



REFLECTING ON THE EMPLOYABILITY ADEQUACY OF COMPETENCIES TAUGHT IN DESIGN HIGH EDUCATION SYSTEM

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Abstract

This paper exposes a clear reflection about design competencies, addressing the ones academia finds necessary to be acquired by design students and the ones the market requires from designers. Besides the identification of those competencies an analysis is done considering the similarities and the differences between these two "worlds." Finally, the paper proposes a set of recommendations on how to work into education a set of competencies that better match the needs both students/designers and the markets.

Keywords: design education, design competences, design knowledge, employability competences, knowledge sharing

1. Introduction

Education in Europe began with the foundation of schools, and evolved into the model of the medieval university first formalized in Bologna in 1088. That model continued to develop into the 20th century, a noteworthy period in which the Higher Education system became available to more than just elites, i.e. education was democratized. Currently, the EU aims to achieve a 40% student graduation rate by 2020 (European Commission, 2013, p. 12). This ambition is related to the efforts being made to affirm the Europe of Knowledge, one more modernized and better suited to face the challenges of a globalized world, in constant change and with significant social, geo-political, economic and environmental problems. As a way of fulfilling its goals within the EU, which brings together different countries with diverse social, cultural, economic and political systems, it was decided in 1998 (Sorbonne Declaration) to find a way of standardizing the System of Higher Education, making it equivalent in terms of degrees and diplomas among all countries. In 1999 the declaration of Bologna was born, establishing goals for student mobility as a way to accelerate the sharing of knowledge, foment research, and to promote greater and better integration of students in the market. It also established itself as a pillar of this Europe of Knowledge and lifelong learning, which will make it possible to fight unemployment, raise the skills of the labour force and facilitate the promotion of social inclusion. Furthermore, it will allow a holistic knowledge as we learn how to learn and to develop knowledge in a continuous way (Tedesco, 2008). To understand how in general Higher education systems are working competences and the way it serves or not the markets (in southern societies) is one of the aims of the reflection we make in this paper. This is central so one can rethink programs curricula and the courses to be taught. To do so it is important to understand the Europe of Knowledge context; the role of research in design education; the model of design education that better suits societies' need - generalist vs specialized and finally to have a view on the competences being worked by education systems and the ones the markets aspire to contract.

2. The Europe of Knowledge context

To guarantee the affirmation of a Europe of Knowledge “(...) European graduates need an education that enables them to work together in a coherent way as global citizens, committed and active, thinkers as well as economic agents in the ethical and sustainable development of our societies” (European Commission, 2013).

To achieve this desideratum, Europe had to introduce a mechanism that would allow analysis of the qualifications of its nations, to create an equivalence of certificates and diplomas. This mechanism is the European Qualifications Framework (EQF), a system that integrates eight European levels of reference, allowing, through the description of the nature of knowledge, skills to be acquired and their associated abilities, to compare the different qualification systems of European countries. The EQF was adopted in 2008, and after determining the types of qualifications and their relative value for each country, national qualification matrixes were created, the so-called NQF (national qualifications framework).

Table 1. European Qualifications Framework (EU website)

EQF Level	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking), and practical (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is described in terms of responsibility and autonomy.
Level 1	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context
Level 2	Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study, adapt own behaviour to circumstances in solving problems
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5[1]	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problem.	Exercise management and supervision in contexts of work or study activities where there is unpredictable change, review and develop performance of self and others

Level 6[2]	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialized field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups
Level 7[3]	Highly specialized knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research	Specialized problem-solving skills required in research and/or innovation to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches, take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
Level 8[4]	Critical awareness of knowledge issues in a field and at the interface between different fields Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialized skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

SOURCE (EU website (European Commission, n.d.))

Notes: Compatibility with the Framework for Qualifications of the European Higher Education Area
The Framework for Qualifications of the European Higher Education Area provides descriptors for cycles. Each cycle descriptor offers a generic statement of typical expectations of achievement and abilities associated with qualifications that represent the end of that cycle.

The descriptor for the higher education short cycle (within or linked to the first cycle), developed by the Joint Quality Initiative as part of the Bologna process, corresponds to the learning outcomes for EQF level 5.

The descriptor for the first cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 6.

The descriptor for the second cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 7.

The descriptor for the third cycle in the Framework for Qualifications of the European Higher Education Area corresponds to the learning outcomes for EQF level 8.

However, this matrix resulted in a higher education system organised into three cycles - 3 of graduation; 2 of master (or 4+1 integrated master) and 3 to 5 PhD -, implying, as mentioned by Bianchetti (2010), a totally different academic organization, since the demand for reflection on the context of the real world is more acute and the proposed teaching model was for a shorter period of time.

Thus, the challenge is to train future practitioners in less time to have a heightened ability to reflect and act. This task is facilitated by the impressive development of information technologies that makes it easier to exchange information and facilitates communication among individuals, allowing them to share and exchange knowledge (Gouveia, 2003). Also, a reliance on life-long learning works as a method to fill this gap, allowing the time for acquisition and generation of knowledge to be lengthened. Tedesco (2008) advocates that in this context, the acquisition of knowledge and competences must be based on education that foments cultural openness and that works within the social consciousness, enlarging the goals of student's qualifications beyond the academic, toward fulfilment of social goals.

This expanded training presupposes that students will acquire relational competences that sustain a better dialogue and co-construction of knowledge benefiting societal development. Therefore, it is important to consider the vision of Dias et al. (2016), who suggest the necessity of creating, at the Higher Education level, and particularly in design education, interdisciplinary environments adjusted to learning based on problems and its quest as well as in critical assessment adjusted to the development of knowledge share nets.

3. The role of research in design education and its implications in the design of competences

Today, it is impossible to educate designers without teaching them how to do research. In fact, the research process has several similarities to the design process. Currently it is fundamental to create a research culture in academia, one that supports students in their search for information and knowledge and their ability to think, connect and transform data. Still, research on education, stimulating continuous pedagogical critiques and reviews, that proposes alternatives to the current problem/solution model might include the research of problems and posing questions to address problems.

Moreover, the deepening of a research culture focused on social and political themes might allow students to operate in a much better defined and informed social context.

The fact is that this in-depth integration of research in design education has defined and determined the acquisition of several competences related to the specificity of the area that also facilitate matching what the market search as competences of their future employees - ability to deal with complex information and problems, good assessment of context and a key use of tools to capture behaviour, anticipate future scenarios, promote resilience, dialogue with different stakeholders.

4. Discussing vocational design training focusing on markets

In the Design field, education and training must enhance the multi-interdisciplinarity that characterizes practices in the field. Thus, it is necessary to establish a relationship between different fields of knowledge in order to be able to frame and develop a process aimed at finding solutions to societal problems. In so doing, one aims at educating practitioners that are autonomous and flexible, and have good capacity for self-learning, that are resilient and have a spirit of cooperation and entrepreneurship. (Jacquinot, 1993).

The goal of educating designers is not simply the creation of manpower but instead, and most importantly, teaching young people to think like designers, independent of the place and function they exercise (municipality managers; director of food chain, etc.) The intent is for their practices to benefit from the design thought process (heavily supported by adductive reasoning (Peirce concept), that is, hypothesis formulation before a situation's confirmation or denial) allowing them to exercise their competences of empathy, design, problem-solving and communication, independently of the context.

Thus we agree with Gunnar Swanson (1997), in this case reflecting upon the field of graphic design, who over 20 years ago (the original text was printed in 1994), at a time in which the market had the ability to absorb the majority of design students, said: 'in light of this tendency toward professionalism, it may seem counterintuitive that I suggest that we not only increase the augmentation of design training with more liberal studies, but also reconsider graphic design education as a liberal arts subject (...) On the whole, design schooling has not helped students become broader thinking people who can help shape a democratic society. (...) The tools of graphic design do not seem too much of a purpose beyond a graphic design career. Graphic design education is not, for the most part, educational, it is vocational training, and rather narrow specialized training at that.' Nevertheless, it is still an issue if one should engage in a more specialized or generalized design education model since both in depth and holist transdisciplinary knowledge is required for the designer of the XXI century to meet the complexity and intensity of the world he/she integrates.

5. Generalist or specialist education - which competences to work with?

The Gabe and Abel (2012) study demonstrates that there are clear geographical tendencies in terms of competences and that specialized knowledge tends to be concentrated in big cities. It also reveals that

employment that requires a more generic knowledge is much more common than employment that requires very specialized knowledge.

On the other hand, the study by Bacolod et al. (2009) analyses the role of "soft skills" and their concentration in cities and industries, revealing that those competences facilitate more productive interactions once the most successful employees show themselves to have them.

Also, Guthrie, in a 2009 study with PhD students in education, professional practice and research in education, discovered that although their programs develop different competences, they could find jobs in different areas since employers do not have a specialized knowledge about their specific competences, focusing instead on generalist ones. In the Design education field most of the soft skills are already being pedagogically addressed since the nature of the discipline implies that practitioners engage in multidisciplinary teams. Nonetheless, in this 21st century the interpersonal and intrapersonal competencies have become much more important than in the past.

6. An overview of the competences should students have when they enter the job market

According to Dzib Goodin (2012), there are two worlds, the academic world, which proposes that certain competences are important for students to find their way in the labour market, and the world of business, which is focused on creating jobs, keeping them, making money and creating prosperity for communities and countries.

Some people remain between these two worlds but most choose one or the other. Students are necessarily in between and that is why it is so important that they know how to select and manage information and solve problems, and that they possess metacognitive competences. The problem is that in Higher Education, course contents are named for scientific areas and not for competences that are assumed as the course goals.

Table 2 (Dzib Goodin 2012) presents the differences between what companies consider to be the necessary competences and what academia highlights as important.

Table 2. Differences between academic competences and business competences

Academic Competences	Academic attitudes	Work competences	Work and personal attitudes
Oral and written communication	Good presentations	Oral and written communication	Self-esteem
Solving problems	Work under teacher's pressure	Solving problems	Work under the pressure of lines of command
Metacognitive	Promote learning	Metacognitive	Promote problem solving
Time management	Plan and finish tasks on time	Time management	Prioritize tasks and work on different projects at the same time, use work time wisely.
Technological	Good management of new technologies	Technological	Superior management of new technologies
Leadership and group management	Achieve joint goals	Leadership and group management	Achieve goals and work jointly or independently of people

Source: (Dzib Goodin 2012)

An analysis of Table 2 shows that there are competences common to both worlds but at different levels and with different goals. As an example, Dzib Goodin (2012) states "Time management abilities can be a challenge for students with 5 or 7 professors requiring tasks at the same time. The main difference will be a professor always saying exactly how and when they want things. There is no opportunity for a high level of solving problems."

Table 3 (Dzib Goodin, 2012) presents another group of competences and, in this table, there are clear divergences between the two worlds.

Table 3. Differences between academic competences and business competences (divergent ones)

ACADEMIC COMPETENCIES	ACADEMIC ATTITUDES	WORK COMPETENCIES	PERSONAL AND WORK ATTITUDES
Theoretical and practical knowledge and its application in specific disciplines	Answer how and when is needed	Ethics in work	Positive attitude; enthusiasm
Ability and will to share his/her point of view with school	Loyalty to institution	Ability to solve group and not only personal problems	Flexibility and Adaptability
Development of social networks	Excel in groups	Act as part of a group	Loyalty
Resilience	Acceptance of criticisms	Ability to accept and learn from criticisms	Honesty and integrity
Presentation	Effective attitude while explaining concepts or theories	Communication ability allowing harmonious relationship between employees and clients	Common sense and sense of humour
Leadership and group management	The group is important but the grade is more important	Initiative and competence to embrace new projects	Creativity in all senses

Source: (Dzib Goodin, 2012)

Table 3 shows a clear maladjustment in the views of both sides. For instance, common sense and sense of humour are not in the academic agenda. The ability to deal with a myriad of different people in the markets is vital to progress and keep a job, but that competence is not specifically sought in academia. On the other hand, what students know in the academic field is related to how it will be evaluated, limiting the knowledge to controlled situations, which is not at all the case in companies now.

Furthermore, one can perceive the same type of divergences in the study by Blaxell and Moore (2012) which proposed to compare competences and attributes employers find desirable and those traditionally required to obtain academic 'success'. In truth, the authors conclude that both sets of competences have several similarities, being supported by the same principles. Thus, they argue that it is possible to design learning experiences supporting the development of those competences, and to integrate these experiences into the contents of the programs of specific academic courses. The proposal is to focus on the simultaneous development of academic attributes and competences as well as 'employability', since they are not antagonistic, being based on the same principles and thus possible to connect efficiently.

The DEST report about employability competences (2002, quoted by Blaxell and Moore, 2012) identifies the personal qualities that are important to employers such as: loyalty, commitment, honesty and integrity, reliability, enthusiasm, personal presentation, common sense, positive self-esteem, sense of humour, balanced attitude between work and personal life, ability to deal with pressure, resilience and motivation. These attributes and competences cannot be taught in isolation and require a commitment to reflection and thought on the part of both teachers and students. It is also necessary that what Blaxell and Moore (2012) call 'self-efficacy' take place on both sides, i.e. the ability to believe in one's own abilities so they can activate them.

On the other hand, and seen from the student perspective, in the study of Miles et al. (2002) we find that there are seven habits common to successful students. They are: passion (alignment of personal interests with study requirements resulting in energy and motivation); construction of support and relationship networks; questioning (pose questions, being inquisitive), being organized and a good time manager; being strategic and an effective manager of resources, keeping the balance between work and personal life and being committed to her/his goals. This type of attitude facing work and life in general, although dependent on personality, might and should be stimulated by Education. Regarding this, Table 4 developed by Blaxell and Moore (2012) exposes the existing links between academic competences and employability ones.

Table 4. Links between key employability skills and academic skills

Employability skills	Academic skills
<p>Formal communication (multiliteracy) including: writing to the needs of the audience using numeracy speaking in a public forum and understanding the needs of internal and external customers using computer technology appropriately and staying familiar with up-to-date equipment, facilities and materials</p>	<p>Formal communication at a tertiary level (multiliteracy) including: academic writing effectively using numeracy skills to complete assignments and other tasks completing oral presentations/ reports for internal or external audiences and critically reading and engaging with texts communicate and complete given tasks effectively and enhance engagement with university activities</p>
<p>Interpersonal and teamwork skills, including ability and willingness to engage with diverse cultures by: communicating respectfully (using voice and body) listening actively empathizing persuading effectively and being assertive and establishing and using networks collaborating with others to achieve team goals recognizing and adopting roles within teams giving and receiving feedback coaching and mentoring and leading with integrity</p>	<p>Interpersonal and teamwork skills, including ability and willingness to engage with diverse cultures by: communicating respectfully (using voice and body) listening actively empathizing persuading effectively establishing and using networks within the university and establishing external community and industry networks collaborating with others to achieve team goals recognizing and adopting roles within teams giving and receiving feedback and committing to a team for the period required to complete the task</p>
<p>Theoretical and practical knowledge and experience of industry demonstrated by: recognizing and enacting of company specific skills gaining experience and participating in work related activities; having sound knowledge of industry specific content understanding business processes- inclusive of aspects such as customer service.</p>	<p>Theoretical and practical knowledge and experience of discipline demonstrated by applying discipline specific knowledge: in authentic contexts for authentic purposes in discipline-related activities for academic assessments and while engaging in WIL</p>
<p>Intrapersonal skills, including ability and willingness to contribute to productive outcomes by: identifying opportunities generating a range of options initiating innovative solutions translating ideas into action adapting to new situations maintaining sense of humour and positive self-esteem under pressure being open to new ideas and techniques evaluating and monitoring own performance taking responsibility managing own learning and aligning work and learning with personal vision and goals</p>	<p>Intrapersonal skills, including ability and willingness to align university engagement with personal vision and goals by: identifying opportunities generating a range of options initiating innovative solutions translating ideas into action adapting to new situations maintaining sense of humour and positive self-esteem under pressure being open to new ideas and techniques self-assessment taking responsibility and managing own learning</p>
<p>High level planning and organizing skills demonstrated by: planning and managing workloads efficiently</p>	

allocating time and resources effectively
 establishing clear goals and plans of action

Problem solving, independent and innovative thinking skills, demonstrated by:

engaging in logical and orderly thinking
 willingly and proactively making decisions
 identifying opportunities not immediately obvious to others

High level planning and organising skills demonstrated by effective day-to-day and longer term:

planning and management of workloads
 allocating of time and resources and
 prioritising tasks according to personal goals

Problem solving, independent and innovative thinking skills, demonstrated by:

conducting and completing research
 engaging in logical and orderly thinking
 willingly and proactively making decisions
 identifying opportunities not immediately obvious to others
 creating innovative solutions to given problems and
 accurately analysing and synthesising information

Source: Blaxell and Moore (2012, p. 5)

Contributing to this topic, researchers Holtzman and Kraft (2011) sought to compare the feedback between graduates and employers in relation to the necessary competences to work in the 21st century, and they found that both placed the following as the top, most important priorities: time management; communication/orality and interpersonal competences. They also identify among the employers that holistic knowledge on global issues is currently one of the most important competences to work. An in-depth look at the five competences most relevant to employers, one sees that besides interpersonal competences and time management (which obtained 100%) and the ability to communicate/orality/speech (which had 98%), ethical comprehension has a weight of 98% and the ability to adapt/change/be flexible is valued at 96%. As for the graduates, in addition to the competences they have in common with employers, they identified critical and analytical thinking, and the ability to locate, organize and evaluate relevant information as being the remaining competences for their top five. This gap between visions give us some clues in terms of the work to be done to match these two visions. We must consider that in this case we are talking about graduates and not students, meaning people that are already employed.

In 2006 and 2007, the company Peter D. Hart Associates, Inc., selected by the Association of American Colleges and Universities (AACU, 2008), made a qualitative and quantitative evaluation on the points of view of employers regarding the competences offered by the Higher Education System. The study's first phase included 305 interviews of employers with more than 25 employees, reporting 25% new workers holding at least a graduate degree. In 2007, 301 more interviews were conducted. Table 5 shows the results regarding the areas of competences employers wish were better addressed and taken on by universities.

Table 5. Skills and areas of knowledge a majority of employers would like colleges and universities to emphasize more

Concepts and new developments in science and technology.	82%	Teamwork skills and the ability to collaborate with others in diverse group settings	76%
The ability to apply knowledge and skills to real-world settings through internships or other hands-on experience	73%	The ability to effectively communicate orally and in writing	73%
Critical thinking and analytical reasoning skills	73%	Global issues and developments and their implications for the future	72%
The ability to locate, organize, and evaluate information from multiple sources	70%	The ability to be innovative and think creatively	70%
The ability to solve complex problems	64%	The ability to work with numbers and understand statistics	60%
A sense of integrity and ethics	56%	Cultural values and traditions in America and other countries	53%

Source: (adapted from AACU, 2008)

Although for 9 nine years AACU has been presenting different priorities in respect to competences, as compared with the other studies presented (most probably because it is a broad study surveying a huge variety of scientific areas and not focused on a specific one), once again one may be confronted with employer's desires and this data should be carefully interpreted by academia.

7. Some recommendations for matching of academic and employability competences in Design Education

If “knowledge and competences acquisition must be accompanied by the education of character, of cultural openness and an increase in social responsibility” (Tedesco, 2008, p. 60), Design Education must work on this behaviour early in the process, i.e. in the pre-university education system. Thus, a much clearer and more consistent relationship between the higher education system and High School is required. Tedesco (2008) also suggests that only with knowledge instruction one can promote the change of the social paradigm based on people's knowledge, information and intelligence. This reinforces the idea that academia plays a fundamental role in citizenship and character formation and that it is through education that one can train people for deeper analyses of the reasons behind problems instead of focusing on solutions. This has to do with the so called "deeper learning" that Pellegrino and Hilton, (2012, p. 5) defined as "the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations". To achieve this academia should stimulate creativity and curiosity instead of obedience and memory, as often happens. Thus, students should have competencies associated with metacognition as proposed by Hattie (2012) and Fullan and Langworthy (2014) or like (Tedesco, 2008, p. 59) proposes they should have “knowledge and competences more broad than deep, they should be able to learn how to learn and be convinced of the necessity to continuously develop their level of knowledge”. This way they will succeed as higher education students, but more importantly as citizens with minds of their own, able to take their own decisions. This citizenship ability corresponds to most of the aims of the market since the market is a complex system of agents that depend heavily on the activation of social and humanistic abilities namely collaboration ability that requires the ability to "work in teams, learn from and contribute to the learning of others, (use) social networking skills, (and demonstrate) empathy in working with diverse others (Fullan, 2013, p. 9). Moreover, it is recommended that universities begin to visibly incorporate employability competences into their course contents, increasing student's awareness and devising strategies for more internship training, exposing students to these ideas while designing portfolios and materials for the students to break into markets, to test them in the real world, promoting joint sessions between graduating students and employers, to design specific material to identify generic competences, specific competencies and employability competencies for teachers, staff and students. Finally, we must embrace continuous contact among teachers, alumni and students, with the focus of reflecting on the attributes and competences deemed most important and how to master them.

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