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Preparing design students for the market: an initial investigation on the required knowledge and skills for graphic designers in Brazil.

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Abstract: How design professionals are trained – knowledge and skills acquired – affects directly the contribution provided for companies. In this paper, we report an initial investigation in how academics (students and teachers) and market (companies) value different skills in graphic design professionals. Through a survey with students, teachers and companies in Brazil, we unveil the relevance of 25 skills for both students, teachers and companies. Then, we compared those groups to find differences in how the skills were rated. Our contribution aims both design educators and practitioners: for the former, the skills highly valued by companies should be addressed through design education practices in order to improve employability chances for students; for the latter, professionals looking to improve their skills and position in the market can use our findings as a possible guide for self-development as a design professional.

Keywords: design education, design skills, design students, Brazil

1. Introduction

How design professionals are educated affects directly their practices and contributions for companies. In other words, the skills and knowledges acquired through education and practice will shape the role designers have within companies. In previous literature, designers are described as playing several different roles within companies (e.g. Bohemia, 2002; Dickson, Schneier, Lawrence & Hytry, 1995; Perks, Cooper & Jones, 2005) and that managers in different functional areas of a company profit differently from the skill set of designers (Valencia, Person & Snelders, 2013). Therefore, past studies on the value of design for companies suggest that a varied skill set is important for designers when working in companies.

A relevant challenge in design education is to assure that students are well prepared for the market and for the technological changes ahead (McKoy, 1998). From one side, there are design educators

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concerned in building educational practices to support the learning and development of future professionals. On the other side, companies employing designers have their expectation on what they need from these professionals. Previous scholars in graphic design education have discussed how the profession is adapting and changing. For instance, Higgins (2008) claims that design educators should not only adapt their educational activities for improving employability of their students, but also to shape how the profession will change in the future. Heller (2005) states that there is insufficient time in the typical four-year undergraduate program to prepare students to function in the complex twenty-first century design field. Following Lewis and Bonollo (2002), market expectations should have a key role in shaping design education practice. Understanding the expectations from the market in design professionals is relevant in building design education practices which will prepare future professionals for their careers.

In this paper, we report an initial investigation in how academics (students and teachers) and market (companies) value different skills in graphic design professionals. Through a survey with students, teachers and companies in Brazil, we unveil the relevance of a list of 25 skills for both students, teachers and companies. Then, we compared those groups to find differences in how the skills were rated. Our contribution aims both design educators and practitioners: for the first, the skills highly valued by companies should be addressed through design education practices in order to improve employability chances for students; for the second, professionals looking to improve their skills and position in the market can use our findings as a possible guide for self-development as a design professional.

Our paper also adds to previous discussion in the topic of design skills (see e.g. Conley, 2008; McKoy, 1998; Prestholt, 2013; Heller, 2005; Wilson, 2014). In addition, there are few studies investigating the relevant skills for graphic designers (as an exception, see Dziobczenski and Person, 2016). Most of studies (e.g. Higgins, 2008; Perks et al. 2005; Yang et al. 2005) focused their attention in investigating the roles and skills of industrial design professionals. Therefore, our paper explores the graphic design field both from the academic and market perspective.

2. Method

For analysing the relevance of skills for graphic design professionals, we conducted a survey to unveil how students, teachers and companies evaluate the necessary skills for a graphic design professional. We relied on a study in the requested skills for graphic designers (Dziobczenski and Person, 2016) to select the skills to be evaluated in our survey: 25 skills under four groups: 1) Conceptual Design skills, referring to the that support and build the foundation for the design project; (2) Project Management skills, referring to how designers manage their projects and deadlines; (3) Software skills, referring to the digital tools necessary to perform design work and lastly (4) Technical Design skills, which are skills carried by graphic design professionals and are directly related to design projects.

Following, we built three identical surveys to be distributed across students, teachers and companies. In order to achieve comparability across our data, we distributed the same survey in three different web addresses for the target groups. Regarding the distribution of our survey, we contacted 90 students in the final year of their bachelor degree in graphic design and 25 teachers from the same university - Anhembi Morumbi University, in São Paulo, Brazil. Also, we distributed the survey to 22 companies who in the past have hired students from the same university for their

internship programs (junior design positions). The companies selected for this study are design studios who provide both graphic and digital design services for their clients, having design as its core competence. Finally, during 2 weeks in November (2016), we received responses from 71 students, 10 teachers and 15 companies.

Students, teachers and companies were asked to evaluate the relevance of each skill using a fivepoint Likert scale ranging from '1: Irrelevant to the profession' to 5: Very relevant to the profession'. After the 2 weeks of data collection, we analysed the data through t-tests to determine if there were significant differences in the evaluation of the 25 skills from students, teachers and companies. When comparing the different groups, we decided to perform two comparisons: (1) Students vs. Companies and (2) Teachers vs. Companies. As both students and teachers come from the academic environment, we decided to have the t-tests between respondents from the market (companies) vs. academia (students and teachers).

3. Results

As a result of our survey, we unveiled how design students, teachers and companies evaluated the relevance for the profession of 25 skills. In general, teachers had higher rates (Mean = 4.02), followed by students (Mean = 3.74) and companies (Mean = 3.33) across the overall 25 skills selected for this study. Those skills were classified under 4 categories: (1) Conceptual Design skills, referring to the that support and build the foundation for the design project; (2) Project Management skills, referring to how designers manage their projects and deadlines; (3) Software skills, referring to the digital tools necessary to perform design work and lastly (4) Technical Design skills, which are skills carried by graphic design professionals and are directly related to design projects.

Our results indicate that students, teachers and companies are rating (1) Conceptual design skills as the highly rated in our survey (Mean Students = 4.06; Mean Companies = 3.54; Mean Teachers = 4.28). In addition, the t-test revealed that three of the seven conceptual skills defined for this study had significant differences: 'Business skills' between teachers and companies, t(23) = 2.123, p < .045; 'Concept design skills' between Students and companies, t(79) = 2.114, p < .038 and 'Idea generation skills' between both Students x Companies t(79) = 2.030, p < 0.46 and between Teachers and companies, t(23) = 2.846, p < 0.009. In all the mentioned skills, students and teachers had higher rates when compared with how companies' evaluations (see Table 1).

	Students N = 71	Teachers N = 10	Companies N = 15	Studen Compa	ts vs. nies	Teachers vs. Companies	
Skills	mean	mean	mean	t-test	Sig.	t-test	Sig.
Briefing skills	4.35	4.73	4.40	181	.857	1.000	.328
Business (marketing/branding) skills	3.38	3.73	2.60	1.678	.124	2.123	.045*
Concept design skills	4.24	4.47	3.60	2.114	.038*	1.992	.058
Idea generation skills	4.44	4.73	3.90	2.030	.046*	2.846	.009**
Market trends skills	4.06	4.00	3.50	1.045	.321	.901	.377
Problem-solving skills	4.42	4.73	3.90	1.181	.265	1.813	.097
Research (users, competitors) skills	3.56	3.53	2.90	1.184	.264	1.049	.313

Table 1: Ratings from students	, teachers and companies and	t-test results in Conceptual design skills
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* p < 0.05; ** p <0.01

Skills for (2) Project management - planning and managing the workload - were rated as the third higher average in our survey in our survey (Mean Students = 3.92; Mean Companies = 3.32; Mean Teachers = 3.83). Our t-test revealed two skills with significant differences in the ratings from students, teachers and companies: 'Leadership skills' both between Students and Companies, t(79) = 4.091, p < 0.001 and between Teachers and Companies, t(23) = 2.265, p < 0.033; also, 'Client Relationship skills' between Students and Companies, t(79) = 2.866, p < 0.005. As in the previous category, those significant skills had students and teachers giving higher rates in comparison with companies (see Table 2).

	Students N = 71	Teachers N = 10	Companies N = 15	Studen Compa	ts vs. nies	Teachers Compan	s vs. ies
Skills	mean	mean	mean	t-test	Sig.	t-test	Sig.
Client relationship skills	3.97	3.60	2.90	2.866	.005**	1.206	.240
Leadership skills	3.59	3.27	2.10	4.091	.000**	2.265	.033*
Presentation skills (internal and external stakeholders)	4.03	4.20	3.80	.710	.480	.922	.366
Project management skills	3.77	3.80	2.90	1.563	.149	1.422	.169
Teamwork skills	4.24	4.27	4.30	219	.827	070	.945

Table 2: Ratings from students	, teachers and companies	and t-test results in Project	: Management skills
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* p < 0.05; ** p <0.01

As the tactical (digital) tools for working as a graphic designer, (3) Software skills received the lowest rates in our survey (Mean Students = 2.94; Mean Companies = 2.82; Mean Teachers = 3.59). In comparing how students, teachers and companies rated the five skills in this category, the t-test

revealed two skills with significant differences: 'Office skills' both between Students and Companies, t(79) = 3.156, p < 0.002 and between Teachers and Companies, t(23) = 2.774 p < 0.011; and also, '3D software skills' between Teachers and Companies, t(23) = 2.085, p < 0.048. In this category, the only skill with a slightly higher rated by companies were '3D software skills' when comparing with Students (Mean Students 2.39; Mean Teachers = 3.47; Mean Companies = 2.40) In relation to Office skills, the ratings were higher across Students and Teachers (see Table 3).

	Students N = 71	Teachers N = 10	Companies N = 15	Students vs. Companies		Teachers vs. Companies	
Skills	mean	mean	mean	t-test	Sig.	t-test	Sig.
2D software (Adobe Suite, Corel Draw, etc.)	4.30	4.93	4.50	686	.494	1.378	.199
3D software (3D Studio, Maya, etc.)	2.39	3.47	2.40	013	.989	2.085	.048*
Coding skills (Java, PhP, HTML,CSS, etc.)	2.23	2.60	2.20	.058	.954	.670	.510
Office skills (Microsoft Word/Excel/PowerPoint etc.)	3.58	3.40	2.30	3.156	.002**	2.774	.011*
Web development software (Adobe Dreamweaver, etc.)	2.51	3.53	2.90	966	.337	1.089	.287

Table 3: Ratings from students, teachers and companies and t-test results in Software skills.

* p < 0.05; ** p <0.01

Lastly, (4) Technical Design skills directly related to the work (project) of graphic designers received the second higher ratings in our survey (Mean Students = 3.98; Mean Companies = 3.51; Mean Teachers = 4.18). Our t-test revealed two skills with significant differences across students, teachers and companies: 'Motion design skills' between Teachers and Companies, t(23) = 2.563, p < 0.017 and 'Illustration skills' between Teachers and Companies t(23) = 2.077, p < 0.049. As in the previous categories, the significant differences were found in skills where the ratings from companies were lower that from Students and Teachers. (see Table 4).

	Students N = 71	Teachers N = 10	Companies N = 15	Studen Compa	its vs. inies	Teacher Compan	s vs. ies
Skills	mean	mean	mean	t-test	Sig.	t-test	Sig.
3D modelling skills	2.65	3.33	2.60	.113	.910	1.529	.140
Illustration skills	3.56	4.20	3.20	.920	.360	2.077	.049*
Layout (grid, compositions, colours) skills	4.63	4.87	4.50	.633	.529	1.095	.294
Motion design skills	2.90	3.53	2.20	1.672	.099	2.563	.017*
Photo manipulation skills	4.31	4.47	3.70	1.333	.213	1.548	.135
Photography skills	3.77	3.73	3.40	1.111	.270	.700	.491
Production (printing/materials) skills	4.32	4.60	4.20	.334	.745	1.072	.295
Typography skills	4.38	4.73	4.30	.291	.772	1.167	.255

Table 4: Ratings from students, teachers and companies and t-test results in Technical Design skills.

* p < 0.05; ** p <0.01

4. Discussion

In understanding and comparing how students, teachers and companies evaluate the relevance of 25 skills (Conceptual Design skills, Process Management skills, Software skills and Technical Design), our study draws conclusions that can benefit both academics and practitioners in design. For the former, we emphasize that the skills with a significant difference (see table 5) between students and teachers (academic side) versus companies (market side) can be addressed through changes in the educational programs. As stated by Lewis and Bonollo (2002), market expectations should have a key role in shaping design education practices. For the latter, knowledge about the expectations from companies in relation to design skills can help practitioners and students in improving and shaping their skill sets in the future following our results.

The results of our study show a difference in how the market (companies) see the role of designers. For instance, 'Client relationship' and 'Leadership' skills were significantly higher rated by students and teachers. As the companies in this study are recruiting design for their internship programs, these results corroborate with the operational role played by graphic design professionals in the beginning of their careers.

Conceptual Design skills	Business (marketing/branding) skills; Idea generation skills
Project Management skills	Client relationship skills; Leadership skills
Software skills	3D software (3D Studio, Maya, etc.); Office skills (Microsoft Word/ Excel/ PowerPoint, etc.)
Technical Design skills	Illustration skills; Motion design skills

Table 5: Skills with significant differences between students/teachers and companies

Previous studies in the requested skills for graphic designers pointed that 2D software, teamwork and project planning were the most mentioned skills in job advertisements in the United Kingdom (Dziobczenski and Person, 2016). In our study, the highly rated skill from companies' perspective was 'Layout skills (Mean companies = 4.50) and '2D software skills' (Mean = 4.50), followed by 'Briefing skills' (Mean = 4.40). In general, the highly rated skills from students, teachers and companies (see table 6) demonstrate that the graphic design profession is valued by its tactical and operational work. In contrast, previous scholars are claiming for a more strategic role for graphic designers (see e.g. Davis, 2005), where these professionals are expanding its role and responsibilities to areas such as business strategy, innovation management, branding and service design. For instance, in our study 'Leadership skills' had the lower rate from companies' perspective (Mean = 2.10), while 'Business skills' as not seen as a necessary knowledge for graphic designers according to companies (Mean = 2.60).

Thus, higher rates from students and teachers in Project management skills - such as 'Client relationship', 'Presentation' and 'Project management' - shows that graphic design professionals are valuing not only more 'pure' graphic design skills, but also, they are preparing themselves for a more autonomous career. In addition, developing these skills will favour students in their job seeking process or even when founding their own company. It is worth noting that this research was applied with professionals in the city of São Paulo, one of the main places in Brazil with the biggest number of small design agencies and freelance graphic designers (ABIGRAF, 2017).

Students	Mean	Teachers	Mean	Companies	Mean
Layout (grid, compositions, colours) skills.	4.63	2D software (Adobe Suite, Corel Draw, etc.) skills	4.93	Layout (grid, compositions, colours) skills	4.50
Idea generation skills	4.44	Layout (grid, compositions, colours) skills	4.87	2D software (Adobe Suite, Corel Draw, etc.) skills	4.50
Problem-solving skills	4.42	Briefing skills	4.73	Briefing skills	4.40
Typography skills	4.38	Typography skills	4.73	Typography skills	4.30
Briefing skills	4.35	Idea generation skills	4.73	Teamwork skills	4.30

Table 6: Top 5 rated skills from students, teachers and companies' perspectives.

Limitations and future research

As an initial study in how students, teachers and companies evaluate the skills necessary for graphic designers, we faced some limitations in our study. First, the number of respondents from the market side was low (N = 15). Second, the study was conducted with students and teachers from one university in Brazil. Lastly, the students who answered our survey were all enrolled in the graphic design bachelor programme. All in all, our limitations are regarding the sample used in this study. Future research could expand our findings in exploring (1) a broader size of respondents from the market (companies) and (2) with students from different universities in different countries. We then end this paper recognizing the value of understanding the skills requested in the market from design professionals to qualify and improve design education.

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