FOUNDATION OF ARCHITECTURAL DESIGN EDUCATION: AN EVALUATION OF THE CONTENTS AND APPROACH IN ARCHITECTURE DEPARTMENT, AT THE YILDIZ TECHNICAL UNIVERSITY, ISTANBUL

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ABSTRACT

This paper deals with the concepts and the methods used in architectural design education in the first year first semester of YTU architecture department. The program of the department is 240 ECTS in 4 years as undergraduate. The courses of Basic Design, Building Theory, Design 1 and Introduction to Architectural Design in first semester forms the core of the program. The outcomes of the courses were evaluated through examples from various practices studied in the courses. All the courses were conducted by the authors between 2004-2008 academic years.

Keywords: *Architecture, design, education, problem solving.*

INTRODUCTION

Architecture has a dynamic structure. The dynamics of architectural discipline has been signified by the practices of architecture as well as design theory researches. Within this reference, first year education in architecture comes with different aspects of design education. Many problems are faced that act as obstacles to design thinking. One of the major problems is the lack of student's background of creative and design thinking. Without any awareness or preparedness about these subjects and as a consequence of a rather questionable choosing method for architecture departments, concepts often fall into an environment of ambiguity. In this sense, developing a system of design thinking is a challenge. Primary structure for design thinking begins to be built in the first-year education, especially in the 'the introduction to architectural design' course. This paper deals with the concepts and the methods used in design training in the first year first semester with the practices of the courses; Basic Design, Building Theory and Design 1 and Introduction to Architectural Design.

DESIGN EDUCATION

To plan the architectural design education is a difficult matter. As there is not a single problem that must be focused on but there are too many related problems that must be solved at the same time. A variety of design education approaches emerge and this phenomenon plays an important role in the determination of the educational strategies. There are two important steps to constitute and carry on a contemporary architectural design education. These are;

- To analyze and to define architectural knowledge accurately,

- The transmission forms of the knowledge,

The teaching ability of the design action; designers, from early design phase till the end production phase use different knowledge and knowledge sets in every step of the design process. Beside the past experiences, perceptions and choices with the concept that knowledge is gained from experience, this knowledge is constituted from interaction, experiences and cross-disciplinary sharing in the design process. Taking into account the architectural design knowledge is continuously changing and developing is a fact that can never be completely defined or taught. Therefore, the important thing is to make the necessary arrangements

so that the brain, fed by continuous stimulus, can connect, synthesize and stabilize the knowledge it receives.

Candidates of Architecture have been prepared to the architectural environment in the design studio. Knowledge using in the design process, approaches of design problem solving, working styles on design problem take form in the design studio. The examination of design behavior approaches in the early design phase has considerable contribution to the development of architectural practice. A research done by Heylighen, Neuckermans and Bouwen (1999) shows that different knowledge forms can be categorized as active knowledge and passive knowledge. It is used in order to produce design concept. It is concluded that students use the categorized knowledge during design process. Moreover, this study shows an interactive design studio environment helps to improve the design concepts of students.

In the early design phase of architectural work, architects begin to produce various concepts which are based on their personal and professional knowledge and experiences. In this phase, the designer tries to oppose and link this knowledge and knowledge groups with the process and tries to begin to create a new knowledge. There is a similar approach in the design studio. During the whole design process in the design studio, students continue to interconnect the divergent thinking process and the convergent thinking process. In the divergent thinking, many concepts are produced to see which one of them is the starting point of the design. In the convergent thinking phase, the aim is to try to focus the defined concepts and bind them together coherently.

Knowledge groups belonging to the basic concepts that should be conveyed in architectural education come into prominence as building, construction and design. In building design, the place of cultural environment, physical environment and technological environment factors and considering the design of the buildings in accordance with these factors constitute the building knowledge group.

In this context, the objectives of the first year architectural design education appear as;

- Design theory and concept formation,
- Visualization in design,
- Language in design,
- Design cognition.

This list makes the background issue more of a problem than any other department of the higher education. Within these objectives developing "creative problem solving skills" of the students come forward. Studying on problems is most commonly preferred method in design education. The quality of the problem would be a key of many other problems and/or probable solutions. In YTU, first year design education is based on solutions rather than problem itself so problem solving approach is on demand.

Studying on Problems

It is possible to examine approaches of problem solving as three subcategories (Rowe, 1987).

- Trial and error approach: A very familiar example of this category is jigsaw puzzle. In the design area, to form/create floor plans of a building or to arrange a room can be given as an example. (Building Theory and Design 1).
- Generate and test approach: This is a variant of trail and error approach. Many designers and architects solve problems while using this approach. (Basic Design and Design Studios)
- Means-ends approach: In this approach, first means and then probable ends (set of goals) are prescribed. Means and ends connect together via appropriate logical system. (An analytical approach).

FIRST YEAR FIRST SEMESTER; THE DESIGN COURSES

Building Theory and Design 1

The course consists of three hours study, one for theoretical knowledge and two hours for practice. The course is continuing in forthcoming

semesters as Building Theory and Design 2-3 and 4 with the scope of various themes in building science. The main theme of Building Theory and Design 1 is "House" and human dimensions, man-environment relations, user requirements, architectural planning process and architectural concepts are additional subjects.

- House is handled with the sub subjects of house and culture such as life in house, activities, activity areas, activity types, postures, furniture, furniture-activity relations and the close environment of house. In this context, to determine the proper furniture's according to the fundamental and partial functions and organize these in a space forms the main aim of the course. This aim is realized through theoretical and practical studies. However, the process of being informed is not working in one way that is a flow only from instructor to students. To achieve interactivity in the course, the students are asked to prepare researches and express them whether written-verbal or visual format and share their knowledge with entire class. So, it could be possible to observe how the students interpret new knowledge that they gathered from theoretical and practical information in the course with the foreknowledge already learned by experiences about the most known function of their lives; "house life". The

teaching style is formulated on induction approach; firstly the house is divided and studied partially and at the last stage the parts come together and form whole house. The course is concluded with a final study; Pioneer Architects and Housing. The aim of this study can be summarized as;

- To evaluate the approaches of architects on housing
- To emphasize the importance of architectural heritage
- To emphasize the relations between house form and space organization.

Basic Design

Basic Design is also a course consists of three hours study, One for theoretical knowledge and two hours for practice. Although the course hours are not sufficient students are motivated to work hard with a dense program. The course is fundamental in design education and the basic concepts of the course are;

- The elements of basic design: Point, line, plane, shape, volume, size, interval, texture, color, light- shadow,
- Visual Perception: Foreground-background relationships
- The principles of basic design: Rhythm, harmony, contrast, gradation, dominance,
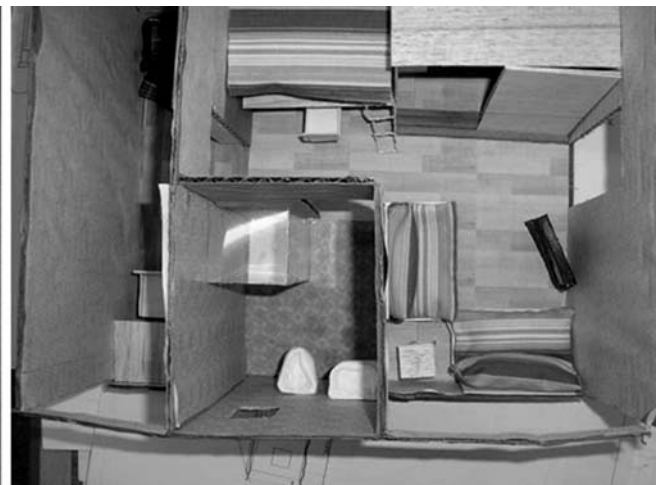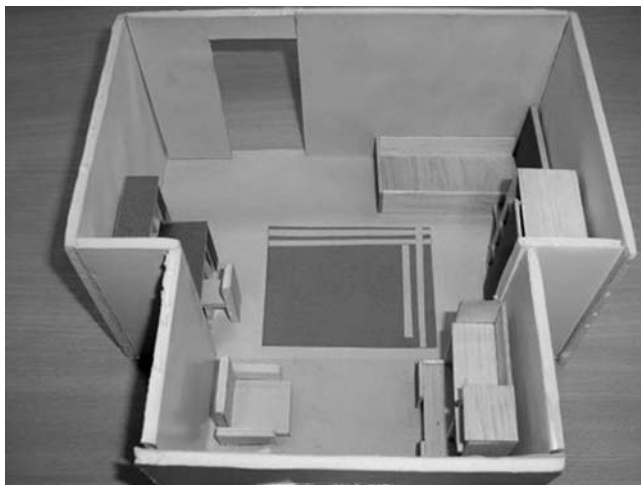

Figure-1: Every thing starts with the room; basic requirements and more …

Figure-2: The organization of fundamental functions in a family house.

balance, unity.
- Form: Form organization, addition and subtraction.
- Space; space concept, elements of space.

The weekly studies are organized as modules where each module has phases of preparing-presenting and evaluating process. Every problem is defined, analyzed and exemplified. The problems are balanced from abstract to concrete or concrete to abstract so students could have opportunity to recognize real and virtual world. Different presentation techniques are encouraged in the course especially freehand drawings and any material around life could be used. Participatory workshops are organized.

Introduction to Architectural Design

The course is consists of six hours study, two for theoretical knowledge and four hours for practice. The presentation of architecture and culture, architectural presentation techniques, architectural analyses techniques, studies on the ability to see and think about the environment and explanations about the architectural design activities and the structure systems in general are the main themes of the studio.

The aim stands as; emphasizing the importance of the architectural presentation techniques, developing design-centered problem-solving ability and design skills, creative thinking skills and rising the awareness of cultural distinctions.

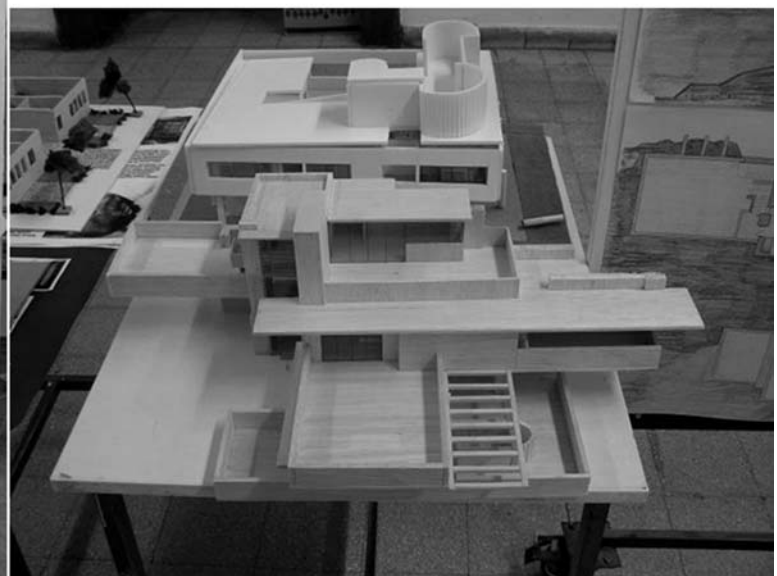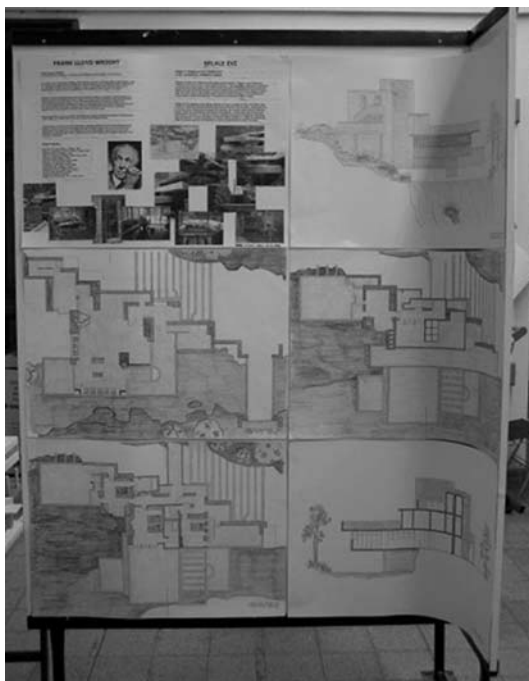The goals to be reached in order to success these aims can be listed as;

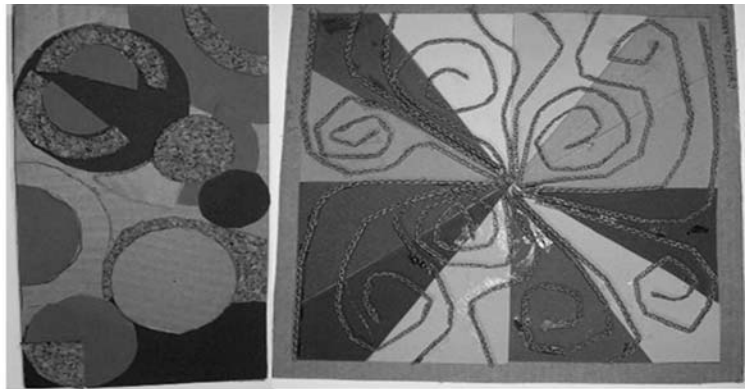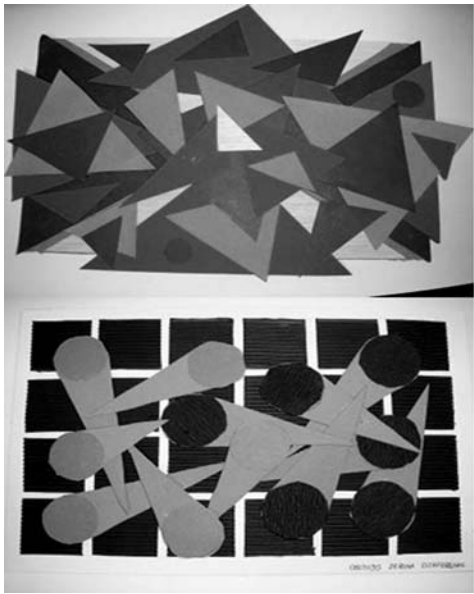**Figure-3:** Final study; PIONEER ARCHITECTS AND HOUSING.

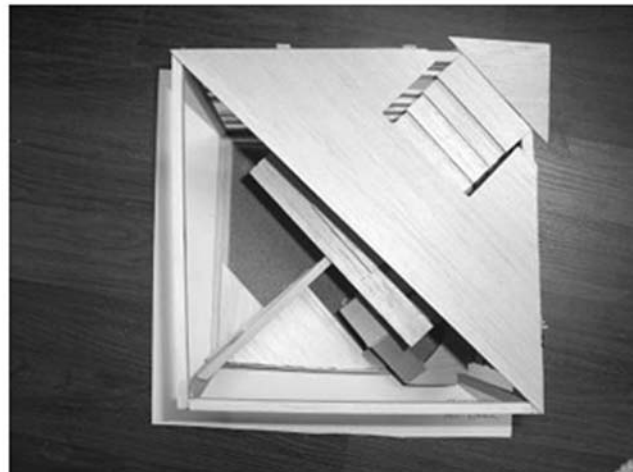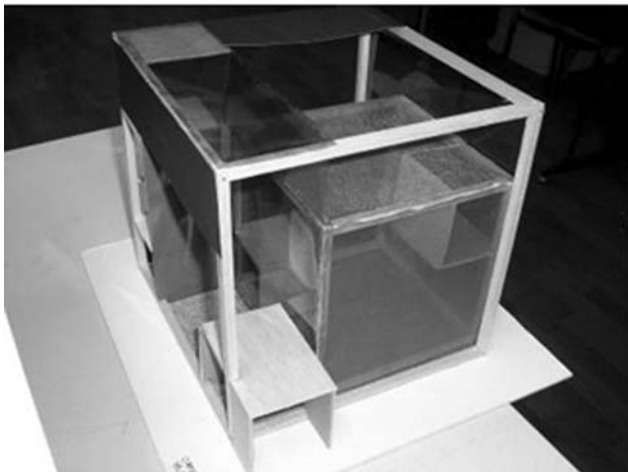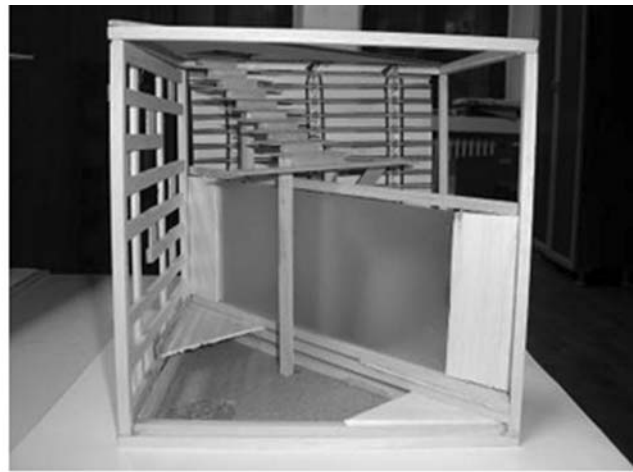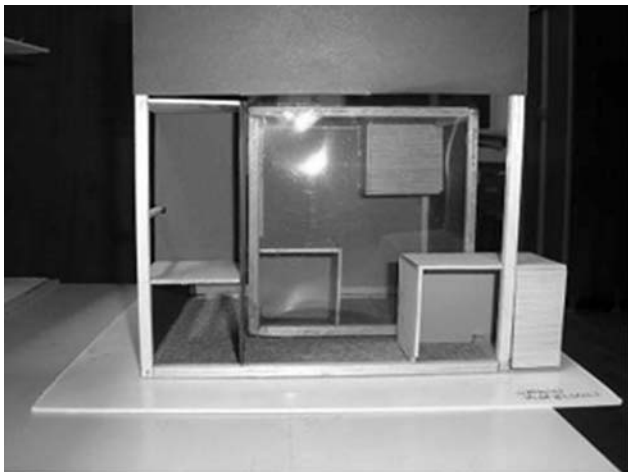**Figure-4:** Visual perception, Gestalt Theory.

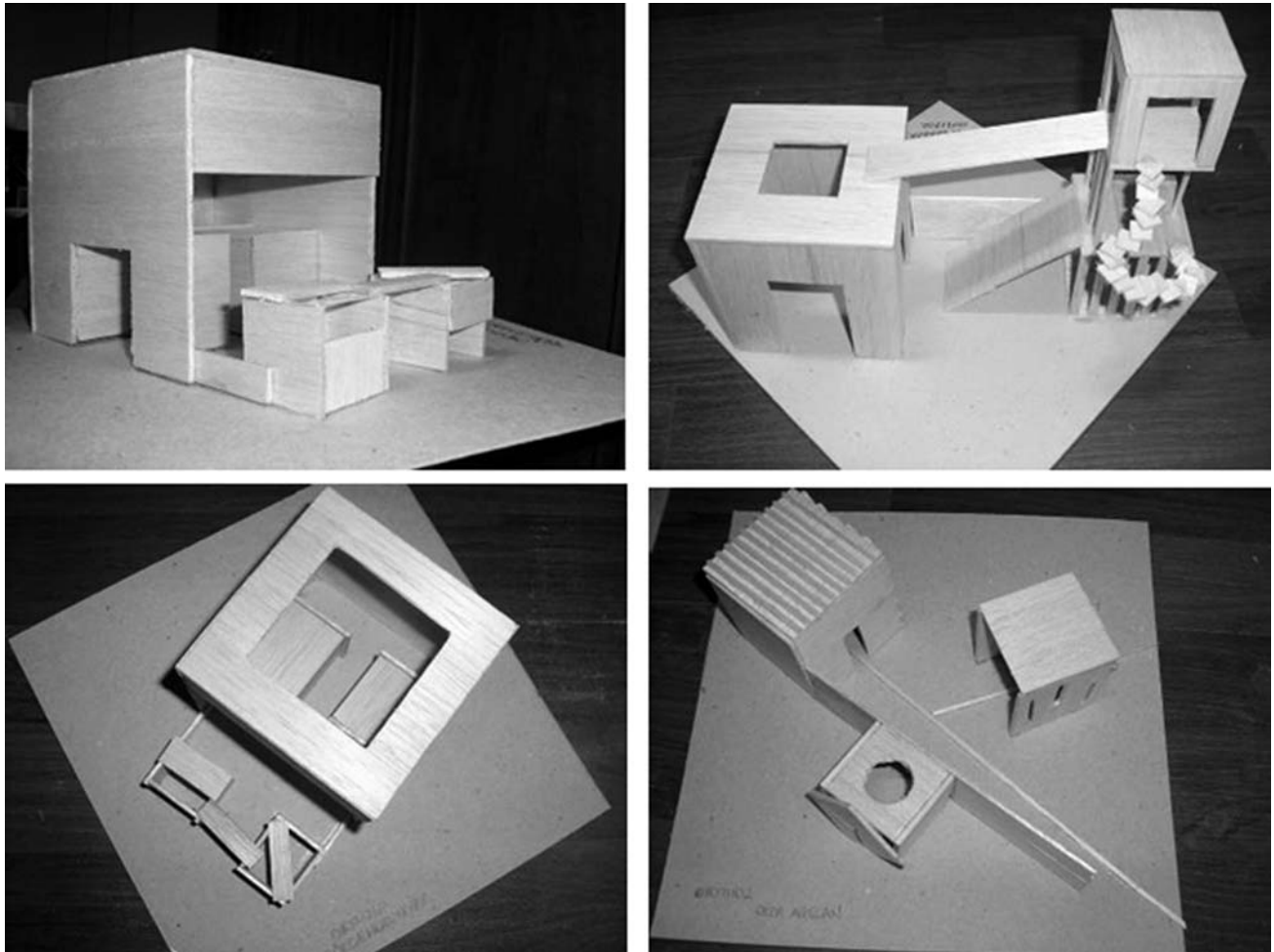**Figure-5:** Arrangement of Planes in a space defined by a cube.

Figure-6: The organization of activities with 3 cubes; Access – Passing – Stay.

- To make the students gain the ability of documenting, analyzing and interpreting the cases, to have the knowledge and ability to use-present architectural elements and compositions in creative problem-solving studies,
- To realize an approach to teach the 'design phenomenon via studying on various different problems in different levels in the first semester.

The 'Introduction to Architectural Design' course consists of; Studies; Problems and Presentation / Evaluation Techniques.

A. The **studies** in the course are grouped into three as;

1. Studies both **abstract and concrete**, in 2D-3D forms aiming to lead to the expressions of the existing forms and environments;
2. **Abstract** studies in 2D-3D forms aiming to lead to the expressions of the student's ideas and solutions to design problems;
3. **Concrete** studies both as 3D models and 2D sketches aiming to reveal the outcomes of the first two groups of studies.

B. The general outline of the **problems** is;

In general, developing the ability of problem-solving is;

1. Defining the problem (with its content and

scope);

2. Solving the problem (with analytical thinking, abstract thinking, analyses techniques);
3. Presenting the outcome project (with an emphasize on the importance on 2-3 dimensional presentation techniques)

C. The general outline of the **presentation / evaluation** process is;

Developing the graphic language of architecture via presenting drawing techniques and building models and their equipments, forming sketches and drawings with pen, collage, lines, tones and shades, different kinds of perspectives and theoretical sketches. At the end of each activity/problem solving, is a discussion, a jury in the semester and a final jury at the end of the semester. Design studio is used as a tool to combine all knowledge that gained in the other design courses.

Figure-7: Observing the environment; recognizing the environment and paying attention to urban and natural forms and landmarks in the environment. Seminar on the concepts of architecture; architecture in different cultures and a visit to Istanbul Historical Peninsula, Hagias Sophia and Blue Mosque.
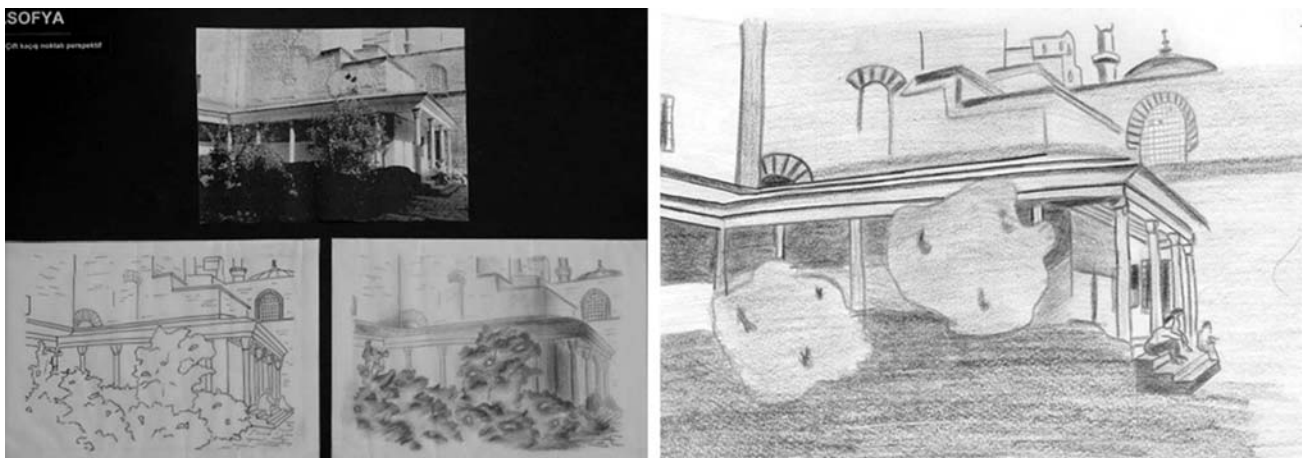

Figure-8: Emphasizing the importance of presentation techniques; Graphic Expressions with different presentation techniques.
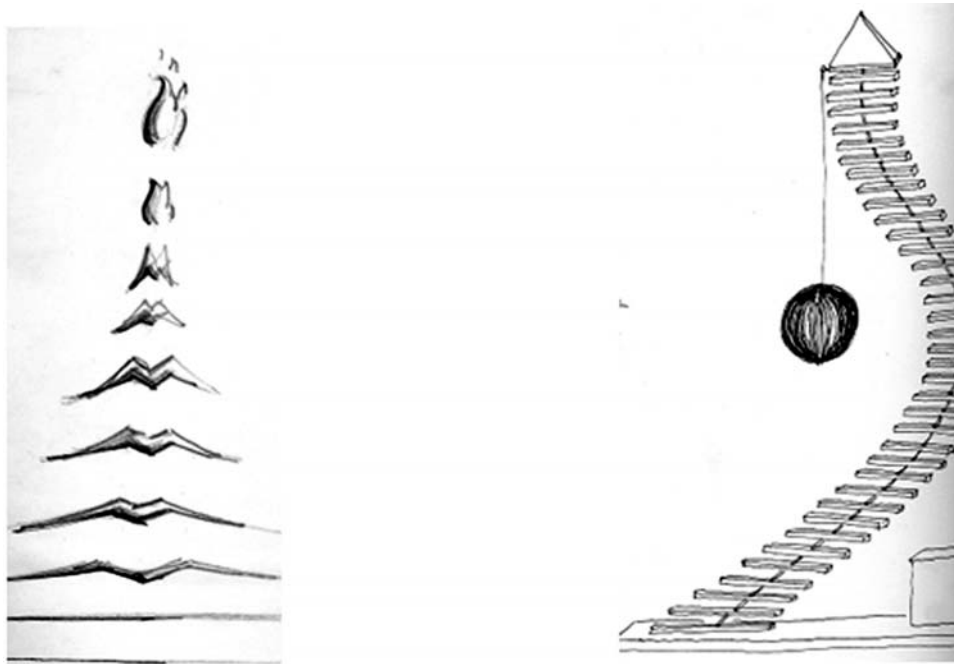
Figure-9: Studies on Design Communication; Conceptual Expression Sketches.
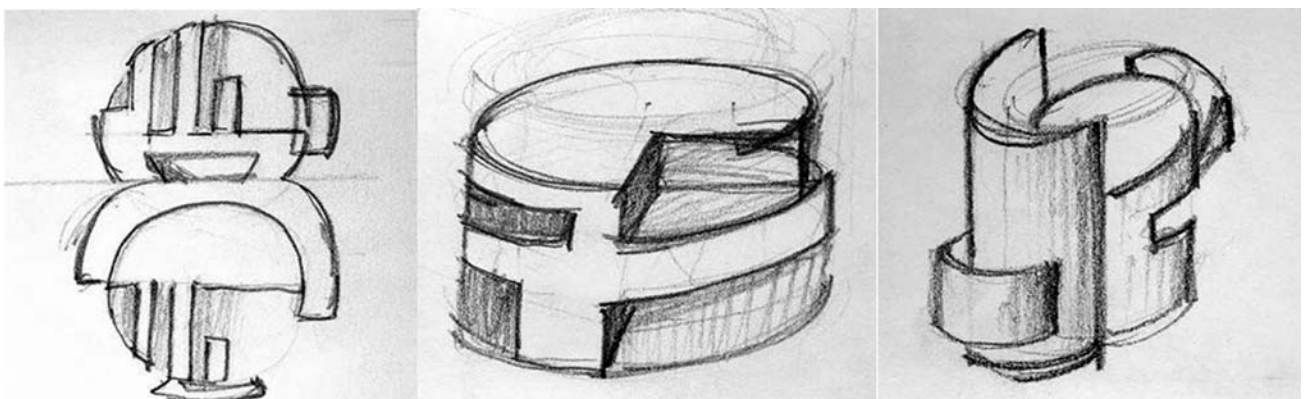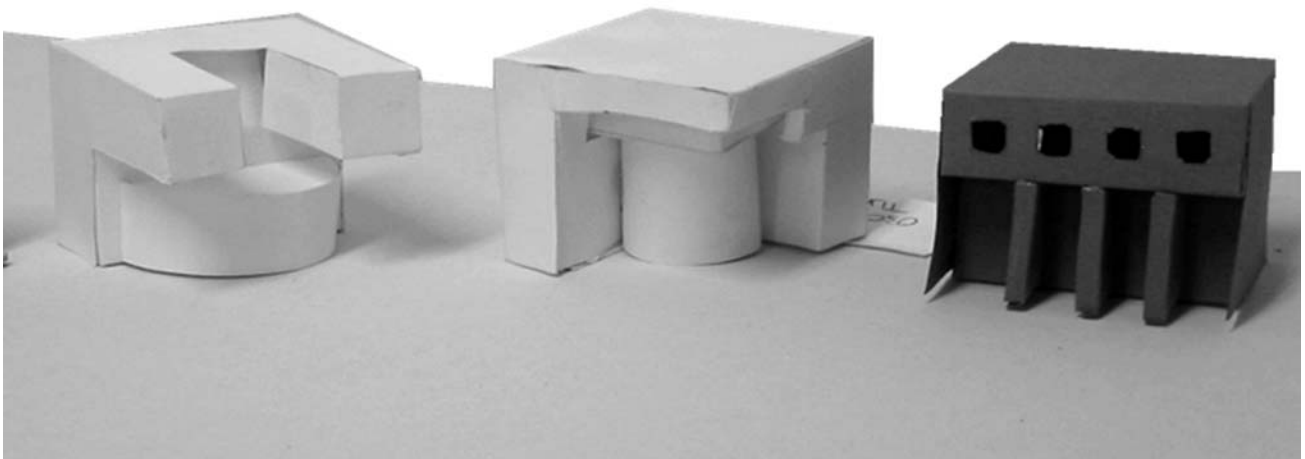

Figure-10: Transforming Forms; Design thinking; obtaining new images (creative images) via using images; ways of changing the iimagination and abstract forms like; addition, extraction, dividing and enlarging.
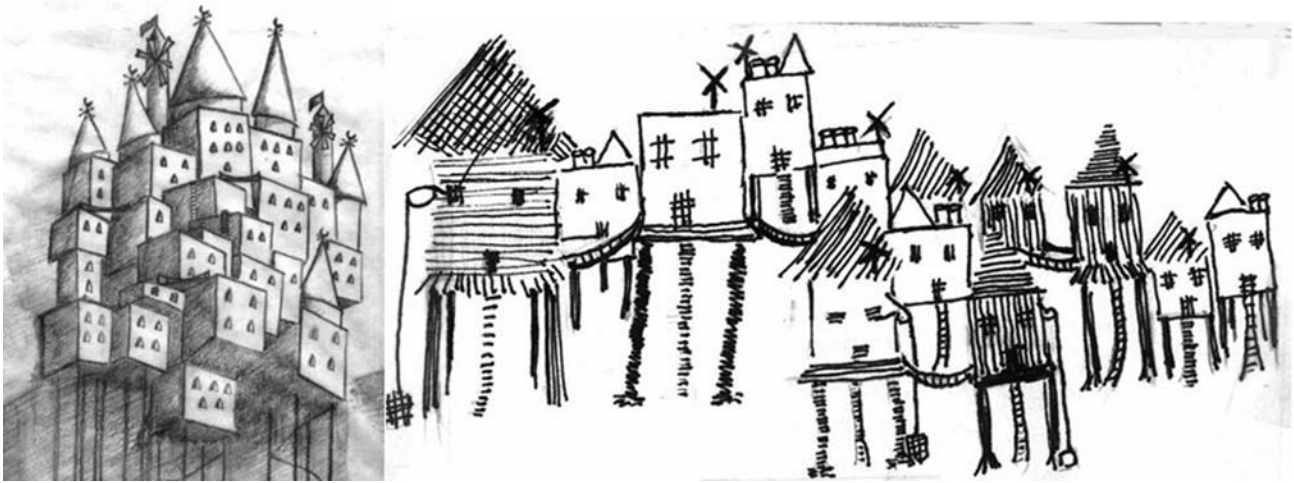
Figure-11: From abstract to concrete; Gaining the ability of converting written forms of descriptions into visual expression, Starting the imaginative design process, Reading 'Invisible Cities'.

Figure-12: Designing in an Existing Environment; the aim is to introduce the architectural design, define the areas in need. to get to know and interpret the environment. The cultural, aesthetical, functional, economic and social dimension of the context is taken into consideration when developing a new design and rising awareness. Teaching the relationships between interior and the exterior space; relationships between the architectural product and its urban and natural environment, explaining user needs, functional requirements, idea/concept-form relations in a design and the concept of 'space'.

CONCLUSION

First year architectural design education puts forward many problems that affect design thinking in the field of design education. The major problem is the lack of sufficient background that has to support student's creative design and thinking activity. In Turkey the students attend to higher education without any preparation in previous stages of their academic career. Depending on this background, first year education differs in various architectural schools. The content of the education may differ but the main theme is to formulate and transmit architectural design thinking as a systematical thinking method to the students.

From this point of view, in YTU the aim stands as; emphasizing the importance of the architectural presentation techniques, developing design-centered problem-solving ability and design skills, creative thinking skills and rising the awareness of cultural distinctions via practices from abstract to concrete, concrete to abstract in the courses of Basic Design, Introduction to Architectural Design and Building Theory and Design 1. As a result, the basic structure of design thinking in the first year architectural design education is tried and achieved by integrated studies held in these courses.

Figure-13: Design studios; various spaces with different equipment for the studies.

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