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Design and Business: Growing up as a Separate Couple

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Abstract. This paper addresses the difficulties faced by postgraduate Design students (DS) and professional designers (PD) concerning the design, development and implementation of business projects (BP), and of sustainable management (SM). The DS have not previously attended any specific course, either dealing with BP, or having had training in SM. A test administered to 60 DS enabled to picture issues regarding: (i) the sense of discomfort regarding business and management areas, due to lack of skills, and (ii) the special requirements for skills in unfamiliar areas such as production, management, marketing and product stewardship. The study determined that DS perceive the need for educative policies that allow the acquisition of new skills in the referred areas. However, it seems that they are not sensitive to BP/SM scientific' research importance. Findings point out a direction to curriculum development to bridge Design and Business areas, by overcoming the identified gap.

Keywords: Design students (DS) · Design and Business · Sustainable Management for Designers · Sustainable business (SB) · Design curriculum

1 Introduction

Training future Designers to act as managers has become an important and often required component of Design education [1]. In part this is due to the fact that multiples sectors of Business are placing a larger emphasis on recruiting creative but business skilled Designers because of the impact of innovation and creativity coming out from successful business initiatives on the economic and societal dimensions. Since the commercial success of a product can be linked to early business ideas [2], research in Design education should also focus on business and marketing, project implementation, and SM during idea generation. While effective and creative concept generation is an imperative for successful design, the commercial success is a sine qua non condition for innovation. However, nowadays both business knowledge and skills are not considered as relevant topics to professional designers despite having been increasingly recognized as essential in Design formation.

What we do know is that the creative potential built up during idea generation and continued in the design process, is often lost throughout the management and market-

ing process because Designers do not know how to properly evaluate, select opportunities and implement ideas in the realm of Business [3].

In addition, researchers have shown that designers avoid seeking disciplines linked to management because they perceive them as being uninteresting and a constraint to their creative process. However, these courses may provide fundamental skills and understanding to position the outcome of Design in the scope of the industrial and business contexts, by putting together different forms of production, management, marketing and product stewardship [4].

In particular, it is important that DS understand business so that their designs can be relevant, contextual and solve real business problems. Arguably, that is the primary function of good industrial design. Therefore, while training DS to develop Business knowledge and management skills, University pave the way to an important component of Design education in Design degrees. Moreover, it is essential that DS comprehend how this knowledge can have a significant impact in the professional lives, on the industry, or in the development of new products. This is a good development as it encourages designers to think in the right way from the outset. Those who come out of their degrees/courses with a sound understanding of business, are very employable and in demand. In addition to teaching business courses to DS, the goal of the combined education is to encourage students to think not only about their designs from a creative perspective, but from a commercial one as well.

2 Aim and structure of the study

In Design, the future professionals should be capable of merging the potential of innovation, competitiveness and commerce to leverage the value of both the design objects and related services either inside or outside the closest scope of Design. This is a gap to overcome in the design curricula of higher education courses by carefully studying the essential requirements. In this article, we propose and explain the dimensions to consider, at a postgraduate level, the integration of young conceptual designers into a realistic business context. This study also discusses the value of enhancing business and knowledge management in Design post graduations.

The main goal is to identify and provide essential skills to analyze understand and propose a viable and SB scope for the products created by new designers. Thus, it is argued for the relevance of proposed the qualitative solution that is neither unique, nor the best. Therefore, other rival views may arise and coexist with it. However, this proposal specifically introduces designer's needs and behavior as a cornerstone of the business plan. This is based on several marketing topics that must identify, bring, and adequately communicate the emerging and explicit requirements of consumers that either constrain the object or service design. In addition, these needs should be positioned within the scope of a sustainable strategic plan for the business backed up by technology novelties, business process and an innovation mindset supporting new product development. The final dimension of this integrated business approach to the Design project concerns a proactive intra / entrepreneurial approach. This should convey the managerial and financial assessment of both business process and product solutions with the aim of preparing the bases for a later sustainable industrial production.

As the main outcome of this research exercise, we expect to draw and support the main guidelines of an innovative curriculum for the education of more effective and business driven professionals, aiming to integrate design principles within the scope of the business, operationalized by sustainable and realistic real work elements. This is understood as a relevant contribution to the teaching practice of Design and to the curricula design by introducing updated demands coming from external stakeholders and society in general, to operationalize inventions into innovative businesses. This paper starts with an overview of the design processes applicable to Design and illustrates the potential of teaching management to DS and the benefits and challenges concerning the practice of bringing business knowledge to DS. The potential for business model design applied to Design is presented, with reference to the Business Model Canvas (BMC) developed by Osterwalder & Pigneur [5] and its applicability in enhancing business knowledge of newly formed designer and DS, in this case by improving the Design post-graduations curricula. The following section presents the research methodology. Finally, the findings illustrate the most relevant aspects applicable to the specific research context with reference as to the perceptions of DS regarding the need of acquiring skills in areas such as production, management, marketing and product stewardship.

3 Literature Review

Generally, design (as a practice) is a process where elements are combined into a consistent whole, in an original way, changing an existing situation into a preferred one [6] and it involves a vastly preproduction planning before implementation (production) takes place. Considering this, the strategic nature of design is well recognized. The design process is a key to several design practices. From clothing to furniture, from architecture to automotive industry, design is a process that utilizes the characteristics of the raw material and the design elements of the components to be used, such as line, stone, wood, metal, color, texture, pattern, silhouette, and shape, to create a new product [7]. Yet, a design process usually includes the planning and production of products [8]. Therefore, from the concept to the product launch, not only creative skills, but also skills related to entrepreneurship are important and it becomes difficult for designers to work in a business environment without these abilities. Those skills involve strategic and business thinking that relate to the designer's ability to apply technical skills in a creative and strategic manner based on strategic and business knowledge [9].

The creative industry is a key driver of economic growth, and creativity and design have become key economic resources [10]. When a designer conceptualizes a new idea, it is essential to direct the thinking to specific scopes such those of production, marketing and business. Moreover, design is a key strategic activity in many organizations since designed new products contribute continually to the end of the old ones and define new abilities and qualifications in the market place. Innovation frequently represents a practice of new product design, however design include more than the discovery and conception of new kinds of consumer goods that covers creative thinking. It covers business planning and also brand, distinctiveness, packaging, color, finishing, form, and user experience; in sum values for consumers and critical issues

for a company's growth and persistence. However, the low degree of business skills acquired in the formation of professional designers could mean that they are less adaptable to work at jobs not related with their training or even to fully integrate a business team project.

Other authors, such [11] and [12], refers to design as more than just an ability to create products, but a way to be innovative in one's business. Creating, judging, deciding and evaluating are natural design abilities of all human beings; however, natural ability is not sufficient to become operative, effective and innovative either in design practice [13] or in making business informed decisions about creative outputs. Natural design ability needs to be developed within four areas: (1) being symbolic and visual communication (communication), (2) material objects (construction), (3) activities and organized services (strategic planning) and (4) complex systems and environments for living, working, playing and learning (systemic integration) [14]. Designing to create products is thus a very concrete way to define design and considering [14] view of being able to communicate, construct, being strategic and incorporating systematic integration, design should go beyond the creation of products and services. So, design should not be seen as a process that design entrepreneurs could apply as individuals or in collective groups to their product/service creation as well to business decisions. This implies that there is an opportunity to incorporate training on communication, management and strategy into Design curricula courses to enhance the business sustainability of the future designer's projects [15]. These abilities are needed for eventual systemic integration when designers addresses SB models.

Relating teaching management and business thinking to Design studies is about creating business and new opportunities by the help of design. It is a natural outgrowth of the typical design practice. It means that to motivate designers to be more entrepreneurial when taking a product from concept to market, it will require giving the designers crucial and extra insights about the total product development process.

Because of the velocity that the tech industry changes today, traditional universities and design schools are having difficulty continuously updating their curriculum to prepare emerging designers for real work. Consequently, today's Design Schools prepare future designers to address complex issues that often lack definitive solutions, require broad collaborations, and have arduous social implications. However, design Schools fail to give the due importance to the value that business enlightening deserves, and many designers think that the talent and creativity at design work is sufficient for success. Yet talent and creativity require creating only viable concepts, and marketing the viable concepts requires entrepreneurship and business skills.

It is necessary to add skills to the Designer's formation that allow them to create business DS to facilitate them to be more entrepreneurial and more able to deal with taking a product from concept to market. This require giving the designers crucial and extra insights about how to manage a business.

Relating teaching management and business thinking to Design studies is about creating business and new opportunities by the help of design. It is a natural outgrowth of the typical design practice. It means that to motivate designers to be more entrepreneurial when taking a product from concept to market, it will require giving the designers crucial and extra insights about the total product development process.

For a newly formed designer, which is in a process of designing their business model and become Entrepreneur, in order to do this, a number of conditions that are

still unknown, do need to be met. The newly formed designer should require business and management skills to make an approach that allows him to understand if and how a value proposition can be successfully scaled up to a profitable business.

Designing a business model or in other words designing relationships between the pillars that support the customer value so that the business makes a profit, could prove to be challenging for a newly formed designer especially those artisan entrepreneurs who tend to be more product/service focused as [16] confirms. In an attempt to operationalize the complex task of designing business models, [17] considers two activities relating to business model design: (i) understanding activities that are associated with making the product (designing, manufacturing); and (ii) understanding activities associated with selling something (finding and reaching customers, transacting a sale, distributing the product or delivering the service). Nevertheless, to conceive the relationship between designing products/services and enhancing the business can be challenging if there is no understanding of the relationship between these aspects [12].

As referred in [12], [5] develop a tool to design business models. The authors presented nine business building blocks with particular questions that promote an awareness and an understanding of what the building blocks in a BMC requires (Table 1).

Table 1. Business model canvas (BMC) [5].

Key partners	Key activities	Value propositions	Customer relationships	Customer Segments
Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from our partners? Which key activities do our partners perform?	What key activities do our value propositions require? Our distribution channels? Customer relationships? Revenue streams? Key resources What key resources do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?	What value do we deliver to the customer? Which one of our customers' problems are we helping to solve? What bundles of products and services are we offering to each segment? Which customer needs are we satisfying? What is the minimum viable product?	How do we get, keep and grow customers? Which customer relationships have we established? How are they integrated with the rest of our business model? How costly are they? Channels Through which channels do our Customer segments want to be reached? How do other companies reach them now? Which ones work best? Which ones are most cost efficient? How are we integrating them with customer routines?	For whom are we creating value? Who are our most important customers? What are the customer archetypes?
Cost structure		Revenue streams		
What are the most important costs inherent to our business model? Which key resources are most expensive? Which activities are most expensive?		For what value are our customers really willing to pay? For what do they currently pay? What is the revenue model? What are the pricing tactics?		

The BMC is very suitable for newly formed designer because is typically used when a lean startup methodology is applied [18]. A lean startup methodology is a methodology that allows shorter product development cycles [19]. The lean startup methodology articulates with design businesses because the design process and the lean startup methodology are processes that promote innovation [20]. The BMC reflects systematically on a business model, but allows the newly formed designer to map each of its building blocks to real business scenarios with no specific condition to define all building blocks [21]. One could argue that in order to apply the lean startup methodology, the business owner needs to consider strategies for the business that incorporates resources other than financial capital (for example, social capital). The BMC offers awareness of these alternative possibilities.

For an entrepreneur and future business owner in the Design area, to implement strategy, he/she would probably first need awareness of the business building blocks as well as how these building blocks relate to the resources and the business environment.

It is possible to apply the questions concerning the key building blocks of a business to the key activities of the business [21]. In a design business, it is argued that some of the key building blocks link to the key activities namely: designing (in the sense of planning), manufacturing and marketing [22]. This implies that an artisan

entrepreneur such as an owner-designer of a clothing micro business can adjust the BMC according to the activities that relate to their business and apply the relevant building blocks in an attempt to enhance strategic planning and eventually design a business model [12]. Designing a business model can probably be equated to the systemic integration design activity that [14] refers to because systemic integration can be viewed as the process of bringing together several components into one system.

Because of the velocity that the tech industry changes today, traditional universities and design schools are having difficulty continuously updating their curriculum to prepare emerging designers for real work. Consequently, today's Design Schools prepare future designers to address complex issues that often lack definitive solutions, require broad collaborations, and have arduous social implications. However, design Schools fail to give the due importance to the value that business enlightening deserves, and many designers think that the talent and creativity at design work is sufficient for success. Yet talent and creativity require creating only viable concepts, and marketing the viable concepts requires entrepreneurship and business skills.

Therefore, it is necessary to change design thinking and design courses and relate it with the study of the practices of working designers [23], and bring forward an application of human-centered 'open' problem solving processes to real world problems in other areas such as business, management and organizations [24]. The need to know about practice business by designers is commonly shared. Moreover, the awareness and identification of the relevant business building blocks, referred by [5] for these designers, could provide a starting point for enhanced design skills or business strategy required to design business models that eventually direct improved strategy for SB.

Business schools are important drivers of the economy, government, business and the whole society [24] and so do design schools throughout the products created by new designers. Thus, design schools should pay attention how business schools address global issues as their graduates play an important role as initiators and managers of the global society [25], [24] because business schools have the intellectual capital, creativity and entrepreneurial vision to contribute to powerful solutions that are globally needed.

4 Research Methodology and data collection

This study constitutes an exploratory study and qualitative research approach. Taking in account the difficulties faced by postgraduate DS and PD concerning the design, development and implementation of business projects (BP), and of sustainable management (SM), it was applied online a questionnaire to a purposive sample of 60 participants, selected with the following criteria in mind:

- Students in Design areas
- Graduated in Design areas
- Design professors

With this questionnaire, the main goal was to seek information about (i) the sense of discomfort regarding business and management areas, due to lack of skills, and (ii) the special requirements for skills in unfamiliar areas such as production, management, marketing and product stewardship.

The questionnaire was limited to 4 groups of differentiated but interconnected questions, as follows: (i) sociodemographic characterization of the sample; ii) identification of the Academic formation; (iii) perception of the skills acquired during the academic formation for the development of the professional activity; and (iv) perception of the importance of the need for other areas (Management, business, Marketing) in the academic formation for the success of their professional activity. The questionnaire was structured using closed questions, which included questions adapted from the Likert scale with five levels of response, and dichotomous questions. In this way, respondents would comment on the proposals presented, and classify them accordingly, with (1) being not at all relevant and (4) being very relevant. The option of I do not know/I cannot answer was also included.

5 Findings

i) Profile of respondents

The sample consisted mostly of women (70%), and all the answers were considered valid. Regarding the age group, 44% of respondents were between the ages of 18 and 22, 30% were between 23 and 32 years, and 26% were over 33 years. In relation to the professional/student status, 57% are students, 16% are working students, and 27% are working professional and 10% out of these 27%, are professors. Concerning academic training, 46% of the sample are design students, 34% has already concluded the design graduation, 30% are MSc students, and 20% had a PhD in design.

ii) Perception of the fitness of academic graduation in Design to the working world

Although in this exploratory survey, the data were quantitative, the analysis was qualitative because statistical significance was not addressed. Therefore, the average values registered is be interpreted in a qualitative way.

Understanding the respondent's perceptions of the appropriateness of their training in design to the working world is an important driver for future improvement of Design courses. Circa 66% considers the quality and relevance of education and training good, 26% considers reasonable. Less than 4% do not express opinion.

In what concerns the perceptions of skills development during the training of Design, either in degree or post-graduation studies, the results reveal that less of 7% do not consider having adequate skills to accomplish a project of design development, while the large majority has a very positive perception.

The learning of subjects related to materials and technologies and their relationship with the design profession was approached in the questionnaire, and the feedback obtained reveals that 70% of the sample is very pleased with the knowledge acquired. However, if the subject addressed in the questionnaire tackles the business and management area, trying to know about the respondents' skills sensitivities in this matter, the competencies perceptions are lower in relation to those related to design areas. The results reveal that only 16% considers having very good skills, while 33% refers to have fair knowledge and skills about the management of design processes applied to business, 10% considers do not having those skills and almost 7% do not respond. If the questions tackle the acquired competencies for the creation of a SB plan, the results reveal the perception of a lack of appropriate qualifications or skills. Accord-

ingly, 30% perceive to have a weak knowledge in this issue, 30% consider having a fair knowledge, and only 34% have a good perception of the previously referred skills.

When the approach was made in the sense of knowing about the importance of the former areas to be included in the curricula of the Design studies, 97% of the answers states about the great importance in having new skills acquired through the inclusion of new courses in management design and business areas. Accordingly, they stress the need of skills development that tailor and promote the integration of designers both in the business world and in the business management. Design entrepreneurs can apply these skills as individuals or in collective groups to their product/service creation as well to business decisions.

Finally, almost all the respondents (97%) were peremptory in their answers regarding the importance of including management studies in Design graduations of Universities thereby allowing the possibility to develop a sustainable business plan.

6 Discussion and final remarks

Day after day the Design is turning more complex, pursuing in parallel the entrepreneurial world. Thus, the design professionals must know how to manage with lower margin for errors. It is in this world that the newly formed designers are integrated, and the acquired skills should be fitted to it. In this context, the value of a discipline resides in its ability to facilitate better-informed decisions. The perceptions of the DS, graduated, and post-graduated revealed in the questionnaire responses of the present research stresses the need to add skills to Designer's formation that could allow them to create business and new opportunities. This means that it will be critical to encourage business learning in DS to facilitate them to be more entrepreneurial and more able to deal with taking a product from concept to market, has referred by [26]. To this end, giving the designers crucial and extra insights about how to manage a business should be a central preoccupation in a design graduation [16]. Students have identified these insights as a key factor underpinning both successful learning and successful professional development [27], [16].

In the present research, Business and SM are identified as the next disciplines to join the pool required for successful Design post-graduations and [28] points a similar situation. According to these authors, it is essential to add a new lens and richness to SB model research by building on the need for more interdisciplinary approaches.

The awareness that creative professional designers and professional service firms have a significant business relevance, playing a key role for the competitive growth of both mature and emerging markets, emerges from the European Competitiveness Report [29]. This awareness led us to one of the pillar framework presented in the Europe 2020 strategy: the one of Education and training. Thus, quality higher education and training is crucial for economies that want to move up the value chain beyond simple production processes and products [25]. In particular, today's globalizing economy requires countries to nurture pools of well-educated workers who are able to adapt rapidly to their changing environment and the production system's evolving needs [16].

The aim of university education is to train a person for a job or to create perfect human beings and to build knowledge-based society or to prepare individuals to various situations that life offers. At its best, a university should broaden students' minds and horizons, allowing them to discern connections and analyse problems successfully, thus empowering them to change the world.

Nevertheless, there is always a gap between what students learn at school and what they are required to do in practice after graduation [15]. One of these gaps in Design training is the curriculum adequacy on attainment of business, management and entrepreneurship skills. The development of these skills requires process knowledge and experience. The university can contribute to this development through education of future designers in and business and sustainable competencies, and directly by commercialization of research and design products within the university, and by being the seedbed for new ventures [30] and partnerships between the Academia, the newly formed designers and the business world.

The main motivation of business, SM and entrepreneurship education in a Design training is raising students' awareness of both the business world and the self-employment as a career option, developing attitudes, behaviors and capacities at individual level to establish growth oriented ventures. It should not be confused with small business training or small management courses [24], [31]. Instead, it should be in a training mostly focused on both, the acquisition of competencies for the creation of a SB plan, and the identification of novel business and entrepreneurial opportunities, eliminating fear of failure, facilitating networks and partnerships and providing inspiration to create long-term benefits to directly individuals but at the same time to society and economic growth. Competencies such as these are fundamental for the profitable promotion of a society oriented towards innovation and quality, in which knowledge and expertise are associated with knowing how to be and knowing how to do.

Drawing from this exploratory case, the results suggest two major preliminary conclusions. The first concerns low business knowledge and low perceived success in DS. The analysis shows that DS perceive the need for educative policies that allow the acquisition of new skills in the referred areas. However, in parallel, it seems that they are not sensitive to Business and SM scientific' research importance. The findings point out to the second conclusion, namely, a direction to adequate Design curriculum in a way that bridges Design and Business areas, by overcoming the identified gap, as highlight by [13].

The future Design professionals should be skilled and furthered the Design education by merging the potential of innovation, competitiveness and commerce to leverage the value either of the design objects and related services, inside or outside the closest scope of Design. This gap needs to be overcome in the design curricula of higher education courses by carefully studying the essential requirements.

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