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Design is cool, but ... A critical appraisal of design thinking in management education

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ABSTRACT

The adoption of design thinking (DT) as content or methodology for management education has increased. Despite the recognizable potentials of it, this paper argues the need to explain the nature of DT as a distinctive approach and aims to elaborate on a critical appraisal of DT in management education. In order to accomplish it, specific objectives are pursued: (1) to contrast the understanding of design (erly) thinking in the academic field of design with an understanding of DT within management, and (2) to understand the fundamental arguments for the approximation between design and management education, the antecedents of this movement and the ontological and epistemological implications of it in the research and professional training in the scope of management. Finally, the text recapitulates the possibilities opened up by the critical appraisal of DT and indicates the need to advance the discussions on the integration between theory and practice in management education.

1. Introduction

Over the last two decades, the popularity of design thinking (DT) in higher education courses for undergraduates, managers, and executives has grown worldwide (Dorst, 2011; Glenn, Siciu, Baughn and Anson, 2015). The rationale for this growth stems from the proposals to “make management training more similar to design training” (Dunne & Martin, 2006, p. 514) and to make the practice of design complementary to the fundamental managerial skills of analyzing and deciding (Boland and Collopy, 2004). The promotion of the idea comes from the use of the perspective of design for problem-framing and problem-solving in large multinational companies such as General Electric, Procter & Gamble, Sony, Phillips and Nokia, and the discourse in favor of DT as a stimulator of innovations propagated, for example, by the American design company IDEO and the books published by its CEOs (Brown, 2010; Kelley, 2001), and the inspiration from the work of celebrated designers, such as the architect Frank Gehry (Boland, Collopy, Lyytinen, & Yoo, 2008).

This popularity has also raised debates that reveal some lack of understanding of what DT is in higher education (Matthews & Wrigley, 2017) or that exposes the fragility of managerial discourse on DT (Johansson-Sköldberg, Woodilla and Çetinkaya, 2013), and mention the possibility that DT is only a passing fad (Johansson & Woodilla, 2009). Therefore it is questionable that many management schools include DT in their course offerings, although little is known about how successful these courses are for students (Melles, Howard, & Thompson-Whiteside, 2012). It should also be pointed out that the design perspective must be combined with solid management training, since using only DT is not enough to fostering creativity and promoting the necessary innovation in the business world (Merholz, 2009). It is though necessary not only to understand how DT came into business schools, but to recover the original proposals of the insertion of design in this educational context, which go back to the ideas of the Nobel laureate in Economy of 1978

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Herbert Simon about interdisciplinary academic training, based on theory and practice for the scientific development of management (Simon, 1967, 1969).

By applying DT as a didactic content or methodological resource in study programs (Glenn, Siciu, Baughn and Anson, 2015), coordinators and teachers of undergraduate, and postgraduate courses are likely in agreement with the premise that management education needs to approach design practices and that DT is the key to innovation “in all aspects of business and society” (Brown, 2010, p. 3). However, one shall consider whether the key players in management education, in the classroom and other institutional levels, share the understanding of what design is, what DT is, and how DT can be incorporated into management education in a manner consistent with the possibilities of managers’ acting and the social demands of the work of management. The purpose of this article is to elaborate a critical appraisal of DT in management education by explaining the nature of design thinking as a distinctive approach.

This article looks at specific aims covered in the sections that follow this introduction. Initially, two understandings of DT and its implications for the education of designers and managers are contrasted, in a spirit of archaeology of discourse, that retraces the origins of DT and the historical account of the ‘translation’ process through which DT has been promoted in the managerial discourse. The first understanding is described in the first section, named Design (erly) thinking in the academic field of design. Design (erly) thinking refers to academic construction in the practice of the professional designer and theoretical reflections about how to interpret and characterize the built-in skills and competencies of designers. The second understanding, clarified in the second section, called Design Thinking (DT) in the scope of management, was deployed from the first one using the translation and appropriation of the original concept within management. DT, as it has been called from the beginning of this article, refers to the discourse in which the practice of design and the designer’s skills are used beyond the context of design projects (including art and architecture), particularly in management, without an academic basis in design (Johansson-Sköldberg et al., 2013).

The article then presents a synthesis of design (erly) thinking and DT approaches in the context of professional management training. The third section, called “Design, and design thinking (DT)” seeks to understand the fundamental arguments for the current approach between design and management education. The purpose of this section is to establish the antecedents of this movement in the works of Simon (1967; 1969) to understand the potential of the design perspective to influence management education, in the sense of integrating theory and practice. The section also briefly reflects on the limitations of management research to contribute to the integration between theory and practice in management education, based on the considerations of Simon (1967).

The text ends with the section of final considerations that recapitulate the possibilities opened up by the critical reflection of this paper and indicate the need to develop the discussions on the integration between theory and practice in professional management education. As a result, the final paragraphs of the text elaborate proposals for future studies related to the issue. Aftermost, there is a reflection on the possibilities of developing an original vision about management training, capable of integrating the thinking, acting, and being characteristic of management professionals, individually and as a community of practitioners.

2. Design(erly) thinking in the academic field of design

The term DT seems to describe design thinking in different ways between design theorists and management thinkers (Hassi & Laakso, 2011). There is some relation between the academic discourse that defines DT in the scientific field of design and the managerial discourse based on the same concept, but the references linking both are scarce. For the managerial world, DT may seem like a sort of new idea, “but in design research, the characteristics of the designer’s work and practice have been discussed for at least 40 years” (Johansson-Sköldberg et al., 2013, p. 123). The comprehension of the typical way of thinking that defines this professional practice, which has come to be called the designerly way of thinking, or only design (erly) thinking, has grown in the collective consciousness of designers. Design (erly) thinking belongs to the academic discourse of design, but also related disciplines, such as architecture, plastic arts, urban planning, etc. The aim of the research about the design (erly) thinking is to understand and describe the designer’s practice for pedagogical purposes (Gray & Siegel, 2014). According to Johansson-Sköldberg et al. (2013), the theoretical perspectives of design (erly) thinking are categorized into five sub-discourses related to influential authors who focused on the pedagogy of design: 1) the creation of artifacts (Simon, 1969); 2) reflective practice (Schön, 1983); 3) problem-solving activity (Buchanan, 1992); 4) a form of rationality, or the production of meaning (Cross, 2006, 2011); and 5) the creation of meaning (Krippendorff, 2006).

Design can be defined as a means of inquiry in which abstract ideas take shape or as a conscious decision-making process in which information (an idea) transforms into a result, whether tangible (product) or intangible (service). Following this definition, the practice of design can be understood as the work of elaborating concrete ways to solve abstract problems. These problems tend to be complex and linked to an ideal solution to approaching a concept. Architecture, for example, seeks the best way to inhabit a space; product design pursues the ideal of the functionality of objects, and visual design wants to perform the perfect interaction with images. The essential and distinctive features of the design (erly) thinking is its nature as an open, experimental heuristics (Dorst, 2006), which incorporates and builds on ambiguity and incompleteness (Hatchuel, 2001; Hatchuel & Weil, 2008).

An essential component for the definition of design is the ambiguous place between a form of art and a technical science (Rowe, 1987). This ambiguity has raised questions about how is it possible to transfer the knowledge based on experience and how much theoretical knowledge is necessary for a well-grounded qualification. Schön (1983) added one more element to these questions in elaborating the concept of reflection-on-action to describe how the designer improves his/her aesthetic judgment and learns about the design process in practice. Between the subjectivity of art and the objectivity of technical knowledge is the practice, which effectively brings together the two positions and elaborates a kind of training in which design (erly) thinking reveals itself as embodied cognition (Groth, 2016), including the thought, the act and the character being of the designer (Adams, Daly, Mann, & Dall’Alba, 2011). In a simplified appreciation, the designer’s education oscillates between a prescriptive approach and an aesthetic approach (Stolterman,

1994), which come together in the multiple practical dimensions of learning design.

The prescriptive approach focuses on design as a process in which an irrational initial problematization can become rationality external to the designer and, therefore transferable to a community of design practitioners. The design process in this approach is oriented to produce a sensible solution to the problem, which can be right or wrong, according to technical criteria elaborated from the accumulated knowledge about the experiences of successes and failures in the search for a solution. These criteria are the result of historical records of the design process, “interpreted according to aesthetic canons, social circumstances, and technical opportunities”; but are also examined under the theoretical prescriptions of what is “good design” (Rowe, 1987, p. 1). In other words, in the prescriptive approach, “design becomes a map that can always be compared and tested against reality” (Stolterman, 1994, p. 450). Such an approach is related to the scientific character of design and to design as a method supported by a theoretical-logical model (Cross, 2001).

The aesthetic approach starts from the premise that the designer can only be guided by his/her own ideas and values in the design process. Accordingly, the designer’s work takes place in a very complex reality, in which the practice of design does not demonstrate the signs of common-sense rationality. The skilled designer follows some form of rationality, but it is not possible to understand it based on rational thought or rational decision-making. The designer’s actions are situated, that is, they do not fit into generic descriptions about the design processes, and the professional plays a central role in judging the quality of their work. The design student should be allowed to develop their personality, style, and good taste, experiencing the reality with which (s)he works and by their methods and possibilities. That is so because “a designer is, above all, guided by their aesthetic sense and not by some outside theoretical orientation” (Stolterman, 1994, p. 451). It highlights the critical disjunction between the understanding of the method in design: from method as a practice of science (which serves to validate the results), and from method as a practice of design (in which the results need not be repeatable and, in most cases, should not be duplicated or copied) (Cross, 2001).

Between technique and art, design (erly) thinking does not choose one path but seeks assertiveness as much as originality in solving the problem. Assertiveness comes from accumulated knowledge about how the problem has been solved repeatedly, while originality becomes necessary as the problem presents itself in a new version at the time the designer is working. Design (erly) thinking seeks a unique solution, but which has been elaborated about the most obvious ones (Adams et al., 2011). Therefore, design training aims to help students develop intellectual capacity and support them with the theoretical tools necessary to be able to understand the nature of design practice and reveal hidden biases and assumptions about it (Stolterman, 1994).

Design (erly) thinking illustrates a learning perspective in practice because it represents more than the knowledge and skills to be acquired and developed in the professional education process. Although it refers directly to thinking, this form of understanding about design education expresses a way of knowing-in-action of the designer’s professional practice (Cross, 2006). In an ontological dimension (Dall’Alba & Barnacle, 2007), design education focuses on turning students into designers; or from a perspective where knowing about design and being a designer are two inseparable and generated conditions of practice. Adams et al. (2011: 594) explained that the designer’s education seeks to consolidate three integrated and constitutive dimensions of the thinking, acting and being of this professional group: “(1) how professional designers achieve understanding about the nature of design and the problems of design, (2) how professional designers approach design, and (3) how professional designers shape their identity (being)”.

A synthesis on design (erly) thinking should not only address what it means to be and become a designer but also what it means to prepare the pupils and renew the practice of the experienced ones. Design (erly) thinking is not only a pre-established order of experiences that consolidate the knowledge about what good design is; it is also a set of heterogeneous social practices, that comes from the possibilities of experience of the designer situated in his/her community and society as a whole.

3. Design thinking (DT) in the context of management

In management, DT is strongly linked to the instrumental application for problem-solving and theoretical foundations tend to be overlooked (Johansson-Sköldberg et al., 2013). The causes of this may be the dizzying popularity DT has gained in recent years (Dorst, 2011), as well as the fact that DT seems self-explanatory, simple, and applicable. First, the popularity comes from the diffusion of DT as a vaguely elaborated proposal for the resolution of problems, generation of innovations, and resumption of creativity (Brown, 2010; Kelley & Kelley, 2012; Martin, 2009). It consists of “addressing the problems of management as designers approach the problems of design” (Dunne & Martin, 2006, p. 512). Therefore, the self-explanatory characteristic: DT, of course, is the thinking of design. Designers are professionals dedicated to thinking about things, in a conceptual dimension, to elaborate on how they could be better in an objective dimension. The simplicity of this logical articulation makes DT seem applicable, as it is possible to establish a precise definition and practical tooling.

This definition and tooling began to emerge in 1987, when the New-Zealand architect Peter G. Rowe definitively consolidated DT by using the term in the title of his book on the creative process in designing the construction of buildings (*Design of Buildings*), published by MIT Press. The book was explicitly aimed at architecture but brought about essential contributions to the preparation of the designers’ professional identity by addressing what these professionals do and how they perform their activity. In this book, Rowe (1987) advanced DT theory, which had already been discussed in the academic field of design, but the most important contribution may have been to present cases and examples that illustrate DT and bring readers closer to the application of DT in practice. Rowe (1987) synthesized a line of thought about the design methodology of his time (Cross, 2001), in describing DT as a way of doing design that could be grasped from observing the work of designers. In another book that uses the term DT in the title, Cross (2011) also contributed to this trend. From examples like these, the “recipe for design thinking” (Johansson-Sköldberg et al., 2013, p. 122) became increasingly common.

In an analysis of the international literature, which included books, scholarly articles, and specialized media materials on DT

between 1969 and 2010, [Johansson-Sköldberg et al. \(2013\)](#) found that “how-to” texts, case reports and the empirical work began to be published more commonly from the 1990s, followed by a weakening of the theorizing about DT. These texts are more based on practical experiences than on scientific research or from scientific research that has theoretical and methodological weaknesses. Regardless of the criticism, after [Rowe's \(1987\)](#) book, multiple DT models emerged, each based on different ways of designing and interpreting situations in which design applies. Currently, DT is recognized as a “new paradigm” ([Dorst, 2011](#)) to deal with problems in many areas, notably information technology ([Brooks, 2010](#)) and management ([Martin, 2009](#)). It is also a possible trigger for abductive reasoning for designing complex problems, escaping cause-effect relations to make sense of puzzling facts ([Dunne & Dougherty, 2016](#)).

The earliest reference to design in management is [Simon \(1967; 1969\)](#), who focused on the subject concerning science, professional training, and, in particular, management education. Years later, design was thought of as a strategic tool by [Kotler and Rath \(1984\)](#) and as a new strategy school by [Mintzberg \(1990\)](#), that could enable companies to deal with complex realities with the fostering of innovation. In spite of the epistemological differences between the positivist perspective of the strategy, the functionalist perspective of innovation and the constructivist perspective of DT, the integration between the three discourses seemed to become possible in a “synergic dialogue”, to “add value” to the development and use of products, services, processes ([Johansson & Woodilla, 2009](#), p. 4) and strategies ([Martin, 2009](#)). The integration could involve the active participation of designers in the mediation between innovation and management, which happened when design management emerged as an academic area in the 1970s. At the time, design management was dominated by designers who taught students and management professionals what design is and why it is relevant ([Johansson-Sköldberg et al., 2013](#)).

The interchange between designers and managers was “counterproductive” ([Johansson-Sköldberg et al., 2013](#), p. 127) because the positivist prescriptions desired by managers striped design from constructivist potential and contextualized meanings. The “synergetic dialogue” ([Johansson & Woodilla, 2009](#)) seems to have happened when scholars and management practitioners came to the world of design to understand design (erly) thinking on their own terms. In this circumstance, the conciliation between incompatible epistemological positions was carried out by virtue of the pragmatism of management, which made possible the understanding that “despite the apparent differences, the discourses [of strategy, innovation, and DT] are all interacting with one another within management, as part of the overall development of the company and as facilitators of [its] growth” ([Johansson & Woodilla, 2009](#), p. 3). This situation is well illustrated by the somewhat radical proposition that “management people do not need to understand designers better: they need to be designers” ([Martin, 2004](#), p. 10). The translation process through which DT has been promoted in the managerial discourse includes, for instance, the influence of the work of the architect Frank Gehry ([Boland and Collopy, 2004](#)), and the arguments justifying the adoption of abductive methods as a necessary complement to inductive and deductive ones ([Martin, 2004, 2009](#)).

In a managerial world increasingly in need of inventing and reinventing products, services and processes, design-driven innovations have come to be explored as alternatives to market-pull innovations, usually more practiced in the context of management, and to technology-pull innovations, which demand technological research, and have distanced themselves from the possibilities of the actions of managers ([Verganti, 2008](#)). The simplified discourse of DT, compared to design (erly) thinking, made the appropriation of DT to promote innovations seem possible. It is also worth mentioning the performance of specific organizations that have transformed DT into an appealing proposal for the world of contemporary management, placing DT as a “panacea for the economy” ([Johansson-Sköldberg et al., 2013](#), p. 121).

The US design company IDEO (www.ideo.com) exemplifies in the diffusion of DT, mainly for bringing the design closer to a broad audience. In 1991, when IDEO was founded in Palo Alto, California, USA, in the heart of Silicon Valley, the designers at the helm of the company saw the application of design far beyond product and graphical interfaces. In a pioneering manner, IDEO has joined the reputation as a developer of products for innovative companies, such as Apple, with the expertise to create design based on user interaction and human-centric experience to market itself as an innovation company instead of a design company. IDEO became trusted with researchers and academics for their cooperation with Stanford University ([Johansson-Sköldberg et al., 2013](#)), which conferred scientific validation to the practice of DT as a procedural methodology for problem-solving through the path of design. The exhibition of the creative process of the products and services elaborated by the staff of IDEO in widely viewed television programs in the United States gave visibility and some materiality to DT and contributed to the aura of playfulness and relaxation commonly associated to DT. The public image of IDEO centered on brainstorming groups, sketches on big posters, and the famous colorful Post-it notes stuck to the walls, forming expressive visual maps of the process of innovation.

Management's discourse on DT makes it appear that “tools of design – including Post-its and whiteboards – have become simple and ubiquitous” and useful for generating “organic growth and innovation” ([Liedtka & Ogilvie, 2011](#), pp. 4–5), as a natural consequence of letting groups of creative people work freely and spontaneously. But the simplification of design (erly) thinking and the superficial images of the DT process suggest “organizations are applying elements of design at the same time to the problems of management, without understanding what they are doing” ([Oster, 2008](#), p. 113). According to [Merholz \(2009:para. 2\)](#), from a satirical viewpoint, the feeling is that “to fix things, all you have to do is employ some ‘creatives’ wearing a turtleneck and using the right side of their brain, to ‘idealize’ tons of concepts and create new opportunities of value throughout the business”. DT reflected in the sketching out of fanciful ideas that maybe the next innovation the market needs is “often ridiculed” because it “rarely meets the obstacles of traditional metrics of businesses” ([Oster, 2008](#), p. 114).

4. Design, design thinking (DT) and management

For managers to become designers without following the route of design training, it seemed necessary to elaborate shortcuts for the appropriation of DT by management. The design approach to organizational problems has emerged as a revolutionary alternative to management education from [Martin's \(2004\)](#) proposal, endorsed by [Dunne and Martin \(2006\)](#), in which management students should

be encouraged to think broadly about problems, develop a deep understanding of customers, and recognize the value in the contributions of others, the way designers do. DT brings into management practices of innovation and problem-solution the pivotal role of empathy and user involvement (Liedtka & Ogilvie, 2011). From this proposal, DT was taken not only as a “method to approach innovation and confused and poorly structured situations” (Glen, Suci, & Baughn, 2014, p. 653) in the field of management, but also as a way for managers to understand design in a more straightforward way than the ones elaborated by design management or the academic perspective of design. The key argument for approaching design in management education is that management schools have sent students into an increasingly turbulent business environment, in which “graduates are ill-equipped to deal with uncertain situations” (Glen et al., 2014, p. 653). The formula for better preparing students, according to Glen et al. (2014) would be to synthesize the knowledge of the disciplines functionally with the day-to-day challenges faced in practice, departing from DT.

Although adherence to DT has occurred more strongly from the second half of the 2000s (Boland and Collopy, 2004; Brown, 2010; Dunne & Martin, 2006; Martin, 2009), mention of DT and an educational perspective for managers based on design are older. Simon (1967; 1969) advocated a curriculum for management that could integrate the basic disciplines of management science with the orientation of practice, incorporating scientific analysis and design. About management education, Simon's (1967) argument is that management schools at both undergraduate and graduation levels could be reformulated from design premises. The design idea adopted by Simon (1967; 1969) refers to the conscious activity of creation and not to the academic and professional field of design, specifically. He believed that the inclusion of the design perspective in management education could be facilitated not only by integrating theoretical content and professional practice into curricula of entire disciplines and courses, but also by developing a complete understanding of the design process itself (Glen et al., 2014). For Simon, “the design process could thus be analyzed and taught in the same way as the sciences” (Glen et al., 2014, p. 654).

Simon (1969) proposed that the concept of design be at the center of a new approach to science and taken as the key to developing alternative strategies to respond to complexity and uncertainty (Cohen, 2011). The author is a first reference in the academic field of design and for the theoretical foundation of DT, and his contribution was to offer a cognitivist perspective to the practice of creation, based on analytical rationality approaching positivism, from the epistemological point of view (Johansson-Sköldberg et al., 2013). Such a perspective was questioned by other scholars on the academic field of design, notably by Schön's (1983) philosophical pragmatism. However, the epistemological discussions about design and DT did not evolve in the same way within management, a field traditionally dominated by an emphasis on positivist-functionalism.

The contributions of Simon (1967) to management education emphasized that organizational theory and management practice need to be combined in a synthesis, achievable through the very building of business schools as environments for professional training in the university context (an idea recently updated in the work of Berti, Simpson, and Clegg (2018)). The merge of practical and academic perspectives would be necessary to avoid the situation of natural accommodation, called “entropy” (Simon, 1967, p. 12), which occurs when teachers trained in practice or trained in academia are together but situated on opposite sides of the faculty of management universities. To prevent it, business schools should become environments close to the ones of the design schools where the integration seemed to be feasible. In regard to a number of orientations in the structure of business schools, forms of communication, planning of activities, and even hiring of staff, Simon (1967: 13) developed a vision of integrated curriculum planning, “so that problems in the practice of management are stressed by economic and psychological theories and by mathematical techniques – and also the reverse”. Simon (1967: 14) also encouraged interdisciplinary research, provided by the formulation of “doctoral thesis problems that require the student to work with faculty members from various disciplines”.

Despite these guidelines, Simon himself (1967: 16) recognized that the organization of a management school through design is “very similar to mixing oil and water: it is easy to describe the expected product, but it is more difficult to produce it”. He also stated that the task of integrating academic knowledge and professional practice is not over just because the goal has been achieved once, because the tendency toward separation is natural. The difficulties of achieving “integrative learning” (Welsh and Dehler, 2013), from a multidisciplinary perspective, are diverse and continuous. Even in design, where the pedagogical approaches to professional education have been the subject of reflection along with the scientific evolution of the academic field (Schön, 1983; Cross, 2006), the ways of achieving it are discussed and continuously problematized. In any case, the use of design and, in particular, DT, illustrates a change of perspective for most management courses, which gained momentum from Simon's (1967) proposal of making theory and practice converge in synthesis in the higher education of management.

The rational-analytic emphasis, which is a legacy of Simon (1969), was challenged by Schön's (1983) approach to a form of practical rationality embodied in action. While Simon (1969) understood design as a set of conscious activities to create artifacts, Schön (1983) constructed an image of the designer from a focus on the practical relationship between creation and reflection-upon-the-creation, which continually improves competence (Johansson-Sköldberg et al., 2013). While Simon's definition of design is too broad (“designer is everyone who devises courses of actions aimed at changing existing situations into preferred ones” (1969: 111)), it points out a fundamental feature of design: the fact it applies to circumstances in which the problem is highly ambiguous (Newell, Shaw, & Simon, 1959), and the advantage of using design approaches over analytic ones resides in their capacity to help to build a better understanding of the issue at hand. It is in such contexts that the notion of “reflective practice” (Schön, 1983) or that of DT as meaning creation (Krippendorff, 2006) become significant.

The resurgence of design in the 2000s recognized Simon's (1967; 1969) earlier proposal and ratified the notion that “design teaching in business schools requires a pluralistic approach that is currently absent” (Dunne & Martin, 2006, p. 521), but still acknowledges the guidelines on how this could be. Glen et al. (2014: 656), as defenders of DT in management training, argue that “management schools have been criticized for their overemphasis on expository classes and case-based teaching methods to the detriment of clinical training or learning by doing”, but they also point out that “we still need pedagogies to address problems [in practice], particularly when it comes to confusing and ill-defined problems”. In turn, Martin is not specific about what courses would

be added or discontinued to the curriculum. However, he comments that there would still be a need to teach “the existing ‘standard’ models” combined with a design approach” (Dunne & Martin, 2006, p. 521).

Another high spot is the emphasis that DT places on solving problems. Mintzberg (2004) criticized this approach of reducing management to problem-solving and reducing problem-solving to the analysis in managerial education, while Simon (1969) contributed to the conceptualization of design as a distinctive mode of rational problem-solving. The challenge of integrating theory and practice remains in mixing water and oil, as Simon (1967) illustrated. Design is singled out as a possibility, but the question of how to deliver an education that includes the perspective of design (erly) thinking in management remains unsatisfactory.

Reflections of design on practice pedagogies (Schön, 1983) are mentioned as possibilities for teaching management, but many learning-in-action methods can be applied to assist in the retention and application of principles and analysis techniques capable of dealing with the context where theory and practice can converge (Glen et al., 2014). Among the teaching-learning approaches based on practice, DT was elevated to the category of “paradigm” for management education (Dunne & Martin, 2006, p. 512) in the 2000s, probably because of the relationship with Simon’s proposals (1967; 1969), but also possibly because the time has come when the use of the design in management seems to make sense. In the socio-economic context of the current era, there is growing evidence that the management environment is becoming increasingly complex and that the need for innovation has become the driving force of business activity. Design (erly) thinking is notable for how it creatively solves problems, which makes it attractive to a general idea of innovation (Beckman & Barry, 2007). But design (erly) thinking is also a peculiar way of elaborating and relating to problems, and this is a question that may have been left out of the management’s appropriation of DT and how design inserted in the context of management education.

As previously stated, design is between art and technique, and discussions in the academic field of design have somewhat agreed that design should not be thought of as a science, but as a discipline (Cross, 2001). In the course of design’s academic development, Simon’s (1969) called for the development of design science in universities as “an intellectually difficult, analytical, partially formalized, partly empirical and teachable body of doctrine about the design process” (Cross, 2001, p. 50) was superseded by Schön’s (1983) cognitive approach, according to which design is an epistemology of practice, implicit in artistic and intuitive processes in which practitioners deal with situations of uncertainty, instability, conflict of values in an inherent way to the practice itself. According to Cross (2001: 55), instead of seeking scientific formatting for the practice of design, designers should focus on the typical ways of knowing, thinking and acting in design. Cross (2001) suggests that other intellectual cultures in the sciences and the arts can focus on their underlying ways of thinking and acting to create knowledge for resolving the balance between science and practice in their domain, the synthesis of disciplinary practice, or a practical discipline, as in the case of design. Perhaps, this suggestion is very precious to management, an area whose scientific aspect combines practical experience and the “art” component to deal with the synthesis based on creative insights and imagination (Gosling & Mintzberg, 2004; Mintzberg, 2004).

In the epistemological reflection on the forms of knowledge that design provides (Cross, 2001), the understanding of design arises as an integrative discipline, which connects useful knowledge from a wide variety of subjects, focusing on situated problems or broader social concerns (Buchanan, 1992). In other words, in this disciplinary perspective the design is stripped of a scientific pretension, so that it is possible to train professionals who have design (erly) thinking as an embodied knowledge, that is, a type of knowledge that is not expressed in content or subject of knowledge, but in the ways of doing and being of the design professional.

In the teaching of design as much as in teaching management, the focus on acquiring knowledge and techniques is insufficient to incorporate and promulgate a skilled professional practice in the student. From an ontological viewpoint, professional education is a process of becoming, in which the student must be exposed to experiences through which (s)he can incorporate the ways of thinking, doing and being typical of the professional group (s)he seeks to belong (Dall’Alba & Barnacle, 2007; Dall’Alba, 2009). Regardless of the use of DT as content or methodology for managerial education, management training requires its own approach, which encourages managers to learn, with their personal individual experience and as a community of management practitioners, to spread knowledge about this practice, on a disciplinary basis (Mintzberg, 2004). Beyond DT, the doubt “whether management can be taught” (Elmuti, 2004, p. 439) persists and the response should focus much less on the theoretical content that fills the curriculum of management courses and much more on what students should have the chance to experiment on the path to their formation, to incorporate the knowledge, qualities, and skills that managers must be able to express in practice.

4.1. Final considerations

The purpose of this article is not to detract from the validity of design for management or to discourage DT in the training of managers. On the contrary, the successful adoption of DT for management education can help to bridge the gap between theory and practice in management knowledge and enrich the problem framing and problem-solving steps of the management practice with multidisciplinary approaches focused on user-centered and iterative perspectives. DT strives for a deep understanding of complex situations, from the standpoint of the user, or the customer, or the ones most affected by the implications of a certain managerial issue. The expected learning outcomes of the adoption of DT comes from decentering the managers from the bias of the management discipline, by opening the management training to diversity and bringing empathy to bear in management decisions. It can also foster the development of organizational theories from the practical lessons that come from the learning process of design-based projects, and bring management research and practice closer, as the processes of problem-framing and problem-solving can make scientific and practical logic and procedures to intertwine. A futuristic look at the relation between design and management may point out to not only to the erosion of the supposed dichotomy between “business thinking” and “design thinking” (Merrholz, 2009) but also to other transdisciplinary pathways to the management knowledge, so a broad diversity of viewpoints and perspectives will prepare the management discipline and practice to fit complex horizons.

The current approach to the academic field of design, through DT, puts education in management in the position of the need to (re) think about practical formation, in the resumption of a movement that has important antecedents, whose proposals have profoundly influenced management schools (Simon, 1967) and MBAs (Gosling & Mintzberg, 2004; Mintzberg, 2004). Thus, DT has the potential to represent a seismic change in most management courses. Possible positive results could come from the cross-sectional knowledge enabled by the interaction of management and design, the increase of utility in management research coming from such interaction and also from the approximation with society, and the boost in the attractiveness of academic research by valuing social aspects, like the feeling of belonging and collective intellectual challenge, as well as the perceived benefits of academic research from organization members. However, one should consider that incorporating DT as a fad has little to contribute to this movement. Repeatedly, elements of other sciences and professional practices are blended into management courses, with the explicit objective of filling theoretical limitations, modernizing the curriculum, reinventing teaching-learning methodologies or contributing to academic research. But the use of other occupational sciences and practices also seems to focus on issues that are specific to management and which can not only be addressed in this context. When DT is adopted without the proper problematization, and it is uncritically assumed that the manager must become a designer (Dunne and Martin, 2006), there may be an inherent tendency to diminish the social importance of management.

Departing from the critique that this paper elaborates, the research in management education must retake the chance to reflect deeply on the practice of management and the defining characteristics of the manager (Mintzberg, 2004), to understand the typical way to think-act-be of the manager in terms of a pedagogical proposal, such as that of DT, and to accept the reduction of borders between different areas of knowledge, favoring the dialogue and the construction of interdisciplinary knowledge. It would also require considering the role of institutional and discursive forces in facilitating or hindering this shift. For instance, a partial or improper introduction of DT has been aided by a rhetorical ambiguity: the use of the term 'design' suggests an idea of top-down planning, which aligns with discursive expectation of managerial control; however, proper application of DT implies the opposite, an acceptance of open-ended ambiguity that is socially legitimate for an artist-architect, but not for a manager. Furthermore, such defining characteristics shall not be static and should express the distinctive traces of management in different time-and-space contexts. One virtue of the DT application for management education is the emphasis on empathy and user's involvement (Liedtka & Ogilvie, 2011). This should not be overlooked in the actual reality of the disconnection of human interactions that have already led to a decline of 40% on empathy between undergraduates in 2010 the US, compared with 20 or 30 years before (Turkle, 2015). Additionally, DT in scientific management research can make a great contribution to the add social relevance and social impact to scientific researches, from the generation of hypotheses and interpretation of data, so that the management research can bounce from theoretical models to empirical testing and figuring out social outcomes as the main result of knowledge production.

The community of practitioners, in synthesis with the community of management academics, should reflect on the profile of managers that the society in which they are inserted needs. It implies that different managerial profiles may emerge in different socio-cultural contexts, leading to contextualized views on teaching, research, and management practice. It also seems to be necessary to observe how the manager's typical way of thinking-acting-being, elaborated concerning specific contexts of action, can be or is being incorporated into the structuring proposals of management education, in institutional and regulatory spheres, when this is applied.

It is hoped that the reflections initiated in this article have emphasized that the adoption of practice-oriented teaching methodologies, like DT, is not the final way to solve the problem of integrating theory and practice. It may be necessary to rethink the management formation, in ontological terms, and to problematize the forms of knowledge production in management, in epistemological terms, in a process that can begin in analogy to design (erly) thinking, but that must develop from the ends of management.

CRedit authorship contribution statement

Marina Dantas de Figueiredo: Writing - original draft, The applicant developed the idea for the theoretical paper and did all the theoretical construction and writing of the paper.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijme.2020.100429>.

References

- Adams, R. S., Daly, S. R., Mann, L. M., & Dall'Alba, G. (2011). Being a professional: Three lenses into design thinking, acting, and being. *Design Studies*, 32(6), 588–607. <https://doi.org/10.1016/j.destud.2011.07.004>
- Beckman, S. L., & Barry, M. (2007). Innovation as a learning process: Embedding design thinking. *California Management Review*, 50(1), 25–56. <https://doi.org/10.2307/41166415>
- Berti, M., Simpson, A. V., & Clegg, S. R. (2018). Making a place out of space: The social imaginaries and realities of a Business School as a designed space. *Management Learning*, 49(2), 168–186. <https://doi.org/10.1177/1350507617737453>

- Boland, R. J., Jr., & Collopy, F. (Eds.). (2004). *Managing as designing*. Stanford: Stanford University Press.
- Boland, R. J., Jr., Collopy, F., Lyytinen, K., & Yoo, Y. (2008). Managing as designing: Lessons for organization leaders from the design practice of Frank O. Gehry. *Design Issues*, 24(1), 10–25. <https://www.mitpressjournals.org/doi/pdf/10.1162/desi.2008.24.1.10>.
- Brooks, F. P., Jr. (2010). *The design of design: Essays from a computer scientist*. Stoughton: Pearson Education.
- Brown, T. (2010). *Design thinging: uma metodologia para decretar o fim das velhas ideias*. Rio de Janeiro: Elsevier.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8 5–21.
- Cohen, B. J. (2011). Design-based practice: A new perspective for social work. *Social Work*, 56(4), 337–346. <https://doi.org/10.1093/sw/56.4.337>
- Cross, N. (2001). Designerly ways of doing: Design discipline versus design science. *Design Issues*, 17(3), 49–55. <https://doi.org/10.1162/074793601750357196>
- Cross, N. (2006). *Designerly ways of knowing*. London: Springer Verlag.
- Cross, N. (2011). *Design thinking*. Oxford: Berg.
- Dall'Alba, G. (2009). Learning professional ways of being: Ambiguities of becoming. *Educational Philosophy and Theory*, 41(1), 34–45. <https://doi.org/10.1111/j.1469-5812.2008.00475.x>
- Dall'Alba, G., & Barnacle, R. (2007). An ontological turn for higher education. *Studies in Higher Education*, 32(6), 679–691. <https://doi.org/10.1080/03075070701685130>
- Dorst, K. (2011). The core of 'design thinking' and its application. *Design Studies*, 32(6), 521–532. <https://doi.org/10.1016/j.destud.2011.07.006>
- Dunne, D. J., & Dougherty, D. (2016). Abductive reasoning: How innovators navigate in the labyrinth of complex product innovation. *Organization Studies*, 37(2). <https://doi.org/10.1177/0170840615604501>
- Dorst, K. (2006). Design problems and design paradoxes. *Design Issues*, 22(3), 4–17. <https://www.mitpressjournals.org/doi/pdf/10.1162/desi.2006.22.3.4>. In press.
- Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *The Academy of Management Learning and Education*, 5(4), 512–523. <https://doi.org/10.5465/amle.2006.23473212>
- Elmuti, D. (2004). Can management be taught? If so, what should management education curricula include and how should the process be approached? *Management Decision*, 42(3/4), 439–453. <https://doi.org/10.1108/00251740410523240/full.html>.
- Glen, R., Suci, C., & Baughn, C. (2014). The need for design thinking in business schools. *The Academy of Management Learning and Education*, 13(4), 653–667. <https://doi.org/10.5465/amle.2012.0308>
- Glen, R., Suci, C., Baughn, C. C., & Anson, R. (2015). Teaching design thinking in business schools. *International Journal of Management in Education*, 13(2), 182–192. <https://doi.org/10.1016/j.ijme.2015.05.001>
- Gosling, J., & Mintzberg, H. (2004). The education of practicing managers. *MIT Sloan Management Review*, 45(4), 19–22.
- Gray, C. M., & Siegel, M. A. (2014). Sketching design thinking: Representations of design in education and practice. *Design and Technology Education: An International Journal*, 19(1), 48–61.
- Groth, C. (2016). Design-and-craft thinking analysed as embodied cognition. *Form Akademisk-forskningstidskrift for design og designdidaktikk*, 9(1), 1–21. <https://doi.org/10.7577/formakademisk.1481>
- Hassi, L., & Laakso, M. (2011). Design thinking in the management discourse: Defining the elements of the concept. In *18th international product development management conference. Delft, The Netherlands, 5-7 June 2011* (pp. 1–14). Delft: Delft University.
- Hatchuel, A. (2001). Towards design theory and expandable rationality: The unfinished program of Herbert Simon. *Journal of Management and Governance*, 5, 260–273. <https://doi.org/10.1023/A:1014044305704>
- Hatchuel, A., & Weil, B. (2008). C-K design theory: An advanced formulation. *Research in Engineering Design*, 19, 181–192. <https://doi.org/10.1007/s00163-008-0043-4>
- Johansson, U., & Woodilla, J. (2009). Towards an epistemological merger of design thinking, strategy and innovation. In *8th European academy of design conference. Alberdeen, Scotland, 1-3 pril 2009* (pp. 1–5). Alberdeen: The Robert Gordon University.
- Johansson-Sköldberg, U., Woodilla, J., & Çetinkaya, M. (2013). Design thinking: Past, present and possible futures. *Creativity and Innovation Management*, 22(2), 121–146. <https://doi.org/10.1111/caim.12023>
- Kelley, T. (2001). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm* (Vol. 10). New York: Broadway Business.
- Kelley, T., & Kelley, D. (2012). Reclaim your creative confidence. *Harvard Business Review*, 90(12), 115–118.
- Kotler, P. G., & Rath, A. (1984). Design: A powerful but neglected strategic tool. *Journal of Business Strategy*, 5(2), 16–21. <https://doi.org/10.1108/eb039054>
- Krippendorff, K. (2006). *The semantic turn: A new foundation for design*. Boca Raton: Taylor and Francis.
- Liedtka, J., & Ogilvie, T. (2011). *Designing for growth*. New York: Cambridge University Press.
- Martin, R. (2004). The design of business. *Rotman Management*, 5(1), 6–10.
- Martin, R. (2009). *The design of business: Why design thinking is the next competitive advantage*. Boston: Harvard Business School Press.
- Matthews, J. H., & Wrigley, C. (2017). Design and design thinking in business and management higher education. *Journal of Learning Design*, 10(1), 41–54.
- Melles, G., Howard, Z., & Thompson-Whiteside, S. (2012). Teaching design thinking: Expanding horizons in design education. *Procedia – Social and Behavioral Sciences*, 31, 162–166. <https://doi.org/10.1016/j.sbspro.2011.12.035>
- Merholz, P. (2009). Why design thinking won't save you. <https://hbr.org/2009/10/why-design-thinking-wont-save>. (Accessed 11 January 2019).
- Mintzberg, H. (1990). The design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, 11(3), 171–195. <https://doi.org/10.1002/smj.4250110302>
- Mintzberg, H. (2004). *Managers not MBAs*. San Francisco: Berrett-Koehler Publishers.
- Newell, A., Shaw, J. C., & Simon, H. A. (1959). *The processes of creative thinking. Paper presented at the symposium on creative thinking*. Boulder Colorado: University of Colorado.
- Oster, G. W. (2008). Practitioners corner: Derailing design thinking. *International Journal of Leadership Studies*, 4(1), 107–115.
- Rowe, P. G. (1987). *Design thinking*. Cambridge: MIT Press.
- Schön, D. (1983). *The reflective practitioner: How professionals think in action*. Cambridge: Basic Books.
- Simon, H. A. (1967). The business school a problem in organizational design. *Journal of Management Studies*, 4(1), 1–16.
- Simon, H. A. (1969). *The sciences of the artificial*. Cambridge: MIT Press.
- Stolterman, E. (1994). Guidelines or aesthetics: Design learning strategies. *Design Studies*, 15(4), 448–458. [https://doi.org/10.1016/0142-694X\(94\)90007-8](https://doi.org/10.1016/0142-694X(94)90007-8)
- Trukle, S. (2015). *Reclaiming conversation: The power of talk in a digital age*. New York: Penguin.
- Verganti, R. (2008). Design, meanings, and radical innovation: A metamodel and a research agenda. *Journal of Product Innovation Management*, 25(5), 436–456. <https://doi.org/10.1111/j.1540-5885.2008.00313.x>
- Welsh, M. A., & Dehler, G. E. (2013). Combining critical reflection and design thinking to develop integrative learners. *Journal of Management Education*, 37(6), 771–802. <https://doi.org/10.1177/1052562912470107>