



New Trends and Issues Proceedings on Humanities and Social Sciences



Issue 3 (2017) 148-154

ISSN 2421-8030

www.prosoc.eu

Selected paper of 5th Cyprus International Conference On Educational Research (Cyicer-2016) 31 March-02 April 2016,
University Of Kyrenia, Kyrenia North Cyprus

The Effect of Theoretical/Technical Courses on the Formation of Design Knowledge: A Case Study on Final Year Students

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Suggested Citation:

Tuzcuoglu, D. & Polatoglu, C. (2017). The Effect of Theoretical/Technical Courses on the Formation of Design Knowledge: A Case Study on Final Year Students. *New Trends and Issues Proceedings on Humanities and Social Sciences*. [Online]. 03, pp 148-154. Available from: www.prosoc.eu

Selection and peer review under responsibility of Assist. Prof. Dr. Cigdem Hursen, Near East University
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Abstract

Architectural education that its objective to provide an opportunity to the students to gain that knowledge contains the design approaches, architectural history, technical knowledge, current developments etc. associate to education field. Correspondingly, it is a process that students can utilize all aforementioned knowledges on architectural scope. Related with the process of architectural education, the accredited programs focus on an appropriate education as well as assessing courses and studios. In this study, it is aimed to focus on the architectural program in Yildiz Technical University and determine the correlation and importance between courses and architectural projects. For this purpose, the focused interview and a set of questionnaire is done with final year students. According to study results, it is evident that design studio is the place where the knowledge gathered from theoretical and technical courses are come together. To sum, a blended learning strategy would be efficient in design education.

Keywords: Education; architecture; accreditation; design

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1. Introduction

Education is the continuous process that has constantly alteration relevant to advance on knowledge, technology, procedure, perception, etc. in time as well as its aim is to provide the knowledge transferred properly and prepared for the subsequent practice. Besides, architectural education constitute similarly comprehensive professional scope relevant to this aforesaid features, it has the primary concern of producing three dimensional space and form related to architectural theory but also constructional techniques, user psychology, human factors, etc. Relevant to this, the education process become more comprehensive and has distinctive knowledge relations in an extensive perspective.

As architects dedicated to the principles of profession, honesty and competence, design built environment using their knowledge and skills, architectural education is supposed to contribute to the development of society in social, cultural and economics (Polatoglu, 2012). Further, the alteration in society and in the construction industry on architecture and related to other construction professions is revealed by a number of reports and studies (Nicol, 2005). Within these changes in society, technological advances and rapid growth in knowledges in a professional scope, it is expected that the architectural education is able to answer all this alterations and needs of professional practices.

As architectural education as most distinctive branches of education, the efficient curriculum that fulfill the interrelation through the courses and design studios become more distinguishing in the process. Between all courses, the design studios are more indispensable places where the students are able to practice all the knowledge's they gathered from theoretical/technical courses.

The aim of this study is to reveal the relation of the courses and design knowledge as well as explore the ways for ameliorating the current relations. Thereby, it is discussed the architectural education in Yildiz Technical University among the national or international accreditation procedures.

2. Architectural Education and the Accreditation Systems

International Union of Architects (UIA) defines the architectural education as it should ensure that all graduates have knowledge and ability in architectural design, including technical systems and requirements with consideration of health, safety, and ecological balance; that they understand the cultural, intellectual, historical, social, economic, and environmental context for architecture; and that they comprehend thoroughly the architects' roles and responsibilities in society, which depend on a cultivated, analytical and creative mind (UIA, 2012).

Through the architectural education, there exists different classification of curriculum relevant to the content of courses and studios as well as the local changes relevant to the region. At that point, various institutions or organizations are established with the aim of the educational quality assurance standards to enhance the value, relevance and effectiveness of the architecture profession. One of the largest boards in the world is the Royal Institute of British Architects (RIBA) in the UK, and the other is National Architectural Accreditation Board (NAAB) in the US. However the systems and programs are not same, they recognize courses nationally and internationally through similar process. Moreover, MIAK (Mimarlik Akreditasyon Kurulu) is a national accreditation board in Turkey that ruins by Chambers of Architects of Turkey.

These accreditation programs, whether national or international, aim to assure the maintenance and enhancement of an appropriate educational foundation and they decide the institution develop a program specific to its mission and correspondingly educate students to be educated and talented of producing work that an educational program assembles an established standard of achievement. These programs generally highlight the need for an architectural design studio and assume to see committed studios for all students.

The RIBA have eleven sections in their Education General Criteria (EGC) for Part i and Part ii, and each of these sections has three sub sections, with 33 criteria included (RIBA, 2011). The NAAB Student Performance Criteria falls into three realms with having 32 criteria included. Critical Thinking and Representation: with ten sub sets, Integrated Building Practices, and Technical Skills and Knowledge: with thirteen sub sets, Leadership and Practice: with nine sub sets (NAAB, 2012). The MIAK has 35 criteria that focus on that evaluate all courses and studios (Miak, 2016).

Apart from accreditation boards, Bologna Process, which become essential in European region, represents a collective effort of public authorities, universities, teachers, and students, together with stakeholder associations, employers, quality assurance agencies, international organizations, and institutions. The main focus is the introduction of the three cycle system: bachelor/master/doctorate, strengthened quality assurance and easier recognition of qualifications and periods of study. The Bologna Process also promote the transformation of education and training systems to make sure these meet the needs of a changing labor market (Bologna, 2016).

3. The Case Study: Architectural Education in Yildiz Technical University

3.1. The Architectural Education

The architectural education started in 1942 in Yildiz Technical University (YTU). The department is a member of EAAE-European Association for Architectural Education, ENHSA-European Network of Heads of Schools of Architecture and CIB-International Council for Research and Innovation in Building and Construction. The department is also has been entitled by MIAK in 2009 (Unver, 2013).

Furthermore, the studies is being proceeded by NAAB from the application year of 2013. In the education year 2011-2012, curriculum altered in accordance with the standards of Bologna Process that is aimed that teaching and learning more transparent and facilitates the recognition of studies (YTU, 2016).

The architecture education in YTU consist of four year education with 240 ect: 6 social elective courses, 11 elective courses, and the rest is compulsory courses and Introduction to Architectural Design (AD), Architectural Design 1, 2, 3, 4, 5, 6 and 7. The masters programs with/without thesis and PhD programs are also offered. The mission of the Department of Architecture of YTU is mentioned as being a leading institution, preferred in academic mobility both in national and international levels, which helps to improve the quality of life and develops the architectural awareness (YTU, 2016).

3.2. Case Study

In this study, it is aimed to examine the efficiency of the theoretical and technical courses throughout the architectural design studios in the whole process of the education. In this scope, the questionnaire is applied to 70 students that are in the final year of the education in 2015-2016 spring semester. Table 1 illustrates one chart with the example of "Basic Design" which takes part in the questionnaire that aims to evaluate the design process through each design studio. The compulsory courses in the questionnaire examined are: Basic Design, Architectural Presentation Techniques, Constructional Elements of Building 1&2, Building Theory and Design 1&2, Structural System Design 1&2. The structure of the questionnaire is formed by two categories as in the follows:

- Standard questions as shown in the Table 1,
- Open ended questions to evaluate the courses and the outcomes more detailed.

It is expected that students evaluate the competence of each compulsory course on each architectural design studio by assessing 5 digits; 1 (very few), 2 (few), 3 (neither/nor), 4 (much), 5 (very

much). The impact of the theoretical/technical courses on the design studios is evaluated by the three phase of the design practices as “understanding”, “analysis”, and “interpretation”.

Table 1. Template of Basic Design Chart of the Questionnaire

			AD	AD1	AD2	AD3	AD4	AD5	AD6	AD7
BASIC DESIGN (contrast, complexity, harmony, etc.)	Design Process	Understanding								
		Analysis								
		Interpretation								
Which are the learning style/s on the course “Basic Design”?										
<input type="checkbox"/> Individual Learning	<input type="checkbox"/> Collective Learning	<input type="checkbox"/> None	<input type="checkbox"/> Other:							

3.3. Data Analysis and Discussion

The evaluation results demonstrate all students participated to the questionnaire, as it is not determined significant difference between female and male students in the pre-evaluation phase. Since some of the answers were realized as marginal, six of the participants of the questionnaire is decided to be left out of the evaluation. The result of the arithmetic mean distribution of the impact of each compulsory course on each architectural design course that answered by the questionnaire is shown in the Table 2. The specific architectural design studios are taken out of the evaluation according to the courses Constructional Elements of Building 1&2 and Structural System Design 1&2 are not processed when the design course were given.

As shown in Table 2, “Basic Design” form a basis of each architectural design studios through the entire design process, whereas the rest has diversified influence on each design studios. It is seen that “Architectural Presentation Techniques” on each design project has further effect through interpretation design process whereas “Structural System Design 1&2” has similar effect especially on AD5 and AD7. Related to the studio content (mass housing/complex building design) of AD5, it is remarkably deduced that while “Basic Design” considerably is effective, the other courses has relatively further effective on AD5 through the whole design process.

Table 2. The Arithmetic Mean Distribution of the Efficiency of Compulsory Courses on Architectural Design Studios

Compulsory Courses	Design Process	Architectural Design Projects								
		AD1	AD2	AD3	AD4	AD5	AD6	AD7		
Basic Design	Understanding	3,1	3,1	2,8	3,1	3,2	2,7	3,3	3,1	
	Analysis	3,1	3,2	3	3,2	3,3	2,9	3,4	3,1	
	Interpretation	3,4	3,4	3	3,3	3,4	3	3,5	3,2	

Building Theory and Design 1&2	Understanding	3,3	3,5	3,5	3,7	3,7	3,5	3,7	3,5
	Analysis	3,2	3,5	3,6	3,6	3,7	3,4	3,6	3,4
	Interpretation	3,2	3,5	3,5	3,6	3,7	3,4	3,6	3,5
Architectural Presentation Techniques	Understanding	3,1	3,5	3,8	3,5	3,5	3,8	3,5	3,4
	Analysis	3,2	3,6	4	3,7	3,6	4	3,8	3,6
	Interpretation	3,2	3,7	4,1	3,8	3,8	4,1	3,9	3,8
Constructional Elements of Building 1&2	Understanding	-	2,5	3,7	3,1	3	4	3,4	3,1
	Analysis	-	2,6	3,7	3,2	3,2	4	3,4	3,2
	Interpretation	-	2,6	3,8	3,2	3,3	3,9	3,4	3,2
Structural System Design 1&2	Understanding	-	-	-	3,3	3,4	4,1	3,8	3,7
	Analysis	-	-	-	3,3	3,5	4,1	3,9	3,8
	Interpretation	-	-	-	3,3	3,4	4	3,9	3,9

At this point, the summarized evaluation is shown in Table 3 as well as the marked values indicate the higher influences on related architectural design studio. “Building Theory and Design 1&2” and “Architectural Presentation Techniques” has further influence through the all design studios whereas “Constructional Elements of Building 1&2” has specific influence on AD5.

Table 3. The Average of the Efficiency of Compulsory Courses on Architectural Design Studios

<i>Compulsory Courses</i>	<i>Architectural Design Projects</i>							
	AD	AD1	AD2	AD3	AD4	AD5	AD6	AD7
Basic Design	3,2	3,2	2,9	3,2	3,3	2,9	3,4	3,1
Building Theory and Design 1&2	3,2	3,5	3,5	3,6	3,7	3,4	3,6	3,4
Architectural Presentation Techniques	3,2	3,6	4	3,7	3,6	3,9	3,7	3,6
Constructional Elements of Building 1&2	-	2,6	3,8	3,2	3,2	4	3,4	3,2
Structural System Design 1&2	-	-	-	3,3	3,4	4,1	3,9	3,8

As the open ended questions of the questionnaire resulted, a number of common interpretations are revealed. These common interpretations and suggestions are listed below:

- “*Basic Design*”: The necessity of the course is underlined. The increased number of visits to museums/exhibitions, the alternative books additional to the advised ones is demanded. Furthermore, the diversified version of the course once again in the last years of the education is claimed (as it is the first semester course).
- “*Building Theory and Design 1&2*”: The entire course content defined as essential and necessary. The extended content and increased hours of the course is claimed.
- “*Architectural Presentation Techniques*”: The utilization of various computer programs relevant to the content of course is highly demanded as well as the course content defined as substantial.
- “*Constructional Elements of Building 1&2*”: The visiting to the construction area within the course content is highly demanded. The scanty of the practice or implementation of the knowledge gathered from the course is underlined.
- “*Structural System Design 1&2*”: The visiting to the construction area and the simple structural system project as a practice relevant to the course content is demanded.

With regard to all these outputs of the case study, it is possible to refer the architectural design studio as a reference point for the architectural education. Since these courses has a significant influence on architectural design project as well as the education quality, the improvement of the content of each theoretical/technical courses should be supported.

4. Conclusion

The main aim of this paper has been to determine the influence of the compulsory courses on architectural design practices throughout the design process. Providing a number of similar qualification required relevant to the accreditation boards, the architectural education process can differ in accordance to the mission of the institute while the design studio is in the core of the education. Besides from the differences, the design studio is the principal space where budding professionals explore their creative abilities as well as it is the assessing ground for all other knowledge gathered throughout the education process.

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