sharing, cooperation and interaction via on-line Archicad 12 and Virtual Building Explorer.

2. Knowledge Based Modules (KBM); presents to the students with an interface, includes the interactive units of architecture curriculum such as society, culture and history of art. It includes all subject related information which can be read and supplied by books.

3. Application Desks (AD): Workshops, named in architecture curriculum as ‘learning through practicing’ or ‘to learning from the ones done before’. Application Desks include samples and practices for structure, construction and structure subjects.

In short, this paper elaborates the main phases of the study as seen in Figure 2: 1) installation, 2) apprehension, 3) operation 4) production – evaluation, 5) conclusion and suggestions.

II. THE PROCESS OF ADA PLATFORM

The Process of the ADA Platform is as follows:

A. Installation which enables the creation of the technical infrastructure

B. Setting up IDDS, KBM and AD considering technical requirements of each installation and starting to work within the content and the scope of each.

C. Implementation of design activities and events which are related to the learning process that occur in electronic media.

D. Establishment of the case studies according to the new cyclical event - action relationship in the context of feedbacks obtained.

E. Integration of IDDS, KBM and AD to the instructional system of traditional architectural education and/or the determination of the parameters of this renovation by a workshop named as “From Cyberspace to Physical Space”
A. Installation which enables the creation of technical infrastructure

According to Davies [2] learning mostly occurs outside of the campus. The ADA Platform is prepared to offer a Hybrid (blended) Learning environment. Hybrid learning environments combine the traditional education with new technical tools.

The design of the platform constitutes Computer Supported Cooperative Work (CSCW); conversations: email, instant messaging, and channel management; video conferencing: tele-presence, eye contact, streaming media technologies; meetings: mailing lists, discussion boards, conference calls; peer networks: firewalls, Java JXTA peer library, development issues; shared information spaces: Usenet News, Web, Blog, Wiki, push and pull strategies, resource control, content management systems, knowledge management systems; classrooms: computer-supported cooperative learning (CSCL), online courses; collaboratories: shared write, shared draw, WYSIWIS paradigm; and interaction/collaboration of communities in virtual worlds.

This system will be accessible from anywhere with an internet connection and it can be used for the purposes of file sharing through a network-based interface; group work, project tracking and interaction. It will serve to implement the most basic issues of instructive learning on the web.

Within the field of IDDS, the multi-use design of virtual environments which are planned with the intention of creating micro-world includes three dimensional java applications and the progressive projects such as “Project Wonderland” and “SciDelik”.

Moreover, Virtual Building Explorer software and Archicad from Graphisoft, will be integrated to the system to provide online services. In the micro worlds which are created by using Wonderland Project, users can communicate with each other; they will intensify and they will also share applications online.

B. Setting up IDDS, KBM and AD to work with

Architecture is related with the concepts of “human life” and “environment”. Therefore, the architectural practice and education is a field which is affected by the dynamics of human life aesthetically, technically, socially, environmentally and economically.

Knowledge based Modules are organized to provide an access to the two classrooms in the digital environment.

The necessary educational materials will be provided electronically; Audio-visual records will be prepared to be published on the web. Online conferences will be organized according to the constructivist learning criteria.

Educational attitude as it is seen in figure 4, is so organized that the categories of the learning objectives are classified into three groups of the Platform: Interactive Digital Design Studios mostly deals with the “Design” topic; whereas “History; Culture and Art ““Environment and Urban Scale”, “Professional Practice, Management and Economy” and “General Instruction” studies will be held in Knowledge Based Modules.

The academic work related with the “Construction and Technology” topic will be dealt on the Application Desks.

![Diagram](image_url)

**Figure 4. The categories of the learning objectives**
ADA Platform uses the European Union Education directive criterion (2006) as an instructive guide in defining the objectives of education (see Tab. I). The topics are convenient to European directive (ACE) on architectural education (Dalby, 1998).

In this phase students from different universities take an active role in the Interactive Digital Design Studios. The design activities will be planned and design experiences will be analyzed and the answers of the research questions will be found.

C. Implementation of design activities and events

Architectural design is a process with many components which affect the design environment. Therefore, especially in the core elements of the platform, the Interactive Digital Design Studio (IDDS) and ADA Platform as a whole will be constructed in a framework which enables the designers to experience all of the design processes and the discussions of the works on the web as shown in Figure 5.

At this stage, the installation and applications related IDDS, KBM and AD activities will be realized.

1) The activities of Interactive Digital Design Studios (IDDS)

These activities focus on learning to develop architectural design skills and they will be implemented in four different ways:

a. Small Design Problems: IDDS events mean intensive studio works which are held in three days of time period. The subjects may vary from the urban scale to room scale; the main concern may be city, neighborhood units, streets or buildings. The process include making researches and designing the solution for given problems; providing web crits and managing the whole design progression. There will be six different design problems for each academic semester. The learning environment is as seen in Figure 5.

b. Team Work: The three-person project teams are constituted by students from three different universities for the aim of managing collaboration. They develop their design solution by working online, either at real-time or different-time. The positive and negative results of this design method will be investigated and evaluated.

c. Free Studio Work: Each student works on the design problem which is conducted in the traditional studio in his/her own university. The way of adaptation of traditional studio to the digital studio will be found.

d. Long-term Projects: Students are required to design projects such as An Artist House; A Youth Club; A Convention Center or A Hotel. The research questions including the activities of design process; the level of participation and collaboration of the students; the perception of the space in digital environment; the management of the digital studio will be studied.
All of the IDDS activities are implemented in digital environment. The traditional desk crits will be given via network. Obviously, the three instructors who are responsible for carrying out this project are the supervisors. However, at least three more designers will be assigned as “private advisors” for each project.

2) Knowledge Based Modules (KBM)

In KBM, learning activities are organized for some theoretical courses which are learned by books, existing environment and built examples. These courses are placed in architectural curriculum in order to construct an understanding of history, culture, arts, professional practice etc.

Distance-learning content will be held using constructivist strategies. In the first stage, the modules "on Art and Architecture" will be working under. The required educational materials will be available via discussion boards, whiteboard applications, audio-visual tools, and video conferencing systems and the lectures will be designed in integration with to the whole platform in an interactive way.

In order to investigate the learning outcomes of this course design and the assessment of the obtained data two different educational design is implemented: One is about “History, Culture, and Art”, “Environment & Urban Scale”, the other one is about “Professional Practice, Management & Economy” will be implemented. The level of learning level will be defined by qualitative and quantitative research methods. “Learning Management System” software will be used in the design of the learning environment.

Each module is prepared permanently by the research team after evaluating these data. Hypothetically, KBM is a part of ADA Platform which contains properties of distance education most. This hypothesis will be examined by the feedback of the students’ recommendation.

3) Application Desk (AD):

AD is assigned to study the subjects of construction and technology courses of the architectural curriculum in electronic environment. AD is figured out in the cross-section between IDDS and KBM. The sub-topics of “Construction &Technology” include either theoretical or practical issues. The learning environment is designed to enable the students to know by reading; to understand by observing; and to learn by doing.

Texts, drawings, images, photographs, simulations, models, and details from built environment are among the educational materials of the AD. The digital environment of the AD gives the possibility to study real-time and different-time in context to the pre-defined exercises. Students can work online in interactive way on the AD. The most research data can be obtained by the AD works and this data will be evaluated and used as a feedback in the cycle.

D. Establishment of the case studies according to the new cyclical event - action relationship in the context of feedbacks obtained.

Periodically, the platform will be examined in terms of data base, educational design and the implementation as a whole. A three person team is assigned to evaluate the process and practice. Team members should be from the collaborative universities.

E. Integration of IDDS, KBM and AD to the instructional system and organizing a Workshop

In this stage, the sum of previous practices and educational attitudes are converted within a particular unity to turn into a permanent structure in architectural curriculum. To find out what kind of effect is seen in the current system, the qualitative and quantitative research techniques will be used. At the end of the process the students from all universities (who collaborate in the digital environment) will work together in a workshop, in the traditional studio environment. The main aim of this workshop called “From Cyberspace to Physical Space” is to re-evaluate the educational experiences during the whole implementation period of the project.

III. Conclusion

In this study, in order to obtain a permanent structure for the use of digital media in the curriculum of architectural education, a group of applications are systemized. The paper deals with the theoretical background of the project to be implemented via net work.

By implementing the application part of this project, it is expected that architectural education curriculum comprises significant improvements.

REFERENCES


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