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## Design: The continuous construction of competences

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**Abstract:** *This article concerns high education curricula and training of designers. The key question considered by Design teachers and explored in this article is: How can we supply designers with useful and essential skills through training that will allow them to effectively respond to the needs of business environment?*

*To answer this question we present the results of a research designed to focus on market and business needs of design competences, and expectations about designer's performances.*

*We intended to provide further information and discuss the curricula in design higher education. Finally we present a model that allows higher education institutions to design new and innovative higher education curricula in design, able to fulfil company's requirements.*

**Keywords:** *Competences, Curriculum, Design studies, Competitiveness*

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## Introduction

There are several different expressions of concerns from the researchers, professors and higher education teachers regarding the quality of graduate training in Design. If in conferences as the one taking place since 1998 – *Conference on Doctoral education in Design* – designers training problems are tackled and discussed at PhD level, it should also be urged to determine and to question, at bachelor and master levels, the training problems of those professionals that are going to integrate working teams that contribute to good success and good business performance, in this kind of meetings of researchers.

Commercial success is becoming ever more dependent on design or on drawing-up of strategies by business fabric, where design is included contributing definitely to the creation of products that satisfy a wide range of consumers' increasing requirements (Potter, 1999, p. 24).

As Margolin (2010, p. 73) refers, design is an activity that produces new products but, for the hit of the product in the market it is important to understand arising needs.

Currently, it is appropriate to make a few observations that might contribute to improve the designers' training, considering, as Bessa & Vaz (2007, p. 29) refer, that the implementation of the Bologna Process allows to apply sharp system reforms and, therefore, it is drastically changing higher education, polytechnic and university education in our country and in Europe.

In terms of designers' training it is important to think of strengths and weaknesses in terms of acquisition and development of competences, in order to address the structuring of curricula, aiming the training's improvement of the current and future professionals of design, making possible its developments from beginners to experts or specialists. Loyens (1997) advocates the importance of understanding the type of knowledge or of competences a Designer should have, in order to provide substantive input for education/training in design.

Some more active views not only acknowledge the gaps in the acquisition of competences during training but also focus relationship that should exist between the business world and the educational institutions. Hence, Monally (2004, p. 49) underlines the urgency of the updating of the existing courses, for tracking the design's constant development, for helping and including the national competitiveness, identifying design as an essential and targeted activity, to allow a greater flexibility and the exchange of tasks and knowledge, foreseeing the performance of tasks in teams grouped according to several abilities and skills.

Looking at design as one of the main factors that influence the cultural and image identity of a country, Morelli (2011, p. 90), highlights the important role of designers at technological and social innovation level contributing significantly to the improvement of the aesthetic quality and technical quality of the products and materials.

Designers begin to be required both to dominate a broad range of knowledge and capabilities, and to demonstrate competences that, to date, have not been sufficiently valued in the training of these professionals. But these are taken into account by the business fabric as essential for the incorporation of these professionals in the companies.

To that end, the need to understand how higher education training in design equips graduates with the competences needed for a good professional performance was considered Subject of Study.

If, in terms of general aim, the need to define the competences' profile that the labour market requires can be identified, currently, and in the future until 2015, in specific terms, the Designer will be given the answers for the following objectives:

- Identify the higher education teachers' point of view in terms of future acquisition, development and needs of several competences for the performance of graduates in Design;
- Analyse the vision of graduates in Design in terms of acquisition and development of competences throughout the received academic education;
- Understand the approach of graduates in terms of the importance and development of competences acquired during training aiming their professional performance;
- Analyse the perception of the graduates in Design, in terms of the future (until 2015) importance and need of several stated competences;
- Examine to what extent the higher education institutions of Design contribute to their students acquisition and development of several stated competences during their course;
- Analyse the correspondence between the designers and higher education teachers perspectives about the competences that have less or more importance in terms of need, in an 2015 horizon;
- Identify some measures that can be taken into account in the structuring of curricula in Design, to the level of development and acquisition of designers competences; measures channelled to meet the needs of business world.

#### Competences: Designer's Competences

The concept of competence has been used with multiple meanings, reflecting different perspectives and subject areas as in psychology, education, politics, management, and others.

According to Cabral-Cardoso, Estêvão & Silva (2006, p.11), generally, the concept of central competences is used in strategic management to name the collective learning that allows the company to develop a clear set of outputs that can help it assuring competitive advantages.

When setting competences as attributes of an individual, with its knowledge, attitudes, abilities and capabilities that affect the performance of the individual or serve the objectives of production of organizations, the link between the skills domination and the professional performance becomes really clear.

However, often, the competences are linked to a higher performance or to a qualified performance (Cabral-Cardoso, Estêvão & Silva, 2006, p.11).

The concept of competence has been the object of many different analysis and approaches, nevertheless, all dealing with personal and professional qualities or attributes.

Boyatzis (1982, p.45) does an approach to the concept of competence identifying it as a feature, or attribute, needed for a professional to perform its functions in an efficient, effective and competent way.

According to Cabral-Cardoso, Estêvão & Silva (2006, p.12), some studies that were carried out, in agreement with the perspective that recognises that the competences represent an addition to the value and determine the professional performance, usually indicate the strong focus on performance and effectiveness of the education-training system. Thus, these refer that the objective of the training will be to give

individuals varied and variegated competences, turning them able to develop, in a competent way, any task or function assigned to them, and that at the same time allow a better adaptation and appropriateness of their operating posture to the position hold.

In a society where the globalization, the technological developments and the developments in information and communication technology stand out the value of the human resource, the concept of education and training emerges in parallel with the gradual and growing awareness of the importance of procurement procedures, development and update of knowledge and of skills (Dercy e Tessaring, s.d., p. 17).

In a study of Aneca (2001) categories of competences are adopted, such as: transversal and specific skills that are part of the academic and professional profile of the designers.

Among the specific skills, the study of Aneca (2001, p. 433) shows the existence of subgroups of competences, being these subject knowledge and expertise, professional skills, academic skills and other specific skills, as the acquaintance and domain of specific techniques.

In the group of transversal skills (generics), the Aneca (2001, p. 531) lists three subgroups, namely instrumental, personal and systemic competences.

If the study presented by Aneca, in terms of the implementation and processing of data obtained from the questionnaires to entrepreneurs, designers and professors or higher education teachers, refers the groups of competences listed above, around the description and identification of professionals profiles of designers in the various areas of expertise, this study refers one other group of competences that, in the current context, may not be left out: competences of corporate nature. Thus, in this study is stressed that the profile of the designer must have knowledge of the economic dynamics and of the economic reality, including the importance of Design at this level: *“Design improves the policy of innovation and of communication of the company, (...) the global results of companies, (...) is a job that generates value at a macroeconomic level, (...) improves the competitive level of a country with respect to the other countries (...) favours the transfer of technology (...) and can help restructure an economic sector within a regional economic policy”* (Aneca, 2004, p. 422). In this definition some aspects are underlined that are presented to justify a professional profile of a Designer to train. From this, in fact, one can draw a suggestion for a classification of entrepreneurial competences.

Regarding the definition of competences in Design or of designers, a number of definitions arise, either by different researchers, or by international and national associations.

To define the skills of Design is glossing over the scope and the performance of a job or a professional, over the different fields of intervention and over the applied methods by designers for the planning and accomplishment of their projects. Currently, the term Design is used to define the whole job, and in global terms, designer is used to characterise and identify the professional that engages this activity.

About the competences of the designer, Potter (1999, p.20) outlines some skills or behaviours that, in his opinion, should be dominated by designers. Thus, this professional must have high responsibility in the supervision of the ongoing work, providing instructions for operating. The Designer must, then, be totally aware of the problem raised, must thoroughly analyse it, classify it and address all the available and given information, adding also the ability to judge and criticise with great imagination.

Furthermore, Potter (1999, p. 24) underlines the designer capacity for decision-making referring that the final decisions affect, vitally, the aspect, the appearance of the work that, whenever they bear this with special care, they always express the functional and circumstantial environment.

In each phase of Design the author refers that the debate, the questions and the arguments should make its presence felt so that the final product that derives be marketable towards the customer.

Hence it is understood that the designers developed competences and abilities to interpret the cultures of the user, needs and behaviours to be able to translate them in terms of industrial supply (Verganti 2003) quoted by (Nicola Morelli, 2011, p. 95)

Still about a statement of specific competences in Design, non-differentiated in specific areas of expertise, Costa (2003, p.97) refers that the designer must be able to implement ideas and projects in an original way, through forms that contain meaning. For the author, the designer is the interpreter of the structure, the strategy, the management and of the company's personality. It is also strategist and is capable of directing its work with the best intention; it is a communicator and, therefore, its work is exactly to convey and to implement an identity in the mind of the public.

In his perspective for an approach, Costa (2003) defends that the designer must, primarily, be a person that communicates well and has entrepreneurial spirit, it must think on Marketing at the time of selling its own work, mastering some essential principles of that area, and it must be able to present its arguments to customers. This author enhances an idea that aims the adaptation of this professional to the current context of globalization, of high business competitiveness, that supports itself in a strong designer's training in management and commercialisation techniques.

The designer can't, however, neglect the concern about social, human, aesthetic, environmental, ecological and political factors during the creation, achievement and accomplishment of ideas and projects of Design. Team work ability with groups of people of many different areas and cultures is also a determinant factor for the characterization of a good professional of Design (Papanek, 1995, p. 10).

The designer works for a vast population universe, addresses a broad public of consumers and not just an elite and, thus, the designer has to be able to devise objects of Design that not only match their designed, projected and conceived functions, but also can cover and meet the aesthetic and functional needs of a high and diverse number of consumers.

The designer, when worried about understanding and establishing the structural, organizational, functional, expressive and economic relations, has always to bare in mind the interests and needs of final users that are the main agents or targets of its products, in the market, under the current concerns with global sustainability and environmental protection. Within the competences that are inherent to designers, the capacity for critical reflection and the monitoring of market developments and technologies are included (APD, 08/11/2008).

According to the "Associação Portuguesa de Designers" (Portuguese Designers Association), to the designer, in the course of its work, competences are assigned: competences as know how to analyze the existing constraints, namely budget, deadlines, the nature of the problem and of its solving stakeholders, competition and markets, applicable legislation, available resources and means of productions. And the designer must know how to integrate these constraints in order to determine the best solution.

So, the designer must be understood as a professional with the ability to contribute for the chain of production, included in teams formed by other professionals, specialists and technicians, during all the process of strategic planning and programming of products, always co-responsible for the implementation of productive policies, in different sectors or existing departments, in finding the best solution or the best procedure and not only the definition of final or formal aspects of a system (APD, 08/11/2008).

Still searching for a definition of competences of designers, some definitions are found that are oriented towards the attitude of the designer as a leader of a process within the organisations concerned. Thus, Totterdill (2002, p. 14) refers that a designer, when responsible for a project, must be able to lead people involved in the process, from customers, to technical specialists, to consultants, managers, etc.. It must know how to manage the time and the customer network and also the organizations. The author notes the vision that ascribe the leaders of Design the responsibility to help companies to clear, define and organize their desires, plans and mid-term aims. In this position, the designer must also be able to, as a team, define or develop the strategies that allow the realisation of the wishes of the several parts involved, of the company and of the consumers. Following this definition of competences of the leaders of Design, the author lists those that according to him are the main competences to request this professional. These are: have a future vision, develop strategic aims, direct the investment of Design, manage company's reputation (corporate identity), develop, implement and accomplish the innovation and work to lead the Design.

In the study developed by Totterdill (2002, p. 66), several competences linked to the fulfilment of several objectives, or to reach diverse purposes are also identified. By this means, the competences are grouped to serve globalization, to allow a quick answer, to have added value, direct sales, to allow the expansion of the customized consumption and the achievement of technical products.

Having been described the diverse competences of the designers, either by several authors and researchers, or by various national and international institutions of Design, efforts were made to identify the referred competences as being business-driven and professional-driven; competences now presented in Table 1.

Table 1 - Identification of entrepreneurial and professional competences

Competences	Author
1 - Ability of analysis and understanding of the features and functioning of the company/customer, its market strategies and business objectives and objectives of profitability	- Costa - ICSID
2 – Ability to Integrate the reality of the company/customer in the global and specific market context	- APD - ICSID
3 - Systemic view of the company	- Costa - BEDA
4 - Competence to establish market strategies in the scope of projects that develops	- BEDA
5 - Competence in the selection of market segments and development of an appropriate image of product/brand/company	- Costa
6 - Capacity to interpret socio-economic tendencies and the behaviour of consumers	- IEFPP - Costa - Munari
7 - Ability of analysis of constraints and definition of criteria to take into to account within the company's business context	- Potter
8 - Capacity to communicate to the company/customer with effectiveness, orally or by writing, the proposals, the briefings, etc.	- ICSID - BEDA - APD
9 - Competence to provide the company/customer clear information regarding style, functionality, security and other aspects inherent in the specific nature of its intervention	- Costa
10 - Capacity to work/project considering the international context	- ICSID
11 - Capability to view and communicate visually the information	- ICSID - BEDA
12 - Ability to fulfil the defined deadlines and budgets	- BEDA
13 - Competence in the guidance, in the construction, building or production of the product of Design	- BEDA
14 – Teamwork ability, coordinate and/or work in multidisciplinary teams	- ABD - Potter - Gondim - APD - ICSID

Bearing in mind the collection and identification of several previously presented competences, according to various authors and institutions, a research work was done to test and understand the strengths and weaknesses, and the main gaps, of the current training of designers that are now presented and described.

## Methodology

The achievement of the study implied a series of operations of data collection and data processing. The collection of primary information was made via questionnaire addressed to graduates and professionals of design of the expertise areas of Textile Design, Fashion Design, Equipment Design and Interior Design. The whole process of completion and conception of tools to collect information has resulted from the

research, analysis and processing of information collected during the previous bibliographic review, according to the described method by Hill & Hill (2005).

The universe of designers of the expertise areas in analysis was defined from a database of APD<sup>1</sup>, AND<sup>2</sup> and CPD<sup>3</sup>, having been identified a total of 200 professionals. The questionnaires were distributed to individuals of the universe through email and the answers were received the same way. The sample, composed by 70 designers, that represent 35% of the universe, was obtained by applying the technique of convenience sampling, having been taken into consideration for the study those that, after contact, showed themselves willing to collaborate.

Respondents were questioned about the level of acquisition, development or importance of listed business and professional competences, by the use of a 1-to-5 scale, where 1 corresponded to “weak level” or “absent”, 2 corresponded to “insufficient level”, 3 corresponded to “average/medium level”, 4 corresponded to “good level” and 5 corresponded to “high level” or “full acquired or dominated”. The assessment of the acquisition level of competence took into consideration three different contexts: at the end of school (graduation), during the professional experience and in medium-/long-term (2015 horizon).

The questionnaires have been subject to analysis and statistical processing, using the programme SPSS.

This study resulted in the elaboration of a model that intends to serve as a basis for the structuring of the new curricula of the BA and MA courses in Design.

## Presentation and analysis of results

This study is based on a sample of 70 designers, 57.8% of whom are male.

Referring the year in which they completed their courses, 71.8% graduated between 2000 and 2008, and 19.7% between 1995 and 1999.

When questioned about their professional background, 60% of the respondents stated that they worked in private companies, 11.7% in the public sector and 28% did not answer the question.

The obtained data by questionnaire were stored in a SPSS file and later statistically analysed. The analysis of the psychometric properties of the questionnaire was based on analysis of internal consistency and validation of the questionnaire. It was drawn up with the use of the coefficient Cronbach's alpha as a measure of internal consistency (reliability) test that assesses whether the questionnaire is able to obtain similar results from the same respondents in similar circumstances, but at in different moments and of factor analysis as a form of validity of construct and content. The questionnaire validity refers to the fact of assessing if the questionnaire measures what is supposed to measure, in a repeatable and consistent way. A good internal consistency must go above an alpha of 0.80. (Hill & Hill 2008).

The general scale and the 14 competences (items) in the three different contexts (“on school completion”, 0 “during experience...” and in “medium/long-term”) present highly significant estimated values of reliability and validity.

We conclude that the questionnaire has satisfactory internal consistency reliability, as 14 of the 14 items had  $\alpha > 0.8$ .

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<sup>1</sup> “Associação Portuguesa de Designers” (Portuguese Designers Association)

<sup>2</sup> “Associação Nacional de Designers” (National Designers Association)

<sup>3</sup> “Centro Português de Design” (Portuguese Design Centre)

The global Cronbach's  $\alpha$  for the questionnaire about business and professional skills of designers was of 0.909. When estimated at entrepreneurial/professional competences in the three different contexts, the Cronbach's  $\alpha$  was of 0.935 for "on school completion", 0.958 for "during experience..." and of 0.847 for "medium/long-term", thus obtaining very good results. By the following three tables it can be concluded that regarding the values of Cronbach's  $\alpha$  if one of the items is deleted, they all will be a value below the  $\alpha$  value of the global scale. Hence all the items were well-formulated.

That is, each item is correlated on average with the remaining items.

**Table 2 – On School Completion**

	Mean	Std. Deviation	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A1.1	1,6667	1,44168	,768	,928
A1.2	1,7536	1,43901	,740	,929
A1.3	1,3913	1,40605	,667	,931
A1.4	2,0580	1,38143	,591	,933
A1.5	2,5797	1,20545	,824	,927
A1.6	2,3478	1,65233	,719	,930
A1.7	1,7101	1,42562	,641	,932
A1.8	2,6087	1,25109	,693	,930
A1.9	2,6377	1,32810	,780	,928
A1.10	2,5362	1,53948	,771	,928
A1.11	3,5797	1,33291	,549	,934
A1.12	2,8696	1,14934	,547	,934
A1.13	2,7391	1,30217	,697	,930
A1.14	3,1739	1,37152	,653	,931

**Table 3 – During professional experience**

	Mean	Std. Deviation	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B1.1	3,6667	1,17156	,644	,958
B1.2	3,7536	1,03477	,793	,955
B1.3	3,6522	1,23462	,649	,958
B1.4	3,3043	1,10219	,761	,956
B1.5	3,6232	1,21391	,891	,953
B1.6	3,6667	1,25636	,671	,958
B1.7	3,4348	1,06382	,719	,957
B1.8	3,7101	1,23790	,845	,954
B1.9	3,6812	1,23065	,893	,953
B1.10	3,3478	1,17356	,777	,955
B1.11	3,9565	1,28835	,815	,954
B1.12	4,0580	1,18674	,863	,953
B1.13	3,6667	1,15894	,788	,955
B1.14	4,1739	1,14989	,712	,957

**Table 4 – Medium-/ long-term**

	Mean	Std. Deviation	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
C1.1	4,7391	,58542	,496	,837
C1.2	4,8406	,44136	,518	,838
C1.3	4,4348	1,06382	,735	,821
C1.4	4,5072	,90136	,485	,841
C1.5	4,8261	,61731	,714	,824
C1.6	4,7681	,73053	,351	,847
C1.7	4,2464	,96109	,494	,842
C1.8	4,8551	,42962	,736	,829
C1.9	4,8116	,60087	,652	,828
C1.10	4,7971	,50234	,554	,835
C1.11	4,8261	,45233	,238	,849
C1.12	4,9130	,33162	,404	,844
C1.13	4,9275	,31243	,500	,841
C1.14	4,9565	,20543	,551	,843

The analysis of variance allowed realizing the significant differences between the classification averages of the several competences in the three contexts: acquisition during academic learning; acquisition or development during personal and professional experience; tendency for medium-term development (2015 horizon). As the analysis of the designers' answers, also the current analysis tried to facilitate data understanding and data analysis by presenting a graphic for each group of competences with classification's averages in the three contexts.

Table 5 – Averages and deviation pattern of the designers' answers about acquisition, development or importance of Business and Professional skills: A – During University/school learning; B – During professional experience; C – In a 2015 horizon

	Competências	Average			Deviation Pattern		
		A	B	C	A	B	C
Entrepreneurial and Professional Competences	1.1 Ability of analysis and understanding of the features and functioning of the company/customer, its market strategies and business objectives and objectives of profitability	1,67	3,67	4,74	1,44	1,17	0,50
	1.2 Ability to Integrate the reality of the company/customer in the global and specific market context	1,75	3,75	4,84	1,44	1,03	0,44
	1.3 Systemic view of the company	1,43	3,76	4,57	1,41	1,07	0,74
	1.4 Competence to establish market strategies in the scope of projects that develops	2,09	3,35	4,57	1,37	1,03	0,72
	1.5 Competence in the selection of market segments and development of an appropriate image of product/brand/company	2,58	3,62	4,83	1,21	1,21	0,62
	1.6 Capacity to interpret socio-economic tendencies and the behaviour of consumers	2,38	3,72	4,84	1,64	1,18	0,44
	1.7 Ability of analysis of constraints and definition of criteria to take into to account within the company's business context	1,71	3,43	4,25	1,43	1,06	0,96
	1.8 Capacity to communicate to the company/customer with effectiveness, orally or by writing, the proposals, the briefings, etc	2,61	3,71	4,86	1,25	1,24	0,43
	1.9 Competence to provide the company/customer clear information regarding style, functionality, security and other aspects inherent in the specific nature of its intervention	2,64	3,68	4,81	1,33	1,23	0,60
	1.10 Capacity to work/project considering the international context	2,54	3,35	4,80	1,54	1,17	0,50
	1.11 Capability to view and communicate visually the information	3,58	3,96	4,83	1,33	1,29	0,45
	1.12 Ability to Integrate the reality of the company/customer in the global and specific market context	2,87	4,06	4,91	1,15	1,19	0,33
	1.13 Competence in the guidance, in the construction, building or production of the product of Design	2,74	3,67	4,93	1,30	1,16	0,31
	1.14 Competence to establish market strategies in the scope of projects that develops	3,17	4,17	4,96	1,37	1,15	0,21

Thus, it is shown that this group of competences is acquired in the learning context in a clearly insufficient level, data that 28.6% of the competences are acquired at an average level less than 2, 57.1% in an average level less than 3 and only 14,3% reach an average level of acquisition bigger than 3 and less than 4.

The analysis of the average acquisition of the business skills through professional practice reveals that the designers develop these competences dominantly in the working context, but with an average level of domain between 3.35 and 4.17, the superior averages at 4 are only 14.3% of the listed skills.

As far as anticipation of the need of domain of the business and professional skills is concerned, most of the respondents suggest that the tendency will be, in medium-

term, towards the imperative of excellence since the average of the levels of all the competences falls within the range of 4.25 and 4.96; only 7% is under 4.5.

## Discussion of the results

The difference recorded between the averages of acquisition, or of development, of business and professional competences, at school or in business context, show that higher education training in design in Portugal does not provide these competences at an appropriate level. Although some competences as, for instance, the “Ability to Integrate the reality of the company/customer in the global and specific market context”, are typically acquirable according to the professional experience, others, as the “Capacity to communicate to the company/customer with effectiveness, orally or by writing, the proposals, the briefings, etc.” or the “Capacity to interpret socio-economic tendencies and the behaviour of consumers” can be a target for school learning. This study shows that the competences that allow the integration of graduates in the labour world, and the competences that allow them to achieve their roles in the company with a good level of performance, demonstrate significant deficit in the set of competences that define the profile of the graduate in design.

As far as differences between the levels of acquisition of competences at the end of courses and the levels with which designers will be confronted in the 2015 horizon are concerned, according to the respondents perspective, these play a differential even more significant. In the 2015 horizon, if the significant increase of the level of requirements for performance in each of the listed competences is accomplished, and the low level of adequacy of education regarding business and professional competences is maintained, the future graduates in design will face serious difficulties in integrating the labour world.

### *Model of Curricula Structuring*

After the study conducted and the information about the levels of domain of the competences in design, according to the view of higher education teachers and professors, and of professionals extracted, the concept of a model that supports the structuring of the curricula of the design courses aiming its adequacy to the requirements that the design professionals will face in the 2015 horizon was made.

The model, of indicative nature, should contribute, mainly, for the informed reflection about forward-looking structural and specific amendments: fundamental to assure a good performance of the future designers. Thus, more than create a bedding for the structure of new courses or the restructure of existing courses, the model aimed to offer a reflexive support that, based on the analysis of the collected information during the current work, makes it easier for the groups of teachers and professors, responsible for the courses, to reach a decision about the profile of the graduates at the end of the course.

Therefore the model was built based in a set of assumptions.

The first assumption reflects an actual structure of higher education in BA and MA. Thus, the basic and structuring competences of the design professional profile should be acquired during BA. The competences more complexes are framed by the MA, although, when they are structuring competences, their acquisition should begin in BA. The competences that involve professional experience for their full acquisition are incorporated in the business context domain. These competences can be fully acquired either as they enter the world of work or through doing projects in companies leading

to the accomplishment of the dissertation, expected in the 2<sup>nd</sup> year of MA. PhD, due to its orientation towards I&D activities, was not taken into account.

The second assumption to build the model was that this should be focussed in the levels of demanded performance in the 2015 horizon, taken from the integrated vision of all the respondents, teachers, professors and designers. The obtained answers' structure showed that professionals are more divergent among themselves than the teachers. Such aspect may be explained by the fact that designers' professional practices occur in different business and sectional environments, therefore with diverse competitiveness demands; while teachers, although with differences between the profiles of the courses they teach and the profiles of the framing Schools, have analogous work logic, framed by similar objectives: the higher education training, graduate and post-graduate in design. The vision that the teachers demonstrate is, plainly, influenced by worries about integrated learning of design students. On the one hand, the designers during their professional practice lose, perforce, the perspective about where the role of school ended and the result of the professional and personal experience began and, mainly, in which pre-acquired competences they based the acquisition or the development of their professional competences.

Thus, the option to consider the two integrated visions emerged as a way to encompass the answers of the people responsible for the training and the recipients of this same training. On the other hand, and in spite of the registered differences, in average, both groups' perspectives corresponded: all the competences are needed and the demanding standard tends toward significantly increase in the near future. Attesting to this fact, the obtained answers placed the required performance levels for all competences between 4 (Good) and 5 (Very good), what represented significant upgrade.

The third assumption that results from the first and the second considers that, once acquired, the competences should be maintained, if possible deepened, even if the business or professional environment is not ripe. Thus, in the cases where there was loss or reduction of the level of domain of a given competence during professional life, its maintenance or deepening is taken into account in the model as training domain during life, framed in advanced short-term courses of study.

The model was then build for a group of competences defined during work, being each competence allocated to the higher education training in BA and MA, to the short-term training and to the training in business context.

The competences appear associated to additional information, since it is considered useful for the user to outline the present/past weaknesses and the future critics. Thus, the competences that registered higher (>4.75) average levels of performance requirement take a colour and the ones that register averages between 4 and 4.75 assume a different colour. The competences which acquisition was considered deficient during academic training (<2.5) are marked with a red symbol. In the performed factor analysis, the structuring competences of the explaining factors – extracted from the data of the questionnaires addressing the teachers, professors and designers – were indicated through specific symbols, properly identified in the legend of the model.

Thus, the use of the model was made easier because all aspects that can be considered important in the structuring or restructuring of curricula of courses of design are in evidence: competences that urge to be considered and that have been weaknesses (red icon), the competences that need to be reinforced with urgency because they are critic in the 2015 horizon (on a yellow background), those that should be a learning target and an ongoing reinforcement (bachelor, master), again and so

forth. The interpretation of the model works because it is easy and direct. The graphic representation of the model is presented in the following tables.

<b>Legenda</b>	
	Valor médio de competência exigida no horizonte 2015 que varia entre 4,00 e 4,75
	Valor médio de competência exigida no horizonte 2015 que varia entre 4,76 e 5,00 (excelência)
	Competência cuja aquisição no âmbito da formação superior acusou um valor médio inferior a 2,50 (fraco ou insuficiente)
	Competência estruturante de um factor explicativo extraído através da análise factorial aplicada à informação recolhida junto de docentes do Ensino Superior em Design
	Competência estruturante de um factor explicativo extraído através da análise factorial aplicada à informação recolhida junto de designers.
CACD	Curso Avançado de Curta Duração

**Legend**

Average value of required competence in 2015 horizon that varies between 4.00 and 4.75

Average value of required competence in 2015 horizon that varies between 4.76 and 5.00 (excellence)

Competence which acquisition scope within higher education training has an average value inferior to 2.50 (weak or insufficient)

Structuring competence of an explaining factor through the factor analysis applied to the collected information among the Higher Education teachers in Design

Structuring competence of an explaining factor through the factor analysis applied to the collected information among the designers

Advanced Short-Term Course

*Table 6 – Identification of the business and professional competences listed in the proposed model*

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- 1.1** Ability of analysis and understanding of the features and functioning of the company/customer, its market strategies and business objectives and objectives of profitability
  - 1.2** Ability to Integrate the reality of the company/customer in the global and specific market context
  - 1.3** Systemic view of the company
  - 1.4** Competence to establish market strategies in the scope of projects that develops
  - 1.5** Competence in the selection of market segments and development of an appropriate image of product/brand/company
  - 1.6** Capacity to interpret socio-economic tendencies and the behaviour of consumers
  - 1.7** Ability of analysis of constraints and definition of criteria to take into to account within the company's business context
  - 1.8** Capacity to communicate to the company/customer with effectiveness, orally or by writing, the proposals, the briefings, etc.
  - 1.9** Competence to provide the company/customer clear information regarding style, functionality, security and other aspects inherent in the specific nature of its intervention
  - 1.10** Capacity to work/project considering the international context
  - 1.11** Capability to view and communicate visually the information
  - 1.12** Ability to fulfil the defined deadlines and budgets
  - 1.13** Competence in the guidance, in the construction, building or production of the product of Design
  - 1.14** Teamwork ability, coordinate and/or work in multidisciplinary teams
-

Código da Competência	Categorização	Enquadramento de aquisição da competência			
		1º ciclo	2º ciclo	CACD	Contexto empresa
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					
1.10					
1.11					
1.12					
1.13					
1.14					

Code of Competence | Categorization | Acquisition framework of competence |  
BA | MA | CACD | Business Context

Figure 1 – Model for application to the business and professional competences

## Conclusions

Gradually, the entrepreneurs value more the fact of being able to count with the incorporation, within their organizations, of the design professionals that participate in the definition of strategies in collaboration with multidisciplinary teams.

The designer will be demanded not only the technical competences, the domain of methodologies for the enforcement and accomplishment of projects, but also the knowledge of methods of production of the products it conceives. There will also be required the domain of competences that are connected with the study, the analysis and the knowledge of markets, of strategies of marketing and of brand logic analysis, as

well as all the competences that are related to the integration of this professional in the business world and that reflect in the understanding of the organizational structure and of the functioning of the company where it is incorporated.

The designers-respondents point out that the biggest gaps in their school learning are connected with the domain of business and professional competences that represent the relationship designer–company/organization: from the presentation and development of the idea, based in market studies and in tendency studies, till the elaboration of specifications and monitoring of all the process of projects' implementation.

The competences that are in fact related to the ability of analysis and understanding of the features, structure, functioning, as well as of the strategies and constraints of companies and clients/customers, and those that entail the knowledge and study of business context, its markets, its tendencies and behaviour of consumers for which projects are developed, are referenced by the main international organizations linked to design, as ICSID<sup>4</sup> and BEDA<sup>5</sup>, and by several researchers. These competencies are pointed as those that are not acquired or are little developed in the academic context, and become focus of concern in the context of designers' training.

As a consequence, the initial preparation, as far as business and professional competences are concerned, should be deepened in higher education, because this aspect is important to companies that increasingly look to integrate design graduates in their teams, to face the ever high and growing competitiveness of the global market.

The employability of the future graduates depends on their domain of competences that are currently gaps in their training. Really, until today, it is through professional experience that the designers see themselves facing the business realities and it is only during the practice of the job that they develop competences related to knowledge of companies, of its organizational structures and markets, of marketing, etc..

It is important, however, to take into account that the school is neither able nor will be able to correspond to all the learning requirements of the students, future graduates in design. If four year of learning is insufficient, the reduction of the period of studies to three years worsens the situation. It is obvious that the spirit of Bologna does not involve the reduction of that period, but does involve the establishment of conditions so that many, preferably all graduates, continue their studies and complete MA. Several competences, necessarily, must be developed during MA learning, because they have to be structured from prior acquired competences or entail maturity/experience in the domain of methodologies and/or technical or mental processes.

Business and professional competences, due to what they imply at the level of domain of the specific nature of the organization, can only be fully dominated in entrepreneurial context. Even so, the appropriate training of graduates in this domain can't be neglected in higher education that tackles the need to develop strategies of teaching/learning that allow students to know the entrepreneurial reality.

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<sup>4</sup> International Council of Societies of Industrial Design

<sup>5</sup> Bureau of European Design Associations

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