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Design Thinking: A New Road Map In Business Education

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Abstract: Design thinking is not only a tool applied to fostering innovation in business, but it is also a novel and prominent approach in education. Being a creative process that enables academics to meet students' needs and to raise innovative individuals, it emerges as a contemporary pedagogic tool, which can be used in all levels of education. Despite its growing importance, the implementation of design thinking into business education is slow and partial, although business education today is in a crisis as traditional pedagogic tools fall short of raising individuals who can meet the challenges of the 21st century. This study explores current trends in applying design thinking into higher education, with a particular focus on the strategies of leading schools. Using a case study approach, we provide an initial road map for educational organizations, and in particular for business schools, which strive for integrating this new tool into their curricula.

Keywords: Design Thinking, Business Education, MBA, Pedagogy, Curriculum Development

1. Introduction

Design thinking is one of the most influential trends globally, extending to many markets and businesses worldwide. The idea itself has been around since 60s (Simon, 1967), and was coined by Peter Rowe in his 1987 book, *Design Thinking*, however it only recently became a buzzword for a variety of industries. This inevitably came with a number opportunities and pitfalls. On the positive side, today more businesses are applying, or at least striving to integrate design thinking into their processes, regardless of whether they engage in design management in a traditional sense or not. On the other hand, the buzz around design thinking makes it one of the concepts that is least understood by the global industries. Moreover, how design thinking should be applied to peripheral structures that support businesses still remains a question at multiple dimensions.

This paper focuses on a particular aspect of this latter question, business education, and explores how design thinking might be integrated into the curricula of business schools. To this aim, we first

review the concept of design thinking, how it developed and became an essential part of processes for many firms in the last two decades. We then turn our lens to business education and provide a brief review of challenges in this domain. Next, we present an analysis of the strategies and the structure of the curricula of leading schools that apply design thinking pedagogy. Finally, we offer an initial road map for educational organizations, and in particular business schools, which strive for integrating this new approach into their curricula.

2. Design Thinking

Design thinking, in its essence, refers to what it literally suggests: The ways that a designer thinks. Academically speaking, the term originally stood for “design-specific cognitive activities that designers apply during the process of designing” (Visser, 2006), and was confined to research that investigates cognitive methods and patterns applied by the designers. Nonlinearity and creativity embedded into this thinking process was particularly fascinating for many researchers and practitioners, through which they sought for alternative models for businesses that they could apply in a variety of managerial contexts.

Alongside the shift towards an experience and service based economy (Pine and Gilmore, 1999), the activity of designing evolved into creating meaningful experiences for people. The ways designers think, the methods they employ and the approach they apply in tackling complex problems also evolved into applying “creative methods, effective communication and proactive entrepreneurship” (Press and Cooper, 2003, p.8). This emerging culture of design prioritizes people’s experiences and point of views, and mobilizes its own highly flexible creative and innovative methods, that are visual and participatory in nature to be more empathetic and communicating. Empathetic design awaits designers to be aware and sensitive to individual experiences, needs, desires and emotions of the people they are designing for. Besides, designers should also be maintaining a holistic perspective of the whole experience and the effect of the product or the service they develop on the society. This ability of design to be empathetic and multifocal in iteratively tackling human centered and complex problems makes design thinking a promising array of methods and principles to apply to tackling business problems. Kolko (2015), cherishing the emergence of this design centric culture, underlines the shift in large organizations towards applying the principles of design to how people work, regarding design thinking, as a collection of principles prioritizing empathy, “discipline of prototyping” and the iterative nature of design tolerating failures, to be the best tool to develop a responsive flexible organizational culture.

David M. Kelley and Tim Brown of IDEO pioneered in integrating the concepts of “empathy”, “rationality”, and “creativity” into managerial problem solving (Brown, 2008). They argued that design thinking should not be limited to a set of practices that are applied during new product development, which are usually undertaken to produce financial rewards and build customer loyalty. The proponents of this camp rather proposed design thinking to evolve into the methods and processes for investigating ill-defined problems, acquiring information, analyzing knowledge, and positing solutions in the design and planning fields, paving the road for the concept to be used as a means to foster creativity and innovation in the organization. As Kelley and Van Patter (2005) claims, this is because “design, acting as the ‘glue’ –the bridge, facilitator, protector, explainer, valuer, modeler, orchestrator, and advocate of all thinking types”. Embodied in this new definition which broadly extends its frontiers, design thinking is now embraced as the ultimate tool and goal in many organizations. Its use ranges from tactical domains, such as sales management activities, to strategic management, such as to establish a foundation for driving a brand or business forward.

Design thinking is not only a tool applied to developing strategies and enhancing innovation in business, but it is also a prominent approach in all walks of life. However, despite its growing importance in business life, many supporting structures in the marketplace fall short of keeping pace with this new approach, and education is obviously one of them. In its very essence, design thinking has much to offer education in general, and business education in particular: Design thinking, as a formal method for practical and creative solution of problems, suggests a new way of thinking to redesign our classrooms, schools and education system. Being a creative process that enables academics to meet students' needs and that helps to raise creative, innovative people, it stands out as a contemporary pedagogical approach which can be used from kindergarten to higher education (Scheer, Noweski, & Meinel, 2012). Most importantly, it can be used as a long-term strategy to meet the challenges that business education is facing in the new millennium.

3. Crisis in Business Education

Today's business schools are in dire crisis, which stems from the fact that they cannot effectively respond to needs and challenges of the 21st century. Major changes in the economic, political, and demographic environments, advances in technology, periods of economic recession and crashes, ethical issues, paradigm shifts in sociocultural domains accompanied the collapse of managerial and economic theories, and all of this has left many business schools with old-fashioned perspectives and curricula that cannot meet these postmodern challenges.

There are myriad of articles in leading business education journals, documenting the dynamics and outcomes of this crisis, as well as offering prescriptions for an ideal curriculum to guide those who develop them. Most research, in this context, is based on the seminal work of Porter and McKibbin (1988), who proposed six essential facets for an ideal MBA curriculum. Subsequent work focused on these insights, as summarized below:

1. Multidisciplinary integration (e.g. Ducoffe, Tromley & Tucker, 2006);
2. Experiential learning (e.g. Kolb, Boyatzis & Mainemelis, 2001);
3. Soft-skill development (e.g. Andrews & Highson, 2008);
4. Adopting a global perspective (e.g. Lorange, 2003);
5. Building awareness, knowledge, and adaptability for information technologies (e.g. Leidner & Jarvenpaa, 1995);
6. Business ethics and social corporate responsibility (e.g. Nicholson & DeMoss, 2009).

Although these insights were provided by late 80s, and there appeared substantial work afterwards which focus on how these might be implemented into business school curricula, the situation today is far from perfect (Datar, Garvin & Cullen, 2011). The failure of business education apparent in many of the above areas, but the most striking problems persist in multidisciplinary integration, experiential learning, and soft-skill development.

Multidisciplinary integration requires the education to be carried out "together in two or more disciplines, subdisciplines, or professions, by bringing together and to some extent synthesizing their perspectives" (Davis, 1995, p. 5). This approach helps the potential employees to become better team players, understand the interaction within the organizational, and enhance decision making skills. However, in a very recent study, Athavale, Davis and Myring (2008) revealed that 81% of the deans at US Business Schools perceive that their curricula strongly needed integration. The second

domain, experiential learning, refers to “learning which uses the learner's experience as a base” (Armstrong, 1977), and includes implementing a broad spectrum of educational experiences, such as study abroad programs, community service, fieldwork, workshops, and internships into the curricula. It is based on a hands-on approach in learning, and although some of the above tools are now common in many business schools, the efficiency of these in generating a real “hands-on-experience” is questionable (Kirschner, Sweller & Clark, 2006). Finally, business schools also fail in equipping the students with soft skills such as creativity, critical thinking, teambuilding and decision-making, which are very important capabilities for an effective workplace (Floyd & Gordon, 1998). In the recent decades, business schools were heavily criticized for mostly paying attention to fit up students with technical skills, but not paying attention to soft skills, a problem, which still persists (Lamb, Shipp & Moncrief, 1995; Datar, Garvin & Cullen, 2011).

Today, business schools admit that they need to focus on what they neglected, but designers have embraced (Glen, Suci & Baughn, 2014). In this context, design thinking may provide business schools worldwide with a new approach in raising the leaders of future. Integrating design thinking into business education may guide teachers and students both for managing innovation and problem solving, by cultivating a culture of creative confidence (Kelley & Kelley, 2013). To date, there has been some notable attempts to this aim, although in general the application of design thinking into business education is slow and limited. In this context, we below provide three case studies, examining schools from the US, Canada, and Japan that have entirely or partially integrated design thinking perspective into their curricula.

4. Methodology

This paper utilizes a case study with the intention of analysing alternative models of curriculum development and proposing guidelines for b-schools that seek to encourage design thinking in their pedagogical approaches. A case study is an empirical study that investigates a contemporary phenomenon in depth and with its real-life context (Yin, 2009), and is appropriate for exploratory purposes, particularly when there is lack of available literature.

As the aim of this paper is to examine the application of design-thinking methodology in university curricula, and to elaborate on the findings by proposing alternative curriculum development strategies for business schools, we initiated the research by selecting three available cases worldwide. In selection of the cases, we utilized the list provided by Kurokawa (2013), which includes universities and schools that have integrated design thinking into their curriculum design. While the list covers around 20 schools, our selection concluded with the d.school at Stanford University, Rotman School of Management at Toronto University, and the Engineering Sciences and Design program at Tokyo Institute of Technology. D-school at Stanford University was selected as it pioneers the use of design thinking in education. Rotman School of Management is one of the early adapters of design thinking in business school, which makes it an important case for the purposes of this study. Finally, we wanted to work on a distinctive example with a different perspective, and included the interdisciplinary graduate major, Engineering Sciences and Design program, at Tokyo Institute of Technology. This last case also offers an opportunity to look at how engineering is combined design thinking, as well as to compare Western and Eastern perspectives in integrating two domains.

5. Case Studies

5.1 The d.school at Stanford University

The d.school, which is also known as the Hasso Plattner Institute of Design at SU, can be called the headquarter or birthplace of Design Thinking. This is an independent institution that only focuses on design thinking as a pedagogical tool, where the students can learn, teach, work on, solve problems, and finally, become design thinkers.

The d.school's methodology is different from all the other universities, as it aims to introduce design thinking philosophy and methods to all Stanford students. In this context, the school's reach is not limited to a department or a course. All students from all seven schools of Stanford, from law to medicine, are welcomed in d.school and can enroll for courses. The school offers an independent Master's program, named as "Design Impact", which is essentially a core that is integrated to other graduate programs. This core includes courses such as design processes, prototyping, and design leadership. Moreover, the d.school offers courses in almost all subjects, which may in some way be related to design thinking. The school employs a diverse teaching team and students, enriching the d.school experience. The courses vary from year to year according to teaching team's expertise. Some of the courses offered in the d.school is provided below:

- Advanced Design Studio
- Building Innovative Brands
- Bursting the 'Impossible' Bubble: The Art of Creative Engagement
- Connectors, Analyzers & Quiet Listeners
- Creative Gym: A Design Thinking Skills Studio
- Creativity and Innovation
- d.compress: Designing Calm
- Design for Healthy Behaviour Change
- d.leadership: Design Leadership in Context
- d.media: Designing Media that Matters
- d.org: Designing Creative Organizations
- d.science: Design for Science
- Designing Liberation Technologies
- Design Thinking Bootcamp
- Design Thinking Studio: Experiences in Innovation and Design
- Design Thinking for Public Policy Innovators
- Designing Solutions to Global Grand Challenges
- Emotion by Design
- Fail Faster
- Foundations of Design for Design Thinkers
- From Maps to Meaning
- From Play to Innovation
- Game Design: Making Play
- Methods in Systems Thinking
- Organizational Psychology of Design Thinking
- Out of the Lab: Design Thinking for Scientists & Engineers in the Real World

- Prototyping and Rapid Experimentation Lab
- Rebooting Government with Design Thinking
- Rethinking Purpose
- SparkTruck: Designing Mobile Interventions for Education
- StoryViz: Communication Redesigned
- The Consumer Mind and Behaviour Design
- The Designer in Society
- Transformative Design
- Understanding Superfans and Their Heroes
- Visual Design Fundamentals

Students can be enrolled to credit courses as core classes, boost classes, as well as no credit courses such as pop-out workshops. These workshops are developed in d.school, but held in different places accordingly with their topics. Instead of taking courses, graduate students may also work in d.school research projects. Other universities and individuals can also benefit from facilities and programs developed by the school. Accompanying the motto that “everyone is a student of innovation”, the school organizes “Executive Bootcamps” for startups, Fortune 500 companies, and NGOs, where executives learn the design thinking philosophy by practicing on real projects, and manages a network to help educators from all levels to integrate design thinking into K12, undergraduate, and graduate education.

The website of d.school is even a course itself. It is a design thinking portal, which contains presentations, videos, interactive experiences, and other tools aimed at individuals who want to learn design thinking methodology by themselves. In summary, the d.school acts as the most comprehensive source to introduce design thinking to the world, by designing and offering a huge variety of trainings specialized according to the participants’ needs.

5.2 Rotman School of Management, University of Toronto

University of Toronto is Canada’s top research university with 85,000 students and over 20,000 faculty members. Rotman is the School of Management of this university. At Rotman, design thinking is the heart of business education, which is not only integrated as a course, but as an embracing philosophy.

Rotman’s choice of design thinking as a pedagogical tool stemmed from the problems in business education, which we discussed before. The management of the School realized that business school graduates were not equipped with necessary skills for contemporary business problems, and considered investing in empathy, creativity, and collaboration as the core skills to enhance innovation and growth. In the words of Roger Martin, Rotman’s visionary leader, “business people don’t just need to understand designers, they need to become designers”, and with this motto the school crossed roads with David Kelley (the founder of d.school and IDEO) and Patrick Whitney (the dean of IIT Institute of Design at Illinois Institute of Technology) in developing a new way of working to succeed in innovation.

The school used design thinking as an inspiration when developing the Business Design concept, which is now operated by DesignWorks, the business studio. Being the core of Rotman’s design

thinking approach, the aim of the DesignWorks is to transform business education through user-centered design. DesignWorks is constituted as a studio due to the belief that business design can only be learned by practice. DesignWorks is not limited to credit courses, and at Rotman students can enhance their business design abilities through a variety of training programs (Figure 1).

For graduate students, Rotman provides the opportunity to pursue a major in Business Design, as well as enrolling individually to particular courses offered under this major. The Business Design curriculum focuses on user-centric business design, and three respective steps in taking a product from design to reality, which are empathy and user understanding, problem-solving, and change management. The students have to take elective courses on each these three subjects in addition to a mandatory core, named as Business Design Practicum. The practicum is also open to other programs as an elective, providing other students with an opportunity to gain expertise on user needs, to create innovative solutions, and to design new strategic business models. Pedagogic approach involves a thinking-doing-feeling triad, with 20% lectures to reinforce thinking through principles and frameworks, 10% instruction to practice methods and tools, 50% application to use these methods, and 20% devoted to discovering mindsets and reflecting on values. Apart from the Business Design major, Rotman also runs boot camps, short workshops focusing on innovation, and sprints enabling its students to collaborate with other MBA students as part of extra-curricular sessions in the Sandbox Series.



Figure 1. Rotman Programs on Design Thinking

5.3 Tokyo Institute of Technology

With its 130 years of heritage and 10,000 students over three campuses, Tokyo Institute of Technology is the top national university for science and technology in Japan. The school offers graduate major programs in a very wide spectrum, from classic branches like mathematics and physics to brand-new topics such as artificial intelligence, and innovation science.

In addition to traditional graduate programs, the school offers interdisciplinary graduate majors. In this context, Engineering Sciences and Design program is central to our study, as it combines engineering with design thinking. The program sets design thinking in the heart of one of program's five features. These features enable the students' practical learning through their interdisciplinary problem-based learning (PBL) courses, which gives the ability and experience to students to solve an open-ended problem.

PBL courses in the program are 1) Design Thinking Fundamentals, and 2) Engineering Design Project A, B, and C. IDEO is also a part of these courses as a supervisor. Design Thinking Fundamentals course is developed to teach students the basics of design thinking, which is succeeded by Project A, which focuses on engineering design. Later in Projects B and C, the students enhance their abilities by working on real projects with companies.

The outcomes of Design Thinking Fundamentals course are enabling the students to use five steps of design thinking: Empathize, Define, Ideate, Prototype, and Test. The course involves lectures and a long-term project, with the aim to teach prospective engineers a useful problem-solving method, as well as generating awareness for the importance to user needs. The modules of the course include topics such as inspiration, ideation & concept development, Business Design, and Storytelling. Competencies aimed by this course are communication skills, critical thinking, practical and/or problem-solving skills, which are then put into practice in Engineering Design Project A, B and C. The projects are based on real world problems, and design thinking is applied as an essential tool to solve them. The program also involves other design thinking centered courses such as design theory, social system design, and human-environment system design.

Besides this graduate program, Tokyo Institute of Technology also offers courses built around design thinking philosophy, such as Design Thinking, and Business Design, which are focused on the application of design solutions in real life business cases.

6. Discussion

Based on a careful evaluation of three cases presented in this study, the main insight for business schools should be that design thinking is more than a course or set of courses integrated in the curriculum. It should embrace a philosophy that pervades all aspects of business education, rather than offering it as a fast-track through credit courses. In this context, schools that want to integrate design thinking into their educational offering should adapt it as a whole, including specialized divisions, curricula, studios, practice courses, industry connections, speakers, and clubs. An institutional structure to guarantee the functioning of the philosophy should be made available, with a long-term commitment of the management, as the fruits of such a radical switch will not be collected in the short term. Physical and nonphysical infrastructure should be accordingly planned and realized. The investment into design thinking should be carefully planned, organized, and monitored to gain the best results and positive impact on graduates.

Second, interdisciplinary structures are key to maintain a design thinking approach in education. Even when the school decides to adapt design thinking into only business education, such as in the Rotman case, the structure should be planned using an interdisciplinary lens, where the curriculum is nurtured and supported by other departments. In this context, the cooperation of design schools and business schools is particularly important. As a consequence of such collaboration, courses may be diversified for the ultimate aim of “design thinking”, accordingly with subdomains and application areas.

A third insight from these case studies pertains to the use of real life business problems in education. Since design thinking is essentially a problem-solving method, teaching it should also embrace a problem-solving perspective. At this point, interaction of the university with outside world, including both private and public sectors, is essential. Apart from institutions, individuals, particularly professionals, should also be considered an indispensable element of the program. Real-world problems should be used as cases, where the students can apply a hands-on approach in finding solutions to them.

As a common finding in all three case studies, design of the “design thinking” courses is one of the most critical issues in curriculum development. There appears to be a consensus that design thinking cannot be taught through traditional lecturing pedagogy. As revealed in the examples, lecturing is limited to a small part of the classes, and only for providing the principles, while rest of the classes is based on practicing. Here practice refers to real world problems and projects, which enable problem-based learning. Hands on learning supervised by the experts will also help students to improve design thinking skills. Furthermore, fundamental knowledge for design thinking includes a comprehensive understanding of the tools, and these tools can only be internalized by personally experiencing them. Therefore, business schools to integrate design thinking into their curricula should switch from traditional lecturing methods to more practice and project based, experiential pedagogic approaches.

The scope of this study is limited to three cases selected from a 2013 list of schools that have entirely or partially adopted a design thinking approach, and will be further expanded to more schools and their implementations, which will provide a more detailed outlook on the issue. However, even three case studies included in this paper provide practical and reliable guidelines for business schools that strive for novel approaches to meet the challenges of today’s markets. Future research may be directed to other schools from different economic and cultural contexts, and may be enriched by integrating pedagogical approaches that also attempt to challenge traditional business education. Comparison of classical business school pedagogies, such as the case method, simulation games method etc., with design thinking method may also be applicable to explore potential advantages and disadvantages of these approaches over another.

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