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## Study on Defining Utilization Steps of Traditional and Digital Tools in Architectural Design Education

Dr. Arzu ÖZEN YAVUZ <sup>a\*</sup>, Dr. M. Tayfun YILDIRIM <sup>b</sup>

<sup>a</sup>Gazi University, Faculty of Architecture, Department of Architecture, Ankara and 06570, Turkey

<sup>b</sup>Gazi University, Faculty of Architecture, Department of Architecture, Ankara and 06570, Turkey

### Abstract

Computers today play an increasingly important role for architectural design. Traditional education tools such as sketch drawings, technical drawing and models are unseperable part of this education. We have been facing problems about how to use computer tools for architectural education such as data collection, archiving, data processing, sketches and visualization. Students who are not able to use computer during the first semester spend much time to use these tools. In this study, architectural design process is divided into stages in order to find a solution to this basic problem, and at every stage, usage of traditional and digital technologies are observed as the usage density of students and usage methods. At the end of the study, it is evaluated that during

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that at the early stages of design traditional methods, while developing the design both technologies, and at the later stages such as size, proportion, material, texture, photorealism only the digital methods and materials are used by the majority of students. As a result, it has been tried to define the stages and processes when to use these different techniques.

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*Keywords:* Architectural Design, Architectural Design Education, Architectural Representation Tools, Computer Aided Design

### 1. Introduction

Design representation tools changed and developed in parallel to the changes in the field of architectural design and design process. Development of representation tools, which have effects on effective representation, facilitation of reaching a solution, shortening design process etc. further improved with digital representation tools and evolved until today.

A hybrid method combining traditional representation techniques and digital techniques is used in architectural education. Traditional architectural design process starts with graphic representations performed on paper with a pen and verbal representations. In this method, “to externalize the images which are created in design process which is a mental process, two or three dimensional drawings and models were used. These drawings and models were developed with graphic representation techniques and were gradually materialized from an abstract representation”

\* M.Tayfun YILDIRIM. Tel.: +90-532-281-9612

E-mail address: [mtayfun@gazi.edu.tr](mailto:mtayfun@gazi.edu.tr)



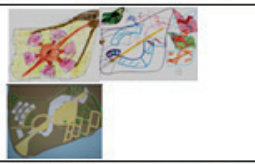

On the other hand digital representation techniques are vector based and object based software, which are used for the preparation of photorealistic media which enable interactive extraction of more information and which yield positive results in expressing inputs like spatial perception, scale, fabric, shadow, light, in which traditional methods lag behind.

In the present study, we aimed to determine representation techniques used in different stages of design process that continue as a mental activity. In parallel to this, we conducted a field and questionnaire study on fourth grade architecture students.

### 2. Case study and findings

A case study was conducted to determine which design representation tools were used at what stages in architectural design process and to measure how much these representation tools were used at the beginning of design, during the design process and in final product. Case study was carried out on a total of 15 fourth grade students enrolled in department of architecture who had adequate knowledge of traditional and digital representation techniques. The students were asked to make “School of Foreign Language Project in Gazi University Gölbaşı Campus” as the theme of architectural project at design studio. In the study, design process was analyzed in four stages including research (data collection, data processing and storage), preliminary project, development and final project, final presentations. The use of traditional and digital technologies, usage density of the students and mood of use were observed. The fact that the students were capable of using either traditional or digital representation tools as required enabled us to obtain significant data in the field.

In this study, the students were made to solve chosen design theme via different representation tools during a semester, to evaluate the products of design works in terms of the use of design representation tools and a questionnaire was administered to the students to determine usage aims of design representation tools. The works of the students in design studio environment and final product were documented with photographs and digital media records. In this process, the use of representation techniques by the students was observed by observation forms. Design process was divided into four principle stages. These stages included research stage for data collection, data processing and storage; preliminary project stage including first idea sketch, concept development and spatial analyses; development and final project stage involving works to create 2 and 3 dimensional sketch and models; final project presentation stage including the research of photorealistic presentations. Works of each student were observed step by step in line with this form.

		Representation techniques						Students works	
		Traditional representation techniques			Digital representation techniques				
		Written		Architectural Drawing	Model	Vector based			Object based
		Trad.	Digi.			2d	3d		
Research	Data collection	•	•						
	Data processing		•						
	Storage		•						
Preliminary project	Spatial analysis	•		•					
	First idea sketch			•					
	Concept development			•	•				
Development project	Sketching			•	•	•	•		
	Modelling					•	•		
Final project	Product					•	•		
	Presentation						•		

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