

# PhD in Design

## Building a Network of Excellence

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An open discussion about emerging issues and challenges for doctoral design education

February 20<sup>th</sup>, 2020

2.30/5.30pm @Polifactory - B3 building – School of Design, Politecnico di Milano

A spontaneous and global network among PhD in Design programs has been recently established involving Politecnico di Milano (IT) with Aalto University (Fi), Carnegie Mellon University (US), Imperial College (UK), The Institute of Design (US), TU Delft University (Ne), aiming at sharing experiences, reflections and ideas for future developments of PhD education in Design.

The seminar will unfold some emerging issues and questions identified within the network to open the discussion to a broader audience of academics and experts.

In particular, we will reflect on the dimension of Research through Design and its relevance within doctoral education in Design.

This document results from a collective discussion and elaboration of a team of professors within the faculty board of the PhD in Design @ Politecnico di Milano.

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### DESIGN RESEARCH AS A MATURE DISCOURSE

The mutual relationship between theory and practice is a key discourse within the evolution of academic design culture, crossed by a multiplicity of transformations. The origin of such discourse can be ascribed to a need for systematization of theories and methods and an aspiration to objectivity and rationality which characterizes western culture from the age of Enlightenment on. After the seminal Bauhaus experience, the goal to '*scientisize*' design emerged with urgency in the middle of last century, in a context increasingly populated by 'designed artefacts', and moved from the recognition of the implicit nature of design practice towards the establishment of the discipline as an independent field of inquiry (Buckminster Fuller, 1957; Bradbury et al., 2018).

The theoretical debate that flourished in the 60s and 70s, especially in the Anglo-Saxon contexts, brought to diversified attempts to formalize a theoretical corpus for design. The need to codify "the" design process led to the appropriation of methodological approaches developed in other scientific fields, such as information sciences, mechanical engineering, mathematics and statistics, as well as social sciences (Collina, 2005), unveiling the undeniable multidisciplinary nature of design discipline (Gregory, 1966; Simon, 1969; Archer, 1979). However, it soon became clear that the elaboration of a comprehensive theory of design based on a set of methodologies able to guide its research approaches and codifying its practices, was incoherent with the nature of design itself. This acknowledgement rose with the epistemological study of several applied disciplines (i.e. medicine, architecture)

showing the interweaving of theories and experimental practices in the process of advancing their disciplinary knowledge (Rosselli, 1973; Schön, 1983; Friedman, 1997; Cross, 2001).

From this moment on, a richer debate - open to different theoretical contributions - drove the transformation of the idea of design research itself. Three categories of design research were first identified by Sir Christopher Frayling and then deepened by several scholars - research *about* design, *for* design and *through* design - clarifying the different roles that design practice can play within design research processes (Frayling, 1994; Buchanan and Margolin, 1995; Manzini, 2000; Cross, 2006; Friedman, 2008). Indeed, design practice can be: the subject, the aim, or the means of the research project.

Within the Italian context, the focus on 'practice' as a specific ontological system of design, has always had great relevance. When in 1990 Politecnico was the first University in Italy to institutionalize design research and education, it could count on several experiences and expertise both inside and outside the academy. They were all the results of the same reflexive attitude transcending the material dimension of artefacts, an attitude which Emilio Ambasz highlighted in the exhibition "Italy. The New Domestic landscape" he curated at MoMa-New York in 1972. He eloquently titled his introduction to the catalogue "Transcending functions. In the world of Italian design simple shapes mask complex thoughts", giving a formal recognition to an original body of contributions where design practices and design theories were strictly interwoven. Such contributions stemmed from a large community of "reflexive practitioners", among which many graduates and professors of Politecnico di Milano (Munari, 1966; Ambasz, 1972; Rosselli, 1973; Bonsiepe, 1975; Ciribini, 1984; Branzi 1999, 2008).

Across the last thirty years of reflection, theoretical elaborations and design research practices, several advancements have been made reinforcing an interdisciplinary vision of design, blending theories and applied methodologies and building a rich, diverse and connected academic community.

Within this path, the relationship between theory and practice, embedded within the concept of Research through Design (RtD), has been often addressed as a key component for building a distinctive design epistemology (Koskinen et al., 2011; Stapper and Giaccardi, 2017; Manzini, 2015; Volontè et al., 2018) able to codify the specific cognitive process design applies to let emerge innovation, new meanings and new design knowledge (Krippendorff, 2005; Verganti, 2008 and 2009; Redström, 2017).

## **WHY TO FOCUS ON RESEARCH THROUGH DESIGN**

The intrinsic nature of design, sourcing different knowledge domains and blending theories and practices, seems to be particularly relevant today, when the 'silos centered' vision of knowledge, still typical of the 20th century, is no longer able to respond to the needs of our world. In light of this, there are three aspects - among the contemporary paradigm shifts - which open up to a more established recognition of design as a research practice. They relate to: (1) the nature of today's technological innovation; (2) the peculiar structure of contemporary organizations and companies; (3) the emerging issues characterizing our 21st century social and cultural environment.

First of all, the nature of technology within the so-called Fourth Industrial Revolution, is dramatically different from the past and its evolution is following accelerated and unpredictable paths. From being a "black box" conceived by experts within the closed boundaries of R&D departments, technology is increasingly becoming an open asset. In our networked world (Castells, 1996), where knowledge is broadly accessible, innovation arenas are not anymore confined within specific functions of companies and organizations, but placed in a larger ecosystem. This has changed the very nature of academic research in all fields (Etzkowitz et al., 1998). Moreover, innovation is open in terms of potential applications, where the digital revolution and miniaturization transformed it into a multipurpose flexible asset (Rosenberg, 1983; Rifkin, 2000; Brynjolfsson and McAfee, 2014), as well as in terms of information and data access (Star and Ruhleder, 1996; Rifkin, 2000). In light of this, design - driven by its user- and culture-centered approach - is able to envision new domains of applications, emerging as a powerful lever to guide technological innovation (Verganti, 2006; Maffei et al., 2015).

Secondly, as a consequence of the shift from industrial to knowledge economy, organizations have been growing

their need for new jobs hierarchy and management styles (Rifkin, 1995; 2011). Organizations are increasingly characterized by parallel, transversal and open processes, where multidisciplinary competences are mostly required. In particular, companies' operations are often project-based, so that professionals who hold both technical and design skills together with managerial skills are highly demanded (Luski, 2001; Florida and Goodnight, 2005). This has been leading to an increasing focus on design professionals, often promoting them to strategic roles (Souter, 2007; Muratovski, 2010, 2016; Deserti and Rizzo, 2014). This is also highlighted by a growing interest on "Design Thinking" - intended as a creative attitude to filter, transfer and connect different bodies of knowledge - as a new approach required for leadership roles to envision innovation's trajectories (Kolko, 2005; Martin and Martin, 2006; Brown, 2009; Cross, 2011; Banerjee et al., 2015).

Finally, the complexity of contemporary societal organizations, resulting from phenomena such as mass urbanization and consumption dynamics, large and global migrations, frictions and conflicts among religious and political systems, is rising complex issues to be faced through systemic and collaborative approaches (Sassen, 2004, 2011). Therefore, design is seeing a progressive broadening of its traditional domains, affirming itself as a powerful driver of innovation within the intertwined social and cultural ecosystem. As a consequence, new application fields such as services, healthcare, public policies, urban and territorial systems are emerging (Bonsiepe, 2007; Manzini and Rizzo, 2011; Mortati, 2015; Deserti and Rizzo, 2014a-b; Meroni et al., 2018). This ongoing recognition of design potential, impacting on emerging sectors, identifying new arenas, feeding strategic skills and leadership styles, facing super-wicked problems and global challenges, can explain the booming of design education demand at university level, as well as the sourcing of design practices and approaches from adjacent disciplinary fields (i.e. management and organizational sciences as well as human and social sciences). In light of this scenario, a deeper understanding of how to grow design research skills within the context of higher education seems to be crucial, as well as the goal of building an international and cross-disciplinary acknowledgement of RTD as the distinctive contribution design can bring to positively drive contemporary transformations.

## FRAMING THE DEBATE

Several scholars have identified in RTD the added value of a designerly approach to research. However, the nature and standards of RTD are still in need of further clarification. Different approaches confront each other, and several aspects deserve a more elaborated understanding. We want to focus on three issues in particular, in which the different possible approaches can be framed within opposite poles. These polarities are represented with metaphors in the following three sections, as a way of inspiring the discussion.

### 1) Structure VS Stigmergy: Shaping Research through Design Processes

- **Structure:** the organizational principle of complex systems made of different parts where each one has a specific function in relationship with the others and the overall purpose of the system itself.
- **Stigmergy:** the organizational principle of certain systems made by agents with the same functions which through signs and signals that other agents sense, determine their subsequent actions within a form of collective intelligence (Parunak, 2006).

The development and acknowledgement of an original set of methodological approaches seems to be an essential step in the process of legitimization of RTD. The two polarities move from the idea of RTD process being planned following a "scientific-like approach" to the concept of RTD being a process which is open-ended and unveiled during its own development.

On the one hand, we look at the RTD process with a methodological approach that conceives design practice as a sort of experiment for the production of new knowledge (Friedman, 2003). More or less defined research hypotheses are then translated into design experiments validated by reiterated testing (e.g. prototyping). The

research process aims at harnessing the creative act of design by means of forms of observation and description that can make it functional for the production of collective knowledge.

On the other hand, we look at the RTD process with a metadesign approach, which offers a framework for "discovering" and "unveiling" the process itself (van Onck, 1965). Metadesign requires methods and techniques that are fluid, rather than prescriptive and environments that can evolve. It is a systemic and open process based on "affecting and being affected" (Deserti, 2003; Giaccardi, 2005). In this sense it offers models of selection and decision, drawing on research and visualization tools and becoming a guiding compass. Within this approach, consecutive and reiterated research and representation processes - i.e. representing and prototyping - guide to structure and redirect the research path, depending on the interaction with its evolving context and components. The two approaches highlight an intrinsic contradiction of RTD, which needs to be addressed. On the one hand: how is it possible to harness the creativity of design in structured, planned and foreseeable processes similar to those of experimental research? On the other hand: if we do not structure the design process, how can we make it a source of collective and compelling knowledge?

## 2) Documentary VS Fiction: The contribution of prototyping to the production of knowledge

- **Documentary:** A demonstration with evidence of contextual reality, through an *intentional and planned* capturing act, provided with explanatory *elements*.
- **Fiction:** A representation of imaginary and/or invented realities, a way of projecting alternatives and formulating speculations that suggests possible - utopian or dystopian - futures that can readdress the understanding of the present.

Artifacts can be used as means to develop new knowledge, as well as to challenge or complement an existing body of theoretical knowledge. Therefore the role of artifacts and prototyping in design research deserves closer consideration. Documentary and Fiction seem to be here the opposite poles delimiting the continuum of the design development process.

Prototyping artifacts serves to test new ideas, facts or theories to be shared with the design community. Furthermore, by designing and prototyping artifacts - in the wider sense of their ontological meanings (Buchanan, 2001) -, researchers can envision and explore alternatives as well as envisage tangible workable design outcomes, even in the early front end of the design development process (Sanders, 2005). In design research, in fact, prototypes can help to envision unforeseen possibilities, suggesting future scenarios by making them embodied, tangible, and, therefore, also testable. In some cases, they are left intentionally "unfinished" and "open-ended" by the designer in order "to explore new opportunities with the materials at hand, to develop new potentials, and to build examples that populate the new design space" (Vallgård 2009, p.11).

The artifact is a "knowledge bearer" in a class of its own, but it is still unclear how it can become a vehicle of collective knowledge production towards diverse meanings and plural understandings of the researched area. Its existence is usually witnessed through images (in printed publications), by models or even directly (in conferences). How can it contribute to the production of reliable knowledge - and not only of measured and measurable evidence or of proof of concept -, that is, a kind of knowledge that is independent of the circumstances of its production?

## 3) Library VS Wunderkammer: Codifying and circulating design knowledge

- **Library:** A systematic collection of textual documents organized by universal analytical category (i.e. alphabet, dates etc.) selected with the aim of offering a comprehensive knowledge on specific domains.
- **Wunderkammer:** An assemblage of heterogeneous elements and artifacts organized by their nature (*naturalia/artificialia/mirabilia*), selected by an 'author' and willing to build a curiosity driven knowledge.

The RTD process is typically characterized by two different forms of output: i) a concrete problem framing, such as theories, guidelines, design specifications for future products, suitable for a Library, ii) a series of artifacts, such as

models, prototypes, products, interfaces, drawings, storyboards, videos etc. (Zimmerman et al., 2007), better fitting a Wunderkammer. These two kinds of output are intrinsically correlated: together, they represent two complementary facets of the same knowledge outcome.

Various observers insist on the need for RTD projects to be accompanied and wrapped up by verbal texts, articles, dissertations, and the like (Bonsiepe, 2007; Findeli, 1998; Schneider, 2007). This seems to be the condition to make results public and disputable - as required by the western system of scientific research - , elevating design research above the level of mere design.

However, the peculiarity of RTD lies in the fact that the researcher's knowledge claims are made possible and validated by the existence of an artifact that embodies and exemplifies them. Thus, the generated knowledge bases itself on producing design exemplars (Zimmerman and Forlizzi, 2008) or "epistemic objects" (Mareis, 2012), in the form of artifacts that can be seen as "the solid form of knowledge to be disseminated" (Bang et al., 2012, p.7; Harman, 2018). Yet it is hard to figure out how artifacts could be filed in a Library.

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