PERSPECTIVES IN COMPETENCIES-BASED EDUCATION: A CURRICULAR EXPERIENCE TO FORM A NEW INDUSTRIAL DESIGN PROFILE

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ABSTRACT

There is an evident gap between the quality of the design graduates and what future employers want them to do, it is understood that there is a difference between what they learn in school and what they are required to do in a professional setting. That is why today's designer needs multiple abilities to develop innovative projects in varied contexts. This implies that it is necessary to implement changes in the scope and structure of the design curricula. A methodology was used that helped create a designer profile and a new curriculum proposal with entrepreneurial skills, the capability to identify business opportunities and the ability to manage a design project.

Keywords: Skills, competencies, curriculum, entrepreneurship, strategy

1   INTRODUCTION

Design in Latin America has been taught using the European Design Schools as benchmarks. Similarities have occurred due to the fact that design is a relatively new discipline in Latin America, with young programs in the local academic context [9]. These resemblances can be found in curricula around the world such as the establishment of links between academia and industry, mobility of students and instructors, implementation of a credit-based curriculum, practical training for the students to have an introductory professional experience, instructor qualification and the need for evaluation systems to improve the quality of the programs.

We found that one of the key aspects of the project-based curricula is related to the relationship between university and industry and the development of new business ventures. In countries such as Colombia there is great potential for the education of the industrial designer as a generator of innovation and added value for industries. There should be an emphasis on small and medium sized enterprises, given that these companies are more than 90,2% of the companies in the country, with only 1% of the firms considered large in size [10].

The goal of this paper is centred in the documentation of a methodology to develop a curriculum oriented toward the development of a new designer that, due to his/her education is capable of acting globally, considering local circumstances. This new type of designer can identify new business opportunities, develop them into new enterprises, undertake the conceptual development of a design project and conduct its promotion in a strategic manner. This designer should also promote a different approach to the private sector, in particular to SMEs, because these companies are the majority of the industrial firms in the country and require the most research [op. cit], innovation and development. This proposal is geared towards the strengthening of the identification, development and management of integrated design solutions.

Contemporary market poses challenges never seen before, unstable economies, changing societies with new values, sensitivity to social and environmental responsibility that require a new approach to design [12]. These challenges are new opportunities that have led us to reinvent the designer, as a multidisciplinary professional, adaptable and entrepreneur able to create new business models.

2 DEVELOPMENT OF A COMPETENCIES-BASED CURRICULUM

2.1 Background

The development of the methodology for curricular change that we will present is conducted on the understanding of the importance that the creation of a professional profile has for a new industrial designer, and that this professional needs to be effective in his/her adaptation to the constant changes of the industrial environment and the new demands of his profession.

The definition of Design presented by the International Council of Societies of Industrial Design [7] is the starting point for this exercise. *"Design is an activity involving a wide spectrum of professions in which products, services, graphics, interiors and architecture all take part. Together, these activities should further enhance - in a choral way with other related professions - the value of life"*. This definition has been interpreted as broader vision than the simple generation and materialisation of objects; therefore, it enables us to propose a curriculum that educates a designer with very specific competencies. It is in this way that the methodology to develop professional competencies described in figure 1 begins. The first step of the methodology was the analysis of the current state of design worldwide. Several rankings of design schools were used in this phase, amongst them we can mention one developed by IF Design [8] and Bloomberg Business Week [4], with the design schools they considered the most influential around the world.

After the analysis of the different educational methodologies and curricular contents used by design schools in Europe, Asia, the United States and Latin America, the conclusion was that the specialities developed by the academic programs result from the specific needs of their respective environments. Thus, design education in Latin America and specifically in Colombia, should be centred on the subjects of entrepreneurship and management.
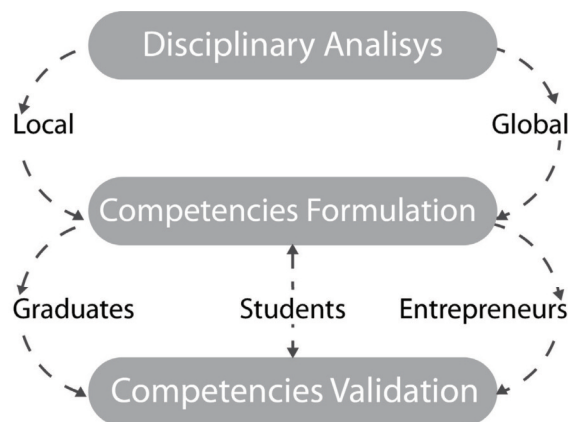

Figure 1. Methodology for the development of professional competencies

An argument to support this choice of focus areas is the fact that only 17% of the designers that have graduated of the program under study are working on their own entrepreneurial ventures and over 70% of those employed by established companies are doing so in management areas [2]. The use of Design Thinking methodologies for innovation and project management to increase the industrial base of the country are the foundation for the new curriculum proposed.

2.2 Professional Profile

Once the local context and the global state of design were analysed, a team discussed and determined which professional competencies should be developed. Three steps were taken into account in order to develop the new competencies. The first step was a disciplinary analysis local and globally to see what others were doing, the second step was the competencies formulation, and finally a validation with graduates, students and entrepreneurs (figure 1). Great importance was given to the multidisciplinary of the team members, as well as to their respective relationships with the discipline of design in the different stages of the educational process. This was the reason to include instructors, current students, graduates and local entrepreneurs and managers with ties to the design discipline. Several definitions

were taken into consideration; [11], [1], [6], [5], these definitions were analysed and it was decided that the one that matched more closely the academic vision of the University was Gallego's. He proposes that competencies are processes that come into play for the resolution of problems and day-to-day activities, seeking to integrate the "knowing how to know", "knowing how to do" and "knowing how to be", considering the specific environment and needs of whoever is applying the competency.

2.3 Generic Competencies

The undergraduate program of Industrial Design at Universidad Icesi has four professional competencies, that directly involve "knowing how to know", "knowing how to do" and "knowing how to be", according to the definition of competency that was adopted. These competencies strive to educate a designer that is capable of conceiving and managing design projects, from the identification of opportunities until their completion and effective promotion, with innovative and sustainable business models that are based in the creativity and dynamic qualities of design, looking to increase the productive base of the country.

This new proposal aims to educate a designer with leadership and a social voice, with the competencies that are required to significantly contribute to problem solving in the discipline of design, as well as to the improvement of economic competitiveness and sustainability in the industrial context. This designer should be able to learn autonomously and stay abreast of the latest developments in the national and international theatres. This professional should be able to establish productive relationships with clients, users and colleagues for the expression of ideas and the transmission and reception of knowledge. Finally, this designer should demonstrate abilities for critical thinking and for the effective presentation and sale of his/her projects.

- Opportunity Identification. To identify business opportunities or market niches, considering the problems and needs of their industrial context.
- Conceptual development of a design project. Materialize innovative and sustainable solutions that have a social and productive impact
- Strategic promotion of projects. Strategically communicating a design that considers the environment and the audience.
- Innovation + Entrepreneurship. Develop new business models based on the dynamic and creative function of design so that the productive base of the country can be increased when new businesses can flourish.

2.4 Specific Competencies

Each generic competency was disaggregated into specific competencies, which makes the process of measurement their achievement more manageable. For example, if we take the generic competency of "Develop new business models based on the dynamic and creative function of design so that the productive base of the country can be increased when new businesses can flourish", we will find that this generic competency should be achieved obtaining the following generic competencies:

- Group management. To use tools for creativity, imagination, motivation for achievement, strategy and interdisciplinary and leadership for the effective management of a design project.
- Business management. To apply knowledge of marketing, negotiation skills, accounting and finance and organisational behaviour for the appropriate management of a design project.
- Legal management. To use legal, regulatory and intellectual property knowledge to write a viable business plan.
- Customer marketing. To use the right tools to characterize the market of the specific customer for the service or product under study.

2.5 Development of the curriculum grid

Having defined the professional profile and the generic and specific competencies, a series of steps are taken to build a proposed new curricular grid. With the new competencies established, a new curriculum emerges conformed by all the new lectures. Afterwards the microcurriculum for each lecture is developed taking into account its main and terminal objectives as well as its contents and strategies all aiming into fulfil the competencies defined (figure 2). The first step is to build a matrix in which we mark the competencies that are developed in each of the courses and to what level. In this matrix (figure 3) we can observe the courses matched to the competencies and it also signals if the

competency is addressed in that particular course to an "introductory", "reinforcement" or "verification" level.

This process of matching courses to competencies results in a number of classes that will be part of the new curricular grid. These courses must be organised in the new curriculum considering the prerequisites for each one of them. With a curricular grid determined, it is necessary to design the micro-curriculum for each course. Each course should comply with the development of competencies at the level that was presented in the matrix through the purposeful arrangement of learning activities according to Biggs [3], when he proposed the Constructive Alignment Model presented in Figure 4.
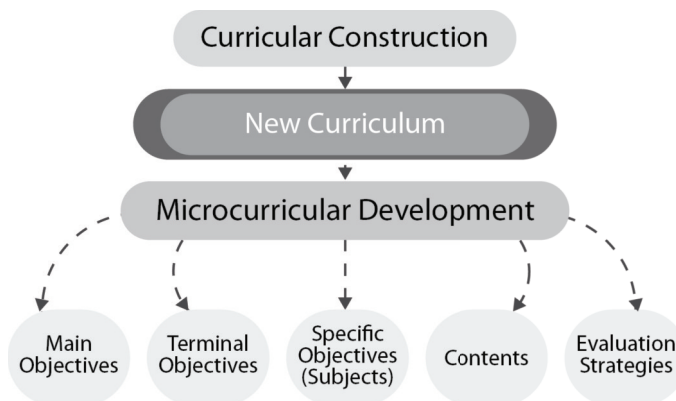

Figure 2. Sequence of steps for the proposal of the new curriculum

Figure 3. Courses – Competencies Cross Matrix

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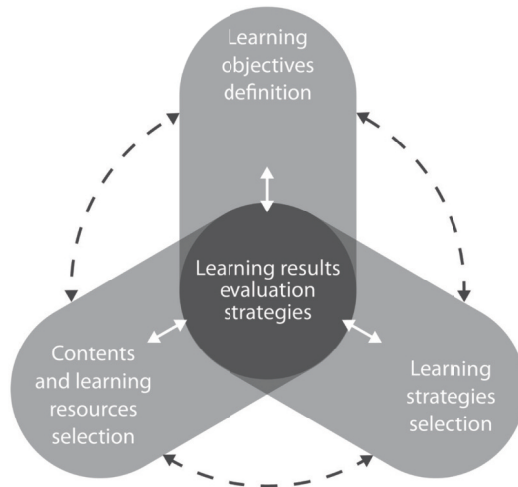
Figure 4. Biggs' Constructive Alignment Model

This instructional design model is based on the notion that students build their knowledge significantly through relevant learning activities, and that the components of the teaching/learning system need to be aligned to this end. Teaching methods, evaluation tools and contents should be aligned in those selected learning activities to ensure the attainment of the learning outcomes.

2.6 Development of micro-curricula

The final activity of this process is the development of the curriculum at a course level, defining its main objectives and disaggregating them into terminal objectives or learning outcomes. The content that will be covered will be then apportioned into lecture's units. Assessment rubrics for each content unit are prepared, ensuring the alignment with the desired learning outcomes (figure 5).
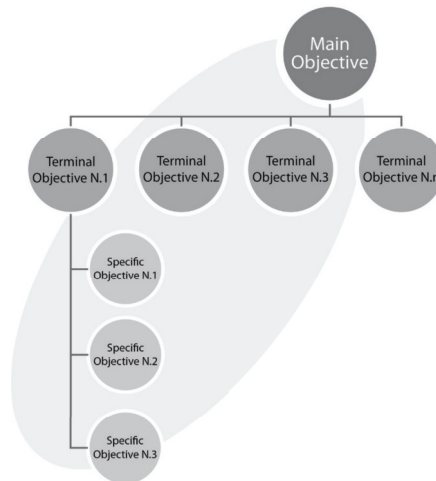

Figure 5. Development of micro-curricula

3 CONCLUSIONS

Each curriculum has its own particularities, depending on the context where it is imparted. The idea of global curricula has some disadvantages because each region's offering of goods and services varies according to its culture and industrial capacity. Today's world requires a new type of designer, an

integral one, one that can adapt to universal environments without losing the local point of view. This is related on a deep level to the way a designer works, because two main characteristics of their employment (either entrepreneurial, freelance or in an established company) are instability and uncertainty.

Industrial Designers today need to develop multiple competencies to finish a design project, negotiation skills to deal with clients and suppliers, problem solving skills, interpersonal abilities and project management capabilities.

The designer's activity is legitimised in interdisciplinarity, through the production of innovation that articulates diverse knowledge areas. This is why the curricular design presented was centred on the competencies gained via the construction of knowledge through solving real design problems that stem from the demands of a globalised market, where the student is able to connect the different areas of the curricula with the participation of diverse disciplinal areas.

Curriculums must be balanced in order to be able to respond to local specific needs such as the entrepreneur aim in the example discussed in this paper as well as developing global competencies such as negotiation and interdisciplinary abilities.

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