DESIGN AND EDUCATION: A DESCRIPTIVE STUDY ON TWO EXERCISES OF THE INTRODUCTION TO DESIGN COURSE AT IZTECH FACULTY OF ARCHITECTURE

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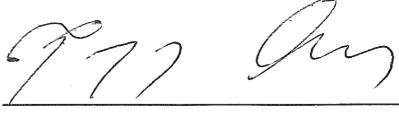in Partial Fulfillment of the Requirements for Degree of

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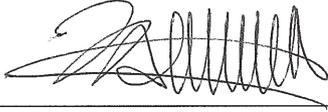We approve the thesis of **Baldan İCİL**

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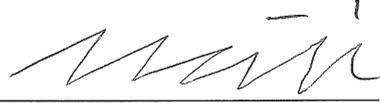Department of Architecture, Izmir Institute of Technology

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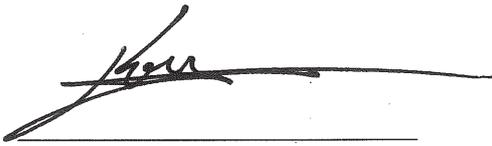
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ABSTRACT

DESIGN AND EDUCATION: A DESCRIPTIVE STUDY ON TWO EXERCISES OF THE INTRODUCTION TO DESIGN COURSE AT IZTECH FACULTY OF ARCHITECTURE

Design is a cognitive activity that many parameters involved to the process. Because of the complex structure of design, design education is also difficult to frame. In the period of architectural design education, first year is the special term that students not only challenge with the complexity of design and learning design, they also experience difficulties because of the changed learning habits, education methods and lack of skill and knowledge on design.

Therefore, this descriptive study focused on Introductory Design Studios in Architecture Faculty of IZTECH in order to understand how the beginner design students respond to learning design exercises in this challenging period. Under the title of the main research question, the design processes of the students according to the simple and complex assignments were analyzed, their responses were evaluated in accordance with the assignment goals, the results were discussed and compared. In the data gathering process, AR101 Introduction to Design, fall 2016-2017 studio was directly observed in the natural studio environment during the semester. Among the students, a focus group were set up in order to follow their design processes closely and five students were chosen for the case study from the focus group. In addition to the research tools, questionnaires and interviews were conducted with both students and instructors.

The results of this study reveal the differences between responses of the beginner design students to the assignments, the changes in the responses according to the simplicity and complexity of the assignments and the influential factors in their design processes and design learning.

Keywords: Architectural Design Education; Architectural Education; Architectural Design Studio;, Introductory Design Studio; Design Studies

ÖZET

TASARIM VE EĞİTİM: IYTE MİMARLIK FAKÜLTESİ TASARIMA GİRİŞ DERSİNİN İKİ ALIŞTIRMASI ÜZERİNE BETİMLEYİCİ BİR ÇALIŞMA

Tasarım, sürecinde birçok parametre barındıran, bilişsel bir aktivitedir. Bu kompleks yapısı sebebiyle, tasarım eğitimini de oluşturması ve şekillendirmesi zordur. Mimarî tasarım eğitimi döneminde, ilk yıl özel bir dönemdir ve öğrenciler sadece tasarımın ve tasarlamayı öğrenmenin karmaşıklığı ile mücadele etmez, aynı zamanda değişen eğitim alışkanlıkları, eğitim metotları, tasarım bilgi ve becerilerindeki azlık sebebiyle de zorluk yaşarlar.

Bu sebeple, bu betimleyici araştırma, acemi tasarım öğrencilerinin tasarımı öğrenme alıştırmalarına nasıl cevap verdiğini anlamak amacıyla IYTE Mimarlık Fakültesi'ndeki Tasarıma Giriş Stüdyosu'na odaklandı. Bu temel araştırma sorusunun altında, öğrencilerin basit ve karmaşık ödevlere göre tasarım süreçleri incelendi, ödevlere verdikleri cevaplar ödevin amaçları doğrultusunda değerlendirildi, sonuçlar tartışıldı ve karşılaştırıldı. Veri toplama sürecinde, AR101 Tasarıma Giriş, 2016-2017 Sonbahar Dönemi Stüdyo'su dönem boyunca doğal stüdyo ortamında gözlemlendi. Tasarım sürecini daha yakın takip edebilmek için öğrenciler arasından bir odak grup oluşturuldu ve beş öğrenci örnek olay incelemesi için odak gruptan seçildi. Bu araştırma yöntemlerine ek olarak, öğrenciler ve eğitimcilerle anketler ve röportajlar da yapıldı.

Bu tezin sonuçları, acemi tasarım öğrencilerinin ödevlere verdiği cevapların farklılığını, ödevlerin karmaşıklığına ve basitliğine göre öğrencilerin cevaplarındaki değişimleri ve tasarım ve tasarlamayı öğrenme sürecindeki etkili faktörleri ortaya çıkarır.

Anahtar Kelimeler: Mimarî Tasarım Eğitimi; Mimarlık Eğitimi; Mimarî Tasarım Stüdyosu; Tasarıma Giriş Stüdyosu; Tasarım Çalışmaları

First of all, I would like to dedicate this thesis to my dear parents Gülnur DELİBOZ and Burhan DELİBOZ who have always stood behind and supported me in every piece and every moment of my life. Thanks to prayers of mom and faith of dad, I overcame every obstacle in my life.

Secondly, I dedicate the study to my supporter, encourager, source of motivation and better half husband Onur İCİL. I am grateful for sharing my life with you.

Lastly, I dedicate the thesis to my source of joy and morale booster lovely nephew Arden Çağın DELİBOZ who vibrating my heart with his love.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1. Problem Definition and Scope of the Study

For some scholars, design is an activity of creating something new through concreting ideas. Therefore, it includes both making and thinking activity. These activities aim to find the proper solutions for the situated problem. However, the activity takes time to propose solutions and evolve an idea. There is a need for finding an idea, interpreting on it, decision making among the choices and concreting the abstract phenomenon in a process. In addition to these, there are many parameters involved to the process like design problem, conditions, materials, designer(s), etc. Thus, each design process is a special and unique case. Because of the complex structure of design, both the process and teaching-learning design are also difficult to frame. However, at the same time design knowledge and enough background information are required to be able to generate, manipulate and shape the ideas in design process.

The knowledge and skill of design in architecture is given to the beginners within an architectural design education system that has been directed in design studios from the late of 1800's and the traditions of "Learning by Doing" developed towards to "problem-based" and "project-based" system in the design studios (Lackney, 1999). This system aims to increase the abilities of students in using learned knowledge, skill and creativity in order to find new solutions and also it objects to gain students permanent skills in their architectural design (Schön, 1984; Onat, 1985). Architectural education methods are exposed to cultural modifications, but curriculums are generally the same. It is known that, most of the graduated architects are getting similar education process. The similar education process is revealed from synthesis of the well-known models such as "French Model", "German Model", "British Model" and "United States Model" (Lackney, 2000).

Architectural design studios are the main parts of architectural design pedagogy that are the core of architectural design curriculum and supply a learning environment for students to employ with design tasks under design instructor supervision. The "Studio-Based" approach has been central to practice and education within traditional design

disciplines for over a century (Fallman 2007). The components of the "Studio-Based Learning" are: materializing the design solutions, presenting the solutions, evaluating the proposed solutions and modifying them by the reviews and design critiques (Vest & et al., 2001). It is believed that design is learned mostly by doing it (Lawson, 2004). As Alexander (1964) declared that, learning by doing is an activity which provides students to build their own history of design experience. By designing again and again, students collect a pile of experience about design and how to design.

In addition to being a part of the curriculum, studios are unique learning environments that are quite different than a usual classroom. Sagun (2001) claims that, it differs pedagogically, sociologically, ideologically and epistemologically from a traditional classroom. Studios allow social relations and integrations (Abdullah, N. A. G., et al., 2011). In addition to these, it is known that the physical setting of a design studio typically serves to increase communication, collaboration and sharing. Dutton (1984) states that studios are active places where students are engaged intellectually, socially, synthetic, analytic and evaluative models of thinking.

Design studios are the social learning environment where architectural design education methods are implemented, and design is the primary activity which aimed to be learned. In order to learn and teach design, it must be firstly clarified by both students and instructors that "What is design?". Therefore, definition of design is one of the main topics which discussed in the studio environment with both instructors and students. Because of the complex structure and vagueness of the activity, it is always open to different point of views. Many different views from design studies characterize design with its nature and its process. There are four main categorizations in regard to the literature on design studies. These are; design as problem solving, design as insight problem, design as conjecture-trial and design as construction.

Design activity is shaped in accordance with the reasoning process of designers. Reasoning is inherent to design process and design thinking (Rittel,1987). In the process of designing and learning by designing, reasonings are the main cognitive actions that helps students to reply to the dynamics of design studios and developing themselves through the responses. Reasoning in design has been theorized within a logical aspect and defined as three main types; abductive, deductive and inductive reasonings (Dorst, 2011; Roozenburg, 1993). Visual images and representations have a significant role in design and design learning process. Beside the main categorization, there are also some

reasonings like analogical reasoning, case-based reasoning and imagistic reasoning that are fed from mostly visual factors in design and design learning process.

Representation studies in studio also has an influential role in cognition of design and design learning. Because, it can affect the reasoning behind the design cognition and plays an efficient role in the process of design and learning design. Students tries to transform their design ideas via representation and through the representations they generate new forms and ideas in their design process. In addition to that, "reflexive conversation" (Schön, 1992) in design process not only occurs between designer and his/her represented design work, but also this conversation takes place between design students and studio masters. Students represent their design and according to the representation, instructors give a review to the students. Therefore, representation techniques are main tools in this learning design environment.

In addition to the general perspective of view for the architectural design education, architectural design studios and their involved influential factors in design learning, introductory design studios are special cases in this architectural design learning process. Introductory design studio is the basis for architecture students to learn the required basic design knowledge (Tavasoli, 2014). It clears students' mind from the existing and pre-established knowledge in field of architecture and provide students to follow the true ways of architectural designs (Clarke, 2014). Tavasoli (2014) states that students attend to the introductory design studios with immature perception of the architecture and start to raise themselves as an architect.

It is generally experienced that first-year in architectural design education is the most challenging period for the beginner designers. One of the main reasons of it is the changing education habits of the students. According to many scholars, pre-university education focuses on memorizing of the information which leads students to vertical thinking more than critical thinking (Salama, 2006; Salingaros & Masden, 2010). Design education is complicated issue and somehow controversial (Gulmez & et al., 2014). It firstly aims to make students' mind free from the regular and inflexible perceptions in order to lead students to offer creative design proposals. The first year in design education is a transition period which takes the design students apart from vertical thinking and an introductory year to describe comprehensive thoughts.

First-year design education is also challenging in Turkey. Because, beginner design students experience this kind of learning pedagogy in their introductory studios for the first time. Aytaç Dural (1999) states that the common features of the pre-university

education in Turkey are: memorizing based learning system, suppressing students' natural talents and gaining knowledge through the lecture-based teaching method. This educational system is generally focused on preparing the students for the university entrance exam. This kind of education habits causes problems in architectural education where needs students have ability to define design problems, think critically and innovatively to solve the problems and decide independently.

Introductory design studios set the organization for active learning approaches in architectural design education and students try to present their own thoughts, perceptions, concept and experience from the essence of architecture verbally and non-verbally. Teymur (1994) declares that building design and learning design is not an easy task. Because, design and learning design has a complex structure any problem can be revealed at any step of learning and teaching context. Kalogras and Malecha (1994) claims that teaching beginner design students requires some specific needs. It is a big responsibility to prepare individuals to the design world that they should be advised, monitored, motivated, inspired through the process.

Students in introductory design studios not only learn design knowledge and mental skills but also, improve some physical skills like: drawing, sketching and model-making (Farivarsadri, 2001). Ledewitz (1985) defines the three main characteristics of introductory design studio like this: learning and practicing visualization and representation skills, learning a new language, learning how to think architecturally. It is required to integrate the knowledge and skill that they should be trained properly during their design process.

As declared before, most of the architectural design students in Turkey come from a different education habits with lack of design knowledge. Therefore, introductory design studio of IZTECH is one of the places where the students first meet learning by doing system and such design problems. This studio provides students a learning environment in which they meet different design tools, media, a new terminology and principles of design. It aims to gain design knowledge to the students and improve their visual, written and oral abilities for the further classes and also for the professional period.

Although first-year in architectural design education is a challenging period that students are not familiar with the studio-based education system, they are expected to response to the given design tasks and by doing that they learn how to design. This descriptive research was conducted to understand how the beginner design students designed for two different learning exercises in this learning environment and what were

the elements which effected their design and learning design process. In order to answer the questions, students were directly observed throughout the semester in their natural studio environment and the responses of the them for the given one simple and one complex design task were analyzed in their design process. The analysis was made in regard to the assignment goals and the projects of the students were evaluated in accordance with the achievement of the goals within the process. In this way, the development of the students in design knowledge and skills could be observed, the similarities and differences between design processes of the students for each design task could be revealed and also similarities and differences between the responses of the students for the simple design task and complex design task could be figured out.

1.2. Research Focus and Objectives of the Study

As declared before, beginner design students have lack of knowledge and skill in design and also, they are not mostly familiar with the design learning habits. However, in this studio environment, they can design in a way and learn design by designing. In order to understand their learning by designing process, this descriptive study focuses on the direct observations of the researcher in the natural studio environment, design processes and project development of the students for the given assignments, analysis and comparison of the responses of the students in accordance with the expected goals of the given design tasks.

The objectives of the thesis are set in this way:

The first objective of the thesis is to analyze design process and project development of the selected five students for the chosen one simple and one complex design tasks. The second one is to evaluate the responses of the students for the chosen design tasks in regard to the defined assignment goals. Thirdly, one of the purposes of the thesis is to identify similarities and differences between responses and evaluation of the students for the chosen assignments. Fourth aim is to compare the simple and complex assignments by taking into consideration the responses of the student. Lastly, one of the objectives is to explore the correlation between design processes, design products, design cognition and taken reviews of the students.

1.3. Methodology

This section describes the general methodological approach for this study. The research strategy of this study was aimed to obtain a qualified analysis and documentation about introductory design studio, studio education and design processes of the beginner design students in the Faculty of Architecture of IZTECH. Then the gathered data analyzed in order to reach the objectives of the thesis like; evaluating the design process of the students in accordance with the goals of the design tasks ; comparing the design process of the students in regard to the evaluation; revealing the similarities and difference between design activities of the students according to the chosen simple and complex design problems; exploring the correlation between design processes, design products and reviews of instructors.

This descriptive study conducted with both qualitative and quantitative methodological approach. Qualitative data was gathered with case studies and direct observations. In addition to the qualitative approach, quantitative data also gathered to have information about the majority of the studio and the semester via the questionnaire surveys which made with both students and instructors. Gathered data was analyzed by making deductions, inferences, statistics and taking into consideration the literature.

1.3.1. Data Gathering Process
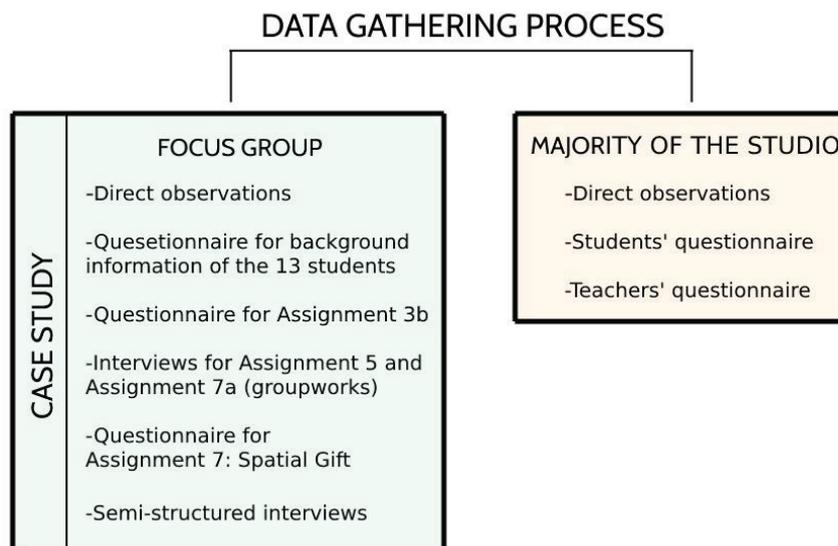
Figure 1. Data gathering process

This research was carried out at the Faculty of Architecture of IZTECH within fall semester in 2016-2017. The research group was AR101 Introduction to Design Studio. According to objectives of the study, data has been collected through both, the quantitative method by the questionnaire surveys and the qualitative method through the direct observation, case studies and the existing relevant literatures (Figure 1). Therefore, the assembled materials for this research have been obtained with three methods. The first one was the case study which was conducted with the same group of students for each assignment during the semester. The second one was long terms direct observations of the researcher on the purpose of exploring the aims of the research. The third one was the questionnaire surveys conducted with students and instructors at the end of the semester to get data for the generality of the studio and semester.

1.3.1.1. Case Study

Case study is a qualitative research method to analyze a case, social unit or a phenomenon within a real-life environment (Meriam, 1998; Yin, 2002). Because of the need for data collection in the natural environment of the studio, case study was a proper methodological approach to obtain data. The purpose of using case study in this research, to have concrete information about the design processes of the students through the given assignments and also to make inferences about the studio environment.
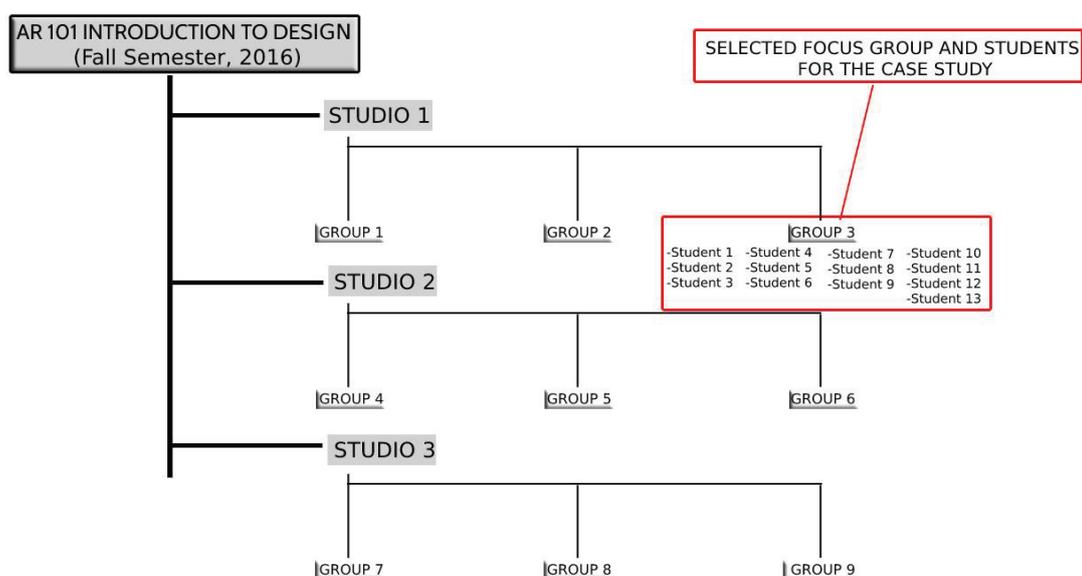
Figure 2. The selected focus group for case study

The education semester (2016-2017 Fall) started on 3 October 2016 and researcher of the thesis started to participate in the studios on 13 October 2016. There were 110 students, 9 research assistants and 4 senior instructors. The students divided into three different studios as seen in Figure 2. and in each studio, there were 3 small groups with 12-13 students. And also, every research assistant was responsible for one small group. One of the little groups was selected by casting lots for the case participants. From the beginning to the end of the semester this group with 13 students was the focus group of the study.

Table 1. Table of the semester with conducted research tools.

ASSIGNMENTS	PROCESS	RESEARCH TOOL	CRITIQUE FORMAT
Assignment 1: What is Control	EXCLUDED		
Assignment 1: What is Flow	EXCLUDED		
Assignment 3: Tree	2 weeks	Questionnaire	Panel Critique
		Observation	
		Semi-structured interviews	
Assignment 4: Animal	2 weeks	Observation	Panel Critique
		Semi-structured interviews	
Assignment 5: Body, Movement, Space	2 weeks	Observation	Panel Critique Desk Critique
		Structured interviews	
		Semi-structured interviews	
Assignment 6: Light Box	EXCLUDED		
Assignment 7: Spatial Gift to Edirne	3 weeks	Questionnaire	Panel Critique Desk Critique Jury
		Observation	
		Semi-structured interviews	
		Structured interviews	

Design processes of the students through the given assignments, lectures, panel critiques, juries and desk critiques and also operated excursions were investigated over the 13 students. However, because of the density and lack of materials, design process of 5 students (Student 1, Student 2, Student 4 and Student 5) among 13 were given in this study. As shown in the Table 1., there were 7 assignments given to the students during

the semester, but among 7 assignments 2 of them were chosen in the aim of comparing the differences between simple and complex design tasks. The simple one was Assignment 3: Tree which initiated when the researcher started to participate in the studio and the other one was Assignment 7: Spatial Gift to Edirne which was the final project and the most complex assignment of the semester. Courses had been done two times a week; full day on Mondays from 08:45 to 17:00 and half day on Thursdays from 08:45 to 12:00. Researcher attended the studio to collect data with the studio participants in every course day. In addition to that, researcher also took place with the students and instructors during the technical trips and excursions.

Researcher was like a part of the studio and in a social contact with the students and instructors through the semester, so verbally gained data was inevitable. Because of that, during the data gathering process for the case studies, semi-structured interviews with students and instructors were also used to collect detailed data. Verbal data was saved with daily notes and recording the voices. Beside the interviews, for the Assignment 3b and Assignment 7 there were implemented questionnaires with the 13 students (Appendix B and Appendix C). The questionnaires carried out to serve for the analysis of the cases. The questionnaires aimed to learn the design processes of the students for the third and the final assignment. Because, there were some missing information about their design process gained through the observations and semi-structured interviews. And also, for Assignment 5 and Assignment 7a, there were conducted interviews with the 13 students with their group mates for the assignments. The interviews were carried out to obtain data for the collaboration and design process of the students in their group works. All the products of the students during their design processes (which were sketches, diagrams, notes, models, drawings) were recorded with taken photographs in every course day. Moreover, the review sessions of each 13 students were followed closely. The sounds were recorded during the course hours and photographs were taken. The gathered data about the cases were analyzed in regard to the literature with the purposes of the study.

1.3.1.2. Direct Observations

Direct observations have been accomplished for the study to record data about the studio environment, studio culture, operation of the curriculum and design processes of the students at the AR101 Introduction to design studio within fall semester in 2016-2017.

The observations have been carried out mostly in the studio 1 where the focus group in (as shown in Figure 2). However, other two studios also tried to be observed. Observations started on 13 October 2016 and carried out on Mondays from 08:45 to 17:00 and on Thursdays from 08:45 to 12:00 in the Faculty of Architecture at IZTECH. In addition to that, studio had been observed during the excursions and technical trips. Researcher tried to be with the studio to the full extent like a studio participant in order to observe students and instructors and collect data.

The observations had focused on the attitudes, activities and behaviors of the students and instructors, the interaction between students and instructors and design processes of the students. In order to save the observations, photos were taken through the critiques, lectures and excursions. And also, some drawings, sketches, notes and models of the students were taken photograph. In addition to that, during the lectures and critiques tape recording was carried out. Moreover, the activities and expressions of the students and instructors were taken note in each course day. After data gathered descriptively through the observations, transcribed and utilized for the thesis.

1.3.1.3. The Questionnaire Survey of Students

Case study had been centered the focus group and direct observations mostly could had been carried out in Studio 1. In order to make deductions, suggestion and inferences about the whole students in the three studios, there was a need for general questionnaire survey.

With the carried-out questionnaire (Appendix D), 28 questions were asked to the students of AR101 Introduction to Design within fall semester in 20116-2017 at Faculty of Architecture at IZTECH. After the final juries, there was organized a colloquium with instructors and students to criticize the semester. The questionnaire was carried out as soon as the colloquium had finished. There were 73 students attended the questionnaire.

The questionnaire sheets were distributed to the students and they answered the questions approximately in 15 minutes.

Most of the questions were open-ended in order to let the students free in expressing their ideas. And also, it was generally hard to limit the answers with choices, because design processes, ideas about the semester can show significant differences among the students. Although, majority of the questions were open-ended, there were close-ended and multiple-choices questions (Appendix D).

1.3.1.4. The Questionnaire Survey of Instructors

Instructors were significant factors for the created studio culture and studio environment and their working system, their opinions about students and the semester also might be analyzed to make inferences about the AR101 design studio.

This questionnaire was implemented at the end of the semester with the whole instructors in the studio. After the final submissions and juries were done and students learnt their marks for their AR 101 Introduction to Design course, there was organized a colloquium with the students and the instructors to talk about the whole semester (fall semester, 2016). After the colloquium finished, questionnaire sheets were distributed to the instructors and they answered the questions in one week then submitted.

There were 13 instructors among them 4 were senior instructors and 9 were assistant instructors. Among the instructors 12 of them answered the question, only one senior instructor didn't attend the questionnaire. Because, he was the supervisor of the thesis and objectivity was considered in the questionnaire. The questionnaire contained varied types of questions (open-ended, closed-ended, multiple choice and matrix). Majority of the questions were open-ended to let instructors express their ideas easily and more detailed (Appendix E).

1.3.2. Data Analysis

The findings of each method were analyzed and contributed to the research to enhance the quality of the study. Different methods of data analysis were implemented in the study for each mentioned data gathering process.

For the case study, the findings of the direct observations were evaluated by reviewing the field notes and photos belong to the students' design processes. By doing that, the given assignments, lectures, critiques and any activity in the studio having role in the design process of the students' in the focus group was considered. And also, the interviews and questionnaires carried out with the focus students to collect detailed data for some of the design processes related to some assignments were taken into consideration while analyzing their design process. The analysis and inferences about the design products of the students were made in reference to literature on design, design education and defined assignment goals.

The corresponding responses from the students' questionnaires and instructors' questionnaire were analyzed by Microsoft Excel Program. The findings were contributed the research in order to reinforce the qualitative findings with quantitative data.

1.4. Structure of the Thesis

In Chapter 1, Problem statement and scope of the study is described. Then the research focus and objectives of the research are clarified. And also, the strategies of inquiries in both data gathering and data analysis are explained. At the end of the introduction chapter, significance of the thesis is described.

In Chapter 2, literature on Architectural Design Education reviewed. Firstly, the development of architectural design education throughout history is declared. Then, architectural design studios are explained with their all extends. After that the significance of first-year architectural design education is stated. Later, architectural education and first-year architectural education in Turkey is scrutinized. Then, this chapter continued in more specific way that architecture education and design studios in IZTECH, Introductory design studio in IZTECH and summary of AR 101 Introduction to Design Studio 2016-2017 fall semester is explained.

In Chapter 3, the design processes of case students for the selected two assignments are analyzed. First of all, the simple design task (Assignment 3) is described with its explanations, instructions and goals. Then the design process, evaluation of the design products in accordance with the assignment goals of each students are written. After that in a discussion part the evaluation of the students is compared. The same

procedure is conducted later for the complex design task (Assignment 7). At the end of the chapter, there is a comparison between the simple and complex assignment.

In Chapter 4, All findings throughout the research is concluded then limitations and future work are presented.

1.5. Significance of the Study

The first year of architectural design education is the fundamental education period for the future architects to learn basic design principles and their usage in the process of concreting the initial ideas creatively. Beside the essentiality of the first-year education, it is also the most problematic period for the architect candidates, because of the first meeting with the different kinds of education system and habits after the memorizing based secondary school education. Facing with the new studio culture, challenges through the instructional method and difficulties of learning-by-doing within the design process make this period more crucial. Therefore, the most important significance of the study is to analyze the design and learning design processes of the students in their natural studio environment.

This research is a helpful and beneficial documentation and analysis of the first-year design education in architecture. It supports the further research about design education in introductory design studios. Because, it is more about understanding the way of thinking and making system of novice design students in their the most challenging education year. Through understanding their design and learning design dynamics, it would be easy to generate new education systems to decrease the difficulties that they face in the first year. And also, this study not only useful in the field of architectural design education but also in the other fields of design education.

CHAPTER 2

ARCHITECTURAL DESIGN EDUCATION

Architectural design education is structured through the main elements which are design activity and studio where the learning and teaching design occurs. Therefore, this pedagogy cannot be thought separated from the main topics. In order to understand the dimensions of architectural design education, there is a need for grasping the design activity and studio environment with their all extends. From this point of view, in this chapter, first of all, how architectural design education system was developed throughout the history will be explained. Then, literature on architectural design studios will be mentioned. Under the title of "Architectural Design Studios", design as the main activity in the studios will be described according to the different perspectives of the scholars, the reasonings behind the cognition of design will be clarified as thinking and learning fuel of design in the studio environment and some representation studies which are mostly used in the design learning process in this environment will be explained in accordance with the literature. After all the general perspective of view to architectural design education and studio, this chapter will be continued more specific. Firstly, architectural design education in the first year will be described by taking into consideration the general education system in the World. Then, architectural design education and first-year architectural design education in Turkey will be examined. After looking at the education system in Turkey, this subject will be scrutinized specific to IZTECH. Under this section, Introductory Design Studio of IZTECH will be described then the fall semester 2016-2017 AR 101 Introduction to Design Studio will be explained in referenced to the direct observations of the researcher.

2.1. History of Studio-Based Learning in Architectural Education

Architectural design education has been directed in design studios from the late of 1800's and the traditions of "Learning by Doing" developed towards to "problem-based" and "project-based" system in the design studios (Lackney, 1999). This kind of development aims to increase the abilities of students in re-use of learned knowledge,

skill and creativity in finding new solutions and also objects to gain students permanent skills in their architectural design (Schön, 1984; Onat, 1985). Although, architectural education methods are exposed to cultural modifications, curriculums are generally the same. Therefore, most of the graduated architects are getting similar education process. Lackney (2000) believes that the similar education process is revealed from synthesis of the well-known models such as "French Model", "German Model", "British Model" and "United States Model".

The French architectural education in 1671 established by "Academie Royale d'Architecture" in order to order its system (Heskett, 1997). School of fine arts was established in 1743 by providing an equal pattern of the skilled designers. This school offered a special program with lectures on geometry, perspective and mathematic. The Beaux Arts system was focused on the "design problem" that has been given to the students to solve under supervision of the professors. The teaching system was based on the "Learning-by-Doing" with neoclassical style and monumental building projects. The projects were being judged by the jury members including instructors and guest architects by the same criteria and expectations.

The Bauhaus school of art and craft was established in 1919 by Walter Gropius, at Weimar in Germany with the aim of uniting art and craft to establish a new way of collaboration in industry and craft (Heskett, 1997). In this school, design studios were organized in order to provide art students can work together. And also, in this environment students are enabled to experiment different shaping tools, different materials and realize their influences in their products. This environment cultivates students' design skills through the "Learning-by-Doing" system and allows them to experience intangible aspects of forms by considering the architectural design principles. This type of design studios also facilitates students to materialize their thinking as a model with foam, wood, plastic and any appropriate material. By making physical models, students signify design object, design process and as a result they can solve the design problems.

British model of architectural education was a modification of the medieval apprenticeship system by controlling students for five or six years (Utaberta & et al. 2012). Architectural Association (AA) was the first school in the United Kingdom which aimed to implement the teaching system in 1847. The first institutions which based on the ideal of professional training and development of practice-based learning in England

were Cambridge and Oxford (Garry, 1998). Apprenticeship system enables architectural students to work with companies from the early stages of their carriers.

The United States execute a different system of architectural education from the "Practitioner-Dominated" system of professional education of Britain and the "State-Dominated" system of France (Stevens, 1998). This system is focused on the "Learning by Doing" to represent thoughts through the artworks and long-term projects (Lackney, 1999). This model brings out from the Bauhaus of Architecture School. Students take education in studios through the lectures, presentations and reviewing art works.

The history of design education demonstrates some features of the current design studio style from its beginning. Austerlitz, Aravot, and Ben-Ze'ev (2002) outlined four characteristics that make the current design studio a different learning environment than it was in the past:

(a) The reflective learning component.

(b) The personalized design process, which implies creativity.

(c) The instructor's influence on the product of the project.

(d) The fact that a student's action, personality, and feelings are laid out in the open.

Lackney (1999) states that although most of educated architects have gone through similar programs, they can show difference in training procedure, criteria and curriculum.

2.2. Architectural Design Studios

Architectural design studios are the core of architectural design curriculum and supply a learning environment for students to employ with design tasks under design instructor supervision. Design problem or more than one design tasks are given to the students by the instructors to the students and they are expected to solve the design problem(s) during the semester. The assigned design problem(s) are introduced to the students with its highlights, requirements, goals, instructors' expectations, site characteristics, technical information and any other important elements which are required for appropriate design solutions. In regard to the given information and design task, students explore ideas, generate them, find alternatives, express their ideas, make decisions, and represent them by making; physical or digital models, technical drawings,

sketches, and diagrams in non-verbal formats. And also, they express their ideas or explain their design in verbal communication formats. In the design process of the students, students take feedbacks via critiques from their instructors who examine and direct projects through drawings, sketches, models or any kind of visual representations of the students (Crowther, 2013). According to Schön`s (1987) explanation, instructors "coach" students in regard to their professional knowledge. In these kind of routines, students design and design. By doing so, experience how it is better for a design. It makes students experience the professional design world. According to Cuff (1991), studio is more than a place to learn design; it is more about starting to experience the professional designer culture.

Studios include some materials, tools and gain new skills to the students. According to Demirbas and Demirkan (2003), there are three main roles of design studios. The first one is; learning and practicing new skills, say, visualization and representation. The second one is about learning and practicing a new language which is defined by Schön (1984) as a graphic and verbal language. And the third one is learning to think architecturally in Ledewitz`s (1985) definition. It means a way of thinking which refers thinking in a particular domain of problems and solutions; characterizing which are fundamental to professional performance.

The "Studio-Based" approach has been central to practice and education within traditional design disciplines for over a century (Fallman 2007). The components of the "Studio-Based Learning" are: materializing the design solutions, presenting the solutions, evaluating the proposed solutions and modifying them by the reviews and design critiques (Vest & et al., 2001). It is believed that design is learned mostly by doing it (Lawson, 2004). As Alexander (1964) declared that, learning by doing is an activity which provides students to build their own history of design experience. By designing again and again, students collect a pile of experience about design and how to design. For every new design task, students scan all the ways which have been done in their history and they can understand which one is proper or discordant for the new design problem. Because of the experiential nature of design, learning design is possible only by designing. It is more about action and production rather than studying and analyzing. Therefore, in this kind of pedagogy, education is more focused on practices and activities than theoretical ones. Design studio provides students to experience design process which spans idea and form generation for a design problem. In this process, the theoretical knowledge which is

generally gained from the other courses practiced. Because of these, studio is seen the core of the design curriculum. The other courses minister to it.

Traditionally, in architectural design pedagogy, there are three divisions in courses. One is about technology, science of architecture. The other one is about communication skills which prepare students to express their ideas by using universal technical drawings (Taneri, 2013). Sometimes there are art-based courses too which teach students to make models or sketches. The third one is design studio, which is in the center of design pedagogy. It takes place in the center because; it prepares students to the professional world. It is the main course which train future designers and directly enables students to see a design process also learn how to use the theoretical and practical knowledge for a proper design solution. As schön (1987) claims that, studio is a place which can provide design students a "simulation" of real world.

Studio performances of the students followed by systematic procedures to help improvement of students within their design process (Hassanpour & et al., 2010). There are four well-known different phases of critique during semester within the design studio, they are: individual table, pin-up, warm-up and final jury (Nikanjam, 2016). "Table-Critique" or "Individual Critique" is the negotiation and dialogue between the studio instructor and student about the student's products for the given design problem which takes approximately twenty to thirty minutes and once or twice a week within the studio environment (Hassanpour & et al., 2010). The design solution proposal of the students can be in variety visual formats like drawings, sketches, model, etc. and instructor makes suggestions and comment both verbal and visual formats through the products. "Pin-Up Critique" or "Panel Critique" is the most common interaction between students and instructors where the students hang their drawings or present their models to both instructors and peers in an open discussion platform. "Interim and Midterm Critique" sessions which are usually considered as a "Warm-up Criticism" to the final type of critique. "Final Jury" session is a situation that students are waiting for their turn to present their last solutions for the project to the jury members (contains instructor and some guest experts) who have usually been in their midterm jury and are familiar with their projects (Hassanpour & et al., 2010).

Design process is a systematic way of producing something and Parashar (2010) claims that this process as a thinking process reinforces the ability to think analytically of students and lead students to be more proactive. He also states that creativity comes through the design process by practices and brainstorming with the students within the

design studio (Parashar, 2010). Design studio is the common shared space by both instructors and students where the architectural design is learned and taught. This learning environment provides open discussions between studio participants (instructors and students) for better understanding about the design projects, their requirements and evolutions.

Studio environment is quite different than a usual classroom. Sagun (2001) claims that, it differs pedagogically, sociologically, ideologically and epistemologically from a traditional classroom. In such spaces within a university like classroom, lectures room and auditorium, there is a clear hierarchy between an instructor and the students. This kind of polarized environment prohibits communication between students and instructor as well as between students and students. In this way, the relationship between those in a classroom is limited. However, in design studios, there is a whole context all together. Studios allow social relations and integrations (Abdullah, N. A. G., et al., 2011). In addition to these, it is known that the physical setting of a design studio typically serves to increase communication, collaboration and sharing. The spatial features of design studios allow a learning environment which is based on continuous dialogue, conversation and critiquing on each other's work (Vyas, D., et al., 2013).

The social relations and integrations give much more meaning to studio rather than being a shared physical learning space. Demirkan and Demirbas (2003) claim that communication is a key word in defining a design studio. Wendler and Roger (1995) declared that verbal interaction is one of the significant factors in design studio which occurs between the studio occupants (students and instructors). Also, Ashton (1998) states that the interaction between student and instructor is very important for students' learning experience. Because, lack of skill and knowledge in expressing design ideas in non-verbal formats makes novice design students tend to explain their design more verbally. The more relax the design students feel, the more they can express their ideas to the instructors. And feeling comfort is directly about establishing a social relation between students and instructors.

Dutton (1984) states that studios are active places where students are engaged intellectually, socially, synthetic, analytic and evaluative models of thinking. Although there are many positive academic writings on unique environment of design studio, there are also some criticism about the conventional design studio pedagogy. Ledewitz (1985) declares that there is lack of clarity over the purpose of the design studio and it causes complexity for the teaching and learning settings. Salama (2005) claims that design

process is intended to function based on intuition, logical treatment, and rigorous reasoning. However, he says that this intent cannot be appropriate for the reality since the instructors tend to teach what they learned when they were student (Salama, 2005). Like Salama (1995, 2005) there are many scholars who believes that the conventional architectural studio pedagogy should be revised to be aligned with the reality of the fast-changing World (Bashier, 2014; Koch et al., 2006).

2.2.1. Multiplicity in Design Definition

In order to learn and teach design, it must be firstly clarified by both students and instructors that "What is design?". Therefore, definition of design is one of the main topics which discussed in the studio environment with both instructors and students. Because of the complex structure of the activity and vagueness in itself, it is always open to different point of views not only between the professional architects and participants of architectural design studios, but also between some scholars.

For some scholars, design is an activity of creating something new through concreting ideas. That`s why it is both making and thinking activity. It aims to find the proper solutions to the situated problem. It is not a spontaneous or a sudden activity. It is an incremental process of evolution. Because, it takes time to find an idea, think and interpret on it, decision make and concrete the ideas to find the most satisfied solution. There is a need for knowledge and enough background info to generate, manipulate and shape the ideas.

There are many different perspectives about defining and understanding the structure of design activity and divergent cognitive issues behind design process. As thinking and making activity, design issue is still one of the research areas that whose goal is to understand the system, structure and meaning of human-made things and the process of creating something new (Bayazit & İstanbul Teknik Üniversitesi, 2004).

Design as a form of thinking has been described by many theoreticians. Many different views from design studies characterize design with its nature and its process. There are four main categorizations in regard to the literature on design studies. These are; design as problem solving, design as insight problem, design as conjecture-trial and design as construction.

2.1.1.1. Design as Problem Solving

Cross et al. (1981) claim that establishing a relation between design method and scientific method is very concerned issue after 1960`s. Gregory (1966) states that general aim was to set a common basis of agreement about the nature of the design methods likely established common agreement for the scientific methods. In regard to this kind of researches of design, design was firstly seen as a problem solving.

According to Dunbar (1998), there are four stages of a problem solving space which are initial state (the knowledge state of the person at the start of a problem), goal state (the aim of the problem solver), operations (the way of problem solver uses to reach his/her goal) and task environment (the physical environment of the solver works in). Well-defined problems have definite four stages. These problems are like solving a mathematic problem or equation. However, ill-defined problems have no definite four stages. The problem solver has to discover the operator, define his/her goal and the initial state.

Newell`s (1969) approach to design problem solving is similar to the studies of chess and puzzle solving. According to him, there can be possible solutions in the solution space which must be the best or the most satisficing. However, it must be considered that, in the situation of puzzle or chess problem solving, there are rules and defined limited moves. But, in design problem solving there is no definite solution space which is full of possible alternatives. That`s why, seeing design problem solving like puzzle solving or chess playing is not a convincing aspect in my consideration. When we consider the design process, it is similar to ill-defined problem solving because of undefined states and solutions. Because of that, design has been described as ill-defined by Eastman (1969) and Simon (1973).

Simon (1973) defines the activity as an organized system of productions. He states that the problem must be divided into constraints from major to self-contained possible. Then, the solutions from the whole divided constraints must be gathered in a structured way. His approach to design problem solving is based on "analysis" of the current state and then solution of the problem in regard to a preferred "synthesis". In addition to that, he claims that in the system the elements which already evoked from memory, work as the stimuli to evoke the next elements. In his structuring problem definition, design is an

ill-defined problem at the beginning and then evocation from memory goes on up to the system of ill-defined problem turns into the well-defined problem.

Due to Simon`s approach to design through searching the process, design process started to be understood as one of the ''sciences of the artificial'' (Maher & Tang, 2003). Thus, design researchers focused on study for a ''design as search'' model by formulating the goals, state spaces and operators for various design domains and design problems. In respect to the problem and solution spaces of Simon, Maher & Tang, (2003) developed a computational model that assumes two parallel search spaces (the problem space and the solution space). The design process iteratively searches each space using the other space as the basis for a fitness function when evaluating the alternatives. In the model they state that requirements and solutions of a design problem iteratively affect each other. They define this type of design problem solving as co-evolution.

2.1.1.2. Design as an Insight Problem

Another model for explaining and formalizing design process is called design as an insight problem. This model focuses on mostly experienced conditions in design process which are generally about sudden changes in definition and structuring of the problem.

It is commonly observed in a designer`s process when designers find an idea suddenly before the most satisfied and creative solution. Even they describe it as "inspiration came" or "a power incites". The situation is generally seen as "illumination". Smith (1995) calls the situation as "restructuring" of the problem definition. He says that, sometimes the current plan is abandoned and a new one activated. At that time, designer retrieves a new idea from his/her memory and suddenly conceptualizes the problem in regard to the new idea. According to Smith (1995) it is an insight experience.

Design is accepted as creative act. In the perspective of the researchers who see design as an insight problem, the creativity comes from the sudden changes in design definition. Because, according to Smith (1995), the sudden changes in problem structuring prevents fixation in design. It is mostly seen that not to present problem in only one context is better for more novel and creative solutions.

The commonly recognized "a-ha!" response is universally considered as a reference to the moment when a creative flash arrives (Akin & Akin,1996). In the study

of Akin & Akin (1996) it is also referred as sudden mental insight. In their definition of design activity, there is a crucial point that must be found and solved to reach a creative product (Akin & Akin,1996). They state that, the sudden alternative ideas don`t come from anything. So, there must be enough domain knowledge from which the new ideas evoke suddenly. And the time which is passed until the sudden mental insight is called as incubation stage that prepares the designer for the insight cognition.

2.1.1.3. Design as Conjecture Trial

For understanding the nature of design, another approach proposed which characterizes design as conjecture trial. In this approach, design is assumed as guesswork. This approach emphasizes pre-structuring the design problem and then testing it in the solution space.

Hillier, Musgrove, and O'Sullivan were the first to apply Popper's ideas to design methods in their paper 'Knowledge and design' (Hillier et al., 1972). They focus on the role of what they called "pre-structuring" in defining problems. They give importance to the corresponding need for a critical analysis of such pre-structuring, which they called as "reflexive design". They claim that conjecturing possible and approximate design solutions in earlier stages of design process compared to analysis/synthesis problem solving model is more useful and beneficial for understanding the design problem and testing out its resistances. According to Hillier et al. (1972), synthesis is a process which combines the fragments like a puzzle making. Bamford (2002) declares that Hillier et al. (1972) rejects the notion of synthesis because they believe that by using such a method for design problem solving, the solution can only be seen towards the end. In conjecture trial model, pre-structuring occurs in problem space and they are tested in the solution space.

2.1.1.4. Design as a Construction

Beside the scientific searches on design, Schön (1983) offers a constructivist approach for understanding design. In regard to Schön`s (1992) perspective, design is a construction. The idea contrasts to the other positivist doctrines and he believes that designing is construction of steps of changes in the given situation.

Counter to Simon, Schön states that construction occurs in design process with the changes by "reflection-in-action" which is followed by "reflection-on-action". He emphasizes that a problem space is not given by any presentation to the designer but rather he/she constructs a design world which he/she sets dimensions of problem space constructed. Schön (1992) claims that a designer's subjective perceptions form the problems he/she tries to solve. He says that the designer creates moves to find solutions. Each move becomes an experiment for reframing the initial problem definition and the initial situation is turned into another situation through constructions which are structured by selecting particular things and relations. (Schön, 1988).

2.2.2. Reasonings in Design Studio

Reasoning is a cognitive activity which decides how people respond to situations in their lives. In the design studio environment also, reasonings are one of the significant factors that stands behind the activities of learning, teaching and designing. Because, it defines the way of thinking, perceiving and responding to the phenomenons in this social learning environment. In the process of designing and learning by designing, reasonings are the main cognitive actions that helps students to reply to the dynamics of design studios and developing themselves through the responses.

Rittel (1987) states that reasoning is inherent to design process and design thinking. Design activity is shaped in accordance with the reasoning process of designers. Therefore, as the inseparable part of design studio "design activity", reasonings in design also belongs to this unique learning environment. Reasoning in design has been theorized within a logical aspect and defined as three main types; abductive, deductive and inductive reasonings (Dorst, 2011; Roozenburg, 1993).

Deductive reasoning is analytical and predictable, since it is an explanation of a known or accepted relationship (Cramer-Petersen, C.L., et al., 2019). Johnson Laird (2006) describes it as an established process in which the conclusion is a valid inference from premises. Inductive reasoning is the process of deriving plausible conclusions (Johnson Laird ,2006). It infers concepts only from available data within a frame of reference. Inductive reasoning tests to reveal whether something is operative or true and it is the main difference between inductive and deductive reasonings. Abductive reasoning is a process of conjecture which output an explanation to an event or situation.

It differs from inductive and deductive reasonings since abductions involve guess work and assumptions are the basis of the reasoning. Some scholars (Dorst, 2011; Roozenburg, 1993) claim that abductive reasoning is suggested as the dominant type of reasoning in design. Because, it is the only way of inference which introduces new ideas.

Some reasonings are claimed to be unconscious, because reasoning also can be existed in a verbal and argumentative form (Rittel, 1987). Reasoning processes are suggested to be independent from domain or context, but the beliefs and knowledge underlie reasoning in a certain situation through the mental model held in a context (Johnson-Laird, 2006).

Mental models are constructed individually and provides people to integrate information and make predictions about the world (Badke-Schaub et al, 2007). Mental models work as stimuli in design process. Although, reasoning is initiated in response to a certain context, the result of a reasoning can expand the context and influence other mental models (Rouse and Morris, 1986).

Design is both thinking and concreting ideas via visual formats. Therefore, visual images and representations have a significant role in design and design learning process. Some of the reasonings like analogical reasoning, case-based reasoning and imagistic reasoning are fed from the visual factors in design process that are more explicit and easier way to figure out in a design activity through visual representations of designers.

2.2.2.1. Analogical Reasoning

Analogy is based on similarities between two different domains. It involves mapping two domains or situations and bringing across inferences from the more familiar domain to the less familiar domain via these similarities. In this relational mapping, the more familiar and known one is also called as source analogue or source domain and the less familiar or unknown one is defined as target domain. In general, analogical thinking helps us explain or better understand the target, by using the commonalities and by making inferences during the mapping process. These commonalities don`t have to be surface and obvious properties. Even, if the similarities are deeper, relational and structural, the success of the analogy increases. In Gentner`s (2010) definition, analogical thinking is the ability to perceive and use relational similarity.

There are many purposes and reasons for making analogy. The familiar knowledge is used in the aim of reasoning about explaining a notion, understanding the unfamiliar domain or it can be used as a starting point to handle the inquired information for a design problem, invention or any tangible artifacts. In these regards, Ward (1998) defines the reasons of analogy making in two direction; explanatory and inventive. According to Johnson-Laird, P. N. (1989), analogy is a tool for thought and explanation. An analogy can be used to ease an explanation about a hard notion. Because, it can be occurred by a source analogue which is appealed to the audiences` existing knowledge. And also, Vosniadou, S., & Ortony, A. (1989) claim that, perceiving similarities and making analogy is crucial for cognition, classification, learning and also has significant role in scientific discovery and creativity. Hofstadter, D. R., & Sander, E. (2013) think that analogy is the fuel and fire of thinking. Under the light of the researches and theories in this field, analogy is currently considered the core of cognition.

Analogical thinking is vital for many theories of creativity. As described earlier, analogy is a process of establishing correspondences between concepts from different domains. In doing so, the different concepts which can be remote or irrelevant, are combined and brought together. At that point, creativity is taken to account. Because, it is important for creativity to find the commonalities between the different things and also making something new by using the similarities. If the similarities are very clear to define for everybody, it is hard to speak of creativity. That`s why, going beyond objective attributes and seeing deeper relational similarities increase creativity. As Kao (2014) claims that transcending surface similarities and identifying a common relational system between two seemingly different domains is the focus point for creativity in analogical thinking. Gentner et al. (1997) also argues that relational and deep structural similarities hallmark analogies, because it moves beyond surface similarities and it makes the target domain sophisticated. Additionally, she claims that in many scientific discoveries the source is very remote and the commonalities between source and target are relational. By giving the case of Kepler, she illuminates the analogical process in scientific discoveries and shows that analogy brings creativity and new knowledge.

Analogy is also a tool for design. It is seen in the works of Visser (1996) and Ozkan (2013) that, analogy is a kind of design methodology for novel products, and also not only experts but also novices can benefit from it in the design process. Goldschmidt and Casakin (1999) show the use of visual analogy in design education. In many design cases, there is a starting point, inspired item or concept. Considering the mapping with

the source and target in analogy, design situation goes in the same way from concept to design product. In many design fields from industrial to architecture, analogy is the core of the process. A designer can create a lemon squeezer from squids or a new building by using a bottle rack as a source analogue (Lloyd, P., & Snelders, D., 2003; Tzonis, A. ,1992). However, in design cases also it is important to transcending surface similarity to make more creative and sophisticated end products.

2.2.2.2. Case-Based Reasoning

In this type of reasoning, memory and learning are bound together. It is based on remembering and reapplying the priori for the new situation. Problem solver attempts to solve the new problem by retrieving traces of relevant prior problems from memory, sets correspondences between the new problem and the prior problem and tries to adapt the prior solutions to the new task (Leake, 1998).

Case-based reasoning model provides problem solver an account of efficient solution alternatives even the situated problem is quite complex. Because, when people face with a complex problem, try to remember prior similar experiences to find a proper solution for the new situation. The similar previous episodes provide a basis for new reasoning. Because, it is a type of heuristic and cognition economy as Visser (1996) claimed. Also, it is a kind of guarantee that problem solver trusts the prior success to achieve the new task or it can direct the problem solver as a lesson not to do the same fault (Leake, 1996). According to Leake (1998), every case is stored in our memory with its results and if the results of the cases are successful, the problem solver attempts to remember those cases for future problems, suggestions or shortcuts. If the results are unsuccessful, retrieving that case warn about potential problems.

Case-based reasoning is used in our daily life very often. For example, judgment in law generally based on previous practices and new decision made in terms of the prior stories and experiences. Doctors save a huge amount of patient stories and each of them are stored as a case for similar problems. Repair of cars and equipment follows previously successful attempts (Schmitt, 1993). Case-based reasoning is used in many disciplines in regard to the similarities between situated problems and previous experiences.

Different disciplines place distinct emphasis on the case-based reasoning related activities of case storage, case indexing, case retrieval and case adaptation. In design

disciplines, when design problem is solving with case-based reasoning, emphasis must be more on adaptation and modification process than storage and retrieval process. According to Schmitt (1993), the reason of it that a single design problem can have many solutions while the problem of an automobile has exactly one solution. Another is about the need for novelty and creativity for a design problem solving. If the previous one is used for the new one, how can we talk about a novel solution? Leake (1998) explains that creativity enter into case-based reasoning through flexible retrieval processes that result in novel starting points for solving new problems, through mapping processes which form novel correspondences and through case adaptation to generate novel solutions. And also Schmitt (1993) emphasizes that adaptation without intelligence could lead no improvements of the current situation. I think, without creative adaptation, the previous case could not fit to the new case or the new case will perform as an imitation of the previous one.

Case-based reasoning also works in a similar system like analogical reasoning. Both reasonings need a prior knowledge and relevance to benefit from that in the recent problem. That`s why, sometimes case-based reasoning is accepted as a kind of analogy. When we talk about the differences, it can be said that analogy is more general, but case-based reasoning is more specific. It means that, in problem solving with analogical reasoning, designer can reveal anything from his/her memory with respect to the similarity with the new situation in hand. It doesn't have to be about the same event or the same field. It can be any visual sense, picture, painting, poetry even a song. However, case-based problem solving is more about the experiences and practices in the same domain. It needs a "similar case" rather than a "similar phenomenon".

2.2.2.3. Imagistic Reasoning

Imagery has been a central cognitive concept in which external world is codified in our brain via retinal impressions (Anderson, 1998; Goldschmidt, 1994). It is generally used as "seeing with the mind`s eye". Although, it is about seeing and perceiving, differs from them in accordance to subjective way of thinking. Because, Anderson (1998) claims that mental images are ultimate in the subjective and an image can be directly experienced only by the imager. An image which is generated by a person cannot be experienced by

the others. That`s why, cognitive researches about imagery and imagistic reasoning has been fraught some difficulties.

Philosophers from Aristotle and Plato to British empiricist have examined the role of imagery in thought. By the early 1970`s, cognitive psychologists had developed a variety of reliable behavioral techniques to understand the role of imagery in cognition. The studies show that under certain circumstances imagery was involved in various aspects of memory and on-line cognitive processing. In the modern period, studies about imagery originated in research of memory.

Imagery is different from what we see and perceive in reality and based on mental image. But, studies show that visual imagery is originated from visual perception. Because, visual imagery can also represent both object attributes and spatial relations. The visual knowledge which is gained from visual perception is hidden in memory and via imagery the knowledge is retrieved and revived. It is more consciously made action than perceiving. That`s why, imagery is more about "doing" while perception is about "receiving" (Anscombe and Von, 1970).

Imagery plays a major role in everyday perception. It supports cognition of visual and spatial information. Moreover, we use it for simulation for the future actions and plans. Even though, it is used for discoveries, creative thinking and design problem solving. People can mentally synthesize novel combinations of objects and their component parts, which often results in creative insights and discoveries via imagistic reasoning (e.g., Finke, 1996; Finke & Slayton, 1988). Because, imagery provides the thinker an unlimited environment in which cognition takes part freely. Although, Locke (1967) and Hume (1969) claim that this freedom is apparent rather than real, Liddament (2000) states that imagery provides thinking mentally, generate and simulate ideas and create a new knowledge thanks to its untrammeled freedom. According to him, this free nature of imagery and imagination lead creative thoughts and actions. Also, Goldschmidt (1991) claims that visual thinking and imagery not only reason production of ideas, the reasoning also gives rise to ideas and helps bring about the creation of form in design, like simulation and rendering. She also believes that beside imagery is used to generate new forms in design process; representation (especially sketching) is used to generate images of forms in the minds as well. This will be explained in the next chapter in detail.

2.2.3. Representation Studies in Design Studio

The aim of giving a place to representation studies in studio in this chapter is the reason of influential role of it in cognition of design and design learning. Because, it can define or change the reasoning behind the design cognition and so it plays an efficient role even it can direct the process of design and learning design. In addition to that, "reflexive conversation" (Schön, 1992) in design process not only occurs between designer and his/her represented design work, but also this conversation takes place between design students and studio masters. Students represent their design and according to the representation design instructors give a review to the students. Therefore, representation techniques are main tools in this learning design environment.

Design is to plan making something new (Goldschmidt, 1991). Design process includes generations, transformation of ideas, refining images in the mind and representations of the non-existent artifacts to make enable examinations and communications about it. Representation is not used only to externalize internal images and ideas. It also works as stimuli for the modification of design ideas and evolution of the design process. These representations are part of a distributed cognitive system which does not only represent what goes on in our minds but that they are cognitive tools with which we think and imagine.

Zhang and Norman (1994; 1995) investigate the cognitive roles of internal and external representations in a distributed cognitive system for problem solving. According to their theory, representation of a distributed cognitive task is not only internal, but also external. They define the cognition as distributed representations which contain both external and internal representations. The internal representations are externalized via external representations and it activates perceptual process. Generally, problem solvers do not need to re-represent them as internal representations in order to be involved in distributed cognitive tasks. He/she examines the externalized representations by perception and according to that defines the next move and behavior (Zhang, J. & Norman, D. A.,1995). In a problem-solving process, representations (both internal and external) specifies the actual mechanism of information processing. That`s why, Zhang and Norman (1995) believes that the same structure can be operated by different representations and different representations can activate different processes.

Actually, the internal representation is not different from what is imagined. Liddament (2000) says that the imagistic materials from the mind`s eye is captured through representational systems. This "iterative" and "dialectical" process occurs between mind`s eye and the activities like sketching, drawing, diagramming, modeling which lead to a completed design work at the end (Liddament, 2000). Schön (1992) describes the dialectical design process as "reflective conversation" with the situation. He clarifies the phenomenon with "seeing/drawing/seeing" theory. He says that: "A designer sees, moves, and sees again. Working in some visual medium the designer sees what is "there" in some representation of a site, draws in relation to it and sees what he or she has drawn, thereby informing further designing." (Schön, 1992, p. 133).

The cognitive roles of representation systems not only stem from memory-based experiences, imagination and thinking. It must be considered that, designing through representation systems is based on sensorial and bodily facture. Schön (1992) states that "designer designs not only with the mind but with the body and senses" (Schön, 1992, p.133).

In the bodily making activities, senses, intuitions and imaginations come to light through a part of body. There is no strict division between brain and hands; hands work as an extension of mind (Frascari, 2011). Hands transfer the thought and ideas which are located in the mind with the interaction of senses which are primarily visual, but not only visual; also hearing, smelling, tasting and touching take a place in design cognition. The texture of paper, the texture of painted places, the smell of the colors, the voice of pencil, the voice of painting with a paint brushes, the atmosphere which designer in, the coffee taste which awakes the designer, etc. take place in the cognitive process of designing too. According to Frascari (2011), the perceived senses influence the inner world of an architect. And also, he adds that through the media and tool which is used for design, designer rediscover and relate them with his/her other senses beside the usual sight (Frascari, 2011).

There are lots of representation techniques using in design, but in design studios some of them are the mostly used ones. In reference to the direct observations of 2016-2017 fall semester AR 101 Introduction to Design Studio of IZTECH, the mostly used representation styles (sketching, drawing, conceptual diagramming and physical model making) were generally observed representation tools. Therefore, under this section these representation tools, their impact on design cognition will be explained.

2.2.3.1. Sketching

Goldschmidt (1991; 1994) claims that designers mostly use imagery to generate new form combinations which they represent through sketching. However, according to Goldschmidt (1994), designers also sketch to generate images of forms in their minds. She states that the dialectics of sketching lead interactive imagery which is the simultaneous or almost simultaneous production of a display and the generation of an image that it triggers. That`s why, sketching is more about searching for such an image than merely an act of representation of an image. She says for this: "Sketching is thinking" (Goldschmidt, 1991, p.131). In regard to the interactive imagery and dialectics of sketching, gradual transformations of images end when the designer found coherence between mental image and representation of it (Goldschmidt, 1991).

According to Frascari (2011), thinking through drawings makes non-trivial architectural thoughts approachable. The role of designers is mainly to bring in existence which is absent and designing with sketching and drawing help designers to understand their intuition and imagination. Frascari (2011) states that: "To draw means literally to involve oneself in a practical experience with signs" (Frascari, 2011, p.96).

Suwa, M., Gero, J., & Purcell, T. (2000) claims that freehand sketches have an influential role for unexpected discoveries in design process. Because, they also agree with Goldschmidt (1994) that sketches can give more information than the intentionally drawn items in its making. When the sketches are perceived and investigated, it is found that they give clues about design ideas and concepts with the relationships between the lines, dots and other marks and also with their drawn methods. Frascari (2011) claims that there is no meaning and understanding behind lines or in every separate line; the whole information is on the paper "between the lines" (Frascari, 2011). For example, designers thicken the lines which they want to emphasize but it has not a meaning without comparison of it between the other precisely drawn minor important lines. Designer can dominate some points or give less importance to some parts and by doing these he/she represent the thoughts (Frascari, 2011).

Sketching is not only representation of imagined one; it also works as a driving force for design ideas and concepts. According to Goel (1995) lateral transformations need to occur during first phases of design problem solving and that the density and ambiguity of the symbol system of sketching facilitate these cognitive operations.

Ambiguity of sketches is important, because designers do not want to fixate or freeze first phases of design. According to study of Goel (1995), freehand sketches support designer to think by drawing without restricted geometrical shapes and this kind of design process helps to transform an idea into another.

2.2.3.2. Diagramming and Generic Abstraction

In the study of Dogan & Nersessian (2010) which is about conceptual diagrams in creative architectural practice, they argue that generic representation of a design situation in the form of a diagram facilitates conceptual exploration and this exploration is resulted in both conceptual and spatial configurations. According to them generic representation is about the core of the design idea which is explained by Lawson (1994) as the central idea which structures the scheme and the minor ideas are organized around it. Lawson (1994) calls the central idea as 'concept' or 'parti' and Dogan & Zimring (2002) describe the representations of the ideas as 'conceptual diagrams'. In the study of Dogan & Nersessian (2010), this kind of representations is used as 'generic abstraction'. In this sense, a representation is generic because it potentially refers to a multiplicity of variations derived from the same core idea (Dogan & Nersessian, 2010). In the case of Staatsgalerie by James Stirling, design process evolves through these generic abstractions, there isn`t any discovery which is occurred through sketches (Dogan & Nersessian, 2010). Dogan & Nersessian (2010) claim that the generic abstractions which are formed in diagrams help the designer to simulate varied spatial components and physical spaces that lead to a creative design conceptualization. In another study of Dogan & Nersessian (2012) which investigates the design process of Daniel Libeskind's Jewish Museum also shows that generations and modifications in design conceptualization made through manipulations of elements of conceptual diagrams. The conceptual diagrams set the relationship between design idea and the spatial organizations so provide spatial creativity. Diagramming is kind of method to do that, because it clarifies complex conceptual relationships and makes it easily comprehended (Dogan and Nersessian, 2012).

2.2.3.3. Physical Model Making

Another representation system which is also a kind of design tool is physical model making. Model making is a reflexive activity that generates other design ideas and develops the project in the limits of concepts and also it provides designers to predict possible problems and see potentials. It can be mostly seen as a 3D representation of the end product because of its pure and clear explanation ability in grasping the finished design (Hohauser, 1970). Although, it is also an influential cognitive method for design, compared to the topic of architectural drawings, there are lack of research on their meaning and relevance for design (Smith 2004).

It is quite admissible that modeling makes the design process easier and develops the projects in more concrete and realistic way. Because, it is a tangible and perceivable object in comparison to 2D representation systems. As Yaneva (2005) claims that, model is not made only to visualize invisible things; it is also made to accommodate human and non-human factors. That`s why it is a composition of multiple constraints. Designers must consider site conditions, materials, concept, functions, natural environments and many other constraints when making model. As stated in the study of Smith (2004), 2D representation systems can be insufficient in both presentation of the final product and designing it. That`s why Gaudi built plaster and hanging wire scale model to understand and clarify the complex forms and structures which he needed to reach for his design concepts (Smith ,2004).

In the study of Provencio & Almazán (2011), the focus is on the use of models as an essential design tools for contemporary architectural design. They show how scale model is used in an innovative way in the work of Kazuyo and Sejimaand Sou Fujimoto (Alonso Provencio, M., & Almazán Caballero, J., 2011). And also, another research which is made by Yaneva (2005), emphasizes the importance of model making in different scales. Yaneva (2005) claims that, modeling is not "universe", it is "multiverse". For this reason, it is hard to see all the constraints and elements in one model. According to him, "two alternative states of the building are simultaneously achieved and maintained: a state of being 'less-known', abstract and comprehensive; and a state of being 'more-known', concrete and detailed." (Yaneva, 2005, p.867). Designers need to make models in bigger scale not to go far from the concept and mass; they must scale down to see details.

2.3. Significance of First-Year Architectural Design Education

The main objective of education is knowledge transformation and continuing experiences (Battle & Lewis, 2002). Dewey (1988) stated that the goal of education is continuing any experience between social groups through social continuity of life. Historical purposes of education are: socializing, preparing the practical, intellectual or self-cultivated person, shaping the human personality to do the research for a profession (Bunch, 1993).

According to many scholars, pre-university education focuses on memorizing of the information which leads students to vertical thinking more than critical thinking (Salama, 2009; Salingaros & Masden, 2010). Design education is complicated issue and somehow controversial (Gulmez & et al., 2014). Design education firstly aims to make students' mind free from the regular and inflexible perceptions in order to lead students to offer creative design proposals. The first year in design education is a transition period which takes the design students apart from vertical thinking and an introductory year to describe comprehensive thoughts. The table below (Table 2) shows the learning habit differences between pre-university and university (particularly in the field of architecture).

Table 2. Comparison of Student's Learning Habits in Secondary School and University Education.(Source: EMU ADHOC Committee Report, 2015)

Pre-University	University (In the field of Architecture)
Student is passive actor in learning process	Students are considered as an active performer in learning process
The fosterage system is based on Using ready and defined information	Expecting innovations and explorations from students within their learning process
Riskless ground knowledge	Knowledge requires student to take risk
Learning for success	Knowledge requires student to take risk
Multiple controlling powers on students to learn according to the set system	Students have multiple permission to learn

Introductory design studio is the basis for architecture students to learn the required basic design knowledge (Tavasoli, 2014). According to Clarke (2014), introductory studios clears students' mind from the existing and pre-established

knowledge in field of architecture and provide students to follow the true ways of architectural designs. Tavasoli (2014) states that students attend to the introductory design studios with immature perception of the architecture and start to raise themselves as an architect.

Basic design studio educates students in order to develop their design abilities in the respect to architectural design principles and prepares students for the upper classes. Introductory design studios have high credit hours per week in architectural education and aim to gain students the required skills and knowledge in order to produce creative, innovative and proper design solutions. It is a preventive process which helps to recognize novice design performer by tracking the performances of students and implementing diverse learning methods (Atanas, 2012). The basic design is regarded as a basis and thought system within design education which catalyzes the education (Denel, 1981). The basic design education has been originated from the Bauhaus school in Germany and roots from teaching and learning design theories.

The goal of the first-year design education is introducing basic elements like point, line, shape, plane, solids and triggering students visual design skills by using the elements in regard to design principles. These principles help to convert the vision into the visuals (Parashar, 2010). In addition to this, any design practice is conducted with these principles and they are inseparable elements in also architectural design practices.

Design teaching and learning strategy creates confusion among students, especially in the first-year and this makes more challenging the learning process for the novice design students (Roberts, 2006). Students in introductory studios learn some skills and design knowledge in order to reveal their initial design ideas for mostly first time. Therefore, this academic year a special one in the students' education period. Abstract way of thinking and rational thinking are two main requirements in the basic design studio which students have some difficulties to carry out them (Gulmez & et al., 2014). Student need to have some specific knowledge and ability in the field of architecture to transform their thoughts and imagination into concrete outcomes. Imagination can be occurred unconsciously in the mind of designer, but the transformation to concrete outcomes gives students the chance to experience and combine several academic disciplines with different systematic training later (Heidarian & Ghafourian, 2014). Farivarsadri (2001) states that enhancing the critical thinking is essential for the students to have desirable educational outcomes. Basic design phase prepares students to think out of routine with architectural manner and provide the students to design in a true way (Heidarian &

Ghafourian,2014). Through the basic design education, students face with intangible and tangible dimensions of creativity. According to Yürekli (2014), basic design education aims to make the intangible things obvious as well as tangible facts in architectural designs for students. Parashar (2010) declares that one the main objectives of basic design education is enhancing the sensitivity of students toward to space quality. Farivarsadri (2001) claims that leakage of some basic design skills leads to absence of the basic architectural design skills and knowledge among students. Therefore, educational methods and objectives in basic design studios should be set very carefully.

Introductory design studio aims to make students be aware of the formal design elements, their features and rules on architectural design works (Heidarian & Ghafourian, 2014). Considering the human-scale in design, spatial organizations, spatial relationship form & function relationship are also significant subjects in the content of basic design education. Beyond these, first-year architectural design education also attempts to develop students' design awareness, provide deeper insights and enable students to look their living environment in order to gain proper skills and abilities to present their perception with their own individual and unique architectural terminology (Gulmez & et al., 2014). Basic design studios aim to teach some educational theories like: theory of color, form, material, symmetry, rhythm, etc. which have been taught through some abstract exercises and usually with the same method in education to the design students. According to Broadbent (1995) this kind of abstract exercises brings mismatch between practical and theoretical aspects of the architecture education for students.

Basic design course focuses on design concept and form generation through producing two or three dimensional forms by considering the procedures. Through the practices, students get familiar to the basic design elements, principles and terminologies in the semester. They also meet the "vocabulary of design" through the form-creation process (Heidarian & Ghafourian, 2014). In addition to these, students are expected to create innovative concepts and designs. Roberts (2006) states that one of the purposes of basic design studio is guiding students to find out creative design solutions.

This course set the organization for active learning approaches in architectural design education and students try to present their own thoughts, perceptions, concept and experience from the essence of architecture verbally and non-verbally. According to Teymur (1994), building design and learning design is not an easy task. Because, in the complexity of design and learning design, any problem can be revealed at any step of learning and teaching context. However, the objective of this course is already applying

the appropriate methods to define the problems and to propose logical solutions for the problems (Farivarsadri, 2001). Kalogeras and Malecha (1994) claims that teaching beginner design students requires some specific needs. It is a big responsibility to prepare individuals to the design world and advising, monitoring, motivating, inspiring through the process is required.

Students in introductory design studios not only learn design knowledge and mental skills but also, improve some physical skills like: drawing, sketching and model-making (Farivarsadri, 2001). Ledewitz (1985) defines the three main characteristics of basic design studio like this: learning and practicing visualization and representation skills, learning a new language, learning how to think architecturally. There is a need for integration the knowledge and skill and also most of the beginner design students face with these factors for the first time. Therefore, they should be trained properly during their design process.

Students' background has an important role in their abilities for critical thinking and analyzing in their own design process (Atanas, 2012). Because, first-year architecture design students come from different backgrounds and they would face with some difficulties in form generation, spatial organization, technical drawing, model making, graphic communications and representation skills. That's why, it is significant to figure out the needs of students through their design process and to improve architectural teaching methods in order to reduce the challenges of students in this process (Koranteng & Essel, 2013).

2.4. Architectural Education and First-Year Architectural Education in Turkey

Department of architectures have been recognized by the National Architectural Accrediting Board (MIAK) for nine years in Turkey. It provides learning environment and support academic development through the performance of students, researches, design studios and workshops. Architectural Accrediting Board (MIAK) is a TMMOB Chamber of Architects and has applied the principles since its establishment in 2008. Evaluating and reinforcing the quality of architecture education for competence is the main concern of MIAK.

The Architecture education in Turkey has been appeared since 1900s. According to the research of Şenol & et al. (2013), the total number of architects in Turkey was established over 40 thousand, around 39925 active members in 2012. This data has been obtained in three big cities: Istanbul, Ankara and Izmir. In addition to these, there are 75 Architecture Departments and 20 departments of Urban Planning in Turkey.

Universities in Turkey offer architectural education generally through their architecture faculties and rarely through fine arts faculties. Architecture faculties has various fields within itself like architecture, interior design, urban planning and industrial design. All the architecture departments in Turkey include Introductory Design Studio for the first year that have been spread by Johannes in 1920 and they are based on Bauhaus rational design methodology in the field of architecture which triggers students toward modernism (Clarke, 2014).

Different variables like cultural background influence the ability to learn architectural design terminologies of students. In Turkey, one of the variables is the past education habits and experiences of the students in their pre-university period. Students in Turkey have to be tested with a general exam which is based on mathematics, science and native language knowledge. Students could enter a university and a department in regard to their exam result. For the architecture departments also, students have to be tested via this exam and assessed through the exam results, there are no other way to be an architecture student. Architecture education lasts four years in Turkey and those four years are followed by two years for master degree and then four years for a doctorate degree in postgraduate programs.

According to Aytaç Dural (1999) the common features of the pre-university education in Turkey are: memorizing based learning system, suppressing students' natural talents and gaining knowledge through the lecture-based teaching method. This educational system is generally focused on preparing the students for the university entrance exam. This kind of education habits causes problems in architectural education where needs students have ability to define design problems, think critically and innovatively to solve the problems and decide independently. Therefore, the challenges should be overcome by some teaching methods especially in the first-year introductory studios of architecture education (Farivarsadri, 2001).

The architectural design education in Turkey is more special case for the first-year design education. Because, beginner architecture students experience architectural designing in their introductory studios for the first time. They gain new skills and

knowledge to concrete their imaginations and design ideas by designing this learning environment. At most of the universities in Turkey, the basis of teaching and learning method in basic design education is rooted in the Bauhaus. Design terminologies and principles are implemented through given design exercises in introductory design studios. First year architectural education program includes four courses in general. These are: Introductory design studios or Basic Design Studios, Graphic Communication or Visual Representation courses to develop drawing skills, Introduction to Architecture course and some courses like Architectural History or Theory of Architecture (Şahin, 2014). There are also variable assistant courses about material knowledge, statics, computer aided representation, etc. which depends on the institutions. However, the main course in all studio course which involves both theoretical and practical knowledge and abilities in order to prepare students to the professional world. And its learning method is based on practicing and exercising in contrast with the memorizing learning method of pre-university period (Serim & et al., 2014).

Learning by doing system is implemented through project-based method in majority of introductory design studios in Turkey. Design students are expected to find proper solutions for the given design problems in their semester projects which require to design architectural spaces in order to develop their design knowledge and skills by taking into consideration some components like: form and space, structure, building material, landscaping, topography, light, scale, proportion and climatic issues. While students trying to design their graphic communication, representation and spatial organization skills are followed and being emphasized through their design process.

Architectural education system in basic design studios have been set in a holistic perception not only prepare the students architectural way of design for the upper design studios but also, to prepare the students for real architectural designs (Heidarian & Ghafourian, 2014). First-year architectural design students in Turkey have different design projects through the semester like "Draft Projects" which are the first materialized design ideas by the students. "Formal Works" are development of the warm-up design projects and lastly "Final Projects" that are the finalized format of the design models with proper workmanship which had been developed throughout the semester (Yavuz & Çağrı, 2012).

Design education methods in Turkey aims to promote "Student-oriented System" which assigns students to implement their gained design knowledge, improve their design skills and understanding through their design process under supervision of the design

instructors (Öztekin &Tunalı, 2015). Design pedagogy of basic design studios organized to transfer design knowledge to the student to lead them use the knowledge while designing in order to reach the maximum efficiency in designing with the architectural manner. According to Bayındır (1994), basic design education focuses on the representation phase of architectural designing and its objective is highlighting and training the design principles and organizations as the detectable phase in architectural designs. Farivarsadri (2001) claims that the goals of the course could be achieved by considering the students as the active member through the educational process.

At the end of the semester, basic design students present their design ideas through models and drawings in their final jury sessions (Öztekin &Tunalı, 2015). They receive critiques from their instructors on their projects during critique sessions within the semester. Although the critique types could depend on the institutions, the formats are generally the same. They are "Individual Critique" or "Desk Critique" where student and instructor alone, "Pin-Up critique" or "Panel Critique" where the students hang their projects and take critique from the instructors in front of the peers. The formal evaluation method of the students' design products in introductory design studios is "Design Jury" which happens through the "Public Critique" and contains guest jury members and the course instructors in the jury sessions (Çıkış & Çil, 2009).

Moreover, Farivarsadri (1998) states that basic design students tend to open up discussions with their peers in their design studios. He calls this kind of discussions as "Peer Criticism" and informal discussions. Introductory design studios in Turkey are seen as the multi-dimensional learning environment with varied participants and mutual relationship between design students and educators. Introductory design studios are both a design course and a physical spaces where the ground knowledge of architectural design shaped to prepare students for overcoming on their incapability (Gulmez & et al., 2014) and to encourage students to design something new for the modern life and gain students a deeper perspective toward their living environment (Heidarian & Ghafourian, 2014).

2.5. Architectural Education and Design Studios in IZTECH

The Department of Architecture was established in 1995 as a part of the Faculty of Architecture. The department was first offered only graduate programs until 1998 and the first undergraduate students entered the program in 1999 (architecture.iyte.edu.tr).

The vision of IZTECH department of Architecture is to develop abilities and skills of practitioners in the design and execution of building and also perform related projects which contribute to the development of architectural knowledge. Architectural department of IZTECH aims to gain knowledge in this field through research and practices; implement group work methodologies, interdisciplinary approaches and research based orientations; develop and revise the structure of the programs in order to ensure the competency of the future architects; raise architects, researches and academicians in this field who are capable of proposing productive, flexible and creative solutions for the problems they are solving; produce architects who are aware of the social responsibilities of multi-dimensional building processes and provide architectural services with vocational responsibility.

The Bachelor of Architecture education is a four-year program constituted with eight semester and summer practices. The undergraduate program is established in order to advance creative and critical thinking abilities of students. The structure of the program is set to gain students required technical and theoretical knowledge to analyze and solve design problems in architecture. Obligated summer practices are divided into four which are measured drawings practice (2 weeks), survey practice (4 weeks), office practice (6 weeks) and construction site practice (6 weeks). The practices help the students to improve themselves in the professional world by developing their skills and knowledge in the field.

The main difference of architectural education of IZTECH from the many other universities in Turkey is that architecture and city planning students take design and structure courses together in the first three semester. And also, in the seventh semester there is an urban design studio where students from architecture and city planning departments work in collaboration on large scale urban design problems. The intersection in education between two bachelor programs reflects a holistic approach in education toward to built environment and also aims to increase interaction and collaboration between candidates of architect and city planner.

In the program of undergraduate, there are studio courses in each 8 semesters which has the highest credit and main course of the curriculum. In the first semester its name is Introduction to Design which focuses on basic design terminologies and principles; in the second semester it is called as Introduction to Architectural Design in which students starts to design architectural spaces and structures and in the seventh semester the studio course is Urban Design Studio in which students work in large scales.

Except the studios, in the other semesters, studios are named as Architectural Design I, II, III, IV and V in these courses, students are assigned to an architectural project which are getting more complex in the upper classes. There are also Graphic Communication course in the first semester and Building Technology and Science course in the upper classes in which students learn technical drawings, structure technologies and building materials. In addition to these, there are also Architectural History and Theory Courses leading as I, II and III in which buildings, spaces, cities and structures throughout the history and their comparison in time are introduced to the students. In the courses Structures in Architecture I, II, III and IV, statics of materials and structures are learned. There are also courses to teach computer aided programs for drawing, representation and digital model making. Beyond these, students are also obligated to take the courses Building Physics I and II to learn mechanical heating and cooling; installation, acoustic, illumination, environmental, etc. systems in structures. In the first semester there is the course Introduction to Architecture which teaches about roots and scope architecture and prepares students to this field theoretically. In the seventh semester Project and Building Management course is given to teach project management techniques, principles and tools. And also, Urban Planning and Design Principles course is given in the seventh semester to give the student knowledge about site planning process, urban design methods and the legal framework of planning and design. Except the core courses there are elective courses students have to select at least 8 among them. Moreover, students are required to take some courses like Math, Advances English, History of Turkish Revolution, Principles of Ataturk and Turkish Language.

Students who successfully complete the program receive their Bachelor of Architecture degree which is an architect license from the Chamber of Architects of Turkey, a member of UIA.

As declared before, design studios are the main course of architectural design education. It is also the same for the architectural design pedagogy of IZTECH. In each eight semesters, students attend the course on Mondays (8 hours) and on Thursdays (4 hours before midday). This studio courses are obligated courses which have 8 credits in the program.

Although, design studios show gradually changes in the content from first semester to further classes, all studios have similar routines and learning environment where "Learning by Doing" system is implemented through "Project- Based" strategy.

The studio projects are getting more complex in both function and size from the first semester to the eighth semester.

The first studio is AR101 Introduction to Design which is given in the first semester. This studio introduces different design tools and media; explains and exercise on the basic concepts, terminology and principles of design. In addition to these, it aims to develop visual, written and oral techniques for the presentation of design products. Students from architectural and city planning departments take this course together in order to increase collaboration between two different disciplines.

In the second semester, students are required to take AR102 Introduction to Architectural Design studio. Its objectives are explaining basic methods of documentation and analysis for the natural and built environment; introducing physical and social definitions of space. Given design problems focus on spatial relations in the natural and built environment in the human scale and their enhancement for simple uses. Studio practices are combined with spatial organization, construction and representation skills. This studio also is taken by both architecture and city planning students.

Students take AR 201 Architectural Design I in their third semester. This studio aims to introduce the concepts, terms and methods for understanding a place in the urban context; explain the concepts of public space and private space. Studio project is based on a public building which has a simple architectural program in accordance with a design idea.

In the fourth semester, the obligated studio is AR 202 Architectural Design II which aims to introduce the concepts of rural environment and natural environment; explain the concepts, terminologies and strategies for understanding a place in the rural and natural context. Studio practices provides analysis of an architectural program including public, semi-public and private spaces and also inquiry of the effects of natural or rural environment to architectural design.

AR 301 Architectural Design III is the fifth studio which is given in the first semester of the third class. In this studio, the studio practices and project are based on designing a public building in an urban context. Educators introduce necessary concepts, theories and methods for understanding and analyzing a part of urban fabric. Students are expected to analyze the concept of public space, design a public building in accordance with the given program with a design concept and represent the project with different techniques.

In the sixth semester, students take AR 302 Architectural Design IV studio. The project of this studio is based on the concepts of housing and dwelling. Students are assigned to design a housing complex including both housing units and different programs in the urban context; analyze the relation between urban life and housing life and represent their design in different techniques.

In the seventh semester which is the first semester of the fourth class, architecture and city planning students and educator staffs are united again for CP 401 Urban Design Studio. This time students of architecture department take studio course from city planning department. This studio aims to introduce application of urban design theory, methods and techniques to specific large-scale development and redevelopment endeavors with metropolitan areas; strategies for change in large areas of cities to be developed over time. Students are expected to develop designs into a natural, man-made, historical and cultural outlooks; provide desirable activity and recreation areas; conceptualize built form; provide infrastructure and services systems. Students from city planning and architecture departments work in groups for the design project which involves a city guideline and a large-scale urban design project. They learn to work in collaboration and in the manner of interdisciplinary.

In the final semester architecture students are required to take AR 402 Architectural Design V studio. The project in this studio is seen as final project before being a professional architect. Therefore, it is the most complex project in function, program and massiveness. The project is based on designing a public building having a complex architectural program in urban context. Students are expected to analyze and understand a special part of an urban fabric; find original and sophisticated design ideas; produce a public building in accordance with the given program; represent the design in different techniques.

The reviews of each design studio are made in similar critique formats which are desk critique, panel review, midterm jury and final jury. The design processes of the students are followed by the instructors, instructors make comments and suggestions about the projects. There can be little difference between the studios in review organization. In some of the studios, instructors are assigned to 10-15 students and students receive critique from their instructors. On the other hand, some studios' educator staff can implement rotational system in which instructors change their student group to give critique periodically. In this method, the aim is to enable students the chance to receive review from different instructors.

In each design studios of IZTECH, there is a tendency to organize technical trip and excursions about the projects. Educator staff arranges the trips in order to increase mobility in design, provide students to see, analyze and understand a different built environment and enable students improve their visual memory.

2.5.1. Introductory Design Studio (AR 101 Introduction to Design Studio) in IZTECH

As declared in the previous parts, most of the architectural design students in Turkey come from a different education habits with lack of design knowledge. Therefore, introductory design studio of IZTECH is one of the places where the students first meet learning by doing system and such design problems.

This studio provides students a learning environment in which they meet different design tools, media, a new terminology and principles of design. It aims to gain design knowledge to the students and improve their visual, written and oral abilities for the further classes and also for the professional period.

In this course students are expected to materialize their thoughts and design ideas in both 2D and 3D format in accordance with the design principles and terminologies; analyze and document spatial and physical features of architectural and urban spaces and communicate design ideas utilizing different representation techniques.

The education strategy of introductory studios at IZTECH was discussed by many educator staffs and groups and it has been still transforming through the discussions. Under the light of "Learning by Doing", there are basic approaches followed during the first semester (https://toytasar.wordpress.com/). The main principles aimed to be followed are:

- Encouraging students to learn from their own mistakes
- Encouraging collective production
- Merging dimensions of spatial production
- Learning from outside and reality
- Searching the limits of experiment and innovation
- Enhancing Studio Culture
- Transparency in schedule

2.5.2. Brief Summary of AR 101 Introduction to Design Studio 2016-2017 Fall Semester

The new education semester (2016-2017 Fall) started on 3 October 2016 and author of the thesis started to participate in studios on 13 October 2016. There were 110 students and 12 instructors. Among the 12 instructors, 9 of them were research assistants and 4 of them were senior instructors. The students divided into three different studios and in each studio, there were 3 or 4 little groups with 12-13 students. And also, every research assistant was responsible for one little group. Courses had been done two times a week; full day on Mondays from 08:45 to 17:00 and half day on Thursdays from 08:45 to 12:00.

Whole semester processed through assignments, lectures, technical trips and critiques. Assignments designed by the senior instructors. Some of them were studio works but generally they were given as homework. Critiques on works were done generally at the same time in all 3 studios. Some of them made in little groups with research assistant and some made as panel critiques with 3 or 4 little groups and the assistants and a senior instructor of that studio altogether. Senior instructors were not stable in studios; they tried to be mobile to see the process and to control the whole 3 studios at the same time. However, the whole design studios came together for a panel or jury less frequently. Beside panels, desk critiques were done generally with the research assistants and less frequently with the instructors.

All the students came together in a classroom for lectures. Lectures were designed and presented by the senior instructors as more visually then verbal in slight formats. Lectures were generally given before new assignments to prepare students to the new subjects and terminologies.

Before author attended to the studio, students had been given two assignments which one is "What is control?" and the other one is "What is flow?". Beside 2D and 3D compositions on these two concepts, students were expected to research, understand and use some design terminologies about basic design elements and principles. When the researcher of the study attended the studio first, students had submitted their 2D and 3D compositions about "flow" and a panel within small groups was carried out to reinforce the understanding and use of basic design principles in compositions.

Next assignment was Assignment 3 whose subject was "Tree". The aim of this assignment was to observe, research, analyze and visualize a type of tree. All students were assigned to a type of tree from the list of tree types which are in Kültürpark/Izmir. Then they found their trees on site, marked them on map, observed and searched for their features. They chose one from the same types of trees which had distinctive features from the others and tried to visualize and abstract its features. After all, they produced a 2D pattern by abstracting a unique physical feature of the particular tree. Then color schemas and coloring practices were carried out on these patterns. Assignment 3 with its under titled assignments 3a, 3b, 3c and 3d had been lasted 2 weeks with color lecture, homeworks, panel critiques and studio work.

The fourth assignment which titled as "Animals in Sasalı Natural Park" was given to students with a list of animals from birds, mammals and reptiles. Students were assigned to choose one bird, one mammal and one reptile from the list. A technical trip was organized to Sasalı Natural Park and students observed their animals. The following studio day, they assigned to submit a promotion poster for Sasalı Natural Park by using their animals in a type of color schema and a single 3D composition made through the abstractions of the assigned three animals. After critiques on the works, in the Assignment 4b, students tried to make 3D modular compositions by inspiring from the physical features of the animals. For this assignment, there were carried out a lecture about modular design. Assignment 4 took 2 weeks as 4a and 4b.

The fifth assignment was an exercise for body, dance and space. Students were divided in groups of three or four. Four different Tango pieces were published on CMS (Course Management System) and students were assigned to three or four sequences from one of the performances. They analyzed and visualized the displacements of the dancers in 2D format with sketches, images, diagrams and texts as a group. In addition to the explanatory posters, each student was assigned to make a 3D visualization of their chosen sequence by using planar elements. On the submission day students were gathered at sports hall of the campus. There was a guest who is dancer and artist Fırat Neziroğlu. He did exercises with the studio participants (students and educators) to show the relationship between body and the used volume in space through its movements. This assignment had an influential role in understanding a new subject by bodily practicing. Until 5b assignment, the Tango performance posters and models were discussed and redone. The following step 5b was an introduction to understanding a space through its physical components like light, color, texture, scales, enclosures, circulation and level differences.

For this, students were assigned to analyze the spatial characteristics of the given public buildings in Kültürpark. They continued to work as groups with 3 or 4 people, made one spatial analysis poster and one information board. After taken critiques for these, they re-did and also submitted the 5c assignment which was about choreographing space through body movement. For this assignment, every group prepared a 3 minutes video from their recordings in their assigned buildings. The aim was to design a choreography which explains and shows the physical and spatial features of the structures by using bodily movements, not only visual but also tactile, audial and olfactory features of the chosen spaces. Fifth assignment took 2 weeks with 5a, 5b and 5c assignments.

The next assignment was assignment 6 which was about light experience. This assignment was given to the students on a Monday afternoon as a studio work. The first phase was to create two square prisms in defined measures by omitting two surfaces of each prism. The first instruction was to make two 3D compositions inside the two prisms each according to an obvious design idea like centrality, symmetry, asymmetry, hierarchy, balance by using the given solids (3 spheres, 2 cubes and 7 sticks) without using any glue. It was a challenging assignment for students because of the model making techniques and also limiting rules. After the assignment 6a, in 6b the compositions turned into more complicated models. Because, in this phase students were assigned to add transparent new elements and all surfaces were closed, only observation holes were added to the box. In this assignment, the aim was to make students observe the composition by considering the light and shadow relations. Then they were assigned to draw some sections to show their design with the light and shadows. In the third phase of the assignment which is 6c, students were expected to enhance their design by using a schema of complementary colors. Beside the sections, in this time an exploded isometric view was expected from the students to draw in their drawing posters. This assignment took 2 weeks long in the curriculum. However, this assignment will not be analyzed in detail in the Chapter 4.

Assignment 7 was the last design task and lasted 3 weeks. It was arranged to consist whole of the semester`s practices. That`s why, it might be considered as a final product which students studied for it, saved experiences and knowledge about design to use in this assignment. In regard to the aspect, this assignment was the most complicated and challenging study for the novice design students.

It was started with a three days long technical trip to Edirne. During the three days students were assigned to draw sketches, diagrams and take photographs to show and

document the spatial features of the structures, building complexes and components in Edirne. The main task was to define paths, passages and enclosures in terms of their spatial features and spatial relations between them. According to the analysis, groups with 3 or 4 students were assigned to produce a Spatial Catalogue of Edirne in which the places visited in Edirne would be represented and explained in terms of spatial analysis and relations with sketches, diagrams, photographs and texts.

The spatial catalogues were submitted in the first lesson after the trip then students concentrated on assignment 7b which was final project named as "Spatial Gift to Edirne".

The final assignment aimed to design a self-standing structure consisting of 7 spatial components which were two main spaces, transitional spaces and trails. It was an exercise for students to use the components (path, passage, enclosure) by using their spatial analysis in their design. To do that, three different routes were defined by the instructors and students designed according to the routes. Their routes were made to put in an order the components. Beside the defined routes there were 14 rules about dimensions and measurements of the components and also physical and proportional relations between the components.

After the preparation days for the final work, the students submitted their designs as posters which contains the drawings and a 1/20 scale model on 08 January 2017. The final jury was made on 09 January and 10 January 2017.

In this introductory studio, there were two main participants who were students and instructors. Students were responsible for attending the studio on time, submitting the proposed design solutions for the given assignments, homeworks and studioworks in regard to the instructions of the instructors on time. Instructors were responsible for designing the assignments, homeworks and studioworks, announcing and explaining them to the students, preparation and presentation of the lectures, giving critiques and instructions to the students for their design process, operation of the curriculum, organization of the studios and evaluating the projects of the students. However, in reference to the direct observations, during the semester all the instructors did not have the same duties in reality. Even though, they were all defined as "instructor" on the syllabus officially, there was a division in responsibilities and duties between senior instructors and research assistant instructors.

CHAPTER 3

DEFINING TWO LEARNING EXERCISES

In this chapter, the selected simple assignment (Assignment 3) and complex assignment (Assignment 7) will be explained with their all extends. After explanation of descriptions, requirements and goals to achieve of the assignments, five students' design processes will be mentioned chronologically through the design products and received reviews from the instructors. After that, the design products at each step will be evaluated in reference to the assignment goals. The evaluation will be carried out as approaching and moving away from the achievement of the defined assignment goals. At the end of the evaluation of the cases, there will be discussion parts in order to reveal the similarities and differences between design processes and responses of the students to the assignments.

3.1. Assignment 3: Tree

This assignment was organized over an object "tree". It was fictionalized with sub-assignments gradually; Assignment 3a: Getting to Work, Assignment 3b: Visualizing Work, Assignment 3c: Abstracting Design, Assignment 3d and 3e: Coloring Design.

In this process students firstly assigned to a type of tree, search the tree, find and locate that type of trees in the given area, analyzed and documented assigned type of tree, choice a "favorite" one among the same kind of trees, visualized and abstracted it, designed a pattern composition through the parts and features of it.

Descriptions and goals of each sub-assignment will be written in reference to the distributed assignment sheets, verbal explanation of assignments by the instructors in the studio and semi-structured interviews with the instructors during the observations. After all, the design processes of students for the Assignment 3c, 3d and 3e will be scrutinized. In this process, the critiques of the instructors which influence the design processes and the way of arriving the design task goals of the students also will be given. At the end of each student's section, the design products will be evaluated in reference to the defined assignment goals.

3.1.1. Description of Assignment 3a: Getting to Work
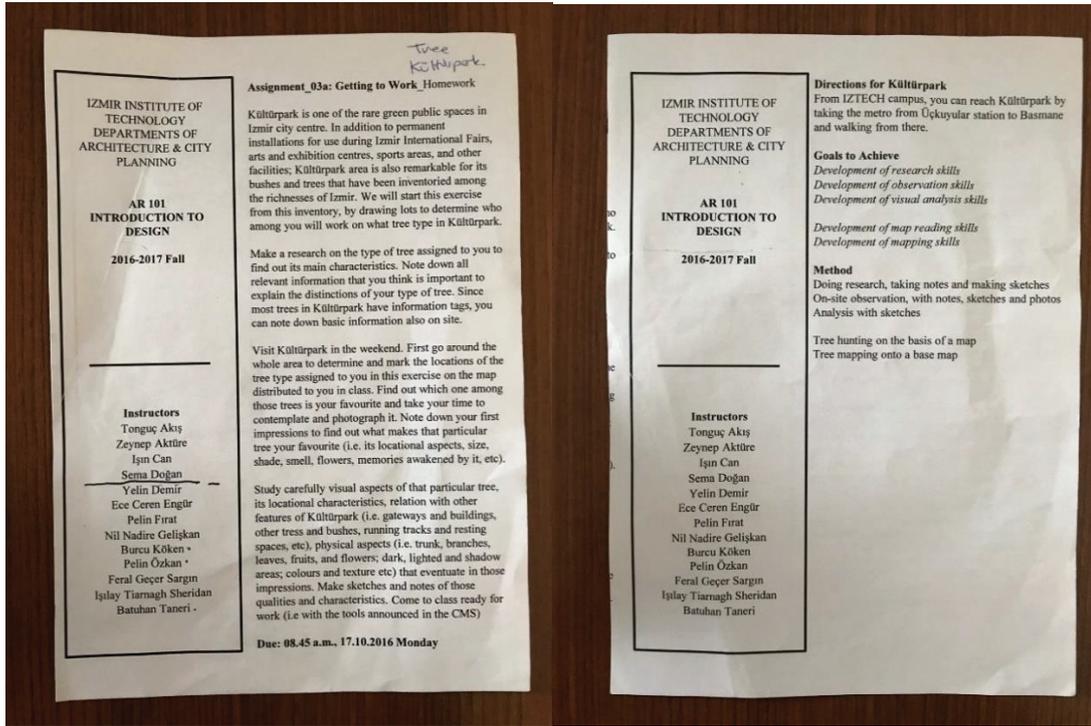
Figure 3. Assignment 3a Homework sheets. Black and white copy, two sided, A5 size.

Kültüpark is an urban park located in İzmir city center. It provides many facilities for citizens with its arts and exhibition centers, museums, event halls, sport areas and permanent installations for use during Izmir International Fairs. Beside the urban facilities, it is valuable as one of the rare green public spaces in İzmir with its bushes and trees that have been inventoried.

Among the inventoried types of trees in Kültürpark, instructors defined 13 different one and listed them on the board. Every student in each little group was assigned to one type of trees.

Students first were expected to research on the type of tree assigned them to find out its main characteristics. They were required to note down relevant information that they think is important to explain the distinctions of their type of tree before going to Kültürpark.

Secondly, students were assigned to visit Kültürpak in the weekend. When they arrived to Kültürpark, first they might go around the whole area to determine and mark the locations of the tree type assigned to them on the map which distributed to them in the studio. Then, they were expected to find out which one among those trees was their

favorite. They would think about why they chose this tree and take notes about their first impressions to find out what made the tree their favorite. The impressions could be like size, smell, flowers, shade, memories awakened by it, etc.
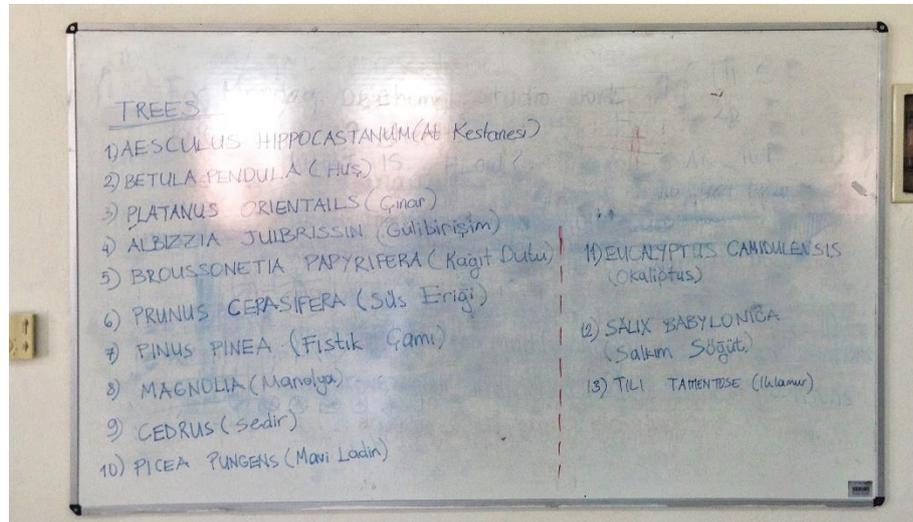
Figure 4. Photo of the board on which the types of trees were written

They were expected to define and analyze visual, locational and physical aspects of that particular tree. When they were studying for this, they would consider relation with gateways and buildings, other trees and bushes, running tracks and resting spaces, distinctive features of those trees like its trunks, branches, leaves, fruits and flowers, colors and texture. They were obligated to take notes, take photographs and make sketches when defining the qualities and characteristics of that particular tree.

3.1.1.1. Goals to Achieve of Assignment 3a: Getting to Work

This preparatory work was a task which includes step by step instructions. Students were expected to research, find, locate, observe and analyze their assigned type trees, then select their favorite one among those and document their impressions and finding about their particular tree.

The goals to achieve of the instructional task were defined on the assignment sheet as below and their explanations were done by the author:

- Development of research skills: Searching the main characteristics, features and distinctive specialties of assigned tree type through internet or any kind of inventory.

- Development of observation skills: Observing that type of tree by considering visual, locational and physical aspects of it in Kültürpark

- Development of visual analysis skills: Trying to scrutinize and define the physical characteristics of the tree, spatial relations of the tree with the other trees, spatial relations of the tree with the bushes, gateways, buildings or any other physical component near the location of the trees during the observation in Kültürpark.

- Development of map reading skills: Finding the locations via the distributed map of Kültürpark.

- Development of mapping skills: Marking the locations of the trees which observed in Kültürpark on the given map.

In addition to them, this assignment also aimed to improve representation skills of the students because of the defined analysis and representation methods on site -taking photographs and sketching- for the assignment. Because of these, the other goals of the assignment to achieve were:

- Development of sketching skills: Making free hand drawings on site to represent the observed and analyzed visual, locational and physical aspects of that tree.

- Development of taking photography skills: Taking photographs on site to represent the observed and analyzed visual, locational and physical aspects of that tree.

- Development of representation skills: Trying to improve the ability of sketching and taking photography on site and exploring new methods or techniques in the aim of representing the observation and analysis findings clearer.

3.1.2. Description of Assignment 3b: Visualizing Work
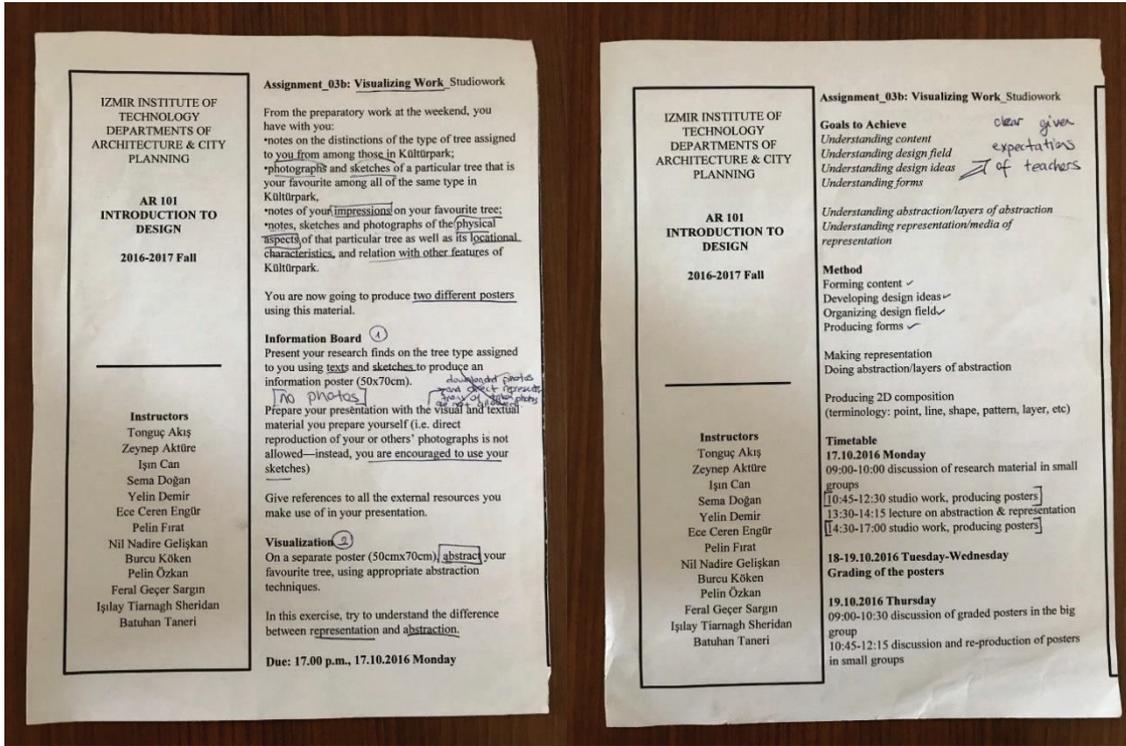
Figure 5: Assignment 3b sheet, black and white copy on A5 size paper, two sided

Students had notes on distinctions of the type of tree assigned to them from among those in Kültürpark, photographs and sketches of a particular tree which is their favorite among all of the same type in Kültürpark, notes of their impressions on their favorite tree, notes, sketches and photographs of physical aspects of that particular tree as well as its locational characteristics and relation with other features of Kültürpark.

For this studiowork, students were expected to produce two different posters by using these materials.

Information board: Students were expected to produce an information poster by presenting their research finds on the assigned tree type. The dimensions of the poster would be 50x70 cm and the presentation would be done with the visual and textual material which students prepared themselves. Students were encouraged to use sketches instead of photographs. And also, there would be brief information about that type of tree.

Visualization: For the second poster, students were assigned to produce an abstraction of their favorite tree by using appropriate abstraction techniques which were

previously explained in the lecture. This poster also would be produced on 50x70 cm board.

Students were expected to understand the differences between representation and abstraction in this exercise.

3.1.2.1. Goals to Achieve of Assignment 3b: Visualizing Work

This assignment was an exercise for practicing to use gathered and analyzed data. Students were expected to represent their materials which gathered throughout the Assignment 3a in both information poster and visualization board.

The goals to achieve of the studiowork were defined on the assignment sheet as below and their explanations were done by the author:

- Understanding content: Comprehending the task and trying to apply the given information about visualization and abstraction in the lecture for this task.

- Understanding design field: Organizing and locating design elements on the given base.

- Understanding design ideas: Developing design ideas and producing the posters in reference to the ideas.

- Understanding forms: Using geometric shapes and exploring their geometric relations between each other.

- Understanding abstraction/layers of abstraction: Comprehending abstraction terminology and its layers while representing the tree in the gap between identifiability and indefinableness of the tree.

- Understanding representation/media of representation: Grasping the differences between in real representation and abstracted representation.

This assignment also aimed to develop sketching skills because students were not allowed to use taken photographs on their posters. In addition to them, it was the first studiowork in this semester, so it was also an exercise to produce something new in a limited time. Therefore, it also aimed to develop time management skills.

3.1.3. Description of Assignment 3c: Abstracting Design
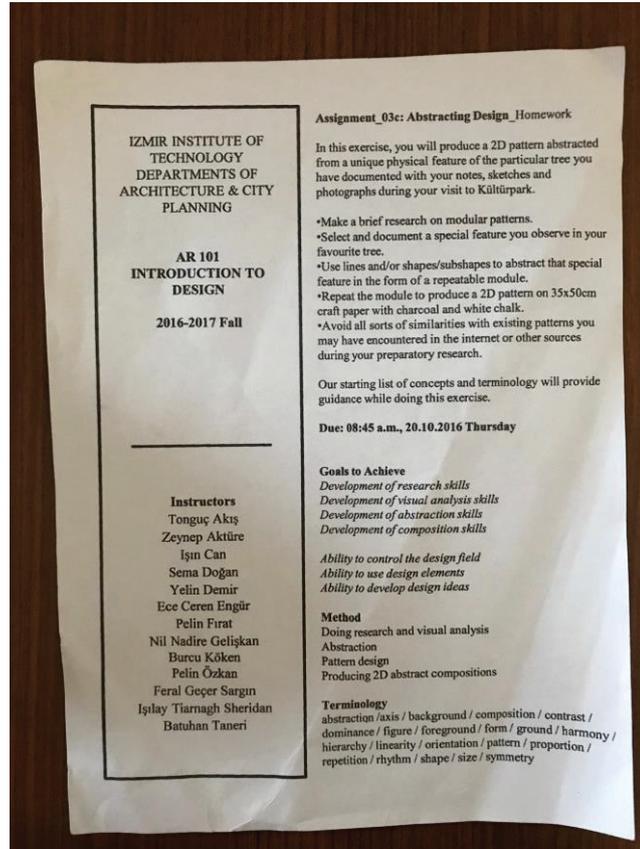
Figure 6. Assignment 3c sheet, A5 format, black and white copy

In the exercise the concept of abstraction of the particular tree turns into a new way of work "designing pattern". It was expected from students to produce a unit by using lines, shapes or sub shapes by inspiring from a unique physical feature of the particular tree and it was important to repeat the unit in a ruled way to produce a 2D pattern.

Before starting to design pattern, students were assigned to make a brief research on modular patterns. Because, there was no lecture given before this assignment about modular design or pattern. Students were needed to select and define a physical feature which they observed in their favorite tree, then they were required to abstract that special feature in the form of a repeatable module. They would repeat the module to produce a 2D pattern on 35x50 cm craft paper with charcoal and white chalk.

Students were warned about copying any existing patterns that they found in the internet or other sources during their preparatory research.

3.1.3.1. Goals to Achieve of Assignment 3c: Abstracting Design

This exercise was a design task that would be produced with the materials which observed, analyzed and documented during Assignment 3a and Assignment 3b. The aim of the assignment was to develop design ideas in reference to the previous works and make a meaningful pattern composition by representing the design ideas in geometric forms.

The goals to achieve for this homework were defined on the assignment sheet as below and their explanations were done by the author:

- Development of research skills: Searching for pattern design, its features, the characters that made it pattern from any kind of source (internet, books, magazines, experts, etc.)

- Development of visual analysis skills: Trying to scrutinize and define physical features of that particular tree.

- Development of abstraction skills: Trying to represent an explored physical feature of that particular tree in an abstracted form.

- Development of composition skills: Improving the ability of composing design elements within meaningful form relations that each design elements seen as inseparable from the organization.

- Ability to control the design field: Ability of considering the given base in organizing the design elements.

- Ability to use design elements: Ability of making design elements well-defined and recognizable and organizing them in a meaningful composed way.

- Ability to develop design ideas: Ability of creating concepts in reference to the findings from the analysis in order to produce a composition through it.

3.1.4. Description of Assignment 3d and 3e: Coloring Design

These two exercises were revising assignments of Assignment 3c in color schemes. Students took critiques and listened studio discussions about their pattern

designs for Assignment 3c. This time, they had to chance to reproduce their pattern design in reference to the critiques.
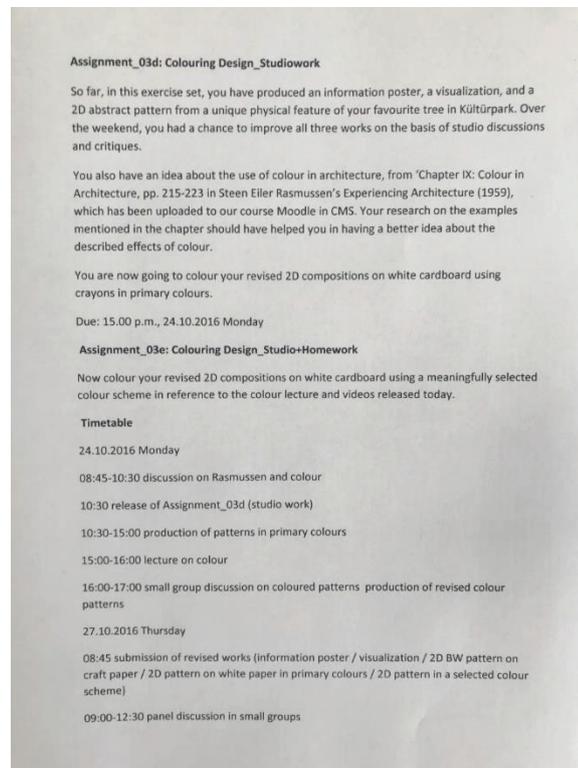
Figure 7. Assignment 3d and 3e sheet, A4 format, black and white copy

Students had idea about the use of color in architecture, from Chapter IX: Color in Architecture, pp. 215-223 in Steen Eiler Rasmussen's Experiencing Architecture (1959), (which is a commonly used source in architectural design education, has clear and lucid expression that every beginner is able to understand) has been uploaded to course moodle in CMS. And also, there was a lecture given to the students about color.

For the Assignment 3d, students were expected to use primary colors while revising their pattern design. It was a studiowork. For the Assignment 3e, students were assigned to select a color scheme in reference to the color lecture and apply it into their revised pattern composition. It was a studiowork too, but students could continue to make it at home if they could not finish in the studio.

3.1.4.1. Goals to Achieve of Assignment 3d and 3e: Coloring Design

There was nothing written about goals to achieve on the assignment sheets. However, it was known and clarified that Assignment 3d and 3e were reproduction tasks of Assignment 3c. Therefore, the goals of the two assignments were the same with goals of Assignment 3c.

In addition to those goals, some more things were expected to achieved. Although they were not written on the assignment sheet, instructors declared verbally about the goals.

They were:

- Understanding the color schemes: Comprehending the various color scheme and trying to apply them in 2D composition.
- Ability to use colors in a 2D composition: Ability of using colors in a 2D composition in the way of making meaningful contribution to the design.

3.1.5. Case Studies for the Assignments 3c, 3d and 3e

In this part, five students' design process were investigated within the scope of goals of the assignment and the responses of the students to the assignment. First of all, the pattern design process of students was explained in reference to the observations during the panel reviews and semi-structured interviews with the students and instructors. Then, the works of the students for Assignment 3c, 3d and 3e were evaluated in regard to the goals to achieve. The design products of the students in each step were analyzed in approaching to achieve the goals or moving away from achievement of the goals.

3.1.5.1. Student 1

Student 1 was assigned to observe and analyze pine trees in Kültürpark then selected her favorite one from among those pine trees. Throughout the pattern design process, she was eager to develop and change her project by taking into consideration the suggestions and ideas of instructor.

3.1.5.1.1. Pattern Design Process

In the beginning of this pattern design process, she presented her first pattern design for Assignment 3c at the panel review (Figure 8). She was impressed from the shapes of the branches of the tree. She first tried to design her unit by abstracting the form of the branches. Then, multiplied the unit to create her pattern. She declared her unit form generation as follow:

> First of all, I would like to form my unit. I was impressed from the shape of the branches which stemming from the trunk like "v" shape. They were longer at the bottom and getting shorter at the top gradually. The branches were closer to the trunk at the top and there were voids between branches at the bottom. In this approach, I created my unit. Then I connected the units from their corners and produced my pattern design.

| Pine tree | Pattern poster of Student 1 with marked unit |
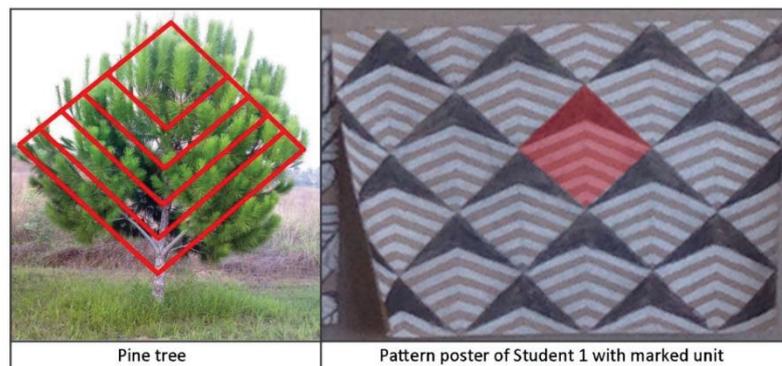
Figure 8. Inspired tree and pattern poster of Student 1

After her explanation about her design, instructor criticized it about relations between units, their connection styles and composition quality. He said that:

> Units are connecting each other only from their corners and their merging style is point. If you could set more geometric relations between the units, your design would be sophisticated. Maybe you can change the directions or scales of the units when gathering them. It can keep away the pattern from "stamp affect".

In addition to the critiques, the instructor also asked for the voids on the poster. Student said that they were done to represent the voids between the branches. Instructor would like to make students be aware of the foreground-background relation and warned the students about every empty space in design field must be a part of the composition.

At the second panel review which was done for Assignment 3d and 3e, Student hanged all the pattern works on the board. She considered the suggestions of the instructor

and tried to change her pattern design in both Assignment 3d and Assignment 3e colored pattern posters (Figure 9).
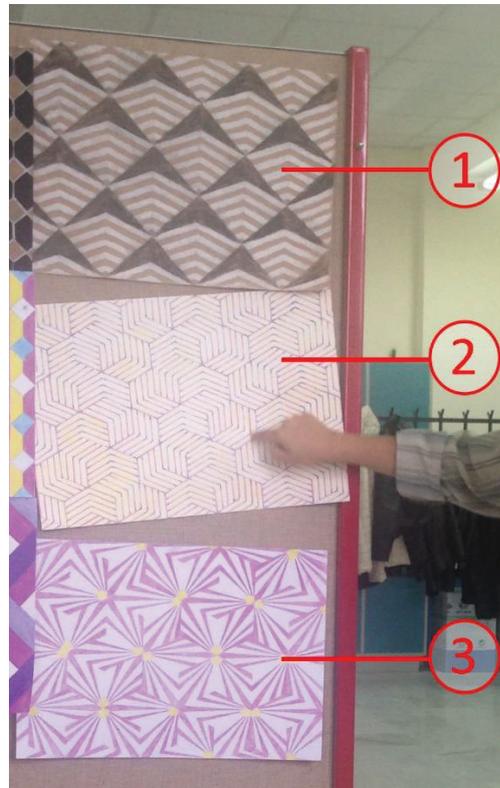
Figure 9. Pattern posters of Student 1

In the second poster which was reproduced and colored with primary colors, she generated a new unit form with the same design idea. She tried to set more geometric relations between the units and connected the units by changing its direction.

> I changed my unit form and transformed the "v" shape idea into this unit. Then by rotating the unit I merged the units. I painted it in primary colors.

The instructor found the second pattern design better at relations between units but he criticized that there was a weak foreground-background relation. Because, the design elements were only linear and the areas between the lines left empty. He said that:

> Your attempt to find a new forms and pattern is fine. This design has a potential, but it is so linear. You colored only the lines. So, the spaces between the lines and the colored lines are not effective for a good figure-ground relation.

For the third poster, she again changed her pattern design and tried to generate a new form. This time, she designed her unit as a center and branches going through the center. Then she tried to follow a similar strategy and rotated the unit in designing the composition.

Instructor appreciated her because of her effort to create new different pattern designs. Then he criticized the third work as follow:

> It is good to generate new forms. This work also has potential. However, this time it is hard to understand how the units coming together. If we would like to continue to the pattern, how will we connect the units? There is not a well-defined rule. And also, the voids between units are not defined. They are unclear empty spaces and do not serve for the composition.

In addition to the comments, he said her that she used design field better in 1st work. In the second and especially in the third one, she couldn't estimate where the design field crops the pattern work.

3.1.5.1.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- Assignment 3c: Abstracting design: When we look at the first pattern composition of the student, it can be said that the student visually analyzed the tree and abstracted the features of the tree. And also, it was recognizable that she made a research about pattern design. So, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. However, there was not creative geometric relations between the units. So, she couldn't get closer to develop her composition skills for this poster.

She also achieved the aim of controlling design field. Design elements were recognizable and well-defined. It was also advantageous for her to find such a design idea and pattern form by inspiring from the branches of the tree to achieve the goal of developing design ideas.

Step 2- Assignment 3d: Reproducing and coloring design: In this second pattern design, she developed a new design idea and generated new forms. This kind of variation in the form of design shows that, she came closer to achieve the goal of ability to develop design ideas. When we consider the other goals of the assignment, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. This composition was more sophisticated in geometric

relations between the units than the previous one, but because of the linearity of the design elements and undefined spaces on the board, she moved away from reaching the aim of controlling the design field.

However, she couldn't achieve the goals about coloring design in this work. Because, she used the primary colors in the linear design elements so she couldn't use the method of coloring as an advantage in her composition, even this kind of coloring made her composition undefined.

Step 3- Assignment 3e: Reproducing and coloring design: For this coloring work, she again changed her pattern design and reproduced something new. She improved her ability to develop design ideas, but in this variation, she moved away from a meaningful pattern composition. Because, the units were not connecting each other in a modular way and there were not well-defined geometric relations between the units. She couldn't develop her composition skills and couldn't use design elements by taking into consideration foreground-background relations and control of the design field.

In addition to these, she couldn't use the complimentary color scheme in a proper way. Because, there were too much empty and undefined white spaces.

3.1.5.2. Student 2

Student 2 was assigned to observe and analyze birch trees in Kültürpark then selected her favorite one from among those birch trees. Throughout the pattern design process, she didn't make significant changes from the first work to the third one. Because, she considered the ideas and suggestions of the instructor and she didn't need to make big changes in both design idea and form generation process.

3.1.5.2.1. Pattern Design Process

She presented her first pattern design for Assignment 3c at the first panel review (Figure 10). She was impressed from the shapes of the leaves of the tree and tried to abstract the form of the leaves. Then, she merged four leaf like shapes as shown in Figure 10 and designed the unit of the pattern work. She declared her unit form generation as follow:

I tried to abstract the form of the leaves as cornered geometric shapes. Then I would like to create my unit to copy and produce the pattern. I tried to connect the leaves in many times then I decided to merge them at one center. Then I colored them in white and black like this to make them definable. After all, I copied the unit like this and composed my pattern poster.

| The leaves of Birch | Pattern poster of Student 2 with marked unit |
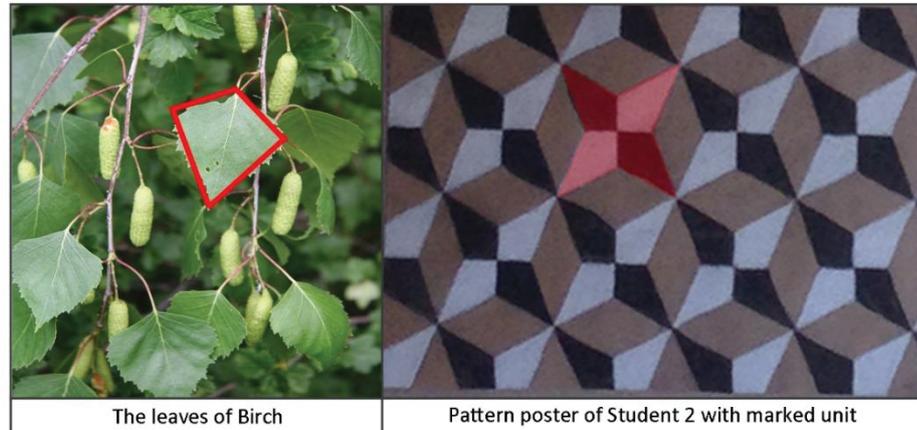
Figure 10. Inspired tree and pattern poster of Student 2

After she told about her work, instructor criticized the work as below:

Your use of design field is good for the balance between figure and ground. Because the spaces which are not filled black or white can be figured out and can be a part of the design with its readable shapes. Although you said that my unit is this shape, somebody looked at the board can see any other modular shapes. It means you integrated the units well and the design doesn't give stamp effect, it looks as a whole.

Instructor commented on the work in a very positive way. He thought that the design work was a good start because of the balance between the design elements and identified figure and ground shapes. He suggested her try to make it more complex. Student asked for its meaning and instructor explained it. He said her try to add more design elements and shapes into your units.

For the second panel review, she presented her works for Assignment 3d and Assignment 3e which were coloring of the pattern designs (Figure 11). She considered the suggestions of the instructor and tried to make it more complex. She explained the changes as follow:

I didn't want to try totally different thing, because you criticized it in a good way. So, in both second and third poster I tried to add something more to it as you said and produced a polygon at the center of the unit. Then I filled up design field in the same way. In the second one I used primary colors, but for the polygon at the center, I couldn't use any colors, because we have three primary colors. That's why it looks like orange because of the intersection of yellow and red. For the third poster, I chose achromatic + one color scheme.
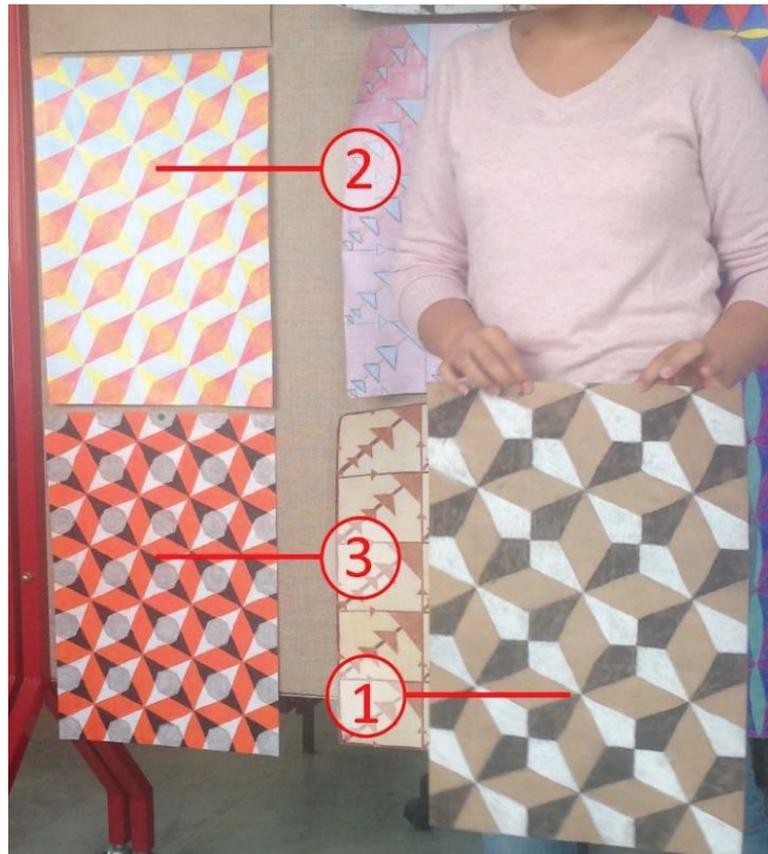
Figure 11. The pattern posters of Student 2

Instructor didn't criticize the works about pattern composition again, because he thought that it was enough for a meaningful pattern composition. However, He made comments about coloring as below:

In the second poster, your coloring quality is not good, blue and yellow areas are so light and undefined near the red areas. It doesn't provide us to read your composition well. In the third poster, your labor is better, but because of using red on the background, eyes are focusing on the background and it covers the importance of the figures. You should try reverse.

3.1.5.2.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- Assignment 3c: Abstracting design: In the first composition of the student, she had a positive start in order to achieve the goals of the assignment. She visually analyzed the tree and its parts, abstracted the leaves, made a research about pattern design and produced her first composition. Therefore, she approached to achieve

the goals about development of research skills, visual analysis skills and abstraction skills. In addition to these, this work was also an advantageous start to develop composition skills. Because, her design elements were identified, figure & ground relation was balanced and design field was controlled. She also had an ability to find such a design idea and pattern form by inspiring from the leaves of the tree and approached to achieve the goal of developing design ideas.

Step 2- Assignment 3d: Reproducing and coloring design: For the second work, she didn't make radical changes in the form of the pattern and design idea. She tried to make it more complex by increasing the number of the design elements and changing the coloring style. However, this made the design elements unclear and the work confusing. Therefore, she moved away from the goal of development of composition skills and she couldn't achieve the goals about coloring design in this second work. Design field was controlled again, because there were little differences in the form.

Step 3- Assignment 3e: Reproducing and coloring design: For this coloring work, she didn't make any changes in the form and idea of the design. She only changed the colors and used a color scheme. However, this kind of coloring didn't reinforce the representation of the composition. Because, she gave more importance to the background than the foreground in this coloring. So, she couldn't achieve the goals of ability to use of colors in 2D compositions.

3.1.5.3. Student 3

Student 3 was assigned to observe and analyze cedar trees in Kültürpark then selected his favorite one from among those cedar trees. During the pattern design development process, he made radical changes in design after the first panel review. In the coloring steps, he didn't change the pattern designs. He made his design decisions in regard to the ideas and suggestions of the instructor.

3.1.5.3.1. Pattern Design Process

He presented her first pattern design for Assignment 3c at the first panel review (Figure 12). He tried to abstract the needle leaves and fruits of the cedar tree then created

the unit b combining them. He filled up the design field by connecting two sides of the units. He explained his pattern design as follow:

The needle leaves and the fruits were the distinctive features of the cedar tree. So, I abstracted them first and emerged my unit. Then I connected them like this and made the pattern design.

After he told about his work, instructor criticized the work as below:

The connections of the units are problematic. Because, there are not clear geometric relations between the units. Some are touching the other unit, but some are not. It also reasons unclear voids between the units. The empty spaces ware not well-defined. I think the overall problem is the bad drawing quality here. Because, each unit was not drawn the same. Try to use clear design elements and shapes and be careful when drawing them.

| The leaves and fruit of tree | Pattern poster of Student 8 with marked unit |
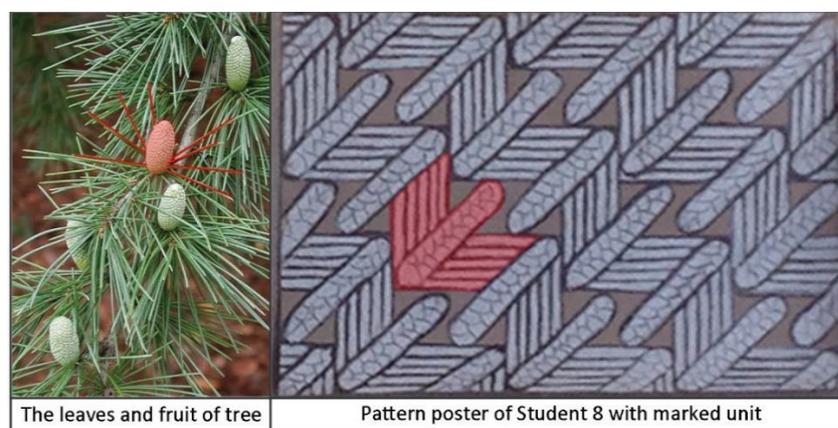
Figure 12. Inspired tree and pattern poster of Student 3

Instructor thought that, it was not a clear composition. Because, the units were not drawn the same and their relations between each other were not the same. It caused unclear figure and ground relations.

For the second panel review, he presented his works for Assignment 3d and Assignment 3e which were coloring of the pattern designs (Figure 13). And also, he reproduced the pattern design in black and white. He took into consideration the comments and suggestions of instructor and changed his pattern design. He said that:

The design elements in my first design was not sharp in shape and I couldn't draw them all the same. That's why, for the new pattern design I tried to use more clear shapes like triangles. Then I thought that I can abstract the needle leaves like the sharp triangles too. Then I created the unit by using 8 same triangles. After that I connected the units from their corners.

Instructor listened the student and criticized the works as below:

The new pattern design is better in integration and figure & ground relation. Your design elements are clear and well-defined. It is good to let the viewer perceive many different units when he or she changed their focus point. I can perceive different shapes as your unit.

In addition to the comments about the pattern design, instructor also talked about the coloring of the student. He thought that for the second poster, using yellow on the background is better to give importance to the units with blue and red. However, for the third composition, he suggested him to use achromatic color scheme instead of complimentary color scheme. Because, the purple background competes with the units in drawing attention.

Figure 13. The pattern posters of Student 3

3.1.5.3.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- Assignment 3c: Abstracting design: He observed the cedar trees and made visual analysis. It can be said that he made an effort to achieve the goals of

development of research skills, development of visual analysis skills and abstraction skills. However, he couldn't approach to the goal of development of composition skills. Because, the design elements were not well-defined and he couldn't control the design field. Nevertheless, he had an ability to develop design idea by inspiring from the leaves and fruits of the tree and approached to achieve the goal of developing design idea.

Step 2- Assignment 3d: Reproducing and coloring design: For the second work, he totally changed the design idea and form of the pattern design and produced something new. In this work, he approached to achieve the goal of composition skills. Because, the design elements were well-defined, figure & ground relation were clear and he had ability to control the design field. In addition to the goals about the design, he also achieved the goals about coloring. He had an ability to color design in primary colors in the way of reinforcing design composition.

Step 3- Assignment 3e: Reproducing and coloring design: In the third poster, he couldn't change anything about design and form. He just colored the pattern in selected complimentary color scheme. However, this kind of coloring didn't contribute anything to the pattern design. Therefore, he moved away from achievement of the goal of ability to use colors in 2D composition compared with the second work.

3.1.5.4. Student 4

Student 4 was assigned to observe and analyze salix babylonica trees in Kültürpark then selected her favorite one from among those salix babylonica trees. Throughout the pattern design process, she was eager to develop and change her project by taking into consideration the suggestions and ideas of instructor.

3.1.5.4.1. Pattern Design Process

In the beginning of this pattern design process, she presented her first pattern design for Assignment 3c at the panel review (Figure 14). She was impressed from the flowers with its buds of the tree. She first tried to design her unit by abstracting the form of the flower buds. Then, multiplied the unit to create her pattern. She declared her unit form generation as follow:

There were many tiny buds on the flowers. I was impressed from them and would like to abstract the form of the buds. I thought to abstract their form like looking them in a microscope. Then I abstracted each bud like a square frame with filled or empty one more square inside it. By gathering two filled and two empty ones, I produced my pattern unit. Then I merged them all until filling the design field.

| The fruits of salixbabylonica | Pattern poster of Student 10 with marked unit |
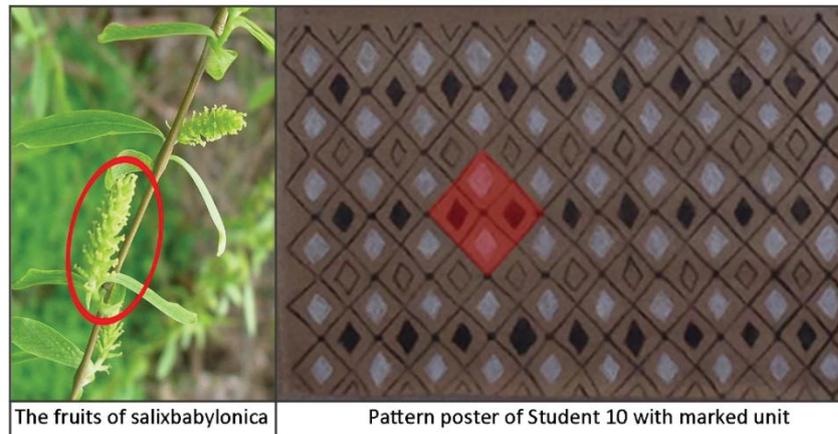
Figure 14. Inspired tree and pattern poster of Student 4

After her explanation about her design, instructor criticized it about figure & ground relation and composition quality. He said that:

Your drawing quality is not good, so the units are not the same. Some are bigger, some have different angles. And also, then empty spaces on the background is not well-defined. Because you are just dividing the spaces with linear frames and there are problems in solid-void relations. You need to define well the figures and also consider the voids on the background when gathering the units.

At the second panel review which was done for Assignment 3d and 3e, Student hanged all the pattern works on the board. She considered the suggestions of the instructor and tried to change her pattern design in both Assignment 3d and Assignment 3e colored pattern posters (Figure 15).

In the second poster which was reproduced and colored with primary colors, she changed her design idea and generated a new unit form. She was impressed from the flowers and buds for the first work, but she changed her design source and said that she tried to abstract the form of the leaves of the tree. She explained her new pattern work as follow:

I changed the part of the tree that I tried to abstract. Because, I couldn't produce a different thing when I tried to abstract the buds. This time I tried to abstract the leaves of the tree. Then I connected them like this in the second poster. I also reproduced the black and white poster.
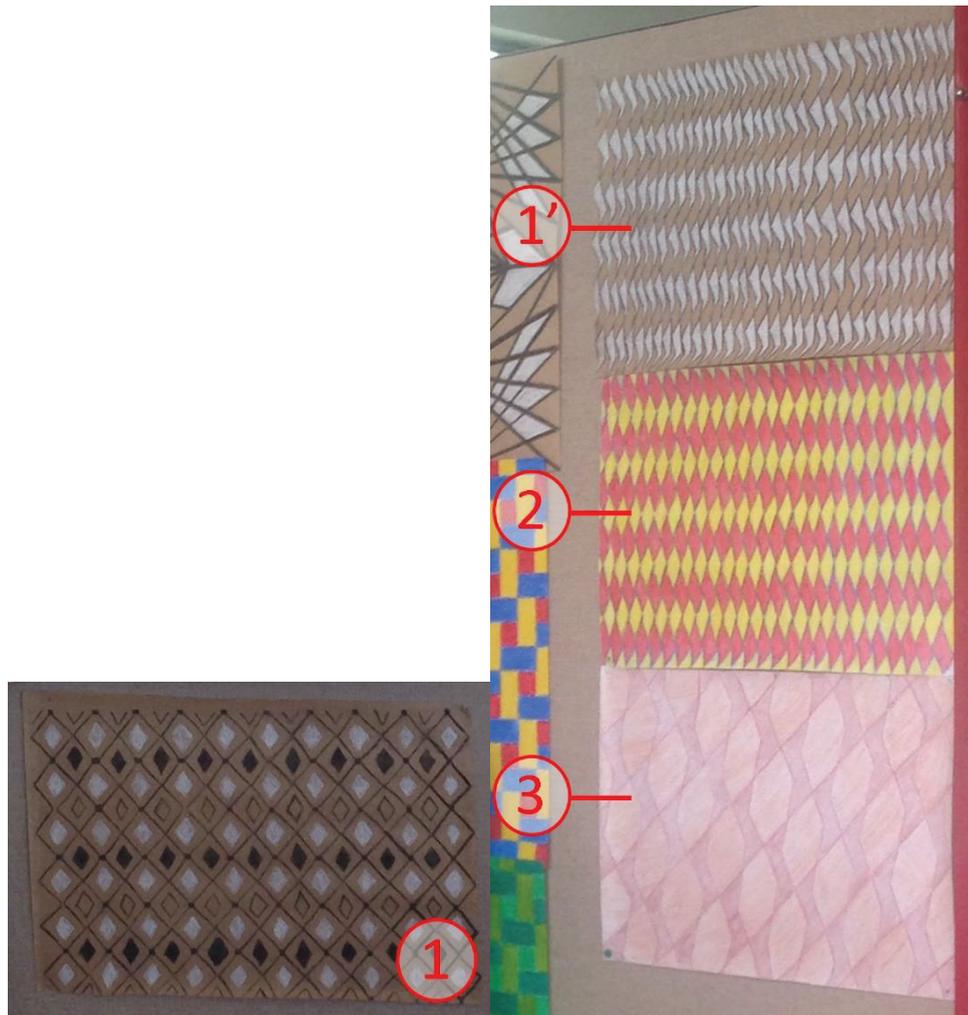
Figure 15. The pattern posters of Student 4

The instructor listened her and analyzed the second work. Then he said that:

Your drawing quality is not good so your units are changing in size and shape in your pattern again. And also, you have only two design elements. One is your unit and the other one is the void on the background. So, it looks like stamp effect which we talked about it before. And also, the geometric relation between units are not designed.

In addition to the critiques about the pattern design, he criticized the second poster about coloring. Because of having only two design elements, she had to use the third color in framing the units. Instructor also criticized it and suggested her to increase the number of the design elements.

For the third poster, she didn't make radical changes. This time, she tried to make the shapes bigger in the form to make the spaces well-defined. Then she used monochromatic color scheme.

After she talked about her third pattern design, instructor also criticized the third one as below:

The figure and ground relations and also proportions of the design elements are more controlled in this work. However, the critiques about stamp affect and geometric relations between the units are valid or this work too. You need to structure your units more than one geometric form.

3.1.5.4.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- Assignment 3c: Abstracting design: For the first pattern design composition of the student, it can be said that the student visually analyzed the tree and abstracted the features of the tree. And also, it was recognizable that she made a research about pattern design. So, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. However, she couldn't get closer to develop her composition skills for this poster. Because, in this first work she was not able to control the design field, figure & ground relations and she was not able to use the design elements in more geometric relations between each other. Although she couldn't approach to achieve the goals about composition skills, she had an ability to develop such a design idea by inspiring from the buds of the flowers.

Step 2- Assignment 3d: Reproducing and coloring design: In this second pattern design, she developed a new design idea, changed the inspiration source buds into leaves and generated new forms. This kind of variation in the form of design shows that, she came closer to achieve the goal of ability to develop design ideas. When we consider the other goals of the assignment, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. However, when we consider the composition skills, she couldn't get closer to achieve the aim of development of composition skills. Because, she still had not ability to control design field, figure & ground relations and use design elements.

In addition to the evaluating the pattern design composition skills, when the second work was analyzed in reference to the goals of coloring design, she couldn't approach to achieve the goal about coloring 2D compositions. Because, this kind of coloring didn't contribute anything to the pattern design.

Step 3- Assignment 3e: Reproducing and coloring design: For this coloring work, she made little differences in her pattern design and she only changed the

proportions of the unit. This time she got closer to achieve the goals of controlling design field, but she couldn't approach to achieve the goals about development of composition skills and ability to use design elements. Because, there were the same geometric relations between the design elements with the second work.

In addition to these, she couldn't use the monochromatic color scheme in a proper way. Because, there were only two design shapes to color although there had to be at least three colors to be used for the assignment.

3.1.5.5. Student 5

Student 5 was assigned to observe and analyze pine trees in Kültürpark then selected her favorite one from among those pine trees. Throughout the pattern design process, she was willing to develop new design ideas and forms. She was not afraid of trying something new and change her project. In this process, she also tried to taking into consideration the reviews of the instructor.

3.1.5.5.1. Pattern Design Process

In the beginning of this pattern design process, she presented her first pattern design for Assignment 3c at the panel review (Figure 16). She was impressed from the texture of the trunk of the tree. She tried to abstract the texture of the trunk and defined her unit as the hexagon which was reference to the particles on the trunk. She explained her first pattern design process as follow:

> I was impressed from the texture of the trunk. Each particle was like a hexagon and I defiend my unit as a hexagon. Then I tried to fill up the design field in this way by multiplying the same hexagon to emerge my pattern design.

After her explanation about her design, instructor criticized it as below:

> In this pattern design you have only one defined design element which is your unit is the hexagon. And there are also empty spaces between the unit, but they are not well-defined with their forms and proportions. You need to integrate it more design elements, it looks too basic.

| The texture of the trunk | Pattern poster of Student 13 with marked unit |
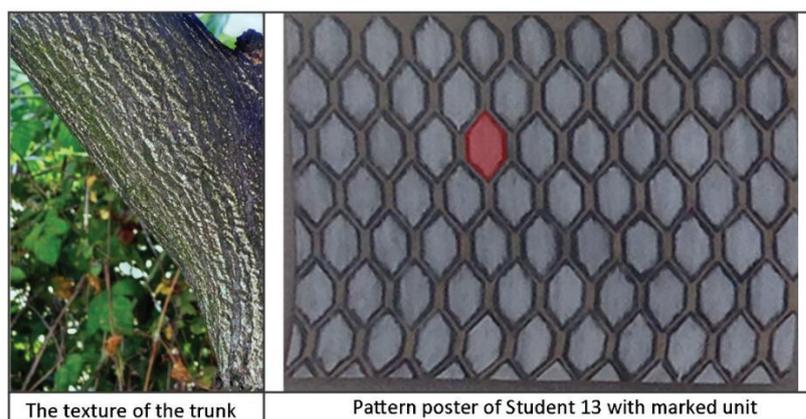
Figure 16. Inspired tree and pattern poster of Student 5

In addition to the critiques, the instructor also said her to consider the geometric relations between the units. Because, he said that there was no relations between the units in this poster.

At the second panel review which was done for Assignment 3d and 3e, Student hanged all the pattern works on the board. She first tried to reproduce her black & white pattern composition an in each coloring step she changed her pattern design. While she was reproducing the pattern design always took into consideration the ideas and suggestions of the teacher. (Figure 17).

In the reproduction of first poster, she tried to compose a unit which emerged lots of hexagons. However, she was not satisfied with her design and tried for a new pattern composition for her first coloring assignment. In this second poster, she made little difference from the reproduced black & white poster (1'). She declared that she again was not satisfied with her design and changed the pattern design again for the third poster. She explained the process at the panel review as below:

According to the critiques from the first panel review, I first tried to increase the number of the design elements of my unit and I did this poster (1'). For the Assignment 3d, I did this one and made some little differences. (2). However, It was again wasn't looking like a pattern and I didn't satisfied again. Therefore, I tried totally different think for the last poster.

Instructor listened her and analyzed the posters. Then He said that:

I appreciate your effort to try new things in each step. In the 1' and 2nd posters, it is hard to identify what is your unit. Because there is a module which structured by too much elements. They are looking like an ordinary composition than pattern composition. Because your module is looking too complex. However, in the last one the unit and each design elements are clearer to identify. And they are coming together in the same way.
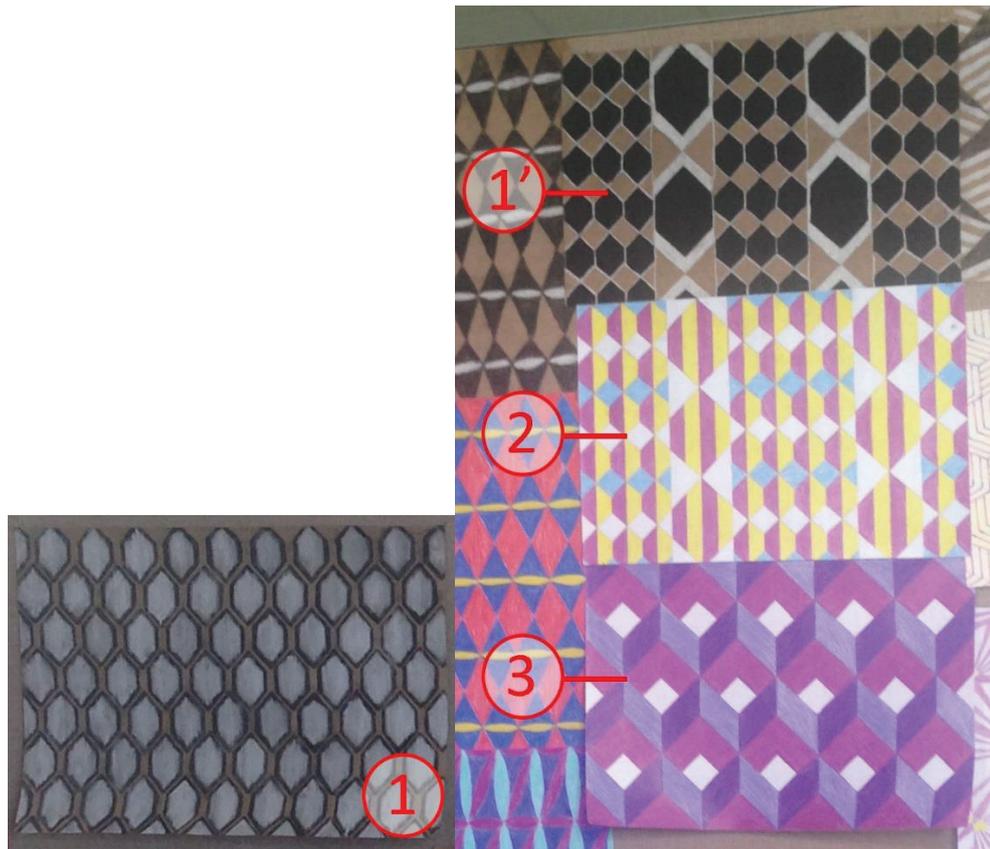
Figure 17: The pattern posters of Student 5

He criticized all the pattern compositions and according to him the last one was better in pattern composition standards. The design elements were well-defined, figure&ground relations were controlled and proportions were balanced. However, he didn't make any comments about coloring the designs.

3.1.5.5.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- Assignment 3c: Abstracting design: When we look at the first pattern composition of the student, it can be said that the student visually analyzed the tree and abstracted the texture of the trunk of that assigned tree. And also, it was recognizable that she made a research about pattern design. So, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. However, there was not any geometric relations between the units and also there was only one defined design element which was the unit. So, she couldn't get closer to develop her composition skills and she had not ability to use design elements for the first poster.

Although the disadvantages in evaluating in regard to the assignment goals, she had an ability to develop a design idea by inspiring from the texture of the tree trunk.

Step 2- Assignment 3d: Reproducing and coloring design: In this second pattern design, she developed a new design idea and generated new forms. This kind of variation in the form of design shows that, she came closer to achieve the goal of ability to develop design ideas. When we consider the other goals of the assignment, she approached to achieve the goals about development of research skills, visual analysis skills and abstraction skills. This composition was more complex because there were too much design elements in one module compared the first one. However, because of the undefined spaces between the design elements and hardness of following the repetition of the unit, she moved away from reaching the aim of controlling the design field. When the goals about coloring were considered, she used the colors in the 2D composition in the way of achieving the goal of ability to use colors in design. Coloring made the composition easy to perceive.

Step 3- Assignment 3e: Reproducing and coloring design: For this coloring work, she again changed her pattern design and reproduced something new. She improved her ability to develop design ideas. This time she approached to achieve the goals of development of composition skills. Because, the last pattern composition was more meaningful in regard to representation of the unit, proportions of the design elements and figure & ground relations. In this composition she got closer to achieve the aim of ability to use design elements and also, she controlled design field better than the previous ones. In addition to these, this kind of monochrome coloring gave 3D affect and let the design elements perceived clear. She was able to use colors in this design.

3.1.5.6. Discussions on Responses of the Students for Assignment 3c, 3d and 3e: Abstracting and Coloring Design

The pattern design assignments were directly associated with analogy, so students tried to create a bridge between the source (tree) and the target (pattern design). And also, the analysis of the pattern posters clarifies the similarities between the source (which is a part of the tree) and the target (unit). This is not an unexpected situation especially for novice design students. Because analogy is known in literature as the core of cognition,

the fire of thinking and it is a natural thinking method for people since their childhood (Hofstadter, D. R., & Sander, E., 2013).

By taking into consideration the evaluation of the design processes of the students in accordance with the assignment goals in each step, it is possible to make some inferences in order to define similarities and differences between them.

In the firsts step, it is understood that students searched for pattern design, tried to learn its features and characteristics. They all first tried to abstract a part or a physical feature of assigned tree and designed a unit, then repeated the unit to create a pattern composition. All five students made visual analysis and defined their source which comes from their trees to abstract. They could make abstraction and approached to the goals of development abstraction skills. However, in their first drafts, most of the students (four students among five) had some problems about making a composition by repeating the units. They generally couldn't merge the units within meaningful geometric relations and couldn't define the design elements well. So, their compositions were not well recognizable in the manner of figure & ground relation and control of design field. Nevertheless, they all had an ability to develop design ideas by inspiring from a tree in their first trial.

In the second step, all students developed new design ideas and generated new form. They were eager to improve their composition skills and develop their project by considering the comments and suggestions of the instructor. In this form generation, they also developed their abstraction skills. Compared to the first step, in this phase most of the students (three students among five) transformed their pattern designs into a more meaningful pattern composition. They explored richer geometric relations between the units and changed their units into more complex geometries which includes many design elements. In addition to these, most of the students (three students among five) controlled design field, considered figure & ground relations and defined design elements well. Briefly, in this step, majority of the students developed their pattern designs in accordance with the goals o the assignment.

In this second phase, students were also assigned to color their compositions. However, it is revealed that most of them couldn't color their compositions in the way of making meaningful contributions to the design, even two students (Student 1 and Student 2) decreased their composition quality in this kind of coloring.

In the third phase, two students among five (Student 2 and Student 3) didn't make any changes in the form of the design because of their satisfaction and positive comments

of the instructor. But they couldn't reinforce their composition by making those colorings. Because, they both gave more importance to the background by using attractive colors for the ground. The other students again tried to generate new forms in both unit and composition. This time, except Student 1, Student 4 and Student 5 developed their compositions in terms of identification of design elements, figure & ground relations and control of the design field. Student 1 moved away from the composition goals while trying to make a more sophisticated pattern design. Among Student 1, Student 4 and Student 5, only Student 5 colored her composition in the way of reinforcing the representation.

In reference to the results, it can be said that all students had a special design process and their distances to achievement of the goals show differences. While some students perform development step by step, some go forward in one step and go backward in the following step. However, it is clear that the novice design students were tented to follow the instructions and suggestions of the instructor. Although, they received critique from the same instructor; their cognition in design, design ideas and understanding of the received critiques were personal. It leads variety in design products and design processes.

3.2. Assignment 7: Spatial Gift to Edirne

This assignment was the final design task which organized over the city Edirne and its standing structures. It started with a three-day technical trip to Edirne in order to observe, analyze and document the findings about the visited spaces. After that the assignment conducted with sub-assignments; Assignment 7a: Spatial Catalogue for Edirne and Assignment 7b: Spatial Gift to Edirne.

In this process students firstly visited the buildings, complexes and structures of Edirne, saved data about the spaces by observing, sketching, taking photographs and notes. They tried to define spatial characteristics of the spaces while visiting. As soon as studio came back to school, started to work in group of 3-4 student to prepare the spatial catalogue for Edirne for the Assignment 7b. After that students had their own analysis and inventory for the Assignment 7a: Spatial Gift. In this final assignment, students tried to reinterpret the documented spaces in reference to the given instructions.

There will be given a brief information about the technical trip to Edirne and the activities in Edirne first. Then descriptions and goals of each sub-assignment will be written in reference to the distributed assignment sheets, verbal explanation of

assignments by the instructors in the studio and semi-structured interviews with the instructors during the observations. After all, the design processes of students for the Assignment 7b will be scrutinized. In this process, the critiques of the instructors which influence the design processes and the way of arriving the design task goals of the students also will be given. At the end of each student's section, the design products will be evaluated in reference to the defined assignment goals.

3.2.1. Excursion to Edirne

Figure 18. Taken photographs by the author from some visited spaces in Edirne

Edirne has an important architectural value. It is located at north-west of Turkey and has still standing architectural monuments from Roman and Ottoman periods. It tooks its name from the Roman Emperor Hadrian (Adrianapolis). The city was the capital of Ottoman Empire for 92 years before Istanbul. At that time, there was constructed many huge building complexes to show World the power of the Empire. The multicultural society affected the structure types. Therefore, there are various buildings like;

synagogues, churches, mosques, baths, towers, sport arenas, bridges, health complexes and barracks. Among them many governmental and civic buildings were constructed by the Ottoman architect Sinan the Great from 16th Century. One of them Selimiye complex which is listed as a UNESCO World Heritage Site since 2011. Today, Edirne is an important gate which is a border city to Europe across Bulgaria and Greece. And also, contemporary Edirne is still conserving historical, cultural and social character of the former urban fabric. Because of the variety in building types, historical and architectural value and conservative features of Edirne, it was chosen to explore and analyze by the instructors.

The assignment sheets were distributed to students in the trip busses. There was written the program of the excursion and attached a map of Edirne with marked locations. When everybody arrived to Edirne, first location was Edirne Municipality. Studio gathered in a saloon and instructors gave information about assignment 7, in detailed about assignment 7a: Spatial Catalogue of Edirne. Then the experts made a presentation about UNESCO and tell the process of making Selimiye Complex a UNESCO Heritage Site. Then Studio started to explore the city in reference to the excursion program.

Students were assigned to document the visited buildings. They sketched and took photographs during the trip. They were needed to pay attention to spatial relationships between paths, passages and enclosures while documenting the structures. They had to examine the space types with their spatial relations and urban context. The spatial analysis would be made by considering the issues below:

- Scale and proportion
- Light and space relationship
- Water and space relationships
- Spatial relationships (adjacency, juxtaposition, interlocking, level differences, etc.)
- Form relations (domes with domes, domes with prism etc.)
- Structural configurations
- Form and structure relations
- Circulation and transition spaces
- Materials and light
- Urban context
- Topography and climate
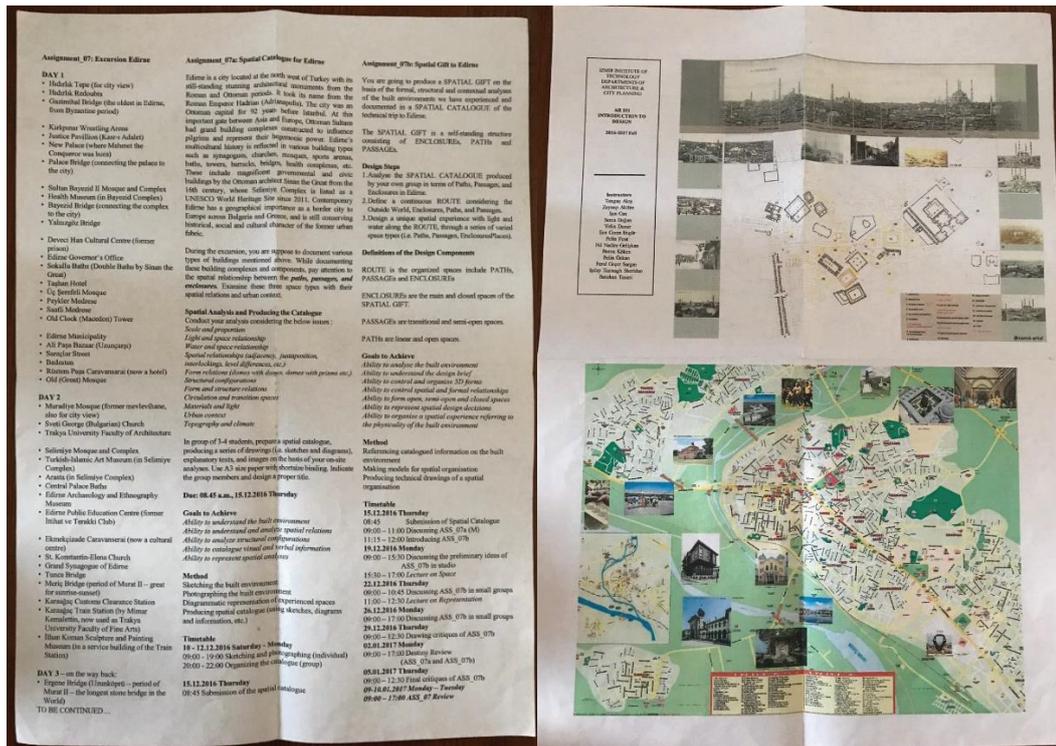
Figure 19. The distributed assignment sheet for Assignment 7, A3 size, two sided

Figure 20. When students were sketching during the excursion

Every three day, students sketched the buildings and showed the drawings to their instructors in the evening in the hotel. The controls were done to encourage students to draw. Instructors advised students about their drawings and criticized the sketches.

Figure 21. A photo which was taken during a desk critique for the drawings in the hotel

3.2.2. Description of Assignment 7a: Spatial Catalogue for Edirne

Students were supposed to document various types of buildings which mentioned on the assignment sheet and visited in Edirne. They had their own sketches, drawings, photographs and notes on their findings through the site analysis. While saving data, they tried to define the spatial features and spatial relations of the building complexes and components. They especially tried to categorize the spaces as path, passage and enclosure.

In this assignment, it was expected from students to prepare a spatial catalogue by using their materials which they had during the excursion. The catalogue would include drawings, sketches, diagrams, explanatory texts and images on the basis of the site analysis. There might be at least 2 paths, 2 passages and 7 enclosures in the catalogue. The aim of the catalogue, to have a guide before the final assignment 7b. It was done in group of 3-4 students. The sizes of the papers would be A3.

3.2.2.1. Goals to Achieve of Assignment 7a: Spatial Catalogue for Edirne

This documentation work was a preparatory task for the next assignment. Students prepared a catalogue which demonstrates their analysis and findings gathered during the excursion and it was made to be used as a reference for the design of Spatial Gift.

The goals to achieve of the task were defined on the assignment sheet as below and their explanations were done by the author:

- Ability to understand the built environment: Comprehending the spatial characteristics of urban context.

- Ability to understand and analyze spatial relations: Comprehending and scrutinizing spatial relations between structures and structural components.

- Ability to analyze structural configurations: Trying to scrutinize and define the spatial and structural grouping ways of the buildings and components of building complexes.

- Ability to catalogue visual and verbal information: Ability to list, document and represent gathered visual and verbal information.

- Ability to represent spatial analysis: Ability to explain and transfer the findings gathered through spatial analysis.

In addition to them, this assignment also aimed to improve the skills of working in a group. Because, students were assigned to work with 2 or 3 friends together to design a catalogue. So, this work was also a practice for students to learn and get used to work collaboratively.

3.2.3. Description of Assignment 7b: Spatial Gift to Edirne
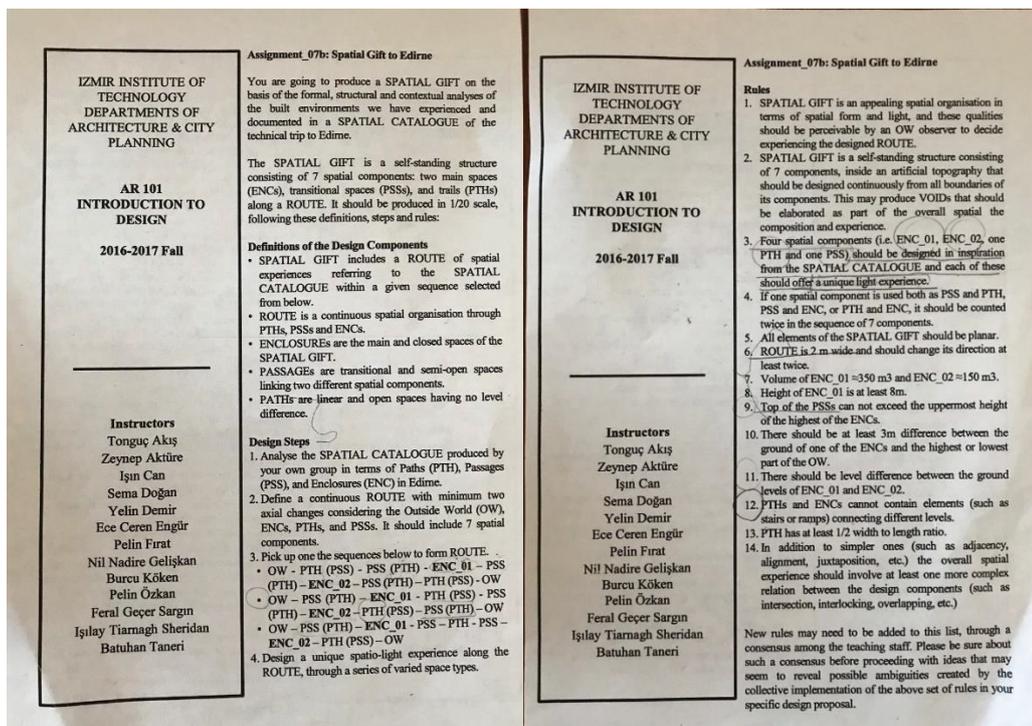
Figure 22: Assignment 7b sheet, two sided, black and white copy on A5 size

For this assignment, students were supposed to produce a Spatial Gift on the basis of the formal, structural and contextual analysis of the built environments which had been experienced during the technical trip and documented in a spatial catalogue.

The Gift would be a self-standing structure consisting of 7 spatial components; two main spaces (enclosures), transitional spaces (passages) and trails (paths) along a route. It might be produced in 1/20 scale by following the definitions, given steps and rules. The definitions of the components were given as below:

- **Spatial Gift** includes a **Route** of spatial experiences referring to the **Spatial Catalogue** within a given sequence selected from below.

- **Route** is a continuous spatial organization through path, passage and enclosures.

- **Enclosures** are the main and closed spaces of the **Spatial Gift**.

- **Passages** are transitional and semi-open spaces which link two different spatial components.

- **Paths** are linear and open spaces which have no level difference.

Also, there was given design steps on the assignment sheet like this:

1. Analyze the Spatial Catalogue which was produced by your group in terms of paths, passages and enclosures in Edirne.

2. Define a continuous route with minimum two axial changes considering the outside world (OW), enclosures (ENC)'s, paths (PTH)'s and passages (PSS)'s. It should include 7 components.

3. Pick up one of the sequences from below to form your route.

   o OW - PTH(PSS) - PSS(PTH) – ENC 01 - PSS(PTH) – ENC 02 - PSS(PTH) - PTH(PSS) - OW

   o OW - PSS(PTH) - ENC 01 - PTH(PSS) - PSS(PTH) - ENC 02- PTH(PSS) - PSS(PTH) - OW

   o OW - PSS(PTH) - ENC 01 – PSS - PTH - PSS – ENC 02 – PTH(PSS) – OW

4. Design a unique spatio-light experience along the route, through a series of varied space types.

There was also rules to obey in composition of the components when producing the Spatial Gift. They were written on the assignment sheet as below:

1.   Spatial Gift is an appealing spatial organization in terms of spatial form and light, and these qualities should be perceivable by OW observer to decide experiencing the designed route.

2.   Spatial Git is a self-standing structure consisting of 7 components, inside an artificial topography that should be designed continuously from all boundaries of its components. This may produce voids that should be elaborated as part of the overall spatial composition and experience.

3.   Four spatial components (i.e. ENC 01, ENC 02, one PTH and one PSS) should be designed in inspiration from the Spatial Catalogue and each of these should offer a unique light experience.

4.   If one spatial component is used both as PSS and PTH, PSS and ENC or PTH and ENC, it should be counted twice in the sequence of 7 components.

5.   All elements of the Spatial Gift should be planar.

6.   Route is 2m wide and should change its direction at least twice.

7.   Volume of ENC 01 ≈ 350 m3 and ENC 02 ≈ 150 m3.

8.   Height of ENC 01 is at least 8m.

9.   Top of PSSs cannot exceed the uppermost height of the highest of ENCs.

10.   There should be at least 3m difference between ground of one of the ENCs and the highest or lowest part of OW.

11.   There should be level difference between the ground levels of ENC 01 and ENC 02.

12.   PTHs and ENCs cannot contain elements (such as stairs or ramps) connecting different levels.

13.   PTH has at least ½ width to length ratio.

14.   In addition to simpler ones (such as adjacency, alignment, juxtaposition, etc.) the overall spatial experience should involve at least one more complex relation between the design components (such as intersection, interlocking, overlapping, etc.)

Beside the given rules, there was a note about possibility to add, remove change any of the rules after the collective implementation of them, in terms of the students' design process.

3.2.3.1. Goals to Achieve of Assignment 7b: Spatial Gift to Edirne

This assignment was both an instructional exercise and a reinterpretation task for students. Students were required to design a spatial composition by inspiring the spatial features of the structures which they analyzed and documented by following the given instructions.

The goals to achieve of the assignment were defined on the assignment sheet as below and their explanations were done by the author:

- Ability to analyze the built environment: Ability of scrutinizing and defining the spatial characteristics of urban context.
- Ability to understand design brief: Ability of comprehending the definition of the design task and its requirements.
- Ability to control and organize 3D forms: Ability of considering physical properties of the 3D design elements in gathering them for the 3D composition.
- Ability to control spatial and formal relationships: Ability of composing 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization.
- Ability to control spatial and formal relationships: Ability of composing 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization.
- Ability to form open, semi-open and closed spaces: Ability of understanding the given spatial definitions and trying to implement them in a composition.
- Ability to represent spatial design decisions: Ability of transferring decided design ideas about spaces and spatial organizations into the models and drawings.
- Ability to organize a spatial experience referring to the physicality of the built environment: Ability of reinterpretation of analyzed and documented spatial experience of the built environment.

3.2.4. Case Studies for Assignment 7b: Spatial Gift

In this part, five students' design process were investigated within the scope of goals of the assignment and the responses of the students to the assignment. First of all, the design process of students was explained in reference to the observations during the desk critiques, juries and semi-structured interviews with the students and instructors. Then, the works of the students for Assignment 7b were evaluated in regard to the goals to achieve. The design products of the students in each step were analyzed in approaching to achieve the goals or moving away from achievement of the goals.

3.2.4.1. Student 1

Student 1 was an active student in participation at the reviews, desk critiques, lectures and juries. Although she mostly made sketches and drawings at the beginning of the design process, she generally shaped her spatial composition by making physical models . Throughout the design process, she was eager to develop and change her project by taking into consideration the suggestions and ideas of instructors.

3.2.4.1.1. Spatial Gift Design Process

In the beginning of this design process, she presented her first warm up model and drawings for Assignment 7b at the desk critique (Figure 23). She was inspired from Synagogue for her ENC 01 and Hıdırlık Redoubt for her ENC 02. And she chose the route: PSS – ENC 01 - PTH – PSS – ENC 02 – PTH – PSS - OW. She declared her composition as follow:

> I was inspired from Synagogue for my ENC 01. Because, I am impressed from its light experience. And for ENC 02, I would like to give similar spatial experience with Hıdırlık Redoubt. I chose this route and connected the enclosures with paths in this way.
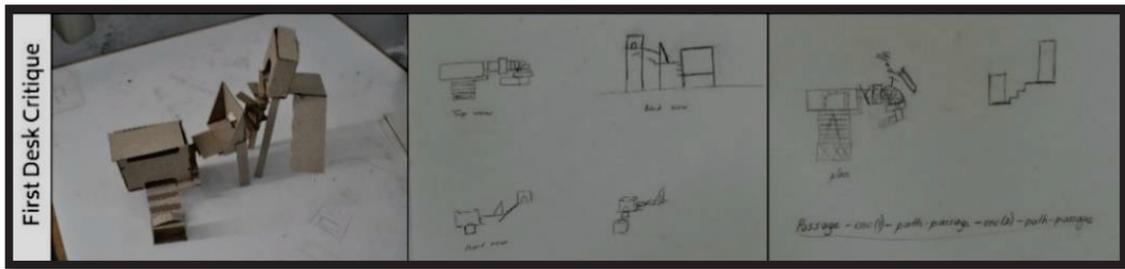
Figure 23. Physical model and drawings of Student 1 for the first critique

After her explanation about her design, instructor criticized it more about organization of the route and also, he figured out that it was seen that there was a misunderstanding about definition of passage. Because, she made her passages as open areas. In addition to that, it was a rule that there would be no level difference on Paths. But she made lots of steps on her paths. Beyond these, instructor gave critiques about the proportions of the components. The ENC 02 was too little and the gate-like semi open space was almost bigger that ENC 01. And also, he said her to try to give the features of the structures that she impressed from. He drew some proposals (as seen in Figure 24) about organization of the components and said that:

> You cannot use steps on paths and the passages have to be semi-open spaces. Also, you need to consider the proportions of the enclosures. ENC 01 must be bigger than ENC 02. Work on spatial organization more. You need to relate the components. In addition to these, try to give the spatial experience of the spaces that you were impressed. Why were you impressed from Hıdırlık? Try to give the spatial experience when you are forming the components.
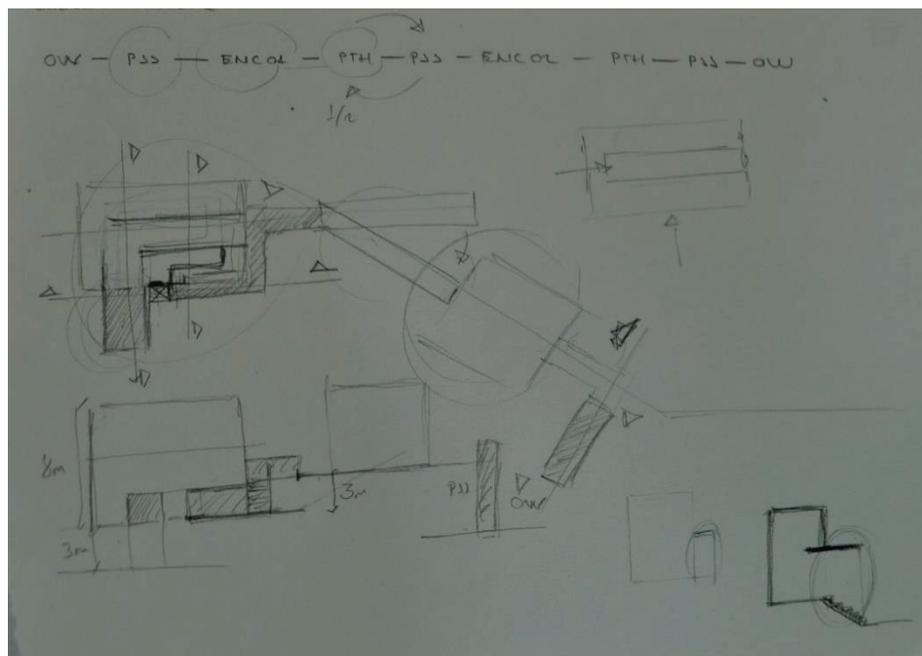
Figure 24. The proposal of the instructor for Student 1 in her first desk critique

Student declared that she was impressed from Hıdırlık because of its darkness and narrowing feel while walking in it. Then instructor said her that she must form ENC 02 with this experience.

Figure 25. Physical model of Student 1 for the second critique

For the second desk critique, Student 1 tried to change what was criticized in her first model. First of all, she changed the shape of Enc 02 to give the narrowing space feature of Hıdırlık Redoubt. And also, she tried to cover top of each level differenced spaces to obey the rule 12. The directions of the route were more defined in this model (Figure 25). She started to make a more compact and organized spatial gift. However, she couldn't take a critique on it because of the limited time and lots of students.

Although she couldn't get a desk critique for her second model, she listened the others' desk critique. And thought about the close relations between Enc 01 and Enc 02. Because, instructors would like to see different connections and relations between components. Therefore, for the third model, she tried to put Enc 02 on top of Enc 01 (Figure 26). In this way, she would use the roof of Enc 01 as a path too. However, she ignored the level difference and directions to reach on top by doing that. Instructor gave a desk critique her especially about the long ramp. He advised her to make clear directions and organized route. A method to make that was to make the path and passages close to the enclosures. Otherwise, the overall composition was looking so messy. Beside these, they talked about the opening in the Enc 01. It was inspired from Synagogue. But instructor advised her to look back at the Spatial Catalogue. He said that there were also openings on top of the synagogue. However, he warned her not to make the same dome. And drew some sketches while giving critique (Figure 27).
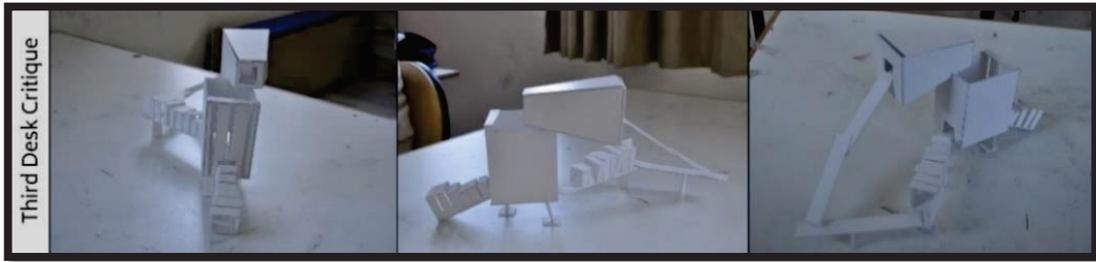
Figure 26. Physical model of Student 1 for the third critique

For the fourth desk critique, she tried a something different. There was a general effort to construct the Spatial Gift by using planar pieces in the studio. She impressed from that and tried to make the new model by using triangular and rectangular pieces (Figure 28). When doing that, she changed the directions of the route again. But only thing that she didn't change was her inspired structures Hıdırlık Redoubt and Synagogue for her enclosures. She said that:

> I listened the critiques of my friends and everyone was trying to use little pieces to make openings in order to give the light experience. You said that there was no opening in my work, so I tried to give the light experience in this way.
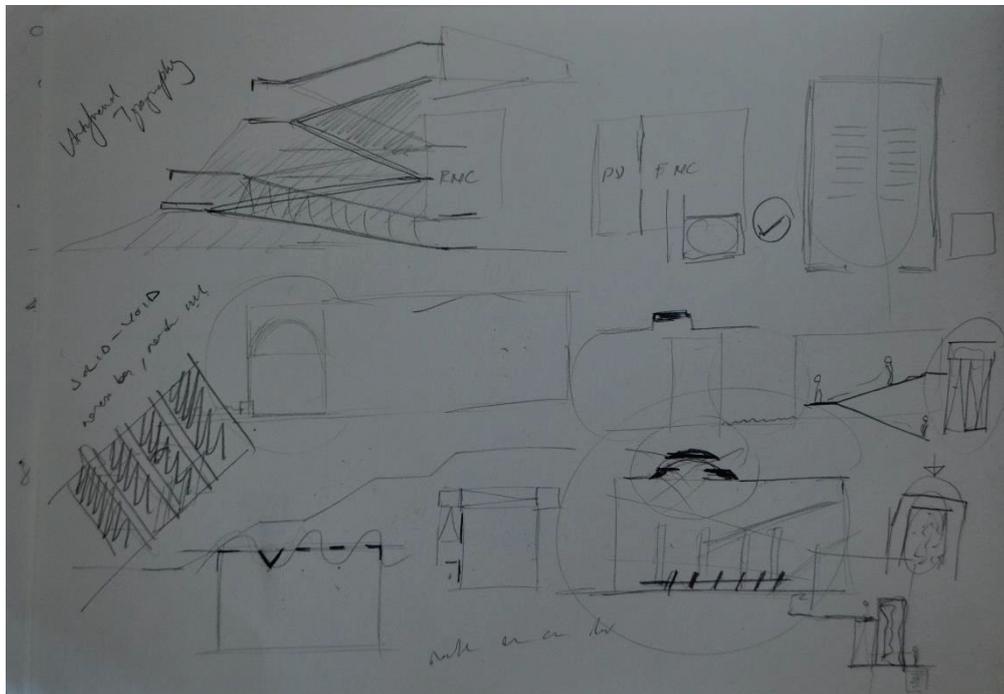
Figure 27. The sketches of instructor while giving desk critique to Student 1 for her third
model
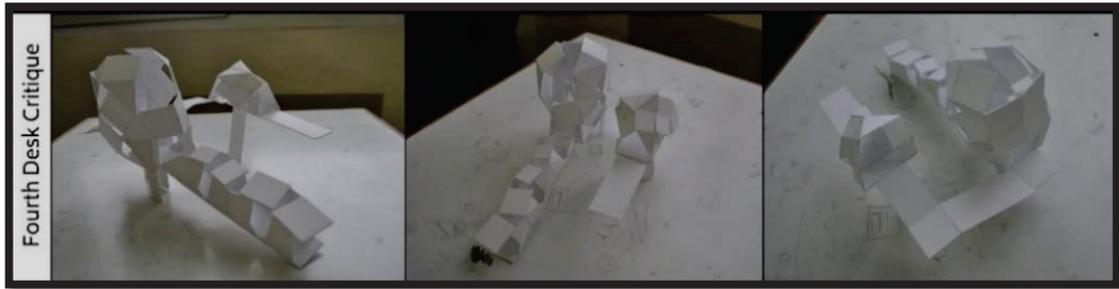
Figure 28. Physical model of Student 1 for the fourth critique

At the desk critique for the model, instructor liked the idea of using little pieces to construct a space. However, he criticized the work as follow:

> The construction idea is good, however, there is no rule in gathering the pieces together. It made the project randomly produced. Beside this, the new forms of enclosures don't give the same spatial experience with the inspired structures. The openings in the Enc 01 would not give the same light experience with the synagogue, because light was not coming into the space from all of the sides like this. And also, you need to work for topography. Because, the model is looking like flying.

The fifth work of Student 1 was the submission project for destiny jury (Figure 29). She tried to consider the previous critique and decreased the number of the little pieces when constructing the enclosures to control the light. And also, she tried to construct Enc 02 in a similar way. She explained her design as below:

> I was impressed from the light experience of Synagogue and by making these openings on side walls and ceiling, I tried to give the same experience. For Enc 02, I was inspired from Hıdırlık and its narrowing spatial experience like a tunnel. I tried to shape it like tunnel and used again planar elements. Then I organized according to my route in this way.

Figure 29. Physical model of Student 1 for destiny jury

An instructor from the jury said that:

First of all, you have a problem with topography. Because, the entrance to Enc 01 is looking under soil now. And also, the Enc 01 and Enc 01 are so close to each other from their corners, but they have no spatial relation. You need to define well their spatial relations.

Another instructor criticized the project as follow:

The method that you use for constructing the components is looking so fragmental. The little planers are looking like decors.

In addition to the critiques of the instructors, the group instructor commented as follow:

You also added opening on top of your Enc 01 and referred to the skylight of Synagogue. But it is too tiny in your model. You need to make it more defined in size.

For the fifth desk critique, she came with an unfinished model (Figure 30). She was trying to decide the locations of the enclosures because of the critiques and suggestions at the destiny jury. And she decided to detach them with a path or passage. It was the last critique before the final jury, but she couldn't get critique because of crowded.

Figure 30. Physical model of Student 1 for the fifth desk critique

Taking into consideration the all critiques, she shaped her last model and made design decisions by herself (Figure 31). She had already decided to detach the enclosures with a path then organized the components in terms of the route. While doing that she gave importance to level difference and topography. And also, she made triangular openings for the enclosures and tried to continue the same design language for the other components. She transformed the light experience of synagogue by using the triangular. And also, for the ENC 02, she continued to give the first spatial experience by making the space narrower at the end.

Figure 31: Physical model of Student 1 for the final jury

Through the all desk critiques and destiny jury, she made her decision and finished her design. At the final jury, there was not many comments about the project. But one jury thought that the Spatial Gift was compact and organized. The route could be followed and the effort to give the spatial experiences like the Hıdırlık Redoubt and Synagogue was found successful.

3.2.4.1.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- First Desk Critique: When we look at the first composition of Student 1, she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes (Figure 32. Because, she could define some spatial characteristics of Hıdırlık Redoubt and Synagogue in terms of her spatial experience. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. However, she couldn't get closer to the goal of ability to understand the design brief by reason of eliminating some rules which obligated to obey. She also couldn't approach to the goal of ability to control and organize 3D forms. Because, she couldn't show any ability of considering physical properties of the 3D design elements in gathering them for the 3D composition. In addition to these, she couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization. Therefore, student couldn't approach to the goal of ability to control spatial and formal relationships. She couldn't form semi-open spaces well and shaped them like a gate in her first design. So, she couldn't implement the given spatial definitions of design components in her composition and couldn't get closer to the aim of ability to form semi-open spaces.

She verbally defined the spatial experiences of Synagogue and Hıdırlık Redoubt. However, in the model Enc 01 had no openings to give a similar light experience like

Synagogue and similarly the shape of Enc 02 was not like a tunnel which she inferenced from Hıdırlık. Therefore, she couldn't approach the goal of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.
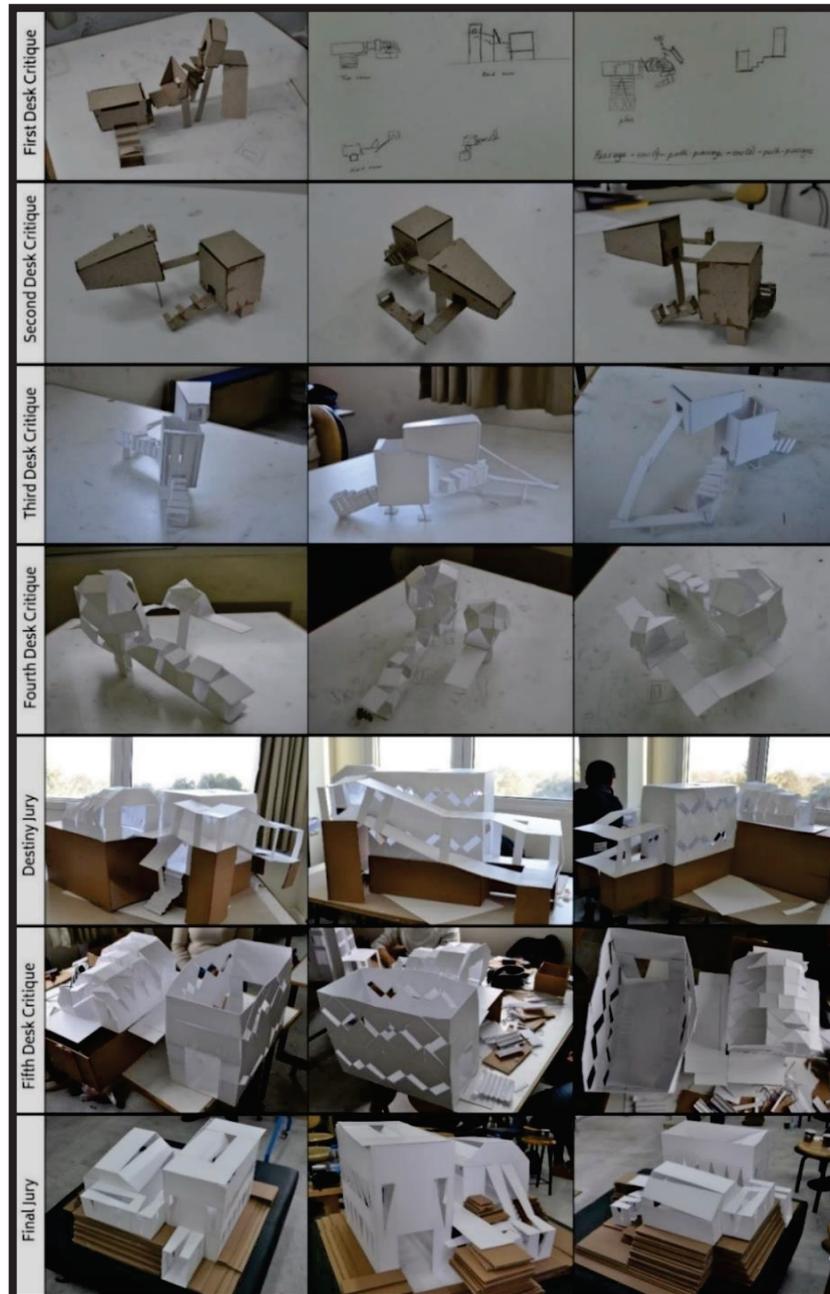
Figure 32. Design Process of Student 1

Step 2- Second Desk Critique: In the second composition, she talked about the same spatial experiences about Synagogue and Hıdırlık redoubts and tried to refer the spatial characteristics of them in the Enc 01 and Enc 02. So, she had still the ability of

scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Therefore, she was still close to achieve the goal of ability to analyze the built environment.

She couldn't get closer to the goal of ability to understand the design brief by reason of eliminating some rules which obligated to obey in the first composition, but this time she didn't skip the rules and considered the design brief more. In contrast to the first composition, she was a bit closer to achieve the goal of ability to control and organize 3D forms. Because, she produced more compact and controlled physical model in this organization. Even though she still couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization, this composition was closer to achieve the goal of ability to control spatial and formal relationships. In addition to these, she had an ability of understanding the given spatial definitions and trying to implement them in a composition in this second design and she approached to the goal of ability to form open, semi-open, closed spaces.

Her spatial design decisions for enclosures were the same with the first production. Although, she couldn't transfer the light experience of Synagogue in the Enc 01, she formed the Enc 02 in reference to the spatial experience of Hıdırlık Redoubt which she defined as "tunnel-like and narrowing" space. That's why, she could get closer to the aim of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the analyzed structures in comparison with the first one.

Step 3- Third Desk Critique: In this third composition, she was at the same distance to achieve the goal of ability to analyze the built environment. Because, her spatial experiences defined from the analysis and aimed to transfer to the composition about enclosures were the same. However, she moved away from the aim of ability to understand design brief reasons of eliminating some rules about use of path and passages. In addition to these, she also moved away from the goal of ability to control and organize 3D forms and ability to control spatial and formal relationships. Actually, she aimed to make spatial and physical relations between enclosures in this way, but she ignored controlling the organization and other formal relations while doing this. She couldn't form open, semi-open and closed in reference to the given definitions, so she moved away from the goal of ability to form open, semi-open and closed spaces.

She didn't change any spatial design decisions about enclosures. The form of Enc 02 was the same, but for Enc 02 which referred to Synagogue was a bit different. This

time, she tried to give the light experience of Synagogue by making some openings although it couldn't give the same light experience. Because of her effort to form enclosures in reference to her spatial analysis, she could a bit get closer to the goal of ability to represent spatial design decisions. However, she moved away from the goal of ability to organize a spatial experience referring to the physicality of the built environment since the spatial relations between the components were not looking as reinterpreted from analyzed and documented spatial experience of the built environment.

Step 4- Fourth Desk Critique: The spatial experiences and analysis about Synagogue and Hıdırlık Redoubt were the same to transfer to the design, so she was at the same distance to achieve the goal of ability to analyze the built environment. She had a grasp of design task, instructions and rules and she achieved the goal of ability to understand design brief. She was closer to the goal of ability to control and organize 3D forms in contrast to the third one. Because, the design components were in an identified organization. In addition to these, she could get closer to the goal of ability to control spatial and formal relationships in comparison with the previous one. Although, she tried a different design idea to form the components, the open, semi- open and closed spaces could be identified. Therefore, she approached to the goals of ability to form open, semi-open and closed space.

This time, she moved away from the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, the forms of enclosures with these openings didn't give the same spatial experience with the experiences of her which she would like to represent.

Step 5- Destiny Jury: In this stage, she was at the same distance to the goals of ability to analyze the built environment and ability to understand design brief. She also approached to the goal of ability to control and organize 3D forms. Because, she could organize the 3D components in reference to the route and within a compact composition. However, she couldn't approach to the goal of ability to control spatial and formal relationships between design components. Because, the spatial relation between enclosures was undefined and the entrance of Enc 02 was under the topography. In addition to these, she approached to the goal of ability to form open, semi-open and closed spaces.

In this work, she approached to achieve the goals of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment in contrast the previous design works. Because, she tried to give

the light experience of Synagogue with the openings on Enc 01 and formed Enc 01 in this way to apply her "tunnel-like" design idea about Hıdırlık Redoubt.

Step 6- Fifth Desk Critique: She didn't change anything for the fifth desk critique after the destiny jury. Therefore, her distance to the goals of the assignment was the same. However, she only decided to change the locations of the enclosures and decided to locate a path or passage between them. In this way, she approached to the goal of ability to control spatial and formal relationships between design components in contrast to the previous one. Because, she defined well the spatial relations between enclosures.

Step 7- Final Jury: For the final project, she got closer to each goal more than the previous ones. She had already approached to the goals of ability to analyze the built environment, ability to understand design brief, ability to control and organize 3D forms, ability to control spatial and formal relationships and ability to form open, semi-open and closed spaces in the previous works. In this final work, she didn't move away from the goals and approached more to achieve the goals. In addition to these she got closer to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, she could reinterpret the light experience of Synagogue in Enc 01 and spatial experience of Hıdırlık Redoubt in Enc 02 within a meaningful design composition.

3.2.4.2. Student 2

Student 2 was an active student in participation at the reviews, desk critiques and juries. However, she couldn't submit enough materials for some of the desk critiques. Although she came to the studio unfinished drawings or models, she was thinking on the project a lot and tried to clarify her mind by asking questions to the instructors at each stage. She was tented to work by making both physical model and drawings. Throughout the design process, she was willing to develop her project by taking into consideration the suggestions and ideas of instructors.

3.2.4.2.1. Spatial Gift Design Process

In the beginning of this design process, she presented her first drawings and unfinished model for Assignment 7b at the desk critique (Figure 33). She impressed from hugeness and light experience of Selimiye Mosque for ENC 01 and underground location of Hıdırlık Redoubt for ENC 02. And she chose the route: PSS – PTH - ENC 01 – PTH – ENC 02 – PTH – PSS – OW. She declared her composition as follow:

> I was inspired from the hugeness of Selimiye Mosque. And I impressed a lot that the mosque was taking quite light despite of its hugeness. I defined to refer Selimiye Mosque for Enc 01. Also, I was impressed from spatial experience of Hıdırlık Redoubt. It was almost under soil and looking like a passage. Because of that, I would like to reinterpret it for Enc 02. Then I chose this route. I drew something to organize the components but I couldn't make the model. Because I was confused about level difference.
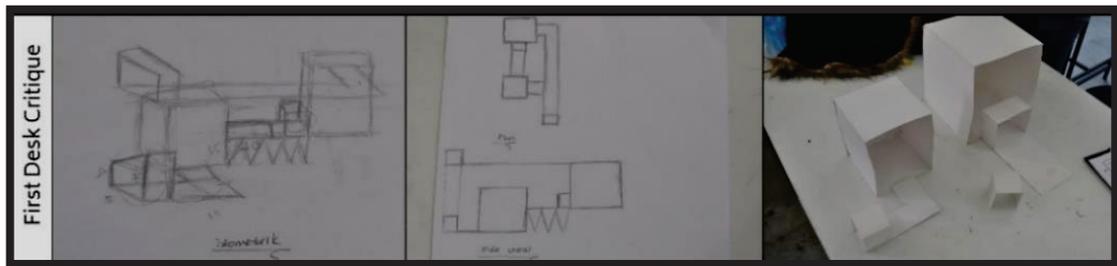
Figure 33. Physical model and drawings of Student 2 for the first critique

After her explanation about her design, instructor looked at the drawings and figured out that there was a level difference inside enclosure. He warned the students about that and drew some sketches while giving critique (Figure 34). He said that:

> According to the rules, you cannot make a level difference in enclosures or paths, you need to make it in passages. You need to make something like this. Then think about spatial relations between the components.

For the second desk critique, she made a model and drew the plan, section and elevations of the model (Figure 35). In this second warm up model, she tried to make a relation between enclosures, so put one the other's top. And the circulation was around the two enclosures. However, there was one more mass like an enclosure. It was not an expected component that she might use only two enclosures. And also, there was no passage in the model, all the circulation was looking as a path. She couldn't get a desk

critique for this model because of density. But she listened the other desk critiques and tried to make inferences for her project.
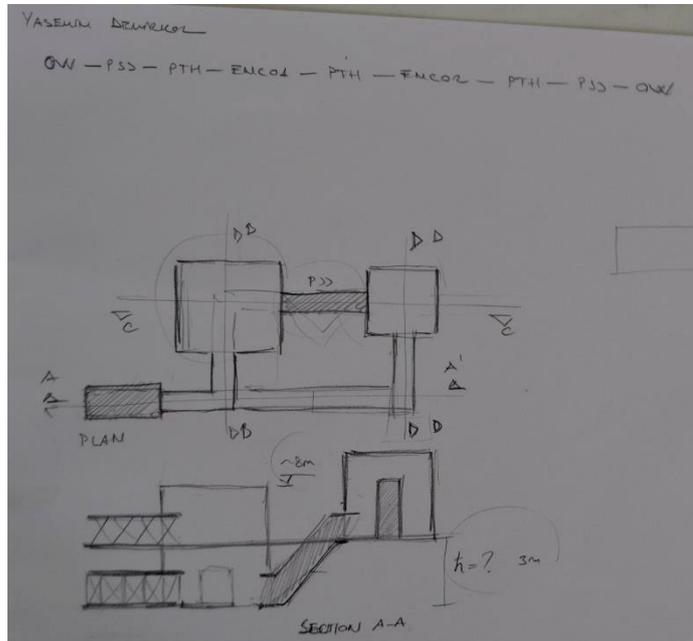
Figure 34. The proposal of the instructor for Student 2 in her first desk critique

Figure 35. Physical model of Student 2 for the second critique

For the third desk critique, she didn't make a new model, just drew some sketches but she had many questions to ask to the instructor (Figure 36). She was confused about the mismatch between her design ideas and rules. She would like to give the same spatial experience with Hıdırlık Redoubt for her ENC 02. However, she had challenge to give the spatial experience without using the vaults on top. And also, she would like to make the floor of Enc 02 inclined like Hıdırlık Redoubt. But it was not permitted because of the rule 12. She declared these as below:

I would like to give the same spatial experience with Hıdırlık Redoubt for Enc 02 and in order to do this I thought to make the floor inclined and make a vault for top of it. However, is it permitted to make level difference in enclosures? And instructors always saying that don't make the same things with your inspired buildings. But how can I make a vault-like thing? Or how can I make a dome-like roof? I tried to draw something, but it doesn't give the same spatial experience.

After the explanation of the student, the comments and suggestions of instructor as follow:

Firstly, you cannot make any level difference in enclosures because of the rule 12. But maybe you can use the design ideas which came from Hıdırlık redoubt for any of your passage. Make a passage with an inclined floor in reference to your spatial experiences about Hıdırlık Redoubt. And secondly, we don't want the same physical structures with your inspired spaces, so you shouldn't make directly a vault or dome, you need to abstract it.

Then the student said that:

For example, I was impressed from the dome and the little domes with openings around the bigger one and I would like to show the experience to give the hugeness and light experience of Selimiye Mosque. I tried to abstract them as pyramids in this drawing. Is it OK?
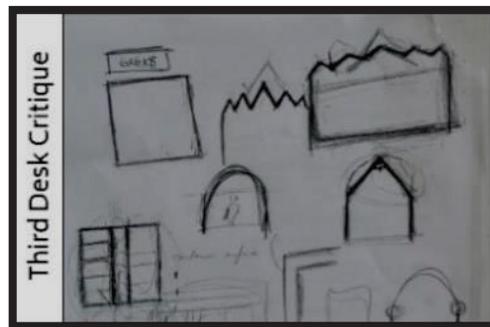
Figure 36. Sketches of Student 2 for the third critique

Instructor looked at her drawings then drew some proposals for her while giving critique. He said that:

You drew all domes at the same level. However, in the mosque it was not like that. You can abstract it like this (Figure 37). How about light experience of Selimiye Mosque?

She answered the instructor as follow:

I thought to use little planar elements to make the openings. I will connect them and detach them to make the walls and windows.
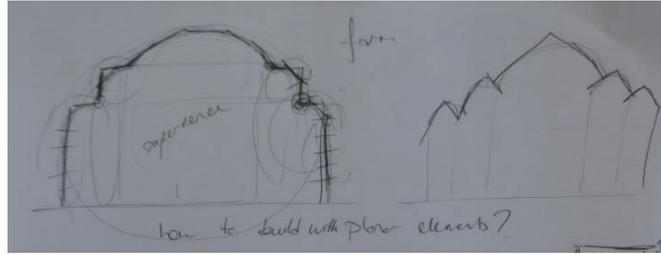
Figure 37. The sketches of instructor while giving desk critique to Student 2 for her third
model

Instructor recommended to use rectangular planar pieces and getting them
together with a rule. The two and more pieces could be gathered by piercing or
interlocking. The drawings of instructor about that in the Figure 38.

For the fourth desk critique, she changed her inspired building for ENC 02. She
was firstly inspired from Hıdırlık Redoubt, but for this time she would like to give the
spatial experience of Health Museum for her ENC 02. And she would like to use the
spatial experiences of Hıdırlık Redoubt for her one of the passages like the instructor
advised previously. She didn't come with a finished model. She fixed on the construction
method by using planar pieces. Therefore, she tried to make the models of ENC 01 and
ENC 02 by trying to build with the small planar pieces (Figure 39). However, instructor
criticized the connection type of the pieces. Because, they were just put on the other one
like bricks. But the instructor had given examples to connect the pieces with piercing
method or interlocking. That's why, it was not an expected method. İnstructor again
showed through the pieces what was piercing and interlocking.
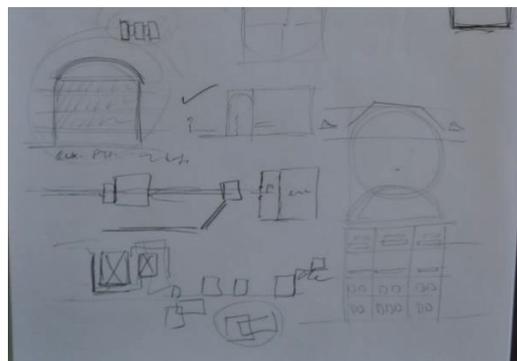
Figure 38. The sketches of instructor while giving desk critique to Student 2 for her third
model

Figure 39. Physical model and drawings of Student 2 for the fourth critique

For destiny jury she produced a model, but she couldn't have a chance to take critique from the juries in the destiny jury. However, After the destiny jury, she took critiques from instructors out of course hours. In the semi-structured interview with the student, she explained briefly the work and talked about the comments and suggestions of the instructors.

In this design, she firstly abstracted the enclosures. ENC 01 was based on Selimiye Mosque that she would like to give the light effect and hugeness of Selimiye (Figure 40). ENC 02 was based on Health Museum and she would like the give the similar plan scheme of it. There was a big courtyard in the center and rooms around it in the Health Museum. She would like to give the same spatial effect. Then she explained the comments and suggestions of instructor during the desk critiques out of course hours:

> One of the instructors said that you couldn't organize the route and circulation well because of giving more importance to the forms of the enclosures. She said that, the direction is confusing and there is not a certain route to follow. And another instructor suggested me to consider topography more. She said that topography also a design component and it need to be a part of design.

Figure 40. Physical model of Student 2 for destiny jury

For the fifth desk critique, she had an unfinished model and the previous model to get desk critique (Figure 41). In the unfinished model she tried to construct a dome-like top for Enc 01 and she thought to put Enc 02 which refers to Health Museum under Enc

103

01. She would like to make a compact overall design organization with this idea. However, she was still confused about design and indecisive about what to do. Therefore, she took desk critiques from many instructors. The group instructor advised her to bury one of those passages to refer the spatial experience of Hıdırlık which was locating under soil.

Figure 41. Physical model of Student 2 for the fifth desk critique

For the final jury, she kept the design ideas for previous desk critique (Figure 42). But she could make the model with the ideas in this time. She explained her design at the jury as follow:

> I was impressed from Selimiye Mosque, Health Museum and Hıdırlık Redoubt. For the Enc 01, I would like to give the sense of hugeness of the mosque and the light experience of the enclosure. For Enc 02, I would like to give the same spatial experience with Health Museum in which there was a center and sub spaces linked to the center. And for one of the passages, I referred to Hıdırlık Redoubt. Hıdırlık Redoubt was looking like underground, that's why I buried the passage under the soil. Then I connected them like this to make a compact organization.

Figure 42. Physical model of Student 2 for the final jury

Juries listened her and analyzed the model. One of the juries said that:

> Enc 01 is looking like a 3-story building. I wish you could reach to the other stories, but you are only using the ground floor.

Another jury criticized the project as follow:

I liked the idea of using topography and walking also at -1 level. However, there is a problem with the passages around Enc 01. You thought to use the eaves-like pieces as top cover of passages, but it is too high and your passages are looking like open spaces.

Most of the juries liked the idea of using planar design elements in constructing the structures, but one of the juries said that she would like to see a component organization and overall composition like the method for construction by interlocking and piercing. In addition to these, all juries declared that the red arrow is unnecessary and takes attention a lot.

3.2.4.2.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- First Desk Critique: When we look at the first drawings and verbal explanations of Student 2 (Figure 43), she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Because, she could define some spatial characteristics of Hıdırlık Redoubt and Selimiye Mosque in terms of her spatial experience. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. However, she couldn't get closer to the goal of ability to understand the design brief by reason of eliminating some rules which obligated to obey. She also couldn't approach to the goal of ability to control and organize 3D forms and the goal of ability to control spatial and formal relationships. Because, she couldn't make a physical model, tried to work with sketches and it was looking that in the composition, design elements were not gathered in spatial relations. In addition to these, she couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization. She was aware of the definitions about open, semi-open and closed spaces, but the components were not well defined in the drawings. Therefore, she couldn't implement the given spatial definitions of design components in her composition and couldn't get closer to the aim of ability to form open, semi-open and closed spaces.

She verbally defined the spatial experiences of Selimiye Mosque and Hıdırlık Redoubt. However, in the drawings and models, Enc 01 was not referring any spatial experience like she analyzed and similarly the shape of Enc 02 was not looking like she inferenced from the spatial experience of Hıdırlık Redoubt. Therefore, she couldn't

approach the goal of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.
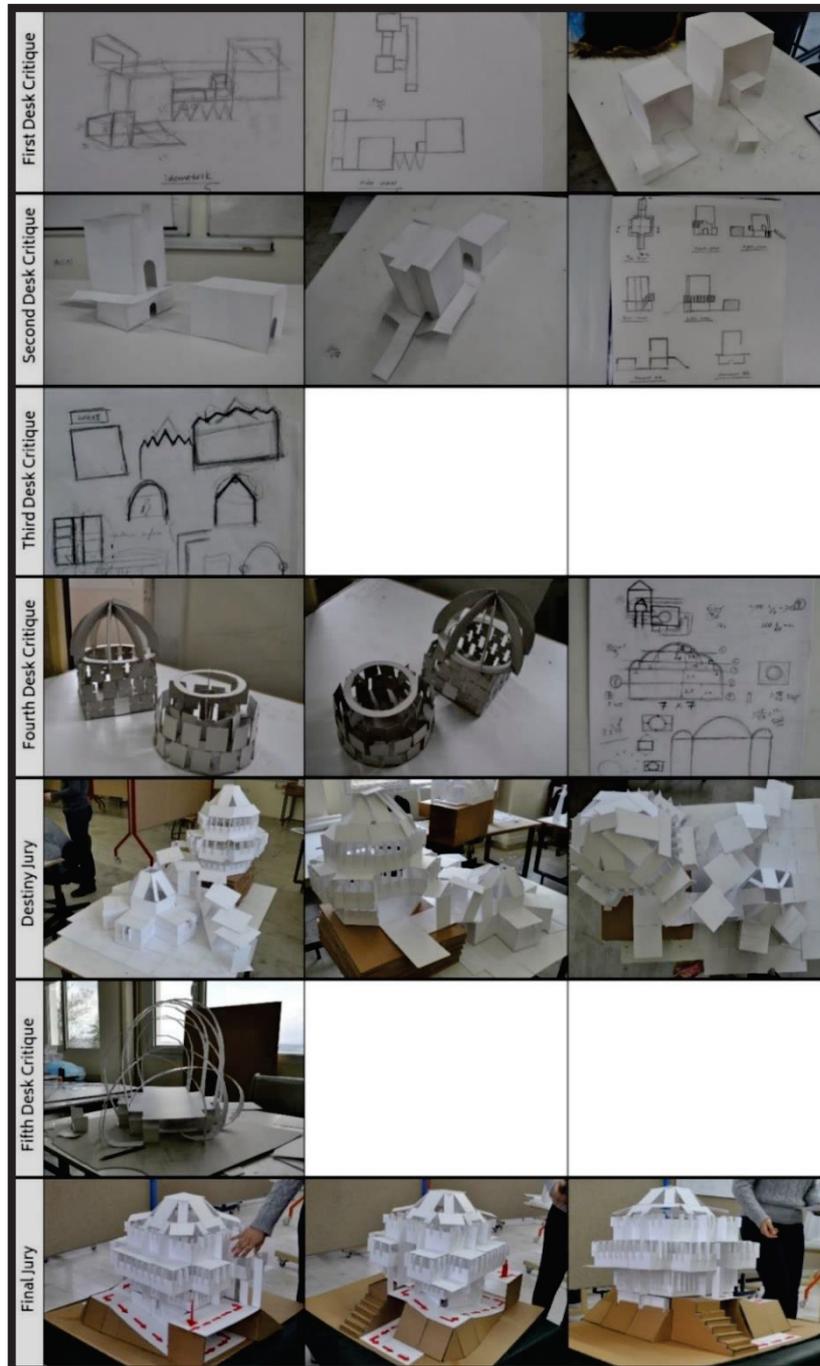
Figure 43. Design Process of Student 2

Step 2- Second Desk Critique: As she declared before, she would like to give the same spatial experiences of Selimiye Mosque and Hıdırlık Redoubt for the enclosures in the composition. So, she had still the ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Therefore, she was still

close to achieve the goal of ability to analyze the built environment. She couldn't get closer to the goal of ability to understand the design brief because similar to the first work, she again didn't obey some rules in this second work. She added one more enclosure to the composition and according to the rules there might be two enclosures. In addition to that, in this second composition there were no passages and all the circulation was looking like path. In contrast to the first composition, she was a bit closer to achieve the goal of ability to control and organize 3D forms. Because, she produced more compact and controlled physical model in this organization. Even though she still couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization, this composition was closer to achieve the goal of ability to control spatial and formal relationships. Beyond these, she couldn't approach to the goal of ability to form open, semi-open, closed spaces. Because, as written before, she couldn't make any passage in this composition so she couldn't form semi-open spaces.

Her spatial design decisions for Enc 01 and Enc 02 were the same with the first production. However, she couldn't define the third enclosure. In addition to these, she again produced the enclosures like cubes and there were no clues about inferred spatial characteristics of the inspired buildings. That's why, she couldn't get closer to the aim of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the analyzed structures.

Step 3- Third Desk Critique: For the third desk critique, she didn't produce something new except the sketches about abstraction of the inspired buildings' form. This desk critique includes only questions about design brief and design ideas of the student and responses of the instructor to clarify the design ideas of the student. Because of having no composition at this stage, there was nothing to evaluate in reference to the assignment goals.

Step 4- Fourth Desk Critique: At this stage, she had still unfinished composition. She had new design decisions this time. She decided to refer the spatial experiences of Health Museum for Enc 02 and she would like to use the spatial features of Hıdırlık Redoubt for one of the passages. It is known that; she scrutinized and define some spatial characteristics of the analyzed structures. Therefore, it can be said that she was still close to achieve the goal of ability to analyze the built environment. However, there were nothing about the design decisions, they were all in verbal format. Because of these, the models which she made for this stage cannot be evaluated in terms of the goals of ability

to understand design brief, ability to control and organize 3D forms, ability to control spatial and formal relationships, ability to form open, semi-open and closed spaces and ability to organize a spatial experience referring to the physicality of the built environment. Although she made an effort to represent formal design ideas for enclosures, the two different 3D design elements which were draft models for abstraction of Selimiye Mosque was not enough to evaluate the products in terms of achieving the goal of ability to represent spatial design decisions too.

Step 5- Destiny Jury: It was known that she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Because, she could define some spatial characteristics of Health Museum, Hıdırlık Redoubt and Selimiye Mosque in terms of her spatial experience. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. She comprehended the definition of the design task and its requirements and implemented them in this composition. So, she approached to the goal of ability to understand design brief. She also couldn't approach to the goal of ability to control and organize 3D forms and the goal of ability to control spatial and formal relationships. Because, she couldn't consider the physical properties of the 3D design elements in gathering them for the 3D composition. In addition to these, she couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization and the organization was not compact. She could understand the given spatial definitions and implemented them in a composition, so she approached to the goal of ability to form open, semi-open and closed spaces.

At this step, she got closer to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, she tried to give the hugeness and light experience of Selimiye Mosque for Enc 01 by forming it in this way and she tried to form Enc 02 in reference to the physical features about central orientation of Health Museum.

Step 6- Fifth Desk Critique: For the last desk critique before the final jury, she couldn't submit a finished composition. She had some questions and problems in mind about design and organization of the composition and tried to clarify them at this step. However, beside the verbal design decisions there no production to evaluate in reference to the goals of the assignment.

Step 7- Final Jury: For the final project, she got closer to each goal more than the previous ones. She had already approached to the goals of ability to analyze the built

environment and ability to understand design brief. At this stage, she also could get closer to the goal of ability to control and organize 3D forms and ability to control spatial and formal relationships. Because, this time she could organize the design elements within spatial relations and made the composition compact. And also, she was close to the goal of ability to form open, closed spaces, but she couldn't define well some of the passages. In this final work, she didn't move away from the goals and approached more to achieve the goals. In addition to these she got closer to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, she could reinterpret the light experience and hugeness of Selimiye Mosque in Enc 01, spatial organization of Health Museum in Enc 02 and spatial experience of Hıdırlık Redoubt as being under ground in one of the passages by burying it under topography.

3.2.4.3. Student 3

Student 3 was an active student in participation at the reviews, desk critiques and juries. At first steps in design process, he was tented to work by making sketches and drawings. After making design decisions about the organization of the components, he worked by making physical model. Throughout the design process, he was eager to develop his project by taking into consideration the suggestions and ideas of instructors.

3.2.4.3.1. Spatial Gift Design Process

In the beginning of this design process, he brought his first drawings for Assignment 7b in order to get desk critique (Figure 44). He was inspired from Selimiye Mosque for ENC 01 and Health Museum for ENC 02. He chose the route: PSS – ENC 01 – PSS – PTH – PSS – ENC 02 – PTH – OW. He declared his first composition as follow:

> I would like to give the spatial experience of Selimiye Mosque. It was a huge enclosure but the lighting system was amazingly enough to light the huge closed space. I was impressed the light experience of it a lot. And for Enc 02, I would like to give the spatial experience of Health Museum. I was surprised when I visited the structure. There was a dome in the center with a sky light and the rooms were opening to the center and taking light from there. After I decided my inspired buildings, I chose this path and according to it I tried to locate the components.
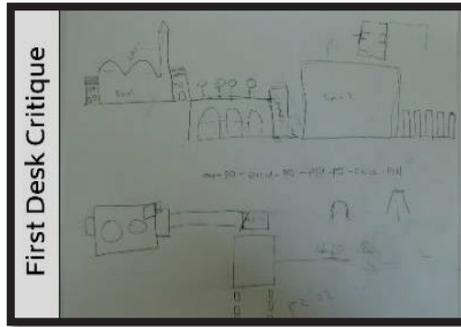
Figure 44. Drawings of Student 3 for the first critique

He explained these to the researcher of the thesis through a semi-structured interview. Because, he couldn't take a critique from instructor because of the density. However, he listened the others' critiques and tried to learn something from them.

For the second desk critique, he didn't attend the studio. He came to the studio for the third desk critique with some sketches and a trial model of a passage (Figure 45). He presented the drawings and model to the instructor as follow:

> I was impressed from Selimiye Mosque and Health Museum and I would like to give the spatial and light experiences of them in enclosures. My route starts with a passage then the visitor comes in to Enc 02, which was inspired from Health Museum. Then through the pat and passage visitor arrives to Enc 01 which refers to Selimiye Mosque. I tried to locate Enc 01 at the end because I would like to give the hugeness and light experience of. In the model I tried to abstract the spaces, but I am confused about how to abstract the buildings.
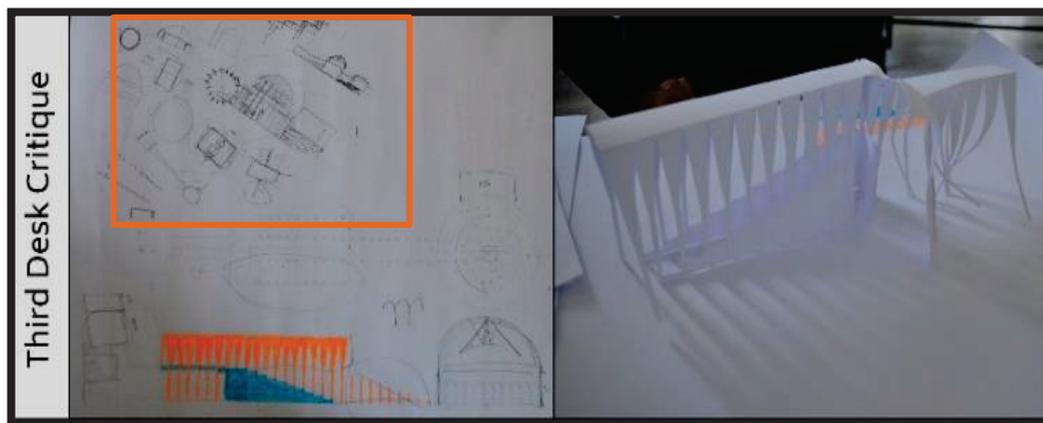
Figure 45. Drawings and physical model of Student 3 and proposal drawings of instructor at the third desk critique

Instructor listened him and analyzed the drawings. He said that:

Your organization is like a chain, it is so linear. It would be better if you can make it more compact. And after the path your route is dividing into two different passages. There should not be a selection for the route, it must direct the visitor through the outside world.

Then, instructor started to draw sketches next to the drawings of the students. And he tried to give suggestions about how to abstract the forms of the buildings (in the rectangular frame on Figure 45).

For the fourth desk critique, he made a physical model (Figure 46). This time he made a more compact organization, used topography and defined the route clearly. He declared the composition as follow:

I changed the circulation and located Enc 01 on topography to make it huge and attractive. And I tried to abstracted the forms of the structures. I made openings in Enc 01 like the windows of Selimiye Mosque. In Enc 02, I tried to refer the skylight of Health Museum.

Figure 46. Physical model of Student 3 for the fourth desk critique

Instructor listened to the student and looked at the model. He liked it but said him to work for the facades and spatial experiences more. Because, according to instructor, the components, especially the enclosures were looking like little mosque and complex. He advised him to construct them by using little planar pieces with interlocking or piercing.

Figure 47. Physical model of Student 3 for destiny jury

111

The fifth work of Student 3 was the submission project for destiny jury (Figure 47). He tried to consider the previous critique and he didn't make any changes in the circulation, location of the components and topography. He gave importance to the forms and facades of the components. He explained his design as below:

I was impressed by the hugeness, its light experience and also the form of going narrower from bottom to top of Selimiye Mosque. Therefore, I tried to abstract Enc 01 like this. For Enc 02 I was impressed from Health Museum. There was a courtyard covered a dome at the center and the light was only coming through top of it. Around the courtyard, there was rooms, but the courtyard was like the main space different from the rooms. Therefore, I abstracted the courtyard and dome with its opening as a pyramid. Then I buried ENC 02 into topography to make ENC 01 more attractive and huge.

Student 3 couldn't take critique at the destiny jury. He explained the last composition to the researcher of the thesis during a semi-structured interview.

Another instructor criticized the project as follow:

The method that you use for constructing the components is looking so fragmental. The little planers are looking like decors.

In addition to the critiques of the instructors, the group instructor commented as follow:

You also added opening on top of your Enc 01 and referred to the skylight of Synagogue. But it is too tiny in your model. You need to make it more defined in size.

For the fifth desk critique he didn't change anything about the organization, circulation and topography (Figure 48). He only made little changes in the form of some design elements like, top cover of the passages and the smallest pyramid on top of ENC 01. Because he tried to make the form more abstracted from the inspired ones. He couldn't take desk critique in the course hours. He could take last critiques before the final submission from some instructors out of course hours. He briefly declared to the researcher that they generally didn't suggest him to change many things, otherwise the organized and considered design could be worse.

For the final submission, he presented the last model and drawings (Figure 49). He declared to the jury which buildings he inspired and which spatial experiences he would like to refer in this composition. In this composition, he only made some little

differences in the form. He changed the form of the top covers of passages and added some design elements on ENC 02.

Figure 48. Physical model of Student 3 for the fifth desk critique

Figure 49. Physical model of Student 3 for the final jury

In the final jury, juries said positive things to the final work. One of the juries found it amazing. Because, he liked the construction method by using little design elements and found successful the adaptation of inspired buildings into the spaces. Another jury thought that this design was looking so architectural and this is up level for the basic design semester.

3.2.4.3.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- First Desk Critique: When we look at the first composition of Student 3, he had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes (Figure 50). Because, he could define some spatial characteristics of Selimiye Mosque and Health Museum in terms of his spatial experience.

Therefore, it can be said that he approached to the goal of ability to analyze the built environment.

He comprehended the definition of the design task and its requirements. Because there was nothing wrong in his first drawing about the content of the design task. Therefore, it can be said that he approached to the goal of ability to understand design brief. However, he couldn't approach to the goal of ability to control and organize 3D forms. Because, he couldn't show any ability of considering physical properties of the 3D design elements in gathering them for the 3D composition, he only located the design elements according to the route. In addition to these, he couldn't compose 3D design elements within meaningful formal and spatial relations that each design elements seen as inseparable from the organization. That's why, Student 3 couldn't approach to the goal of ability to control spatial and formal relationships. He could approach to the goal of ability to form open, semi-open and closed spaces. Because, he could implement the given spatial definitions of design components in this composition and the characters of design components were defined well.

He verbally declared the spatial experiences of Selimiye Mosque and Health Museum. However, in the drawing the inspired spatial and physical features were not figured out. Therefore, he couldn't approach the goal of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.

Step 2- Second Desk Critique: He didn't attend studio and desk critiques for second desk critique. So, there was no production to evaluate in terms of the assignment goals.

Step 3- Third Desk Critique: In this second composition, he was at the same distance to achieve the goal of ability to analyze the built environment. Because, his spatial experiences defined from the analysis and aimed to transfer to the composition about enclosures were the same. However, he moved away from the aim of ability to understand design brief since he used two different paths and it caused problems in conformation the defined route. In addition to these, he also moved away from the goal of ability to control and organize 3D forms and ability to control spatial and formal relationships. Because, in this kind of linear organization there were limited spatial and physical interaction between the design components. In addition to these, he was again at the same distance to achieve the goal of ability to form open, semi-open and closed spaces. Because, the path, passages and enclosures were clear in his drawing.

He didn't change any spatial design decisions about enclosures. However, he had still nothing more about defined and inspired spatial experiences. Therefore, he again couldn't approach to the goal of ability to represent spatial design decisions and the goal of ability to organize a spatial experience referring to the physicality of the built environment.

Figure 50. Design Process of Student 3

Step 4- Fourth Desk Critique: The spatial experiences and analysis about Selimiye Mosque and Health Museum were the same to transfer to the design, so he was at the same distance to achieve the goal of ability to analyze the built environment. He had a grasp of design task, instructions and rules and he achieved the goal of ability to understand design brief. He was closer to the goal of ability to control and organize 3D forms in contrast to the previous ones. Because, the design components were in an identified organization and the overall design was more compact. In addition to these, he could get closer to the goal of ability to control spatial and formal relationships in comparison with the previous ones. Paths, passages and enclosures in the model could be identified. Therefore, she approached to the goals of ability to form open, semi-open and closed space.

This time, he was closer to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, the forms of enclosures and organization of the components were supporting the spatial design decisions of the student.

Step 5- Destiny Jury: In this stage, he was at the same distance to the goals of ability to analyze the built environment and ability to understand design brief. He was closer to the goal of ability to control and organize 3D forms and ability to control spatial and formal relationships between design components in this model compared to the previous one. Because, he could organize the spatial relations between design components and topography. He was at the same distance to the goal ability to form open, semi-open and closed spaces since the characteristics of the components were clear in the model.

His abstraction of the inspired structures and impressed spatial experiences which transferred to the design were clearer than the previous one. Therefore, He got closer to the goals of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment.

Step 6- Fifth Desk Critique: In this stage, he was at the same distance to the goals of ability to analyze the built environment, ability to understand design brief, ability to control and organize 3D forms, ability to control spatial and formal relationships between design components, ability to form open, semi-open and closed spaces, ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, there was not a difference in the

organization and spatial design idea with the previous one. There were only little formal differences which doesn't change the distance to the achievement of the assignment goals.

Step 7- Final Jury: For the final work, he again didn't make radical changes. There was no difference in the organization and spatial relations. The only changes were about tiny formal differences in the components. Therefore, this production was at the same distance to each goal with the previous work.

3.2.4.4. Student 4

Student 4 was an active student in participation at the reviews, desk critiques and juries. She was tended to work by making physical models. Throughout the design process, she was eager to develop her project by taking into consideration the suggestions and ideas of instructors.

3.2.4.4.1. Spatial Gift Design Process
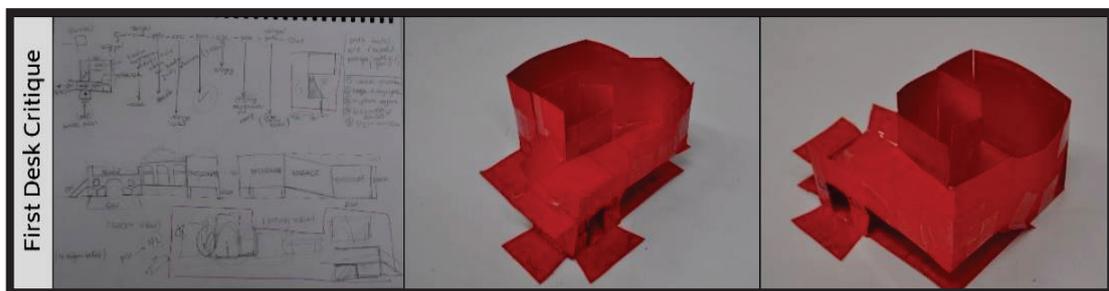
Figure 51. Physical model and drawings of Student 4 for the first critique

In the beginning of this design process, she presented her first warm up model and drawings for Assignment 7b at the desk critique (Figure 51). She was impressed from the two spatial experiences of bridges. Because of that, she would like to use a structure like abridge for both as path and passage. Also, she was inspired from Selimiye Mosque for her ENC 01 and Synagogue for her ENC 02. And she chose the route: PSS – PTH – ENC 01 – PSS – ENC 02 – PSS – PTH - OW. She declared her composition as follow:

> During the excursion, I was mostly interested in sacred places. I was impressed from the light experiences of Selimiye Mosque and Synagogue most. Therefore, I would like to refer Selimiye Mosque in Enc 01 and Synagogue in Enc 02. In addition to that, I figured out that bridges were using as both passages and path. Top of the bridges were open transitional spaces and under of them were semi-open spaces. So, I also impressed this spatial feature of Palace Bridge and I would

like to give this experience by using this kind of component. Then I chose this route and organized the components according to it.

The instructor saw the works and warned her about the level difference and topography. Because, with a scaled drawing and model the stairs in the passage could be so inclined. She was using the first passage as a bridge that was using as a path at the end of the circulation. However, she gave 150 cm for the height of the passage of the bridge. Visitor would go through it, so instructor fixed the problem and increased the height. Then instructor advised her to work for the forms and openings. While doing this, he drew something on the paper (Figure 52).

For the second desk critique, she had tried to work for the openings on the façade. There was no different from the first model in terms of organization of the components and circulation (Figure 53).

Instructor asked for the roofs or top covers of the enclosures and passages. Then he gave critique as below:

Firstly, it can be a draft model but consider the roofs too. And secondly, this model is looking nice and compact in this scale. You need to work with a bigger scale. Your openings looking like windows, but I didn't mean this at the first critique. Try to make openings with voids when the solid pieces connecting. It also would be hard to work in this scale.

Then he continued to give critique while drawing proposal sketches (Figure 54). He said that:

You want to give the spatial experiences of Selimiye Mosque and Synagogue. To do that, you need to define where the openings and what were their proportion to the structure.
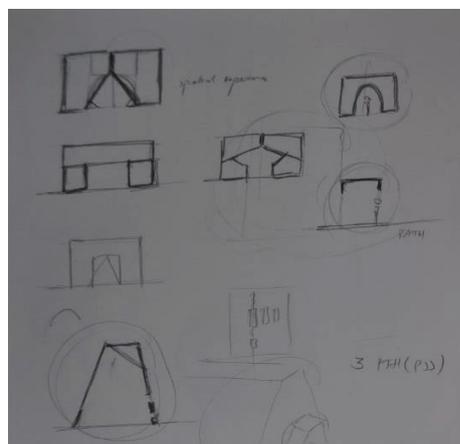
Figure 52. The proposal of the instructor for Student 4 at her first desk critique
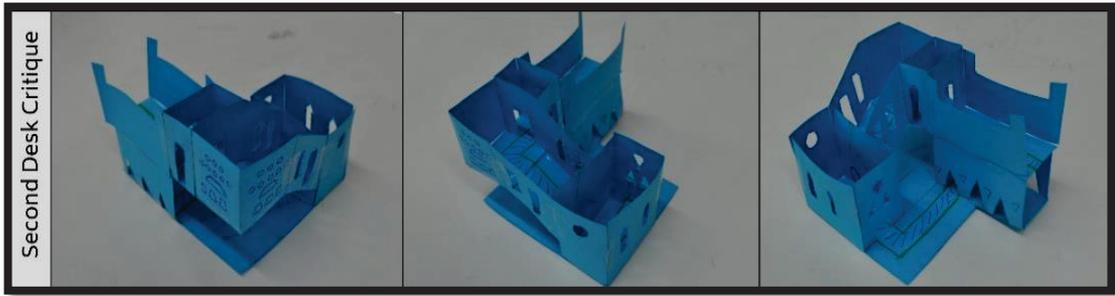
Figure 53. Physical model of Student 4 for the second desk critique

For the third desk critique, she had considered the previous critiques and she had started to work with a bigger scaled model (Figure 55). However, it was not finished and there were many other students needed to take critique from the instructor. So, she couldn't take a critique, but continued to work for the forms in the studio.
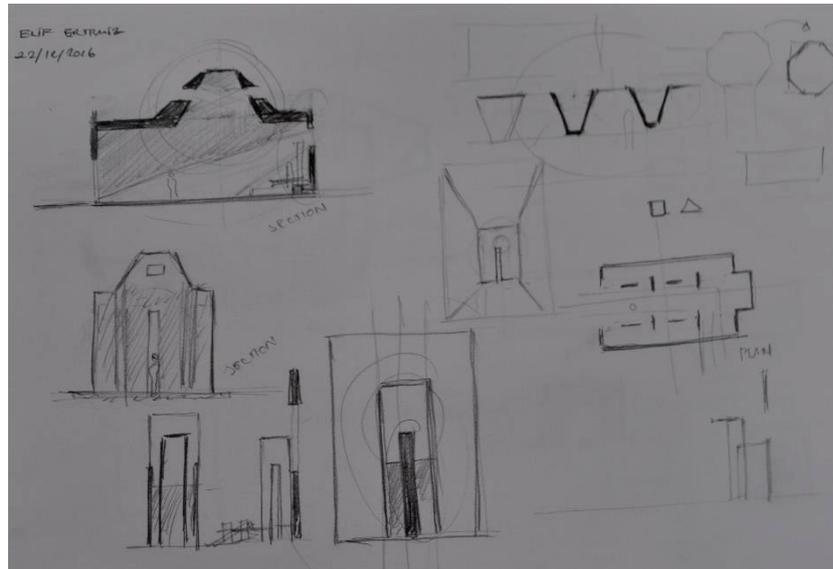
Figure 54. The proposals of the instructor to form components in reference to the spatial experiences of the inspired structures

Figure 55. Physical model of Student 4 for the third desk critique

For the fourth desk critique, she still couldn't finish the model (Figure 56). Because, she was confused about abstracting the form of the impressed structures, especially, while trying to make the dome-like coverings. She explained the situation as follow:

> I am trying to use planar pieces to make openings and to form the components. But I started to dislike the project. Because, it is not giving the same spatial experiences. I don't know how can I abstract the domes or arches.

Figure 56. Physical model of Student 4 for the fourth desk critique

Instructor listened her and commented on the work as below:

> You are using very big planes, so you cannot control the bigness of the openings and light. Especially, in this dome-like structure. Try to use smaller planes to construct the model.

The fifth work of Student 4 was the submission project for destiny jury (Figure 57). She considered the previous critiques and tried to construct the structures by using smaller planer pieces. However, she spent a lot time to construct the bridge by using the smaller pieces and couldn't make anything about the coverings. She didn't make any changes in design components and their organizations. She couldn't have a chance to take critique from the juries. But she was in studio and listened the other juries.

For the fifth desk critique, she came with the same unfinished model. She was trying to decide the locations of the enclosures because of the critiques and suggestions at the destiny jury. And she decided to detach them with a path or passage. It was the last critique before the final jury, but she couldn't get critique because of crowded.

Figure 57. Physical model of Student 4 for the destiny jury

For the last critique before the submission, she didn't make something more. Because, she would like to take critique from the model which she made for destiny jury. She showed the model and listened the critique of the instructor. Instructor said that:

> There is not a common language in the form generation. Many of the walls are huge pieces, but the walls of the bridge are constructed with too much little pieces. Try to use the same planers. And also you still don't have any roof of the enclosures. Work for them too.

He didn't give a critique about the circulation or the location of the components, since it was accepted as enough.

She didn't make so changes for the final jury (Figure 58). The organization of the overall composition and the circulation had already been defined. She added the coverings of the enclosures and to make a common design language, she tried to construct one of the passages' top cover like the dome of ENC 01 and the feet of the bridge. At the jury, she explained the composition as below:

> I was impressed from the light experiences and spatial organization of Synagogue and Selimiye Mosque. Therefore, I tried to refer them for the enclosures. And also, I was impressed from Palas Bridge and tried to use this component as both path and passage. Then I organized the components according to the route and I tried to make them in the same design language. That's why I used the small pieces in making them.

Figure 58. Physical model of Student 4 for the final jury

Juries didn't talk about the overall composition and circulation. They thought that the ENC 01 was so irrelevant to the others. Especially, the roof of ENC 01 was like a hat. One of the juries said that It would be better if the fragmental dome was going through as covering to the top of the ENC 01.

3.2.4.4.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- First Desk Critique: When we look at the first drawings and model of Student 4, she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Because, she could define some spatial characteristics of Selimiye Mosque, Synagogue and Palace Bridge in terms of her spatial experience (Figure 59). Therefore, it can be said that she approached to the goal of ability to analyze the built environment. And also, she was close to the goal of ability to understand the design brief by reason of obeying the rules and instructions of the design task. She was also close to the goal of ability to control and organize 3D forms and the goal of ability to control spatial and formal relationships. Because, in the composition of the student, the overall design was compact and 3D design elements were in relation between each other according to the selected route. She was aware of the definitions about open, semi-open and closed spaces, but the components were not well defined because of not using coverings. Therefore, she couldn't implement the given spatial definitions of design components in her composition and couldn't get closer to the aim of ability to form open, semi-open and closed spaces.

She verbally explained the spatial experiences of Selimiye Mosque, Synagogue and Palas Bridge. However, in the model, the spatial experiences were not transferred in the form to the composition. Therefore, she couldn't approach the goal of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.

Step 2- Second Desk Critique: The second composition was almost the same with the first one. Therefore, she was at the same distance to the goals of ability to analyze the built environment, ability to understand design brief, ability to control and organize 3D forms, ability to control spatial and formal relationships and ability to form open, semi-open and closed spaces.

She had an effort to represent the spatial experiences by making little differences in the forms of the components. Therefore, she a bit got closer to the goals of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.
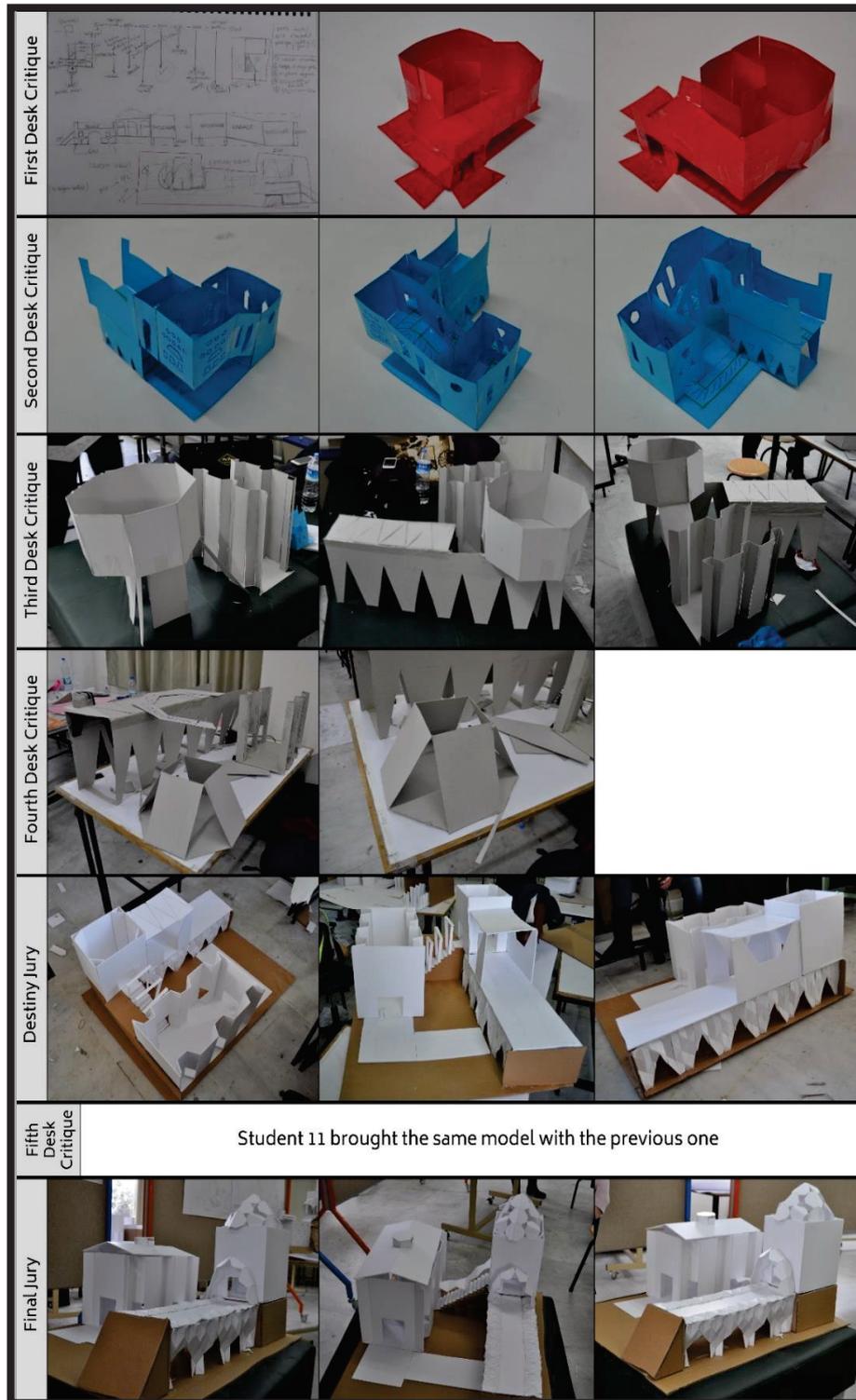
Figure 59. Design Process of Student 4

Step 3- Third Desk Critique: For the third desk critique, she couldn't finish the model. There were just some design components which she worked for the form generation of the parts. Therefore, the model parts cannot be evaluated as a composition in terms of the goals of the assignment.

Step 4- Fourth Desk Critique: For the fourth desk critique she had also an unfinished model and there was no composition. Therefore, the model parts cannot be evaluated as a composition in terms of the goals of the assignment too.

Step 5- Destiny Jury: It was known that she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Because, she could define some spatial characteristics of Selimiye Mosque, Synagogue and Palace Bridge in terms of her spatial experiences. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. She comprehended the definition of the design task and its requirements and implemented them in this composition. So, she approached to the goal of ability to understand design brief. She didn't make any changes in the organization of the components, so she was still close to the achievement of the goal of ability to control and organize 3D forms and the goal of ability to control spatial and formal relationships. There was still nothing about the coverings of the components. Therefore, although she knew the spatial definitions of open, semi- open and closed spaces, she couldn't implement them in a composition in regard to the model evaluation. Therefore, she was again at the same distance to the goal of ability to form open, semi-open and closed spaces.

At this step, she was a bit closer to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, she tried to transfer some spatial analysis about the inspired structures to the composition in the form. However, they were not enough to achieve this goal.

Step 6- Fifth Desk Critique: For the fifth desk critique, she didn't produce something new and took critique from the instructor through the previous work. Therefore, there was nothing to evaluate in reference to the assignment goals.

Step 7- Final Jury: For the final project, she didn't make radical changes in both the form and organization of the composition. Therefore, she was at the same distance to the goals of ability to analyze the built environment, ability to understand design brief, ability to control and organize 3D forms and ability to control spatial and formal relationships. However, this time she defined well the open, semi-open and closed spaces

because of using coverings in required parts. That's why, she approached to the goal of ability to form open, semi-open and closed spaces.

She also at the same distance to the goals of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, her representation of the spatial and physical design decisions was almost the same with the previous one.

3.2.4.5. Student 5

Student 5 was an active student in participation at the reviews, desk critiques and juries. Although she didn't produce something for the first critiques, she listened the other critiques and attended to the studio. She was tended to work by sketching more than making physical model. Throughout the design process, she was eager to develop and change her project by taking into consideration the suggestions and ideas of instructors.

3.2.4.5.1. Spatial Gift Design Process

She couldn't produce anything for the first and second desk critiques. However, she was in the studio, attended the courses and listened the others' desk critiques.

She presented her first drawings for Assignment 7b at the third desk critique (Figure 60). She was inspired from Selimiye Mosque for ENC 01, Synagogue for Enc 02 and Hıdırlık Redoubt for one of the passages. she described the route as PSS – ENC 01 – PTH – PSS – ENC 02 – PSS – PTH – OW. She declared her composition as follow:

> I was impressed from Selimiye Mosque. It was a huge and single space. There were no subspaces in the ground level. I decided to refer Selimiye in Enc 01. I also impressed from Synagogue a lot. Its light experience was amazing. So, I would like to refer its light experience I Enc 02. Lastly, I also impressed from Hıdırlık Redoubt. Although, it was looking like a closed space, I think it was a long and dark passage under soil. Therefore, I would like to give this kind of spatial experience in one of the passages. However, I couldn't locate it, because I couldn't know how to put under topography. I chose this route, then I tried to organize the components. And also, I tried to abstract the forms of the components by analyzing the geometries of the inspired spaces.

After her explanation about the design, instructor criticized the drawings and made suggestions as below:

If you want to use a passage like Hıdırlık Redoubt, you can put under of one of the enclosures. Maybe you can also cover the façades of it with topography and you can give a similar spatial experience. It is hard to understand and design a spatial composition by making drawings. Try to make models.
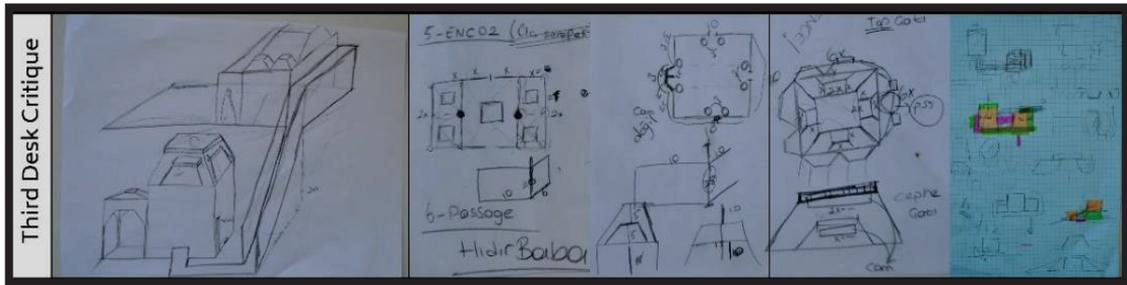
Figure 60. Drawings of Student 5 for the third desk critique

She didn't attend the studio for the fourth desk critique. For the destiny jury, she had prepared the drawing poster, but couldn't finish the mode (Figure 61). She could just make the enclosures. She didn't change any former design idea, just tried to make them for the destiny jury.

Although she couldn't finish the model, she tried to explain her design through the drawings. She declared the project to the juries as below:

I referred to light experience and hugeness of Selimiye mosque in Enc 01, light experience of Synagogue in Enc 02 and spatial experience and location of Hıdırlık Redoubt in this passage. I tried to make openings on the huge dome of Enc 01, like Selimiye; I tried to make openings on the face and roof of Enc 02 like Synagogue and I located a passage under Enc 01 (it has no model, but here on the drawings). Then, I organized them according to the route.

Figure 61. Drawings and model pieces of Student 5 for the destiny jury

Juries liked the use of passage under an enclosure like a tunnel. However, they declared that it would be better if they could see the topography in the model. Most of the juries said that the light experience transformed well with the openings in ENC 02. However, some juries thought that the openings of ENC 01 was too big in proportion to

the mass. Generally, they didn't give a negative critique about the organization, composition, circulation and the form generations.

For the last critique before the submission, she didn't make a new thing to take critique, because she was satisfied with the comments of the juries at the destiny jury. She started to work for the final jury in the studio and tried to make decisions about the last forms of the components. She decided to change the openings of Enc 01, because jury had criticized them. She sketched something for ENC 01 and calculated the sizes of the design elements for the last composition (Figure 62). While working in the studio, she sometimes asked to the instructor to get approval about the little formal changes. Instructor didn't say anything like make it or not make it and leave the decision to her.
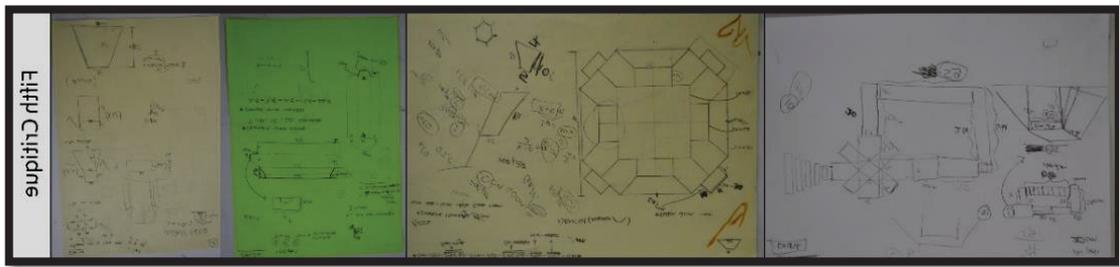
Figure 62. Drawings of Student 5 for the fifth desk critique

Taking into consideration the previous critiques, she shaped her last composition and presented the design at the final jury (Figure 63). Her spatial organizations, spatial design ideas and circulation was the same with the previous one. She only made little changes in the forms of some of the design elements. She explained the spatial experiences which she would like to refer to the components and also, she described the inspired buildings and structures to the jury.
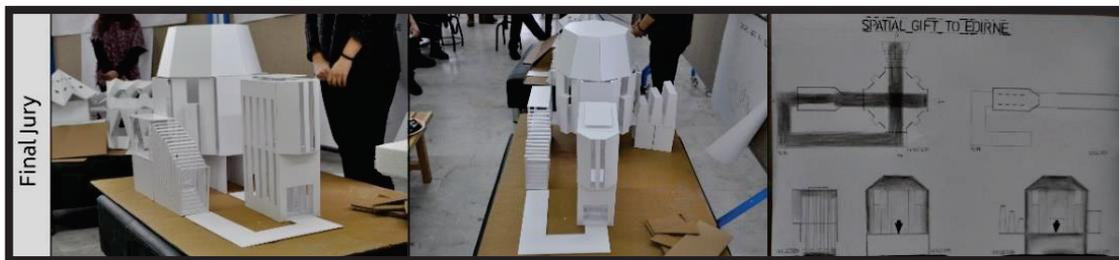
Figure 63. Drawings and model of Student 5 for the final Jury

Jury made positive comments about the composition. They generally liked the design ideas and form generations. However, one of the juries thought that the rectangular

pieces on the façade of ENC 02, the covering of passage and the pieces on the façade of ENC 01 were not looking variations of the same rectangles. He said that, it would be better if she conserved the same proportions of rectangles for all. Another jury declared that, the drawings were better in representation than the model, because topography was defined well on the drawings.

3.2.4.5.2. Evaluation of the Works in Regard to the Assignment Goals

Step 1- First Desk Critique: She couldn't produce any drawing or physical model for the first desk critique. Therefore, there were nothing to evaluate in reference to the assignment goals.

Step 2- Second Desk Critique: She again couldn't produce any drawing or physical model for the desk critique. Therefore, there were nothing to evaluate in reference to the assignment goals.

Step 3- Third Desk Critique: For the third desk critique, she had the first drawings. When we look at the first drawings of Student 5, it can be said that she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes (Figure 64). Because, she could define some spatial characteristics of Selimiye Mosque, Synagogue and Hıdırlık Redoubt in terms of her spatial experience. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. And also, she was close to the goal of ability to understand the design brief by reason of obeying the rules and instructions of the design task. However, she was not close to the goal of ability to control and organize 3D forms and the goal of ability to control spatial and formal relationships. Because, although she described the spatial characteristics of Hıdırlık Redoubt, there was no topography and underground passage on the drawing. And also, the overall design composition was looking disordered and unconsidered in terms of the physical relations between the components. She was aware of the definitions about open, semi-open and closed spaces, but there was no covering above the passage on the drawing. Therefore, she couldn't implement the given spatial definitions of design components in her composition and couldn't get closer to the aim of ability to form open, semi-open and closed spaces.

She verbally explained the spatial experiences of Selimiye Mosque, Synagogue and Hıdırlık Redoubt. However, in the model, the spatial experiences were not transferred

in the form to the composition. Therefore, she couldn't approach the goal of ability to represent spatial design decisions and goal of ability to organize a spatial experience referring to the physicality of the analyzed structures.
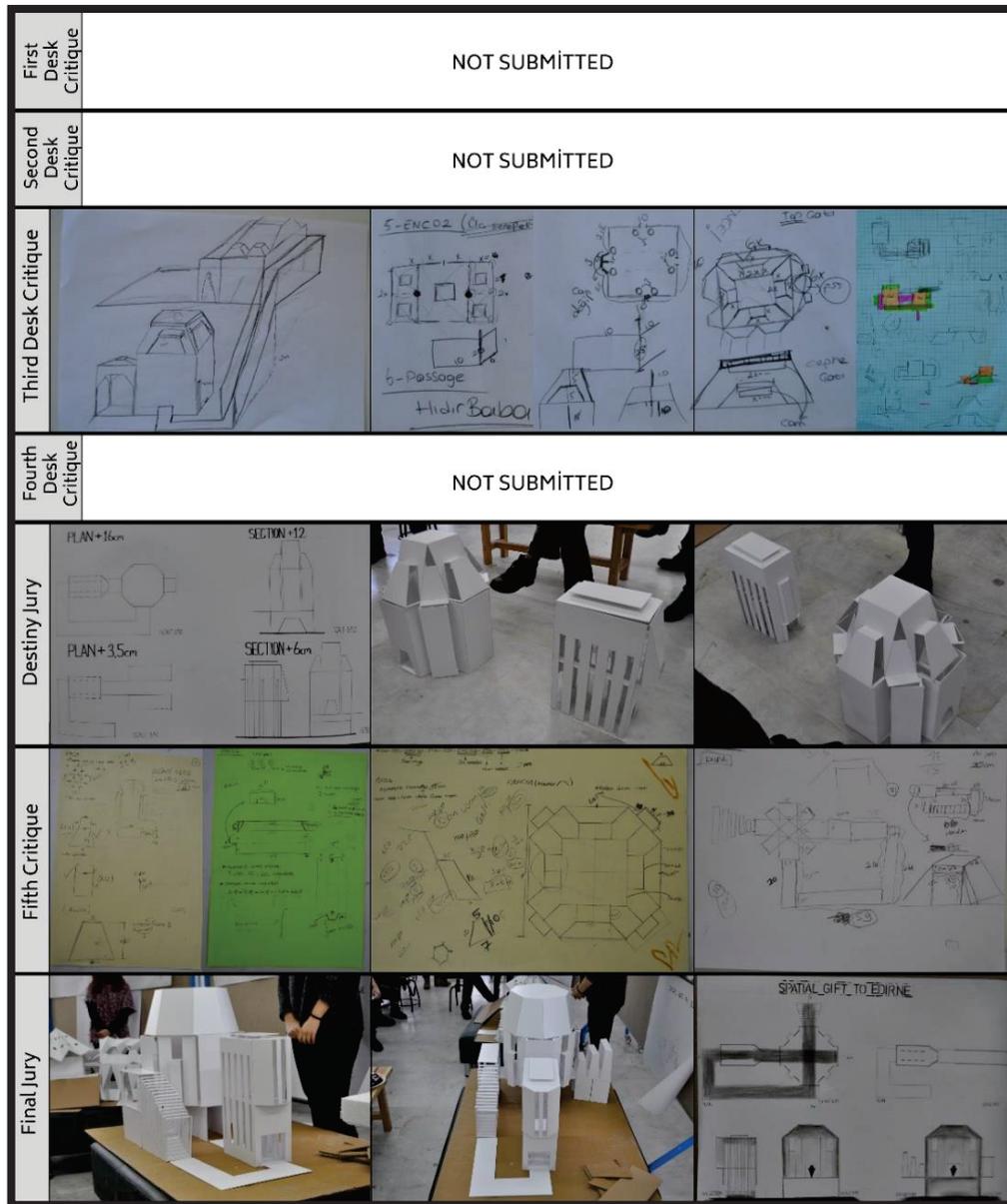
Figure 64. Design Process of Student 5

Step 4- Fourth Desk Critique: She didn't attend to the studio on the fourth desk critique day. Therefore, there was no material to evaluate in terms of the assignment goals.

Step 5- Destiny Jury: It was known that she had an ability of scrutinizing and defining the spatial characteristics of visited structures, buildings and complexes. Because, she could define some spatial characteristics of Selimiye Mosque, Synagogue

and Hıdırlık Redoubt in terms of her spatial experiences. Therefore, it can be said that she approached to the goal of ability to analyze the built environment. She comprehended the definition of the design task and its requirements and implemented them in this composition. So, she approached to the goal of ability to understand design brief. In this composition the design components were organized in terms of the circulation, spatial experiences and physical properties. And also, the overall composition was more compact. Therefore, she approached to the goals of ability to control and organize 3D forms and ability to control spatial and formal relationships. In addition to these, she got closer to the aim of ability to for open, semi-open and closed spaces. Because, she could define the paths, passages and enclosures well in this design.

At this step, she approached to the goal of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, she tried to transfer some spatial analysis about the inspired structures to the composition in the form. She tried to give the same light experience by making the openings in the enclosures and buried one of the passages under topography to give the spatial experience of Hıdırlık Redoubt.

Step 6- Fifth Desk Critique: For the fifth desk critique, she didn't produce a new composition to take desk critique. Because, she was satisfied with her last composition. She just was working for some changes in the forms of the design components. But the drawings were not including a composition, so there was nothing to evaluate in reference to the assignment goals at this step.

Step 7- Final Jury: For the final project, she didn't make radical changes in both the form and organization of the composition. Therefore, she was at the same distance to the goals of ability to analyze the built environment, ability to understand design brief, ability to control and organize 3D forms and ability to control spatial and formal relationships and ability to form open, semi-open and closed spaces.

She also at the same distance to the goals of ability to represent spatial design decisions and ability to organize a spatial experience referring to the physicality of the built environment. Because, her representation of the spatial and physical design decisions was almost the same with the previous one.

3.2.4.6. Discussions on Responses of the Students for Assignment 7b: Spatial Gift to Edirne

The cognitive approach of the students was generally analogical to the assignment. However, the task was already analogy based. It was good to experience and to take base standing historical structures to make something new. Thus, the students not only analyzed the spatial features of the structure, but also, they tried to reinterpret the spaces in terms of their experiences and gathered data.

In the first step, students (except Student 5) had sketches about the chosen route, basic mass models and drawings according to the route and ideas about their inspired structures' spatial features for the desk critique. It is seen that, all students analyzed and defined spatial characteristics of the visited spaces and decided to reinterpret the experiences in their spatial gift. For the first review, they explained the spatial experiences and inspired structures verbally, because the interpretations of the students were not well represented in their first drawings and models. Therefore, in the first step, students couldn't approach the goals of representation spatial design decisions and organizing a spatial experience referring to the physicality of the built environment. In reference to the design products of the students, most of the students (three students among four) couldn't control and organize 3D forms and also couldn't define spatial and formal relationships between design elements. In addition to these, among four students only one student (Student 3) could form open, semi-open and closed spaces properly. According to the evaluation results, two students (Student 1 and Student 2) couldn't comprehend the design brief. Because, they eliminated some rules and requirements of the assignment.

For the second desk critique, two students (Student 3 and Student 5) didn't produce something new. The other three students followed the same spatial design decisions and two of them (Student 1 and Student 4) attempted to represent the decisions in the form of the design components. This time students tried to make more compact and controlled spatial organizations, so they considered meaningful spatial relations between design components. However, two students (Student 2 and Student 4) among the three had not still define open, semi-open and closed spaces properly. This time the rules and requirements of the design task was comprehended better by the students, but Student 2 eliminated some assignment rules again.

For the third desk critique, two students among five didn't produce something new to get critique. The other three students brought new design products to take review from the instructors. However, all three couldn't control and organize design components that each design product was looking disordered and separated. Therefore, they also couldn't represent any spatial and formal relationship between components. Among the three students only Student 1 attempted to represent spatial experience spatial design decisions in the form of a design components. Among three students, only Student 3 could represent open, semi-open and closed spaces properly. Even though, students got used to the rules and requirements of the assignment, among three students only Student 5 didn't eliminate any rule.

In the fourth step, only the products of two students could be evaluated in accordance with the assignment goals. Others produced unfinished models and drawings. The two student (Student 1 and Student 3) who produced composition for this stage, understood the design brief that there was nothing inappropriate in regard to the rules and requirements of the design task. And also, both compositions were controlled, organized and design components were identifiable. In addition to these, the students could produce open, semi-open and closed spaces properly. However, Student 1 couldn't represent spatial design decisions and experiences well in contrast with the Student 3.

In the fifth step, student formed their compositions for the destiny jury. In this phase, all five students comprehended the design brief and there was nothing eliminated or ignored in accordance with the design task. All students made changes in design forms in order to represent their spatial design decisions, reference their inspired buildings and spatial experiences. Among five students only Student 2 couldn't control and organize design components. And also, Student 1 and Student 2 couldn't control spatial and formal relationships between 3D design components. Beside these, only Student 4 couldn't form open, semi-open and closed spaces properly that there was no roof for some enclosures and passages.

In the sixth step which was the last desk critique before the final jury, Student 1 and Student 3 made little differences in the form of the composition; Student 2 didn't produce a finish composition, but worked on the forms of the components to represent spatial features of the inspired buildings; Student 4 and Student 5 didn't produce something new and received critique from their previous work. This stage was the last chance for the students to make last design decisions before the final submission that each

student tried to make minimum changes in their composition not to lose time in the process of preparation for the final jury.

For the final jury, all five students developed their projects in the way of achieving the goals of the assignment. Their distances to the goals were different inevitably, but all performed the best solutions within their special design process for the final submission.

In reference to the results, it is seen that each design process a special case in itself. Therefore, their project developments show differences. All students didn't go forward at each step, some of them went backward or remained stable. However, all them tried to consider the reviews of the instructors. The results of students' questionnaire (Appendix D, Question 22) also show that, not only the five students, 86% of the students in the AR 101 Introductory Studio believes that the taken critiques contributed to their design process. Also, because of the studio environment, students criticized also their peers' works, listened their friends' reviews and discussed on the projects in the studio. This learning environment also made contribution to their design development.

3.3. Comparison of the Simple and Complex Assignment

These two assignments were chosen regarding their intensity in their structure. Because, it was important to reveal the responses of the students not only for one design task, but also for one more complicated assignment in order to define what changes in their responses when the structure of the design task changed. Therefore, one was chosen as simple design task, which is Assignment 3: Producing Pattern Design and one more design task was chosen as the complex one which is Assignment 7: Spatial Gift to Edirne.

Although the content, intensity, descriptions and requirements of the two assignments were different from each other, there were resemblances between them. First of all, in both there was a context that contributed with the reality in outside world to the studio environment. In the simple assignment this context was about assigned kind of trees in Kültürpark and in the complex assignment the context was the built environment of the city "Edirne". Secondly, both assignments included observations and analysis through the realities in the context. Then in both situations, students were assigned to represent and document what they observed and analyzed through their visit to Kültürpark and Edirne. After the preliminary preparation, students started to synthesize their data for the design production. They made abstractions, reinterpretations and represented their

ideas in different forms in order to produce a design product. In the both assignments, there was a given design source and students were expected to be inspired through the sources for their reinterpreted design products. Therefore, in the design processes of the students, analogy mainly took place.

However, there were big differences between two assignments which reasons calling one of them as simple and the other one as complex. First of all, the main differences between two was that the simple one was aimed to produce 2D composition and complex one aimed to produce 3D composition. Therefore, the representation studies also changed. In the pattern design students made drawings and sketches, but in the complex assignment they worked by making physical models in addition to making sketches and drawings. In the simple assignments the source was a tree, but in the complex one the source was the whole built environment and visited buildings of Edirne. Tree can be identified as a well-known reality that everyone can figure out its main parts characteristics and features. On the other hand, Edirne and its built environment was an unknown reality for the beginner design students that they first tried to understand the spatial and physical features of the context. In the pattern design work, students were required to design a unit by inspiring from that tree and multiply it by considering geometric relations. In contrast to the simple assignment, in the complex one, students were required to design many different design components in 3D and merge them in accordance with the spatial configurations and physical properties. Therefore, there were many design elements needed to be considered in the complex assignment. The beginner students had to think in 3D and architecturally while making their spatial gift. This was one of them main difference between them that defines Assignment 7 more complicated and complex than Assignment 3.

In addition to these, the descriptions and requirements of the assignments were quite different. First of all, there were many rules and limitations in the complex assignment that students were obligated to obey them. However, there was no complexity in design task description of simple assignment. This situation also influenced the design processes of the students. It took too much time that students comprehended the design brief, its requirements and rules well for the complex assignment. Therefore, in each case of five students, no one could complete their design compositions in accordance with the rules and requirements of the design brief at the first stages. However, students could finish their 2D compositions in regard to the requirements of the design task at the first steps in the design process of simple assignment. And also, it was seen that, students

approached most of the assignment goals in shorter time in contrasted to the complex assignment.

When we look at the design processes and responses of the students for each design task, it can be said that students majorly challenged with making a meaningful design composition. In the simple assignment, students had difficulties to merge the units in well-defined geometric relations by considering figure & ground relation. In the complex assignment, students were challenged with similar things that were like versions of the challenges in the simple assignment. That time students had difficulties to organize spatial components by considering spatial relations and configurations. They challenged in defining the characteristics of the spaces in both the 3D design components and between the design components.

In the design process of each assignments, the review types also showed differences. In the pattern design process, students received critiques from their group instructor through panel discussion method. However, for the final assignment, students mostly took desk critiques from their group instructor and also there were organized destiny jury before the final jury. In addition to these, students received critiques from many other studio instructors during the process. It means that, many instructors from the juries and desk critiques were incorporated to the design processes of the students. However, most of the students declared through the questionnaires (Appendix C, Appendix D) and interviews that, these variety in instructors made them confused and they confronted with dilemma between different kinds of comments and suggestions. Because, in the design processes of the students for both design tasks, instructors were main expertise and decision maker for them. Also, in regard to the direct observations, students were generally tending to apply what instructor suggested. Therefore, in the design process of simple assignment they directly attended to develop their design in terms of the critiques of their group instructor. However, for the complex assignment, receiving different critiques from different instructors provided them choices in making design decision. They couldn't be sure about which critique should have been followed and this special situation also hardened the process for students.

The defined time for design production and the time of assigning the design tasks were also different because of the differentiation between two assignments. The simple one was the third assignment and the complex one the final assignment in the semester. It shows that, in the introductory studio of IZTECH, there was an aim to order the design tasks from simple to complex. The educator staff would like to assign students with design

tasks which were getting more complex gradually. The curriculum was organized in a constructive approach that design knowledge and skills were objected to gain to the beginners by superimposing.

CHAPTER 4

CONCLUSION

In this chapter, the findings and inferences obtained through the literature, interviews, observations and questionnaires will be summarized firstly. After that the limitations of the study will be given. Lastly, what can be done for the future works in reference to the analysis and documentations of the study is going to be stated.

4.1. Conclusion

Design is a cognitive activity that includes both making and thinking process. In the process of design, there are many parameters which influences and changes the characteristics of the activity. It depends on the conditions, materials, people, situated design problem, etc. Therefore, each design process can be regarded as unique and special. Because of the complex structure of design, both the process and teaching-learning design are also difficult to frame. Nevertheless, in order to shape the ideas, provide new solutions and generate new forms, there is a need for enough design knowledge and skill.

The knowledge and skill of design in architecture had been given to the beginners within an apprenticeship system long time ago. (Demirbaş, 2001). Studio-based model of learning-teaching design environment was established by the École des Beaux Arts in Paris in the eighteenth century. Lackney (1999) states that project-based educational methods were developed from the "learning by doing" tradition. In this learning design environment, students have influential role in their learning with the tutors' guidance. Learning by doing strategy provides students to learn by designing than studying. The goal of the education strategy is to gain students permanent skills in their architectural design. (Schön, 1984).

In the architectural design education system, studios are the core of the architectural design curriculum and supply a learning environment for students to employ with design tasks under design instructor supervision. In addition to being a part of the curriculum, studios are unique learning environments that are quite different than a usual

classroom. The physical setting of a design studio typically serves to increase communication, collaboration and sharing. Studios are active places where students are engaged intellectually, socially, synthetic, analytic and evaluative models of thinking (Dutton, 1984).

In addition to the general perspective of view for the architectural design education and architectural design studios, introductory design studios are special cases in this architectural design learning process. First year is known as a foundation and preparation year for the students. Therefore, introductory design studios are regarded as the most important stage for the profession education process (Tavasoli, 2014). Because, beginner design students meet with design principles, skills, knowledge and environment at the first time and the learned things have a strong relation to the further design studios.

As declared in the thesis before, students have difficulties during the first-year design education. The main reason of it the changes in education routines and strategies between university and pre-university education period. While design education focuses on critical thinking and creativity, pre-university education related with regular and inflexible patterns (Salama, 2009; Salingaros & Masden, 2010). Therefore, students confront with dilemma while getting used to the new education environment. And also, because of the lack of design knowledge and ability, they challenge to learn design by designing.

Most of the architectural design students in Turkey also come from a different education habits with lack of design knowledge. Because, learning happens via lecture-based and memorizing based system in pre-university education period in Turkey that suppress natural talents of students. (Dural, 1999). This kind of education habits cause problems in architectural education where students need ability to define design problems, think critically and innovatively to solve the problems and decide independently. Therefore, this thesis focused on introductory design studio of IZTECH to describe and understand how the beginners respond to the learning exercises in this challenging learning design period. The objectives of this research were to analyze design process and project development of students for the given design tasks, to evaluate the responses of the students for the chosen design tasks in accordance with the defined assignment goals, to identify similarities and differences between responses and evaluation results of the students for the chosen simple and complex assignments, to compare the simple and complex assignments in terms of the design environment, design

processes and responses of the students and to explore correlation between design processes, design products, design cognition and taken reviews of the students.

In order to reach the purposes, direct observation was made during the whole semester to collect data in the natural environment of the studio. Focus group was chosen to be followed closely and 5 students from the focus group were selected to be analyzed in detailed to understand design approaches, activities, cognitions and responses of beginner design students for the given design tasks. At the same time, 2 design tasks were chosen among seven, one was the third assignment and simple one and the other one was seventh final assignment and complex one. The design processes of the 5 students for the chosen assignments were observed and documented in this research. After all, the responses of the students were evaluated at each design step in regard to approaching and moving away from the goals of the assignments. In order to get more data, there were also conducted semi-structured interviews and questionnaires. The gathered data and results of the analysis were used to compare the responses of the students for each assignment. And also, assignments were compared by taking into consideration the design and learning design process of the students in the studio environment.

In reference to the findings through the interviews, questionnaires and direct observations, it is seen that each design process is a special case in itself. Therefore, their project developments show differences. All students didn't go forward at each step, some of them went backward or remained stable. However, all them tried to consider the reviews of the instructors. According to the interviews, questionnaires and observations, majority of the students were willing to learn and open to criticism. Students were generally applying instructors' critiques in both design process and decision-making process.

It was declared in the study before that, both learning exercises were majorly based on analogy and the first cognitive approach of the students were analogical. There was given a source domain to be inspired from that, for the simple assignment it was a tree and for the complex assignment it was the built environment of Edirne. The generation of the source domain generally made through sketching for the simple assignment and model making for the complex assignment. Because, as Goldschmidt (1994) declared that designers sketch to generate images of form in their minds. Beside seeing what they thought in their mind, they also expressed their ideas to get critique from their instructors. Schön (1992) explains it with "reflective conversation" and clarifies that designers direct their design process by seeing, drawing and seeing. When the sketches

139

and drawings were insufficient to see the imagined idea, students made models to see in 3D. As Smith (2004) states, 2D representation systems cannot be sufficient in both presentation of the product and designing it. It was also observed that, instructors also encouraged students to sketch at every step of exercises through the semester and they also encouraged the students to make models beyond sketching for the learning exercises in 3D.

This course aims to gain students the ability to materialize their thoughts and design ideas in both 2D and 3D format in accordance with the design principles and terminologies at IZTECH (https://architecture.iyte.edu.tr/en/b-arch/). However, according to the findings through the observations, interviews and questionnaires, majority of the students had similar difficulties during their design processes for the two assignments about this course goal. They had problems in making a meaningful composition in both 2D and 3D designs. They generally had challenges in using design field properly, figure & ground relations, solid-void relations, gathering design components, making relations between design components and proportions between design components.

Although there were similarities between simple and complex assignments like having a context, including observations, analysis, representation and documentation, and also making reinterpretations and producing design by using the handled data, they were different from each other in terms of content, intensity, descriptions and requirements of the assignments. Simple assignment was about producing 2D composition, there was a well-known source domain "tree" and design brief was explicit. On the other hand, the complex assignment was aimed to producing a 3D spatial composition, there was unknow context "the built environment of Edirne" and the design brief was so complicated that there were many requirements and rules. In the design process of the simple assignment, students approached most of the assignment goals in shorter time in contrast to the complex assignment. Because, in reference to the findings, interviews, questionnaires and observations, understanding the design brief of the complex assignment was also a big deal for the beginners.

The complex structure of design and design learning was tried to be understood through the student cases and direct observations in the introductory design studios of IZTECH via two course exercises. By making discussions and comparisons with the gathered and analyzed data, this descriptive study reaches the research objectives.

4.2. Limitations

This study included two assignments among the seven assignments which implemented through the fall 2016-2017 semester of Introduction to Design Studio in IZTECH. Only third and seventh assignments were contributed to the research because of the intensity.

This research was made in a retrospective approach. Observations were made during the semester, but analysis and interpretations were made after data collected. However, there were quite amount of materials like voice recordings, video recordings, taken notes during the observations and photographs. Also, the memories and experiences have been still fresh.

Students and instructors were only observed within the course hours and during the excursions. The contributions of the students to their design process while they were working for homework couldn't be observed. However, if there were some missing points through collecting data about the design process, they were gathered via questionnaires, structured and semi-structured interviews.

The results of questionnaires which made with students and instructors were not given directly, some information gained from the results were used in order to reinforce the explanation. There were 73 students among 110 students who responded the students' questionnaire at the end of the semester. Because, many of the students turned back to their hometowns since the semester had finished. Also, some of the students didn't attend the colloquium which the questionnaire was implemented after it. To provide more students participated in a questionnaire, the time should be properly chosen. In addition to these, in the questionnaire of students, there were a lot of unanswered questions. Because, some students got bored with the questions and didn't show a great interest. To have more reliable data, the number of the questions should be considered.

4.3. Future Work

This study provides a comprehensive documentary and analysis for the design process and learning design process of the introductory design students in IZTECH. It scrutinizes the introductory design students through the given design briefs and responses of the students to the given assignments. By doing that, this study tries to reveal the

differentiation between the responses of the students when the design task becomes more complex. It shows the influential factors in design and learning design process of the students, tries to figure out the similarities and differences between the responses. In reference to the findings of this research, further researches can propose suggestions in order to decrease the challenges and increasing the performances of learning design. It provides the basis for further studies and future works in several relevant areas.

This kind of study can be implemented in other institutions. And also, this kind of research method can be used in order to understand the design responses of the students in the upper classes of architecture faculties. In this way, the differentiations between institutions and classes can be verified. In regard to the similar research questions, different studies can be made with different methodologies. In addition to these, this study also can be a sample for the other researches on education of different design-based disciplines.

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144

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APPENDICES

APPENDIX A

BACKGROUND INFO QUESTIONNAIRE OF THE FOCUS GROUP STUDENTS

İsim-Soyisim:

1. Yas:

2. Cinsiyet: K/E

3. Hangi bolumdesiniz? Sehir bolge planlama/Mimarlik

4. Nerelisiniz?

5. Nerelerde kac yil sureyle yasadiniz ve su anda nerede yasiyorsunuz?

6. Nerede konakliyorsunuz? (ev,yurt,…)

7. IZTECH`ye hangi vasita ile geliyorsunuz?

8. Kim(ler)le yasiyorsunuz?

9. Calisiyor musunuz? Nerede? Hangi gorev ile?

10. IZTECH`ye Gediz ya da Izmir Universitesi`nden ozel ogrenci olarak mi geldiniz? Eger oyleyse hangi kurumdan?

11. IZTECH`ye gelmeden once hangi egitim kurumlarinda okudunuz?(ilkokul-ortaokul-lise-yuksekogretim (varsa))

12. Aile bireylerinin meslekleri nelerdir?

13. Ekonomik durumunuz hangi duzeyde? (dusuk/orta/yuksek)

14. Burs aliyor musunuz? Aliyorsaniz ne bursu?

15. Bu bolum kacinci tercihinizdi?

16. Bu bolumden oncelikli olarak hangi meslek dallarini tercih etmistiniz? Neden?

17. Neden bu bolumu sectiniz?

18. Hobileriniz nelerdir? Hala aktif olarak bu hobiniz ile ilgileniyor musunuz?

19. Odevlerinizi yaparken ve ders calisirken hangi mekanlari kullaniyorsunuz?

APPENDIX B

QUESTIONNAIRE OF FOCUS GROUP STUDENTS
ABOUT THEIR DESIGN PROCESS OF ASSIGNMENT 3B

Assignment 3b Questionnaire
17.10.2016

1. What was your starting point in these two poster compositions?
2. How did you generate your poster design idea? (by making drafts, sketches, asking the others, looking at resemble samples,...)
3. How did you study? (standing, sitting, talking the others, listening music, drinking or eating sth, ...)
4. How did you make your decisions during the process of studiowork? (by asking the others, individually, by considering the prior assignments or lectures, according to the design principles and relations like; figure & ground, symmetry, proportion, axis, repetition, ...)
5. Did you understand the goals of the studiowork clearly? (yes/no)
6. Did you find the studiowork difficult/easy to understand the assignment? What was difficult/easy?
7. Do you know what is expected from the assignment? (In terms of goals and physical expectations)

APENDIX C

QUESTIONNAIRE OF FOCUS GROUP STUDENTS ABOUT THEIR DESIGN PROCESS OF FINAL ASSIGNMENT 7: SPATIAL GIFT TO EDIRNE

Date:
Student:
Assignment 7-7a-7b

Try to consider your Spatial Catalogue, Final Composition, Final Drawings and Final Model when you are answering the questions below.

1. a) What was your **starting point** for the assignments?

   b)Where did you get your **design idea** from when you are shaping/forming your spatial catalogue and spatial gift?

   c)Which structures were you **inspired** from for your enc 01, enc 02, path and passage and which features of them affected you?

   d)Which **spatial experiences** and **perceptions** did you try to give in your enc 01, enc 02, path and passage?

2. How did you generate your design idea?
   a)by using which methods? (sketching, model making, doodling, diagramming, …)

   b)Is there any source that you have chosen and used in your generation?
   (ideas of people outside the studio like parents,roommates or ex-first year students, ideas of classmates, any image from internet/instagram/pinterest…,toytasar, your ex-assignments,..)

3. What a kind of design environment that you have been to?
   a)Where did you study for the assignment?

   b)How? (standing, sitting, listening to music, drinking, eating, talking with the others,…)

c)Whom with? Who were with you when you are designing/studying for the assignment?

d)Do you need a specific design environment?

4. How did you make your final decisions during the design process? (individually, by considering the prior assignments or lectures, according to the critiques of instructors, classmates or anybody else from studio...)

5. Consider the days from last Thursday to today (Sunday):
a)Did you change anyting after the last critique? What did you do?

b)How long time did it take to make last decisions for the end product?

c) How long time did it take to finish your assignment for your spatial catalogue, drawings and model?

d)Did you change any design decision when you are preparing the catalogue, the model and drawings?

6. Did you give breaks when you are studying? Why? (during the decision making and presentation process)

7. Did you continue to think about your assignment when you gave breaks? What did you think?

8. Could you fill the given timetable according to the instructions?
9. Do you think that given time for the assignment is enough? If it is not, why?

10. Do you think that you spent your time efficiently? If you don`t, how could you manage your time? Can you fill your second timetable according to that?

11. Did you understand the goals of the assignment clearly?

-Yes,they   are:
……………………………………………………………………………………
……………………………………………………………………………………
….

-No,
because:………………………………………………………………………………
…
……………………………………………………………………………………
….

12. Did you find the assignment difficult/easy?

-Easy, because:
………………………………………………………………………………………
………………………………………………………………………………………
……
-Difficult, because:
………………………………………………………………………………………
…
………………………………………………………………………………………
…

13. Do you know what is expected from the assignment? What is it?

14. Spatial Catalogu:
a) Who were your groupmates?

b)How was your distribution of roles in the group?

c)Where did you study for the catalogue?

d)Could you tell me how did you design and present your spatial catalogue from the beginning to end?

THURSDAY				FRIDAY				SATURDAY				SUNDAY			
hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who
09:00 09:30	table critique	studio	Batuhan Hoca												
09:30 09:45	smoke break	in front of canteen	classmate												
09:45 11:00	study in studio and listening to music	studio	classmates												
11:00 11:30	table critique	studio	Tonguc Hoca and a classmate												
11:30 12:00	chatting hanging looking at other`s works	studio	alone												
12:00 14:00	lunch chatting	Kidonya	classmates and 2 students from second year in architecture												
14:15 16:00	study for design model mak.	studio	classmates												
16:00 17:00	sleep	studio	classmates												
												15:30	submission		

THURSDAY				FRIDAY				SATURDAY				SUNDAY			
hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who
												15:30	submission		

Timetable
Question 8

THURSDAY				FRIDAY				SATURDAY				SUNDAY			
hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who	hrs	what	where	with who
												15:30	submission		

Ideal Timetable
Question 9

161

APPENDİX D

STUDENTS' QUESTIONNAİRE

IZTECH _ AR 101 Genel Anket

Bu anket IZTECH Yüksek Lisans Programında yürütülen bir tez için yapılmaktadır. Tezin kapsamı öğrencilerin birinci yıl ilk dönemi boyunca stüdyo kültürünü nasıl kurdukları ve tasarım düşüncesini nasıl geliştirdigi araştırılmaktadır. Bütün dönem boyunca stüdyolardaki bir örnek grubun çalışmaları izlenmiş, kaydedilmiş ve incelenmiştir. Bu dönem sonunda yapılan bu anket ile stüdyonun geneline yönelik bilgiler edinilecektir. Zaman ayırıp, sorularımıza açık ve samimi yanıtlar ile katkı verdiğiniz için teşekkür ederiz.

---

1.   Sizce tasarım nedir? Bir cümle ile tanımlayınız.

2.   Tasarım öğrenilebilir bir olgu mudur?
                 (E / H)
3.   Tasarım öğretilebilir bir olgu mudur?
                 (E / H)
4.   Lütfen tasarıma nasıl yaklaştığınızı yanıtlarınız ile paylaşınız:
a. Tasarlamaya nerede, nasıl ve ne yaparak başlarsınız?

b. Tasarımı nerede, nasıl ve ne yaparak geliştirirsiniz?

c. Tasarımda sonuca giden kararlarınızı nerede, nasıl ve ne yaparak alırsınız?

5.   Tasarımın yetenekle ilişkisi sizce var mı?
                 (E / H)
Var ise, bir cümle ile tanımlar mısınız?

---

6.   AR101 dersi için hangi fiziksel ortamın daha verimli olduğunu düşünüyorsunuz? Birden fazla şık işaretleyebilirsiniz.
a) stüdyoda, hocalar varken,
b) stüdyoda, hocalar yokken arkadaşlarım varken,
c) stüdyoda, yalnız başıma,

d) evde/yurtta tek başıma,
e) evde/yurtta ortak alanda (ev arkadaşlarım / ailemin yanında)
f) diğer, belirtiniz.

7.   Dönem boyunca en çok nerede, kimlerle ve ne yaparak çalıştınız?

8.   Bu çalışma alanını tercih etmenizin sebebi nedir?

9.   Tasarım düşüncesini oluştururken muhakkak yaptığınız, devamlı tekrar ettiğiniz, olmaz ise tasarım düşüncesi gelişmez dediğiniz etkinlik ve eşya var mı? Birden fazla şık işaretleyebilirsiniz.
a)Müzik dinlemek,
b)kahve ya da çay içmek,
c)eskiz kağıdı,
d)uğurlu kalem,
e)yüzmek,
f)yürümek,
g)arkadaşa danışmak,
h)hocaya danışmak,
i)T cetveli,
j)bilgisayar,
k)akıllı telefon,
l)çizim masası,
m)eskiz defteri,
m) diğer, belirtiniz.

10.   Aile bireylerinizin meslekleri nelerdir? Bu mesleği tercih etmenize etken yakınınız var mı?

11.   Aktif olarak yaptığınız hobileriniz var mı? Okul dışı zamanınızı nasıl değerlendiriyorsunuz?

12.   Dönem sonu teslim ettiğiniz SPATIAL GIFT ödevinizdeki tasarımınızdan memnun musunuz? Neden?
13.   Dönem boyunca grup ödevlerinizdeki tasarımları ne yaparak oluşturdunuz? Görev dağılımınız nasıldı?

14.   Grup çalışmalarınızı nerede yaptınız? Ödev yapım süresince, tüm grup üyeleri ile birarada mıydınız?

15.	Grup çalışmalarınızda tasarım fikrini nasıl buldunuz ve nasıl geliştirdiniz?
a)beyin fırtınası yaparak,
b)eskize birlikte çizerek,
c)birlikte örnek görseller bakarak,
d)internette gezinerek,
e)Whatsup ile görüşerek,
f)sabahlarken yapılan sohbet ile,
g)diğer, belirtiniz.

16.	Grup çalışmalarınızda grubun tasarım fikrinin sonuç kararını nasıl verdiniz?

17.	Grup kararlarını alırken ve görev dağılımı yaparken yönlendiriciliği ağır basan bir arkadaşınız var mıydı? Yoksa kararlar hep birlikte mi alındı?

18.	Grup çalışmalarından neler öğrendiniz? Hangi becerilerinizin geliştiğini düşünüyorsunuz?

19.	Grup çalışmasının dezavantajları var mıydı? Neler olduğunu belirtiniz.

20.	Dönem boyunca yapılan sunuşların konuyu anlamada ve uygulamada size yardımcı olduğunu düşünüyor musunuz?
(E / H)
21.	Lecture sonrası CMS'ye girerek lecture a tekrar baktınız mı?
(E / H)
22.	Hocalarınızdan aldığınız kritikler tasarım sürecinize katkı sağladı mı?
(E / H)
23.	Sunuşlarda hocalarımızın size karşı tutumunu nasıl tanımlarsınız?
24.	Panel kritiklerde hocalarımızın size karşı tutumunu nasıl tanımlarsınız?

25.	Masa kritiklerinde hocalarımızın size karşı tutumunu nasıl tanımlarsınız?

26.	Dönem boyunca stüdyo çalışmaları sırasında karşılaştığınız zorlukları kısaca yazar mısınız?

27.	Bu zorlukları nasıl aşabiliriz?
28.	Dönem boyunca stüdyo çalışmaları sırasında karşılaştığınız en güzel şey ne idi?

APPENDİX E

İNSTRUCTORS' QUESTIONNAIRE

IZTECH _ AR 101 Hocalar (Instructor) Anket

Bu anket IZTECH Yüksek Lisans Programında yürütülen bir tez için yapılmaktadır. Tezin kapsamı öğrencilerin birinci yıl ilk dönemi boyunca stüdyo kültürünü nasıl kurdukları ve tasarım düşüncesininin nasıl geliştiğini araştırılmaktadır. Bütün dönem boyunca stüdyolardaki bir örnek grubun çalışmaları izlenmiş, kaydedilmiş ve incelenmiştir. Bu dönem sonunda yapılan bu anket ile stüdyonun geneline yönelik bilgiler edinilecektir. Zaman ayırıp, sorularımıza açık ve samimi yanıtlar ile katkı verdiğiniz için teşekkür ederiz.

1.   Sizce tasarım nedir? Bir cümle ile tanımlayınız.

2.   Tasarım öğrenilebilir bir olgu mudur?
                (E / H)
3.   Tasarım öğretilebilir bir olgu mudur?
                (E / H)
4.   Lütfen **öğrencilerin** tasarıma nasıl yaklaştığını yanıtlarınız ile paylaşınız:
a. Tasarlamaya nerede, nasıl ve ne yaparak başlamalarını istersiniz?

b. Tasarımı nerede, nasıl ve ne yaparak geliştirmelerini istersiniz?

c. Tasarım sonuca giden kararlarını nerede, nasıl ve ne yaparak almalarını istersiniz?

5.   Tasarımın yetenekle ilişkisi sizce var mı?
                (E / H)
Var ise, bir cümle ile tanımlar mısınız?

6.   AR101 dersi için **öğrenciler için** hangi fiziksel ortamın daha verimli olduğunu düşünüyorsunuz?
Birden fazla şık işaretleyebilirsiniz.
a) stüdyoda, hocalar varken,
b) stüdyoda, hocalar yokken arkadaşlarım varken,
c) stüdyoda, yalnız başıma,
d) evde/yurtta tek başıma,
e) evde/yurtta ortak alanda (ev arkadaşlarım / ailemin yanında)
f) diğer, belirtiniz.

7. Dönem boyunca **öğrencilerin** en çok nerede, kimlerle ve ne yaparak çalıştığını gözlemlediniz?

8. Bu çalışma alanını tercih etmelerinin sebebi sizce nedir?

9. Tasarım düşüncesini oluştururken **öğrencilerin** muhakkak yapmasını istediğiniz, devamlı tekrar ettirmesini beklediğiniz, olmaz ise tasarım düşüncesi gelişmez dediğiniz etkinlik ve eşya var mı? Birden fazla şık işaretleyebilirsiniz.
a)Müzik dinlemek,
b)kahve ya da çay içmek,
c)eskiz kağıdı,
d)uğurlu kalem,
e)yüzmek,
f)yürümek,
g)arkadaşa danışmak,
h)hocaya danışmak,
i)T cetveli,
j)bilgisayar,
k)akıllı telefon,
l)çizim masası,
m)eskiz defteri,
m) diğer, belirtiniz.

10. Aile bireylerinizin meslekleri nelerdir? Bu mesleği tercih etmenize etken yakınınız var mı?

11. Aktif olarak yaptığınız hobileriniz var mı? Okul dışı zamanınızı nasıl değerlendiriyorsunuz?

12. Stüdyo kültürü ile kullanılan mekanlar ve geziler arasındaki ilişkiyi kısaca tanımlar mısınız.
13. Dönem sonu teslim edilen SPATIAL GIFT ödevindeki tasarımlardan memnun musunuz? Neden?

14. Dönem boyunca ödev tasarımlarında görev dağılımınız nasıldı?

15.   Tasarım ödevleri sizce **ne umarak tasarlandı?** Ödev **tasarımı** süresince, tüm hocalar ile birarada mıydınız?

16.   **Tasarım ödevlerini** nasıl kurdunuz ve nasıl geliştirdiniz?
a)beyin fırtınası yaparak,
b)eskize birlikte çizerek,
c)birlikte örnek görseller bakarak,
d)internette gezinerek,
e)WhatsApp ile görüşerek,
f)sabahlarken yapılan sohbet ile,
g)diğer, belirtiniz.

17.   Tasarım ödevlerini kurduktan sonra, sonuç kararını nasıl verdiniz?

18.   Hocalar arasında, grup kararlarını alırken ve görev dağılımı yaparken yönlendiriciliği ağır basan bir arkadaşınız var mıydı? Yoksa kararlar hep birlikte mi alındı?

19.   Hocalar arasında, grup çalışmalarından neler öğrendiniz? Hangi becerilerinizin geliştiğini düşünüyorsunuz?
20.   Hocalar arasında, grup çalışmasının dezavantajları var mıydı? Neler olduğunu belirtiniz.

21.   Hocalar arasında, grup çalışmalarında rolünüzün yeterince tanımlandığını düşünüyor musunuz? (E / H)

22.   Stüdyodaki görev ve sorumluluklarınızın neler olduğunu düşünüyorsunuz?
23.   Stüdyo kültürünü kuran temel ögeler nelerdir?

24.   Dönem boyunca yapılan sunuşların **öğrenciler için** konuyu anlamada ve uygulamada size yardımcı olduğunu düşünüyor musunuz?
                              (E / H)
25.   Sunuş sonrası öğrencilerin, CMS'ye girerek yapılana tekrar baktıklarını düşünüyor musunuz? (E / H)
26.   Verdiğiniz kritiklerin öğrencilerin tasarım sürecinize katkı sağladığını düşünüyor musunuz?   (E / H)
27.   Sunuşlarda öğrencilerin size karşı tutumunu nasıl tanımlarsınız?

28.   Panel kritiklerde öğrencilerin size karşı tutumunu nasıl tanımlarsınız?

29.   Masa kritiklerinde öğrencilerin size karşı tutumunu nasıl tanımlarsınız?

30.   Dönem boyunca stüdyo çalışmaları sırasında karşılaştığınız zorlukları kısaca yazar mısınız?

31.   Bu zorlukların en önemlisini nasıl aşabiliriz?

32.   Stüdyo kültürünü nasıl tanımlarsınız?

33.   Dönem boyunca stüdyo çalışmaları sırasında karşılaştığınız en güzel şey ne idi?