A STUDY OF THE RELATIONS BETWEEN THE DEMANDS OF THE INDUSTRY AND THE CAPACITY OF THE GRADUATED INDUSTRIAL DESIGNERS IN IRAN

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ABSTRACT

The industrial design has been created in some Iranian universities since 1983. As a new discipline, it faces certain challenges and weaknesses in terms of educational concepts. According to the problem mentioned, exploring the issues of roots is the principal objective of this study. In proportion to the certain restrictions and problems found in the pilot study, such as the gap between heads of companies' expectations and the requirements of industrial designers, certain types of questions are prepared (for the interview) which are selected for this paper. Fourteen subjects from two separated groups (7 industrial designers working in industry as employees and 7 Department officials ID working in private or public sectors) were voluntarily participated in this cross-sectional study. The sample size is limited because our goal was not to quantify the respondents, but to collect different opinions of designers. So, this study has explored some critical gaps between the needs of education and industries. According to the in-depth interview, the employee designers believe that some changes must be made on credit education and workshops to improve knowledge and skills of students in industrial design, particularly in some important areas such as "innovation", "the capacity of software", "economics" and also "aesthetic concepts". These data can help Iranian universities in the rearrangement of the credits, the course works and also the workshops. Beside the mentioned results, this research study helps industries in the evaluation of industrial designers who are looking for opportunities to work.

Keywords: Industrial design, design education, employee, statistical analysis, software ability, evaluation.

1 INTRODUCTION

"As designing is the first link of an article production chain, industrial design (ID) process is the first link of an article industrial production chain and a general equation to achieve optimum performance, form, style, variable, mode and cost."[1]. Industrial Design major was established in Tehran University in 1983. Then in the years 1985, 1986 and 1993 other public universities such as Tehran University of Art, Alzahra University and Iran university of Science & Technology established this major. Since 1983, about 2,200 students have been graduated in the undergraduate and post graduate levels. Today, twenty five years has passed since the establishment of this course in Iran. A wide variety of job opportunities are available for industrial designers, for instance giving consultation in offices (private or university), designing and realizing various projects such as exhibition halls, stand and interior design, medical implements, city furniture, laboratory needs, home furniture [2], which is a very small range of this discipline in Iran. This diversity is owed to the identification of the needs (by factories, different private and governmental research offices and also the private and the governmental enterprises to design and designers). The need to design is so evident that factories and enterprises are demanding the designers special ability (and no various skills as what Martin Carnoy mentions: […] companies need a workforce with skills increasingly diverse [3]. Arrival to the factory,

at the office of studies, etc., young designers do not have very pleasant experiences. "They must often confront mistrust of the technicians, impose him-self to engineers or attract gradually the confidence of leaders" [4]. For these reasons, we are focused on the current state of the education in Industrial Design in order to provide some improvement in this system [5]. Under this condition, the present research seeks to reflect the diverse view points, translating the demands of the industry and the professional, evaluating the capacities of graduated industrial designers and assessment of their outcomes in industrial sector.

2 LITERATURE REVIEW

However, some surveys were done about the mentioned subjects. There has not been any submitted or registered report on evaluation of the educational system's effectiveness in field of industrial design in Iran. So, one can not refer to any valid report.

3 METHODOLOGY

This research study is a descriptive one. For the purpose of data gathering, a list of local small and medium-sized enterprises (SMEs) including Industrial Design department and the graduates of University of Science and Technology were initially created. Correspondence was established with the ID department leaders and the graduates by phone or letter. Some have agreed to be interviewed with (seven graduates and seven head of industrial design departments of different companies), but the graduates were not asked to quote their characteristics. The researchers tried to choose those who both work at various locations and are students as the ID department leaders. Then, the researchers met them and interviewed with them. Finally, the analyses of the answers gathered have been made. Some of questions asked for current paper are as follows.

3.1 Questions of graduates
1- What are the problems of industrial designers in general?
2- Do you need to be connected to school after graduating?
3- What are your theoretical and practical problems?

3.2 Question of ID department leaders
4- What are your recommendations for the teaching methods in universities?
5- How do you evaluate the designers' understanding of the issues and the way they deal with a problem?

4 RESULTS

The first question: "What are the industrial designers' problems in general?"
6 out of 7 participants mentioned the lack of the technical and engineering information [6, 7, 8, 10, 11, 12]. This group believes that the lack of the technical and engineering information is the problem of industrial designers. This problem has caused the weakness of the communication among them and other engineers. Because of the variety of job opportunities in this course in Iran and the incapability of the graduated industrial designers to have control on all the engineering fields, which takes away the opportunity of a professional discussion during the manufacture of the product, the decline of the industrial designer by others within the company will happen. When the person grows in the needed fields of the company, the communication and acceptance of the designers in the group are postponed. Four of the seven graduates mentioned the inability of the graduate students in team working and also their weakness in time management (they are not punctual) [6, 8, 11, 12]. They knew the universities as the responsible ones. So, they emphasized on group activities. These people believed that after finishing school, there is no time to learn the above mentioned subjects and students shouldn't think that outside of the university everything is ready for the designers. "In reality, young designers should be prepared to face problems of any kind" they mentioned [Ibid]. Four people mentioned that the lack of attention to get the organization between different effective factors in new concept and its own production is the other problem of industrial designers. Here are some examples: creative ideas, doable ideas, suitable expenses for producing, assembling, renovation, repair, maintenance and recognition of other people's tastes must all be associated [6, 7, 8, 12]. These examples are dominant especially in the activities with time limitation (such as exhibition hall design or construction). These four people

said that being aware of the industrial designers' ability in finishing projects in a short time offers teachers to meet the agenda of university projects even if it does not appeal to students and force them to do and to respect the school calendar; this is not the case in all universities.

The second question: "Do you feel the need to be connected to the school after completing your studies?"

Despite the existence of a wide variety of information sources, the connection with the university and the specific books may seem superfluous. But six people mentioned that motivations such as using specific books of the university library, exchanging information with professors and other students, not being away from the research and academic experiences and finally, being informed of new research methods and designs are required for graduates in order to help them to be connected to the university [6, 7, 9, 10, 11, 12]. So, the need to return to university after graduation is felt even in anticipation of a desired job.

The third question: "What are your theoretical and practical problems?"

5 out of 7 designers mentioned that with the existing teaching method differences at universities in Tehran, the proficiency of the graduate designers in subjects aren't the same (it is important to mention the fact that all universities are forced to use the syllabus and the subjects dictated by the Ministry of Science and Higher Education) [8, 9, 10, 11, 12]. For example, the lack of knowledge of available materials has been mentioned as one of the known problems of the designers, two of which proclaim this lack of knowledge is not seen among graduate students of Islamic Azad University (the only private university in the whole country since 1993 which has industrial design course). 2 female students out of 3 ones affirmed that they have not been recognized by industries, these people judged Iranian industrial environment as very "macho" and declared that women have no place there [7, 12]. But in general, problems such as considering themselves different from other groups of specialists in the company or the factory, not being present within the company and refusing to engage in team work, incompetence in estimating the cost of production are the biggest weaknesses of the graduated students. On the other hand, inadequacy or the lack of knowledge of the young designers about their rights to protect their industrial or artistic inventions is a mental threat that endangers the safe use of industrial designers as well as industries and other designers.

The first question asked from the managers of the industrial design departments of the companies (the seven companies under evaluation) was "What is the basis for your industrial designer selection in your field of work?"

All the companies mentioned the "book" representing the projects done by students (which shows the quality and the quantity of their activity) and the ethical issues as important factors for their employment. All of them consider a designer as someone who is interested in his work (designing), is committed to the people with whom he works, Avoids to change his field of work, is prepared to work with others on the team, is confidant and is assigned by the company, carries a high level of professional knowledge and also tries to improve. These are all very important items should be kept in mind.

Three companies conducted some exams to select their designers [13, 14, 15]. These exams usually consist of imaginary projects which the ability of drawing, the variety of creative ideas, presentation, visualization skill, 3D form acquaintance, problem solving methods, colour usages, geometry and at last usefulness of the person for the job will be evaluated.

The knowledge of 3D design software, graduate university, ranking of the university and also obtained scores by graduates were the answers of three companies out of seven ones [13, 17, 19].

The second question is "What recommendations do you have for universities for their teaching methods?"

Working on reels projects based on the needs of the industries and the society and not on imaginary or irregular subjects was one of the recommendations given by all of the industries.

Forcing students to follow the standards and to respect the minimum requirements are very important in school projects (14).

Better investing on workshops and opening a special place for industries in school projects, eliminating the bureaucracy for stage, getting involved the students in learning a specific subject can have a great effect on their future (18).

Taking a privilege attention to technical and engineering courses to find a common language with other engineers and also teaching research methods and using the obtained information (on the data base) will help designers to communicate better with other team members (16).

In addition to all the managers who have given us the above information, "Fara Gaman Co." maintains a different opinion, which takes away the minds of students to think about industry requirements. This company believes that: "previously, the knowledge of the designers was seemed as a need for enterprises, but today it is more like it". This company insists considerably on the harmony in team work. This office cites that: "industrial limits are negative factors for creativity of the designers" and adds "the feasibility of the study and the production of ideas with the present industrial possibilities are the responsibilities of the engineers" [17].

The second question: "How do you evaluate the designers' understanding of the issues and the ways they face a problem?"

One out of seven mentioned above companies says most of designers are wasting their time dreaming [14]. Another company says: "some designers have no specialization while studying, and generally do not have enough information in any field, therefore after joining the company, it will take some time until they are ready to work and to be profitable for the team"[13].

Another one declares that "complaining about all the current situations and to believe to change everything at once are the problems designers face" and continues: "some of them underestimate the manufacturing phase and want to spend all their time to express their feelings in their concept, because of entering this discipline (Industrial Design) they escape issues of engineering; therefore, they are unable to provide a high level of technical work" [16].

Two companies out of seven ones noted that "graduates see themselves needless of other specialists. They also mentioned that "new designers are weak in technical subjects, so, they face many problems during prototyping or realizing the technical drawings." They add that "they feel fear and nervous in facing the engineering problems; moreover, they are not punctual at the deadline" [13, 19]. Statistical analysis by SPSSWin 13 (Paired T-test) among the mentioned qualitative variables show that there are some significance differences between industrial designers' opinions (in industrial sectors) and another participants.

5   CONCLUSION

In spite of our limited number of participants (but very experienced ones), authors believe that the mentioned results might create a clear and new path toward educational improvement in the industrial design course in Iran. According to the interviewed themes, it seems that the educational systems of industrial design in Iran meet certain critical subjects such as those follow:

a   A logical relationship among universities and industries must be created (rather by the government) "even if university-industry relations are often considered too complex to be advantageous" [20]. Under this condition, employers and industrial designers who are working in manufacturing companies will state their needs and expectations to educational sectors, so, new approaches on training and practical industrial design issues might be explored. On the other hand, the government should participate in strengthening the relationship between university and industry [21]. This is the case in other countries such as Canada, United States, Japan, Italy, France, Netherlands, and Great Britain [22].

b   The engineers who face the problems of the industry must ensure more some courses and university credits, which include technical subjects based on industrial technology. The main titles of these courses must be developed in collaboration with engineers (who were themselves students before and work in factories today), which leads us to a certain applicable and better adapted courses.

c   According to the industries and factories limitations, financial problems and their productive needs, some specific branches should be defined for students during their two last bachelor degree. Under this condition, industrial design students can choose some courses due to their interests.

d   To prepare some short term educational programs for training some industrial design technicians, a two- year program will be preferred for the mentioned recommendation.

e   And finally, some industrial designers around the world should be invited to introduce their experiences to the Iranian designers. Surely under this condition, some results based on brainstorming will be explored: "Thinking Globally, Design locally".

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