Diversity of industrial design education in Turkey and future prospects

Ayşem G. Çakıroğlu Başar a *, Devrim Ülkebaş a

"Faculty of Fine Arts, Yeditepe University, Ataşehir 34755, İstanbul, Turkey"

Abstract

Industrial design education in Turkey has a 40 years background with different design approaches; art based industrial design education and technical based industrial design education and different student selection and placement system; graduate placement examination- LYS and aptitude exams. Different approaches and methods for the same degree bring complexity in education system. The aim of the study is to discuss about this diversity and to perform a circumstantial analysis of industrial design education in Turkey. The findings from the comparisons of the undergraduate education programs will help us to make predictions about the future trends and prospects in industrial design education.

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1. Introduction

In today’s world industrial design discipline has a very complex structure. New technologies, new materials and different manufacturing processes lead to new approaches in design theories. The emergence of the design practice starts after the industrial revolution, thus design as a profession has a recent background. Yet, evolving consumer culture and globalization differ from the past and it forces design to meet all the expectations. Thus the industrial design discipline scope has grown.

Today industrial design covers a wide range of disciplines like sociology (society, changes in the society, social issues), anthropology (culture, ethnography), business (marketing, management, corporate identity), engineering (technology, techniques, materials, processing), aesthetics (form, visualization, style) and ergonomics (operation, safety, usability and sensation) (Giard, 2000; ICSID, 2003; IDSA 2003). Improvements that take place in the industrial design profession also made an influence on the industrial design education.

The aim of the paper is to discuss the general structure of the design education, the approaches and the trends in the industrial design education in the world and also take a closer look at the structure of industrial design education in Turkey and the future prospects for industrial design education. In the first part of the study, a literature review is made to analyze the general approaches in industrial design education in the world and in Turkey. In the second part in depth interviews are made with the industrial design lecturers and the founders of the departments from the two
different universities in Istanbul which have different educational traditions and different student selection and replacement methods that have an influence on the education system.

2. The development of industrial design education

Although institutional design education has a recent background, many of the acts of design, especially the physical acts, have been embodied in craft practice and guild tradition (Friedman, 2000). As Ken Friedman (2002) states, design education in general at first took place in the apprentice tradition of the art and craft guilds, afterwards schools for craft or art developed and then some of these schools became schools of art and design. However, design education moved into the university during the past half century. Friedman (2000) sees the reason of this transition as a consequence of economic transition; shift from an industrial economy to a post-industrial economy, to an information society and a knowledge economy happened between 1950 and 2000 and the new needs and demands of this knowledge economy (Friedman, 2002). However, this transition acted differently in different nations. In some nations, especially in Europe, design education remained in independent schools of art and design, on the other hand in some nations, especially in North America, design was thought in university departments, generally departments of art and design where design has been seen as a form of applied art or craft skill, but some other universities developed specialized design programs in colleges of architecture, engineering (Friedman, 2000; Friedman, 2002). In North America design courses entered the colleges and universities with art programs since late 1940’s (Friedman, 2000). Also in UK, the education of industrial designers has been mostly in the responsibility of art schools. Friedman (2002) sees that these art schools are no longer having the rich craft tradition, yet they neither have the research tradition of the universities. A research project about industrial design programs in United States shows that industrial design programs are heavily centered on teaching product form and give little attention to product function, also the design firms agree that many industrial design programs lack sufficient training in functional aspect of products (Domermuth, 2009). According to survey of IDSA (Industrial Designers Society of America) in 1998, there are 49 institutes that have industrial design undergraduate or graduate programs registered in IDSA list and by 2007, there are 900 undergraduate degree programs in UK offering design studies and related topics and the number of industrial/product design graduates entering the workforce each year is roughly 1,000 and growing by 10% annually (Prior et al., 2007).

Besides the western countries, in newly industrializing countries in Asia, like Taiwan, S. Korea, especially China, a big progress made in design education. In Taiwan, there’s also a conflict in industrial design student recruitment. The two types of universities recruit students in three ways: the entry exams, recommendations and selections and applications (Yang et al., 2005). China has diversified design education which aims to train design students for different levels of design professionals; design profession for comprehensive design knowledge and applications for basic design, design strategist coming from science and engineering background to design based on scientific and technological innovation and design professionals with research and development capability which will able to explore cultural resources and apply to high-end technology (Sheng, 2009).

3. The nature of design thinking and general structure of industrial design education

As we look through the examples of design education in the world, we can see that different trends and approaches are taking place. Different aptitudes are expected from the candidates who want to study industrial design; the tendency is to recruit students with art or science/engineering aptitudes. The first approach of design education is more artistic, based from the arts and crafts tradition. The art based education system is usually focused on teaching form and aesthetics; foundational courses in sketching, color and light, drawing and presentation techniques are in the curriculums. The products and presentation usually incorporate a consideration of function but they are dominated by form (Domermuth, 2009). On the other hand, science based design education system that usually put into practice in the technological universities or faculties of architecture are focused on teaching innovation based on technology and design engineering.
Skaggs (2002) claims that the aptitudes of an industrial designer are the visual, creative and flexible thinking styles and students can learn design quickly and easily if they have these aptitudes. As for Giard (1999) the design education derives from arts and crafts education and it usually trains students with the hands-on experience of visual presentation skills. Also according to Cross (2004), expert designers are “ill-behaved” problem solvers. According to National Association of Schools of Art and Design, industrial design involves “the combination of the visual arts disciplines and technology, utilizing problem solving and communication skills (Comprehensive standards review, 2005-2006)”. Another definition describes industrial design as a service of products and systems; “Industrial design is the professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer. (Industrial Designers Society of America – IDSA)”.

International Council of Societies of Industrial Design- ICSID (2003) suggests that a comprehensive industrial design education program should educate students in three categories of competency; *generic attributes* (problem solving, adaptability to rapid changes), *specific industrial design skills and knowledge* (design methodologies, visualization skills and knowledge, knowledge of product development processes) and *knowledge integration* (strategies of system integration).

As these statements indicate practitioners and theoreticians of design education have various discourses about design and its attributes. However, design is no longer an activity dealing with form and function, further it has to cover broader set of prospects and as Norman (2010) states although there’s still a need of classical industrial design approach which is a form of applied art, requiring deep knowledge of forms and materials and skills in sketching, drawing and rendering for styling and forms, the shift in design activity through the new areas like applied social and behavioral sciences for understanding human cognition and emotion, requires a need for a new breed of designers with the knowledge of science, technology, people and society. There is move from the traditional notion of art and craft based models to new models that integrate into the practice and offer curriculum considering anthropology, sociology, psychology together with technology, skills and systematic approach to design process and development (Popovic, 2005).

As design has become more complex decision making process and designers are expected to be more knowledgeable than those of the past (Poon et al., 2001), design education should also catch up this transition. Focusing on the nature of design thinking and learning styles of students in particular to design, can improve design education.

Creative problem solving can be considered as one the core activity of design thinking and this differs the methods of working and problem solving processes of designers to the other professionals (Durling et al., 1996). Creative thinking depends on seeing and analyzing the problems of existing structures and producing new ideas to produce, to design new solutions. Liam Hudson (1967) mentions about two kinds of problem solving behavior; divergent and convergent thinking in his study on creativity and unconventional approaches for problem solving. Convergent thinking gathers information and converges it on the central problem and seeks for single “right” solution to the problem. On the other hand, instead of a single correct solution, divergent thinking seeks novel ideas, new perspective and possibilities. Therefore, divergent thinking, moving away from the known and predictable, is suitable for designers (Durling et al., 1996).

Bernice McCarthy (1990) emphasizes the relationship between learning styles and hemispheric (right mode/left mode) processing of the brain. In his Nobel Prize winning research on right and left brain hemisphere functions, Roger Sperry (1973) identifies the different properties of the two hemispheres; the left hemisphere is specialized for speech and dominant in the activities involving language, arithmetic, and analysis, on the other hand the right hemisphere is better at copying of designs, discrimination of shapes e.g. picking out a camouflaged object, understanding geometric properties, reading faces, music, global holistic processing, understanding of metaphors, expressing emotions, reading emotions. These properties indicate that left brain is logical, rational, analytical, objective one and looks at parts and right brain is intuitive, holistic and subjective one that looks at wholes. In this manner, design activity requires to engage both sides switching from one to the other as appropriate (Tovey, 1984).

According to CAPT’s Atlas of Type Tables (Macdaid et al., 1986), there is a distinction between science, art and design related professionals. CAPT’s Atlas of Type Tables includes 300 type tables for carrier groups and based on
The Myers-Briggs Type Indicator, a widely used personality instrument, used to measure psychological preferences in how people get information, perceive the world, and make decisions. In Atlas of Type Tables, science related occupations have more analytical, logical, impersonal and objective modes of thought and they prefer to begin to learn with details and facts, and then move towards concepts. On the other hand, art related occupations have more personalistic, subjective modes of thought and they prefer to begin to learn with the big picture and then move towards details and focuses on possibilities and give alternatives. And design related occupations take place quite between both logical, objective and personalistic, subjective modes of thought, still majority of them have objective and analytical modes of thought, but they mostly prefer to begin to learn with the big picture and then move towards details and focuses on possibilities and give alternatives.

4. The industrial design education in Turkey

The origin of industrial design education in Turkey dates back to the second half of the 1950’s and 1960’s within the Middle East Technical University-METU, established by international support including U.S. (Er et al., 2003) in Ankara and the State School of Applied Fine Arts-TGSYO (later named Marmara University), developed in the style of Bauhaus (Şatr, 2006) in Istanbul. The initiative for industrial design education in METU was conducted by American designers within the Marshall Aid Program (Er, 2004), aiming to improve the craft products in Turkey and increasing their market potential in the advanced markets (Er et al., 2003). Collaboration with German educational institutions, TGSYO departments was designed to train experts. Although there wasn’t an independent industrial design department in TGSYO till 1985, industrial design education was part of all departments in the school, resulting due to the approach of the school aiming both handicrafts and design for industrial purposes (Şatr, 2006).

Beside these initiatives for industrial design education in Turkey, the first department on industrial design was established in the faculty of architecture in State Academy of Fine Arts-DGSA (later named Mimar Sinan Fine Arts University), mainly concentrates on art education, but also having department of architecture, in early 1970’s. As these examples indicate, same as the world (Friedman, 2002), at that time industrial design education in Turkey was mainly based on art and craft tradition (Ünlü, 2004). In the following years, departments of industrial design were established in the faculty of architecture in ODTÜ and the faculty of fine arts in TGSYO. Although in some recently established private foundation universities, departments of industrial design are positioned in the faculties of integrated arts and design programs; faculties of art and design or faculties of art, architecture and design, today departments of industrial design are mainly in the faculties of architecture or in the faculties of fine arts. Only at Anadolu University in Eskisehir, industrial design graduate education is in the School of Industrial Arts.

In Turkey, The Council of Higher Education-YÖK, established in 1981, is responsible for the planning, coordination, governance and supervision of higher education. The higher education institutions have no autonomous structure. All the regulations including the criteria of selection of students to the institutions are implemented according to the Higher Education Law. Departments of industrial design select the students either by graduate placement examination-LYS organized by Student Selection and Placement Center or by aptitude exams organized by the higher institution itself (Table 1). Departments of industrial design in the faculties of architecture, except Mimar Sinan Fine Arts University and Haliç University, select students by LYS and departments of industrial design in the faculties of fine arts, except Gazi University, select students by aptitude exams. Apart from few exceptions, in which faculty departments of industrial design is located defines the type of the exam (Table 2).

|            | Istanbul | Ankara | Izmir | Kayseri | Eskişehir | K.K.T.C | Turkey |
|------------|----------|--------|-------|---------|-----------|--------|--------|
| **Aptitude Exams** | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* | *SU* | *PFU* |
| LYS        | 2        | 2      | 2     | 2       | 1         | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      |

*SU – State University  *PFU – Private Foundation University
Table 2. Number of universities according to the position of industrial design departments in the universities, 2010

| Faculty of Architecture | Faculty of Fine Arts | Faculty of Engineering and Architecture | Faculty of Architecture and Design | Faculty of Fine Arts and Design | Faculty of Art, Design and Architecture | School of Industrial Arts |
|-------------------------|----------------------|----------------------------------------|----------------------------------|----------------------------------|----------------------------------------|--------------------------|
| SU          | PFU      | SU          | PFU      | SU          | PFU      | SU          | PFU      | SU          | PFU      |
| Aptitude Exams |          |          |          |          |          |          |          |          |          |
| LYS         | 1        | 1        | 1        | 4        | -        | -        | -        | -        | 1        | 1        | -        | -        |
| LYS         | 2        | -        | 1        | -        | -        | 2        | -        | 1        | 2        | -        | -        | 1        |

By 2010, there are 21 undergraduate degree programs in Turkey offering industrial design education and the number of industrial/product design candidates entering to the universities each year is roughly 870 (according to the 2010 Student Selection and Placement Center university quota). 486 of the candidates are selected through the aptitude exams which 50 of them are placed in State Universities and 436 of them are placed in Private Foundation Universities. 384 of the candidates are selected through the center placement exam which 155 of them are placed in State universities and 229 of them are placed in Private Foundation Universities.

LYS basically aims to analyze the level of knowledge in science, social sciences, and linguistics and departments of industrial design consider the level of knowledge in science. LYS has a multiple choice format which allows for only one answer out of the choices. Further to that, another disadvantage about LYS is that problem-solving and higher-order reasoning skills cannot be assessed through multiple choice tests, contrarily the limited types of knowledge can be assessed (Phelps, 1996).

Aptitude exams are organized as a single level or multiple levels or it can be organized for all the departments of the faculty without aiming to analyzing the aptitudes specifically for industrial design departments itself. Even though aptitude exams differ in some points from university to university, because these exams are organized by the higher institution itself, these exams mainly aims to analyze similar aptitudes of the student, which is visualization skills; sketching, color and light, drawing and presentation techniques. The main reason for this situation is, universities organizing aptitude exams are rooted art and craft tradition. Although some of these exams seek aptitude on creative thinking and imagination, they mainly concentrate on visualization skills. In this point, either LYS allowing for only one “right” answer or aptitude exams assessing only visualization skills are not sufficient to evaluate qualifications for design. However this is not an “appropriate exam” problem. Although this problem is in the responsibility of the whole education system, to overcome this erosion is mostly in the responsibility of higher education.

Even though there are two approaches for selecting students for industrial design education and different educational traditions, when we look at the undergraduate curriculums of the universities’ industrial design programs, a general approach is seen, but in the application of the courses the content changes through the departments’ industrial design education approach; science based or art based.

In this scope, to understand the underlying issues in industrial design education, in depth interviews are made with the industrial design lecturers and the founders of the departments. The interviewers are chosen from the two universities in Istanbul that have a significant place in both higher education and industrial design education in Turkey. These universities are chosen according to their different educational tradition; university and art& design school tradition and according to their different selection and replacement methods which have an influence on the education system. Therefore, these two universities reflect the general structure of industrial design education in Turkey.

The interviewees from the university who selects the students by the aptitude exams summarize the advantage and disadvantage of their approach as; drawing skills are important for industrial design education, yet it is not enough; analytical thinking, problem solving and knowledge in basic mathematics, especially in basic physics are also important for industrial design education. These interviewees both emphasize that drawing is not just a tool for visualizing the ideas, but part of the design process. In recent situation, the candidates are expected to get the lowest
passing score in LYS to attend to the aptitude exams. It may seem that, in that situation the candidates cover both the expectations on the visualization skills and analytical thinking, but the interviewees state that “the lowest passing score” is not enough to evaluate the analytical thinking and knowledge in basic sciences. In the early years of the department’s establishment, the aptitude exams had several levels, these levels included to meet various expectations such as drawing skills, creativity, and design. Today there are generally two levels in the aptitude exams focusing mainly on drawing skills. Therefore it’s more difficult to choose the appropriate candidates. Because of the Higher Education Law, administrative necessities and practical issues, it is difficult to regulate and develop ideal education methods. In conclusion, according to the interviewees, applicable and suitable student selection method should be the combination of aptitude exams and LYS with higher passing score.

On the other hand, the interviewees from the university who selects the students by LYS, emphasize that design activity is based on analytical thinking, creative problem solving process and although LYS is not sufficient to analyze these aptitudes, in some ways it contributes to determine the capacity of the students in these aptitudes. Furthermore, these interviewees state that drawing skill are not as important factor as analytical thinking, problem solving in the creative process, hence drawing skills are just a tool for visualizing the ideas. However, they face the fact that students selected by LYS have problems in visualizing their ideas, but they imply that the student with a high score has also the capacity to eliminate this problem. Therefore, their suggestion to solve this problem is that the drawing skills can be learned during the design education by emphasizing the courses on visualizing techniques. In conclusion, the interviewees are mainly contented with selecting students by LYS, as long as there are improvements in the courses on visualizing techniques.

5. Conclusion: the future prospects in industrial design education; neither art nor science

Consequence of economical, social and technological transitions, the nature and the borders of the industry, products and services are blurring and expanding. The traditional design approach is not sufficient anymore. There is a need for new kinds of designers that can work across disciplines, who can understand human beings, business, and technology (Norman, 2010). Design is constantly evolving and changing. On this account, there is no single treatment suitable for all designers; there is a need for more adaptive (Durling et al., 1996) approaches in industrial design profession and education.

As it has been an agriculture society almost for 80 years, Turkey is at the beginning of its industrial journey when compared with developed countries and so do the disciplines related to the industry. Although industrial product design education has been given in Turkey for 40 years, the importance of industrial design recently increased according to the dramatic development of the industry due to the liberalization of the Turkish economy and impact of the European Union in the 1990s (Er, 2009). This transition caused the rise of the factors such as technology, design and quality in industry which has also has an effect on industrial design education in Turkey. The interviews conducted in this study show that the industrial design education has been trying to adapt itself to the transition in design thinking and specifically transition in industrial design in Turkey.

The interviewees coming from different educational tradition also emphasize that industrial design education should cover both logical, objective, analytical and subjective, holistic intuitive thinking, practice and research, problem solving ability and aesthetic sensibility. If we consider the case of Turkey, the different approaches in industrial design education do not cover the inter-disciplinary new design paradigm. Therefore, the future prospects should cover the synthesis of these two different approaches.

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