INTERNATIONAL ENGINEERING AND PRODUCT DESIGN EDUCATION CONFERENCE
2-3 SEPTEMBER 2004 DELFT THE NETHERLANDS

INDUSTRIAL DESIGN EDUCATION IN THE NINETIES – THE CURRICULUM MATTERS

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ABSTRACT

This paper is based on a qualitative study held in 1996 and deals with the directions in industrial design educational institutions in the world in 1990s concerning curriculum components such as educational philosophy, curriculum orientation, needs assessment, curriculum change, and curriculum development and evaluation. A 20-item questionnaire was prepared to collect data on the above issues and sent directly to the chairpersons of 174 institutions that may have industrial design departments. Thirty-four people from 19 countries who filled out the questionnaire served as the sample of the study. Especially the last six questions of the questionnaire were about the 'recent' (1990-1995), 'current' (1996) and 'prospective' (2000-..) alterations in the field of industrial design and their reflections on industrial design education. The educators' viewpoints on the change in the field and its education in 1990s and their expectations about 2000s are presented in this paper so the reader/audience will have a chance to compare the last decade with the current situations.

Keywords: industrial design education, 1990s, curriculum, curricular changes

1 INTRODUCTION

1990s were the times of alteration of the world due to the social, political, economical, and technological metamorphoses. The world map had also changed due to emerged countries from the former Eastern Bloc. European Union, and other unions were integrating the member countries' economies and markets. Concepts such as 'common policy,' 'single money,' and 'single market' between member states were not slogans, they were going to be realities. Those days, life styles were reshaped by innovations, especially in the production and information technologies. In the early 1990s, electronic mailing and conferencing, multi-media environments, virtual reality, industrial robotics, and so forth, were relatively unknown for most of the people; they were rapidly integrating into our daily lives, which indicates that there should have been some modifications in our professional life.

In addition to the above issues, topics like globalization, planet conservation, and dematerialization strengthen the need to concentrate on the profession of industrial design where one needs an education appropriate to the changing situations. Industrial design education should have addressed newly evolving priorities and responsibilities in the profession: static curricula for a changing world were at variance with future planning.

The educational curricula "not only need to incorporate those changes and differences with flexibility, but also to anticipate future developments to ensure that new generations are well prepared for their professional careers and responsibilities" [1]. A

strategy for the future of the field should have been "the deepening and the widening of design education in general, towards the social, economical and ecological reality, from where the needs emerge" [2]. In order to attain this goal, the curricula serving industrial design education, and the processes for designing such curricula should have been examined in scope and sequence.

2 THE STUDY

In the midst of 1990s, the literature indicated that 'curricular applications in industrial design educational institutions in different countries' had rarely been studied in Turkey or abroad. A detailed analysis of the status of industrial design curriculum and related issues would be significant in interpreting common and distinctive curricular concerns of those days.

Specifically, this study was guided by three major research questions:

1. What was the status of the curriculum in industrial design education in 1990's?
2. What was the status of the curriculum change process in industrial design education in 1990's?
3. What were the visions of the industrial design departments on both the future of the field and of their own?

A 20-item questionnaire was prepared to collect data on the above issues and sent directly to the chairpersons of 174 institutions that may have industrial design departments. The chairpersons were preferential respondents since they were assumed as the source people to reach appropriate information and it was expected that they were the natural participants of the curriculum studies. Almost all of the respondents were chairpersons, only four were not. Thirty-four people from 19 countries who filled out the questionnaire served as the sample of the study. So, close to 20% filled out questionnaire return rate was achieved.

Table 1 Distribution of Respondents According to Countries

Australia	3	India	1	Netherlands	1	Switzerland	2
Denmark	1	Ireland	2	Norway	1	Taiwan	1
England	3	Israel	1	Poland	1	Turkey	3
France	1	Japan	1	Scotland	2	USA	5
Germany	2	Korea	1	Spain	2		

The data collected through the questionnaire were analyzed by coding and categorizing the themes emerged from the answers for each item. First, all the answers to the questionnaire were grouped under the question-headings. For all the questions, each statement which represented a different theme emerged from the answers was listed side by side separately until a statement matched a theme already listed. Similar statements were listed below the leading theme statement. After the grouping of the themes emerged, groups formed under each question headings were classified under higher-level themes. Categorization from sub-themes to higher-level themes reduced the number of overlooked themes.

3 RESULTS – CURRICULAR ISSUES

Curriculum is defined here as (1) the range of subject matters with which it is concerned (substantive structure), and (2) the process and procedures of inquiry and practice that is followed (the syntactical structure). Thus, the curriculum field, may be described by the

subject matters that are treated in schools and the many processes (e. g., curriculum development, curriculum evaluation and change, etc.) with which specialists are characteristically concerned [3].

3.1 Educational philosophy

Tanner and Tanner (1980) said that "we cannot examine carefully any significant curricular problem or issue without confronting philosophical considerations." The term philosophy "is often used by teachers and administrators to convey their common-sense outlook on education and curricular matters" [4] while it may even be defined as the general theory of education.

Archer (1994) stated that "what is still a little new to all disciplines, as well as to art and design, is the need to demonstrate the quality of the theoretical underpinning they provide to their teaching" [5]. Correspondingly, the results of the study showed that the respondents' understandings of educational philosophy were different from that of educational scientists. Mostly, they stated ingredients of course contents or educational objectives as the indicators of their educational philosophies.

Preparing students to the professional life was the most mentioned issue as one of the concerns of educational philosophies. Requirements of the professional life and the connections between real world and schools were the most discussed subjects in the literature on industrial design education. Signs of the evolving interests in those issues can be considered as the beginning of demolition of the barrier between industrial design schools and the real world. Additionally, as a part of their educational philosophy, some respondents indicated the importance given to the knowledge on the materials and the processes of industrial production. These indications can be accepted as the efforts to strengthen the desired real world connections in industrial design education.

In the early 1980s, teaching too much design and not enough about the social, economic, and political environment in which design takes place was discussed as the main trouble with design schools [6]. A decade after, educating humanist and socially conscious designers was still stated as the part of educational philosophies of respondents' institutions. Cultural and multi-disciplinary aspects of industrial design, and design management seemed to be the 'newly' evolving philosophical concerns. Moreover, concerns such as creativity, problem solving, and economic aspects of industrial design were rarely mentioned.

3.2 Educational orientation

'Society, learner and knowledge' triple of general education can be modified to adapt different fields of study. It can be varied according to the aims and attitudes of the educational institutions towards their philosophy, objectives and curricular studies. In order to designate the orientations of the industrial design educational institutions, a multiple-options question was asked. It examined if the curricula of respondents' institutions were technology, student, industry, market, or teacher oriented, or not.

More than two thirds of the respondents made groups formed by at least three of 'technology, student, industry, and market.' Furthermore, these items had nearly the same selectiveness level as one of the basis of respondent's institutions. Thus, there was no avant-garde 'basis formation' for curricular orientation in industrial design education for those days. This might be because of many respondents limited the concept of curriculum within the outline of the course programs and contents.

A considerable amount of the respondents perceived their institutions' curricula as teacher-oriented. Guiding curriculum according to the teachers was common to almost all the educational institutions especially in which professionals serve as educational staff. Determination on the courses due to the professionalities of the teachers and to their leave-takings was not an uncommon case in the industrial design educational institutions. Because of the creative nature of the profession and its openness to biased criticisms and personal interpretations, it is difficult to isolate objective teacher from subjective personality. Furthermore, this dilemma can be considered as a strengthening factor to the creative productivity of industrial design students even it strengthens the teacher-orientedness of the curriculum.
Course programs of the respondents' institutions were stated as the indications of their curricular orientations. Specialties of the educational staff, subjects given as the project problems of studio courses, and relations with the industry were mentioned as some other reflections of curricular orientations.

3.3 Needs assessment

A question was asked to designate if the respondents' institutions conduct any kind of 'needs assessment' to provide guidance to their curricula. Needs assessment is the process of delineating, obtaining, and applying information to determine the things that are useful or necessary to serve a defensible purpose [7]. It can lock an educational system into maintaining the status quo unless some provision is made for anticipating future needs [8]. Industrial design profession has dynamic bases as technology, market, and consumer; industrial design education should not lag behind its basis. Needs assessment is a vital process to gain continual curricular improvement that is very important for any industrial design educational institution.
Most of the respondents' institutions conducted some kind of needs assessment but not in its formal meaning. It seemed that conducting needs assessment to gather information on industrial needs was the most common one in the 1990s. Results of the study showed that the student and market needs were assessed scarcely in comparison with the industry needs. Almost all needs assessment activities mentioned by respondents were conducted by faculty members except some institutions belonging to some organizations such as accrediting associations, or organizations that give grants for specific projects conducted in those institutions.
It is apparent that, staff of almost all the respondents' institutions had critical roles in curricular issues like needs assessment processes. Apparently, it was preferred that voluntary people (not appointed) participate in the curricular studies in their institutions. Some times, as mentioned by some respondents, person at the top as a chairperson or a course director was obliged to get rid of those studies, might be owing to the shortage of pertinent people.

3.4 Curriculum development

Designing is "somewhat creative aspect" of curriculum process that is similar to the "role of the architect in building or the fashion designer in clothing or the menu planner (not the recipe maker) in cooking" [8]. Curriculum design can be considered as a 'scenario' for providing learning opportunities that is built on the certain educational goals and objectives.
Due to the traditional mysteriousness of the curricula developed for the industrial design education, information on the curriculum development processes of the respondents' institutions could not be gathered adequately. Quality of education in an industrial

design educational institution might have an influence on the selectiveness of that institution for the joint projects with the industry as well as the sponsorships. This situation shows the monetary facet of the industrial design education which is not the primary concern of this study. Endeavors for becoming an eligible institution make the curricular studies concealed owing to its commercialized nature. With an optimistic view, this situation can be interpreted that it might have an influence on the lack of information on curriculum development processes in respondents' institutions.

In some respondents' institutions there were special committees embodied by faculty members and appointed for the development of curriculum. However, curriculum development process needs permanent participants not only insiders but also outsiders like professionals.

On the other hand, the results of the study showed that most of the curricula of respondents' institutions were developed informally by the participation of their staff. In some cases, a person at the decision making position, as previously mentioned, developed the curriculum of his institution. Thus, some respondents might have thought that those studies on curriculum development were worthless to mention. This situation might also be one of the reasons of quasi-curricular weakness of industrial design education of those days.

3.5 Curriculum change

Although dimensions of curriculum change identified as the changes in a) subject matter, b) organizational structure, c) role/behavior, d) knowledge and understanding, and e) value internalization, almost all the respondents perceived curriculum changes as the changes occurred in their course programs and contents. Staff turn-over was seen as the most effective factor for changes in the curricula of their institutions. This situation supported the belief on increasing teacher-orientedness of the industrial design education. It was apparent that the primary reason of the teacher-orientedness was the dependency of the institutions to the professional part-time teaching staff. So, any change in the faculty (e.g., a turn-over) causes unavoidable changes in the curriculum (e.g., course drop, need for new personnel, change in the content). On the contrary, as stated by a respondent, curricular changes should require the appointment of new faculty, acquiring or upgrading facilities, and so forth.

Respondents stated students' needs, technological changes, market changes, and institutions' facilities as the other effective factors on the curricular changes, gave people who favor formal curricular applications in industrial design education a peace of good news for 'coming' days.

3.6 Curriculum evaluation

Curriculum evaluation is the scrutiny of whether a curriculum produces desired results or not; and serves as a means for finding how it can be improved. According to the results of the study, the evaluation process seemed to be the most common curriculum component. Almost all respondents stated that their curricula were evaluated in some respects. The application of both external and internal evaluations together was the most applied evaluation mode among the respondents' institutions.

In considering the responses to the question on the curricular affections of evaluation processes, the course contents and the subject areas were the most affected items by evaluation results. Addition of optional or elective courses, changes in educational philosophies, more interdisciplinary works, more emphasis on sponsored projects were

some of the other items stated as the results of the curricular evaluations conducted in the respondents' institutions.
One of the meanings of any curriculum evaluation is the improvement for adaptation to the 'pervasive changes' [10]. There were no responses mentioning changes in teaching methods, instructional strategies or other educational concerns rather than those related with the course contents.

4 STUDENT PROFILE

Designation of the students' profile, in many respects, is important to validate the implementation phase of any curriculum; it also helps to make curriculum reliable. In order to gather information on students of the respondents' institutions, a question was asked to learn how they describe their current students' profile in respect to their knowledge, formation (creative process of design), and communication (transmission of design decisions) skills.
Almost all respondents stated that they were satisfied with the students regarding their skills. It was obvious that their understandings of these skills were restricted in some respects. For example, 'knowledge' was commonly received as the technological knowledge. It was interesting that some of the respondents mentioned inadequacies of the students' oral and written skills since the improved computer skills such as the skills in multimedia environments, computer graphics and information technologies caused a decline in their hand skills.
According to the respondents, in the first half of the 1990s, some additional changes occurred in their students' profile. Industrial design students of those years had: more self-rationale, better self-expression, evolving interdisciplinary thinking, more professional consciousness and design awareness, and improved intellectual inquiries.
Consequently, characteristics of the industrial design students, especially their intellectual abilities, had been improved except their hand skills including their writing skills. It was an attractive result that the 'prospective' industrial designers were not mentioned at expected level in spite of the changes in their profiles. Of course, education had influences on the changes occurred on students' profiles, those changes should also have influences on the improvement of the education.

5 CHANGING PRIORITIES AND RESPONSIBILITIES

As the results revealed, ecological awareness was one of the 'newly' evolved themes that was the most stated by respondents as the one that should be reflected on the industrial design education. Interests to the social sciences were accepted as the secondary concern of those years. Environmental awareness and social consciousness were the most discussed themes of industrial design education literature in the midst of 1990s. According to some respondents, industrial designers were more aware of their social and moral duties. On the other hand, aesthetics, one of the most effective considerations of industrial design and its education in prior times, had lagged behind the other considerations previously mentioned.
Technological innovations and developments, progress in the electronic media and human interface designs were accepted as the other most effective changes in the field of industrial design that must be reflected in the industrial design education. Although they were less mentioned in comparison with the above issues, it seemed design management, marketing orientation approach, and product semantics would be the 'coming' themes having effects on the industrial design profession and its education in the second half of the 1990s. Lateral thinking, chaos theory, non-dogmatic aesthetical

viewpoints, immaterial design, strategic design, design for assembly and disassembly were some other items thrown out for consideration as 'recently' evolved issues whereas some people in the field had not heard anything about them in 1996.
It was declared by most of the respondents that there were some modifications in course contents for adapting to those designated themes evolved in the first half of the 1990s. So, the curricular modifications according to the evolving themes, as for the evaluation or needs assessment results, did not go further from the content adaptations.

6 IDEAL CURRICULUM

Although some respondents believe in the impossibility of it, an ideal industrial design curriculum of 1990s could be shaped by the results: Firstly, it should be aware of market, as well as technological innovations and developments, especially in the fields of production and information.
Secondly, at the end of their education, students should be well skilled in the fields of communication, research, and computer; they should be good in creative thinking and evaluation; and should have strong multi-disciplinary understandings by the application of team learning and teaching approaches within well-equipped facilities.
Lastly, the content should also cover the design theory, knowledge and process as well as the legal aspects of the profession. It should be humanistic and conscious about social, cultural aspects of industrial design while giving importance to the students' needs. Additionally, in order to prepare an adequate environment for professional practice of prospective industrial designers, an ideal curriculum for industrial design education should be in close contact with the industry without degenerating its academic nature.

7 FUTURE OF THE INDUSTRIAL DESIGN FIELD

It was expected that until 2000, due to the globalization and liberalization there would be some changes in the market, and because of the technological innovations and developments there would be changes in the communication and design tools. All those changes would bring more social and cultural responsibility and more control in the production processes to the industrial designer who would work in a cross-disciplinary team.
According to some respondents, there would be an increasing need for industrial designers in all the areas of production. On the other hand, there was a belief that industrial design education would struggle to maintain its currency because of the lack of 'future' demands for the profession. The idea of user interfaces and user-friendly designs would have more importance in 2000s. Responsibility of user and more care for the ecological aspects would be among the basic concerns of the industrial designers as well as the inter-disciplinary design approaches. More awareness for managerial issues, more computer integrated life, more care for conservation of cultural identities were the other 'foreseen' items for the 'future' of industrial design field.
As the results showed it was expected that the profession of industrial design would have a broader base and would be more flexible in 2000s. Some of the respondents believed that the profession would become more specialized whereas others believed completely the opposite of this expectation. Producers and consumers would also be educated about design issues that the industrial designers would directly be influenced by this situation.
Consequently, for the preparation of an industrial design educational institution for the 'future' scenarios stated by respondents, there should be a continuous self-evaluation of

the institutions and a continuous in-service re-education of the educational staff as well as the betterment of facilities, and more emphasis on interdisciplinary works.

8 CONCLUSION

Margolin stated in 1989 that "we live in a time of questioning; certainties are not always unequivocally espoused. The diversity of contemporary thought about designing and design has finally brought to the surface many issues that had been previously repressed or set aside" [9]. Depending on the results of the study, it might be said that the curricular studies in the respondents' institutions even in 1990s were somewhat superficial.

By considering the results of the entire study, there was no significant grouping dependent on geographical, economical, or political circumstances of the respondents' institutions. Preparing students for professional life, and improving relationships with industry were the most common items mentioned. According to the respondents, besides 'ecological responsibility,' industrial designers would have more responsibility on social and cultural issues that should have been reflected in the education of industrial designers. The more 'recently' evolved items of industrial design in 1990's such as 'design management' or 'user friendly design,' 'product semantics,' and 'strategic design' were considered to be likely items on the 'future' agendas of industrial design education. It is worth to mention once again that, for those days 'future' means 2000s, in other words 'today.'

REFERENCES

[1] Bahnsen, U., 5. President's Report. ICSIDnews, ICSID, Helsinki,1995, p 3.

[2] Manu, A., Dialogues On and About. ICSID Papers, ICSID, Helsinki, 1994.

[3] Mc Neil, J. D., Evaluating the Curriculum. In Giroux, A. and et al. (eds.), Curriculum and Instruction, McCutchan Pub. Co., Berkeley, 1981, pp 237-51.

[4] Tanner, D. & Tanner, L. N., Curriculum Development. Macmillan, New York, 1980.

[5] Archer, B., Design Education. Unpublished notes from the in-service short course and workshop programme held in Dept. of ID, METU, Ankara, Turkey, 1994.

[6] Papanek, V., Design for the Real World. Granada Pub. Ltd. in Paladin Books, London, 1978.

[7] Stufflebeam, D. L., Conducting Educational Needs Assessment. Kluwer Nijhoff, Boston, 1984.

[8] Saylor, J.G., Alexander, W. M., & Lewis, A. J., Curriculum Planning for Better Teaching and Learning. Holt-Saunders, Tokyo, 1981.

[9] Margolin, V., Introduction. In: Margolin, V. (ed.), Design Discourse. The Univ. of Chicago Press, Chicago, 1989, pp 3-31.

[10] Bellon, J. J., & Handler, J. R., Curriculum Development and Evaluation. Kendall/Hunt, Dubuque, 1982.

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