

INDUSTRIAL DESIGN EDUCATION IN IRAN: A CASE STUDY FOR DEVELOPING A NEW SYLLABUS

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ABSTRACT

This paper is concerned with developing a new framework of Industrial Design educational program in Iran. Education of Industrial Design is one of the important factors for achieving economical stability in developing countries. In Iran, it has been educated in Bachelor and Master Courses in ten universities. All these universities follow the same syllabus in Bachelor courses. This syllabus contains 135 modules which are taught during four years. This syllabus has been established since 1995. Obviously the syllabus is very old and needs up to dating. In order to develop a new syllabus, there was a need for performing a comprehensive study. For this aim, the current syllabus was investigated and compared with the program of other universities in the world. The world best nine design universities were selected from the business week's worldwide ranking and their modules were classified in two levels. The first level includes Art, Science, Art and Science combination and liberal materials. In second level each part divided into detailed divisions. The modules were calculated in each category and analyzed. The results showed that American universities have quite equal distributions in all categories. For selecting a reference for benchmark, these distributions were considered and compared with the needed criteria. Art Centre College that met all the criteria was selected as the reference. According to the lesson plan of Art Centre College, a draft syllabus was developed. In order to generate a new syllabus, the draft will be modified via professional meetings.

Key words: Education, industrial design, syllabus

1 INTRODUCTION

Industrial Design was born in industrial societies and inserted to developing countries [1]. According to ICSID (International Council of Societies of Industrial Design) definition, Industrial Design is concerned with the marketability of a product. Industrial Design as a discipline between science and arts acts as a link between Marketing and Manufacturing. It helps in field of product planning and strategy formulation. It also can play a significant role in using technologies to bring out effective products into the market. This attribute of Industrial Design is most significant for 'product success' in local and global markets [2]. One of the important factors for the achievement of high product quality and economic stability in the developed countries is Industrial Design activities [3]. The gallop interviews of over 300 managers of leading U.S. companies indicate that in small companies \$ 1 invested in Industrial Design activity gets \$160 in sale. It also concludes that the contribution of Industrial Designer is estimated to be 60% in success of the products [4]. Furthermore, the role of industrial design is not just economical benefits. The cultural messages transmitted via design help to characterize the socio-cultural profile of groups and individuals. In this way the culture-based values have become vital in design practice and also the new product development it serves. Many corporations have understood these benefits as key resources in the competition in the global market [5]. The standard of Industrial Design in a society reflects its intellectual, technological capabilities. So it seems Industrial Design could have vital roles to achieve economical and socio-cultural promotions in developing countries. However it is necessary to understand Industrial Design as a 'creative force', working with the technological and socio-political structures of a society. Conducive structures of society can enable Industrial Design to mould it for better 'values'. Thus it has a fundamental role of incorporating technological advancement for better quality of people life in developing countries. However the trained industrial

designers will not find acceptance in these societies unless their role are understood and valued. So the act of 'creating design capabilities' must be seen in a broader perspective [6]. Design education will play an important role in generating these capabilities. It is also important to create design awareness in the society that will ultimately use the new designs. Both these can only happen with the support of a proper education system [7]. Industrial Design as a business could not be apart from the industry which has to be employed in it. According to a report by the Economist, Iran has been ranked 28th in annual industrial production growth rate in 2009. As this report shows the government of Iran has plans for the establishment of 50-60 industrial parks by the end of 2015. Iranian contractors have been awarded several foreign tender contracts in different fields of constructions, power generation, and gas, oil and petrochemical industries. The availability of local raw materials, rich mineral reserves, experienced man power have all collectively played crucial role in engaging with the international offers [8]. Therefore, As a developing country, the active industries in Iran are depend on the foreign technologies and most of the industrial products are copies of the foreign samples in design which could be made in available manufacturing systems. According to the Central Bank of Iran, annual inflation declined that the economy has seen only moderate growth. However Iran's educated population, economic inefficiency, and insufficient foreign and domestic investment have prompted an increasing number of Iranians to seek employment overseas, resulting in significant "brain drain"[9]. These reports show that unfortunately in spite of the great numbers of the graduated students from Iranian universities, there is a large gap between Academic Educational Systems and real industries' requirements. ID (Industrial Design) Education in Iran is an academic field, which is established since fifteen years ago. It has been taught in Bachelor and Master Courses in ten universities in Tehran and five other cities. All these universities follow the same plan and syllabus in Bachelor courses. This syllabus has been established since 1995 and has not been revised during these years to be modified or changed in spite of industrial and social changes in Iran. Obviously the syllabus is very old and needs up to dating. In addition some of the universities have potentials to expand their educational systems in specific fields of Industrial Design. Furthermore, the few numbers of ID graduated students in Iranian industries during these years indicate that perhaps the current educational system is not able to prepare such students to be acceptable for industries. In order to explore the current syllabus and develop a fresh and suitable BA program this study was carried out.

2 THE CURRENT ID EDUCATIONAL PROGRAM IN IRAN

According to Educational Program of Bachelor of Industrial Design, which was approved in 1995 by Ministry of Science Research and Technology, it contains 135 modules which could be educated during four years [10]. One hundred and fifteen of these modules are related to design field and twenty of them are Liberal Arts that are same in all different courses and are not related to design matters. These are compulsory units due to the religious government regulation. The other 115 are classified in four different categories as Liberal Arts, Main courses, Foundations and Professional modules. Figure 1 shows that the distributions of modules in these categories.

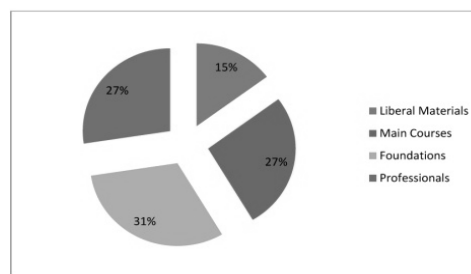


Figure 1. Modules distributions according to the current Iranian Program

As Figure 1 shows, Foundations have the most portion which contain Fundamental arts, Drawings, Model making, Photography, Geometry, Art history, Human factors, Mathematics and Physics. The next categories are Main and Professional Courses that are equal. The modules in Main course are physics, Technical drawing, History of Industrial Design, Human factors, Products evaluation method, Economy, Material and Manufacturing, Sociology, Computer and Technical design. The Professional category contains Industrial Design basics, ID projects, Packaging, Creative projects, Environmental project, Future design, Furniture

Project, Bionics and Final project. The Liberal Materials which has the minimum distribution are not related to design matters at all. These are modules that are the same in all courses in all fields in Iran. Furthermore, there are two courses as internships which are not contributed as normal units.

2.1 Criteria

According to the contents of the current program and Iranian economical and industrial issues, it seems some criteria should be considered in program modifications. These criteria are generated from the idea of the importance of the growth of innovative and artistic abilities of students which could be effective on Iranian industries' requirements for freshness. Furthermore, scientific materials are very important to prepare students to be aware of new sciences and technologies in modern industries. In the other hand, Laboratory and practical projects are the vital needs for ID students to be able to work in real world. The survey in current ID program shows the Liberal Materials have not any connection with design issues and they are just religious and ideological lessons which are similar in all Bachelor courses in Iran. Also all these materials are necessary to study and they are not electives. The other issue is Portfolio course which is not considered in this program and students do not know anything about the ways and importance of the presentations as designers. According to the necessity of the engaging students with industries and industrial companies, Internships are very important courses in academic education programs. The criteria were gathered and listed as the necessary items which could judge the proposals for modifications. These criteria are:

- Artistic and innovative aspects of the program
- Design knowledge
- Scientific courses which contribute on Industrial technologies
- Laboratory courses
- Practical Projects
- Related Liberal Materials
- Elective and complementary courses
- Internships for establishing relationships between universities and industries
- Portfolio and Presentation techniques
- The equal distributions of all materials
- The limitation of the modules numbers

3 BENCHMARKING ID BACHELOR PROGRAM

In order to find the best references for developing a new syllabus, a benchmark study was carried out. The world best forty four design universities and schools were selected from Business Week's worldwide rankings [11]. Due to the Design fields and availability of the syllabus information on their websites, nine of them which had relatively complete information were selected. Table 1 shows these universities with their worldwide rankings. As Table 1 shows six of these nine selected design schools are American schools which have rather the best worldwide rankings.

Table 1. The selected Design schools for benchmark study

Ranking	University/Institute	Location	Design Fields	
A	2	Art Center College of Design	USA	Product, Environmental, Transportation Design
B	5	California College of Arts	USA	Industrial, Furniture, Fashion, Interior Design
C	6	Carnegie Mellon University	USA	Industrial Design
D	8	Cleveland Institute of Art	USA	Industrial, Interior Design
E	9	College of Creative Studies	USA	Product, Car, Transportation, Interior Design
F	11	Delft University	Netherland	Industrial Design
G	38	Polytechnic of Milan University	Italy	Industrial, Interior, Fashion Design
H	39	Pratt Institute	USA	Fashion Design
I	47	Monash University	Australia	Industrial Design

3.1 Structure of the study

Due to the websites and electronic catalogues of the schools, the modules, lesson plans and their descriptions were investigated and studied [12]. In order to find out the tendencies of schools and identify their educational strategies, the modules were analyzed and classified in two levels. Table 2 shows the clustering of the levels. According to the Table, due to the nature of Design definition, which contributes in both art and science, the first level as the general level, was included in Art, Science, Art and Science combination and liberal materials. In second level each part divided in detailed categories. Art foundations and design basics were results of dividing Art. Applied science and Laboratory lessons were the two parts of Science filed. The Art and Science combination was separated in specific design projects and portfolio. The Liberal part was consisting of elective courses and complementary lessons. Furthermore, this classification was performed due to the criteria which would be followed to identify the reference program via benchmarking. The current modules in Iranian BA program were classified based on these categories as well to be comparable with other programs. This was necessary for identifying the current program strategy.

Table 2. The clustering of the categories for modules classification

1 st Level	Art		Science		Art and Science Combination		Liberal Materials
2 nd Level	Art Foundations	Design Basics	Applied Sciences	Labs	Design Projects	Portfolio	Elective and Complements

3.2 Results

The numbers of modules in each category were calculated for all universities and analyzed by Excel. At first the average distributions of the modules were analyzed in general categories. These results are shown in Figure 2.

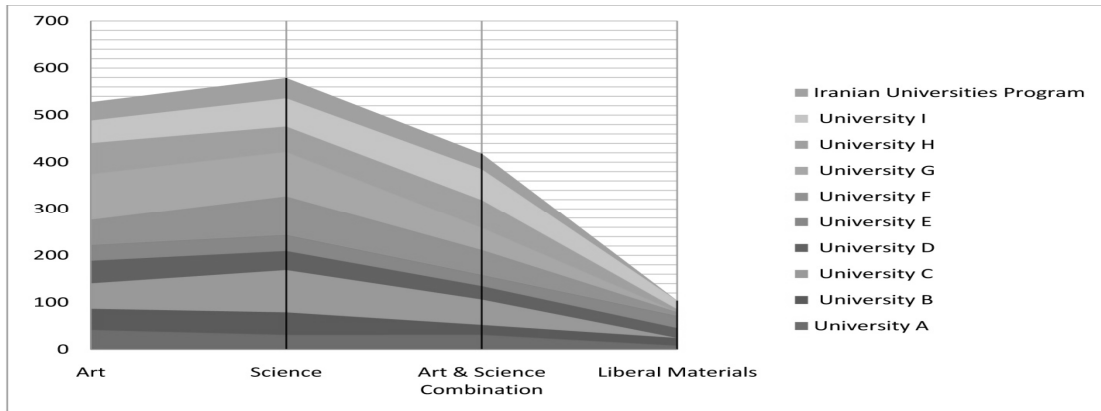


Figure 2. Modules distributions according to the first level categories

According to Figure 2 the numbers of modules in each category were different in universities and the average distributions in each university were not the same either. As Figure 2 shows University A has relatively equal distributions exceptionally in Liberal Materials. The average distributions of the modules in this university are 37.2% in Art, 27.7% in Science, 28% in Art and Science Combination and 7% in Liberal Materials. About the University B, these distributions are equal in Art and Science sections (34.5% and 36.8%) as the major distribution and in Art and Design Combination and Liberal Materials (16% and 12.6%) as the minor distribution. The highest area in module distributions of University C belongs to Science category and Art. Art and Science Combination have a smaller area (about 27.3%), while there is not any module in Liberal Materials category. The module distributions in Art category as the most part in University D is 34.8% and Art and Science Combination with 20.7%, Science category with 19.3 and Liberal Materials with 15% are the next ones. In University E all the categories have the equal distributions; 28.5% in Art, 29% in Science, 20.3% in Art and Science Combination and 22% in Liberal Materials. The analysis shows that the biggest portion of the modules is in Science category in University F with 42%, while Art has 27.3% of the distributions. Also, Art and Science Combination have 26.8% and Liberal Materials with just 4% has the minimum portion. In University G, modules in Art and Science categories are close (40.9% and 39.5%). The

distribution of the modules in Art and Science Combination category is 19.7% in University G and there is not any module in Liberal Materials section. These portions in University H are 35% in Art, 30% in Science and 32% in Art and Science Category which are close, while the modules distribution in Liberal Materials is only 3%. In University I, the averages of the modules are relatively equal in Science and Art and Science Combination (31% and 34.4%) and have less distribution in Art category (25%) and Liberal Materials has only 9% of these distributions. Figure 2 also shows that the distribution of modules in Iranian program is approximately equal in Art and Science categories with 34% and 35%. Art and Science Combination has less distribution about 28.5% and there is no module in Liberal Materials category which is related to Design matters. At the next step, in order to find out the distribution of each university program in the second level, all the modules were classified in detailed categories and then compared in Figure 3 by Excel software.

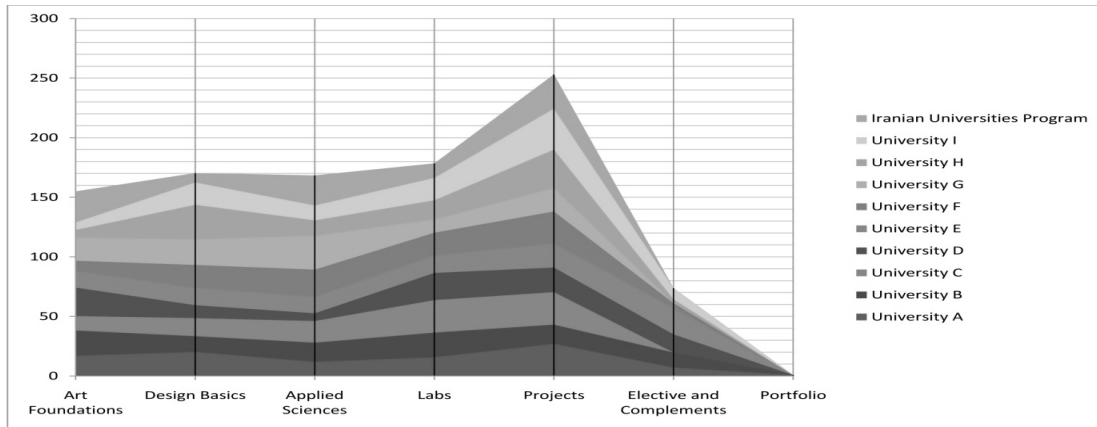


Figure 3. Modules distributions according to the second level categories

According to Figure 3, Distributions of modules are obviously various in second level categories. The highest area in University A belongs to specific Projects and the lowest one is Portfolio which has just one unit. Design and Art foundations, Labs, Applied Science and Elective courses are the next highest areas. These distributions in University B are relatively equal; however Portfolio is not available in its program. In University C, Projects and Labs categories have the most distributions. Applies Sciences, Design and Art Basics have the fewer units in this university and there is no Electives and Portfolios in the program. The minimum units are available in Applied Science and Design Basic in University D and the maximum belongs to Art Foundations. Distributions of modules in Labs, Projects and the Electives are very close. There is not any Portfolio in this program. The modules distribution is in the highest area in Electives in University E and the other categories are rather equal. In University F, the most module numbers are in Project and Applied Sciences. As Figure 3 shows the highest area is Applied Science category. No Electives or Portfolio is available in this university program. In design program of University H, specific Projects category has the highest area. The maximum distribution in University I belongs to Projects category and the minimum is Art foundations. Figure 3 also shows the distributions of the current Iranian ID modules in the second level classification. As it could be seen, Projects, Art Foundations and Applied Sciences are the three highest areas and Labs and Design Basics are the Lowest Areas. There is not any module available in Elective courses or Portfolio category.

4 DISCUSSION AND CONCLUSION

As benchmarking shows different design universities have different tendencies in their educational policies. According to the nine universities which were selected for study, five universities have various design fields and the rest of them are focused on a specific field. Some of these universities (A, B, D, E, and H) are art schools and University F and G are technical institutes. The overall numbers of the modules are not same in all universities. University G has the highest numbers and the average in all fields is approximately 240 units. In the contrary, University A has the lowest numbers in about 112 units. As results in Figure 2 and 3 show American universities (A, B, D, E and H) have a more equal distributions in two level categories. In the first level, Art and Science categories relatively have larger areas and in the second level there are more stresses

on specific Projects and Laboratory lessons. Although, Portfolio as a module is only available in the program of University A but exists in the other American universities program. According to results, University F and G have the largest areas in Applied Science category as the Technical universities. Liberal Materials as the Electives and Complementary studies have different distributions in the universities program. University D and E have the largest areas and University C and G have the smallest areas in this category. All the materials in Liberal studies category are considered as Electives and students have different choices to select them based on their requirements. Results show that modules in Iranian program have equal distributions in Art, Science and their Combination categories. However, Design Basics and Laboratory lessons have the minimum portions. According to results, there is not any related Liberal Materials available in this program and no Elective course and Portfolio lesson exists. In order to modify this program, there is a need for choosing a reference university. Obviously, a high standard University, with top worldwide ranking and innovative program could be an ideal reference. Due to the limitation of modules numbers, the reference university should have the similar amount of modules such as University A or E. According to the criteria, an equal distribution of modules is required. Universities A, D and E have this kind of distribution. Due to the importance of Portfolio, it is aimed to add this module to the program. Therefore, the reference university ought to present this lesson. Considering these criteria, the university A (Art Centre College) was chosen as the reference. In order to follow the pattern of this university, there is a need for adding design basic and laboratory lessons. However, limitation of modules numbers requires modification of all modules distributions. Respecting the reference university program, related Liberal Arts should be added as complementary and elective courses. The distribution of them should be around 7% in total. According to the criteria, the internships for establishing relationships between universities and industries are needed. Therefore, it should be considered as a module in Art and Science combination category. Thus, for new program, Art, Science and their combination would be distributed equally. As the total units are 115, each category would contain 37 units. Liberal art would be 9 elective units, which 4 of them should be selected. In Art category 19 units would be related to Art foundation, 18 to Design basics. In Science section 18 units would be Laboratory classes and 19 units related to applied science. In combination category 36 units would be design projects and one unit Portfolio. According to this classification and considering the details of reference university program, a draft syllabus would be prepared. Obviously the draft needs assessment with professionals. Therefore next step is preparing a questioner for interview and performing professional meetings. The result would be compared with samples from leading developing countries that successfully up to dated their ID program such as India and South Korea.

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