

ADVANCEMENTS IN DESIGN RESEARCH

11 PhD theses on Design as we do in POLIMI



edited by Lucia Rampino and Ilaria Mariani



Direction: Silvia Piardi

Scientific Board:

**Alessandro Biamonti, Ezio Manzini, Carlo Martino,
Francesca Tosi, Mario Piazza, Promil Pande**

Over the last few years the international design research network has become an important reality, which has facilitated the sharing of ideas and opinions, improved understanding of the subject and increased awareness of the potential of design in various socio-geographical contexts.

The current expansion of the educational network allows teachers, students, researchers and professionals to meet, both online and in person.

It would seem therefore that the time is now right to propose a new series of books on design, contributing the construction of the international design community, helping authors bring their work onto the world scene.

The Design International series is thus born as a cultural setting for the sharing of ideas and experiences from the different fields of design, a place in which you can discover the wealth and variety of design research, where different hypotheses and different answers present themselves, in an attempt to draw up a map of Italian design, though in a continuous comparison with the world scene.

Different areas of design will be investigated, such as for example: fashion, interior design, graphic design, communication design, product and industrial design, service and social innovation design, interaction design and emotional design.

Books published in this series are selected by the Scientific Board and submitted to two referees for peer-review.



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DESIGN INTERNATIONAL

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The evolving boundaries of design research at Polimi: education, soft skills, creative companies and digital tech

Lucia Rampino and Ilaria Mariani
Department of Design, Politecnico di Milano

Twenty years have passed since October 1998, when the first conference on doctoral education in design was held. Organized at Ohio State University, it brought together participants from a number of countries. Among them, Ezio Manzini, then Coordinator of the Politecnico di Milano PhD Programme in “Industrial Design and Visual Communication”.

On the occasion of that seminal conference, Buchanan, then Director of The School of Design at Carnegie Mellon University, envisioned doctoral education in design as a “neoteric enterprise” (Margolin, 2010). In Buchanan’s own words, the objective of neoteric education was to “gather resources from any area of previous learning in order to find new ways of addressing the new problems, thereby creating a new body of learning and knowledge” (Buchanan, 1999, pp. 6-7). Twenty years after, these words can still be shared: the *new problems* affecting our globalised, bewildered and worried society are growing in numbers and in complexity, and *new ways* of addressing them are more sought-after than ever.

First established in 1990, in 1998 – at the time of the above mentioned conference – the Politecnico di Milano Doctoral Programme in “Industrial Design and Visual Communication” was still affected by the traditional legacy of the design discipline, being mainly concerned with the relations between tridimensional and bidimensional artefacts and their users. In the following years, the spectrum of the research issues addressed by the doctoral candidates has widened, so to embrace not just the system of material objects, but also the relationships between production networks and social systems, up to urban areas and the environment. What should be noted, in this broadening of topics, is the constant reinforcement of themes related to both the development of cultural and environmental assets and the enhancement of local identity and productions, matters typical of the Italian context (Bertola

and Maffei, 2008). To testify this enlarged disciplinary focus, in 2009 the name of the Doctoral Programme was changed into “PhD Programme in Design”.

Today, twenty-eight years after its first establishment, it might be said that the perspective of the Politecnico PhD Programme has undergone a process of zooming out, from a focus restricted to the product itself, to a wider focus also including users, to an even wider one taking into consideration a system of interconnected digital products and stakeholders, and finally to one which embraces society as a whole (Rampino, 2018).

The PhD Book Series and the PhD Festival

The present book is part of a series that documents the production of the Politecnico di Milano Design Programme, presenting a detailed summary of the doctoral theses defended each year (Biamonti and Guerrini, 2017; Guerrini, Biamonti and Mariani, 2018), as well as of the design discourses that are nodal in the field (Guerrini and Volonté, 2018).

To promote participation and nurture debate, in 2010 the defence itself turned into a public event where candidates present and discuss their thesis in front of a varied community composed of master students, peers (designers and researchers), as well as a committee of international scholars (panel of discussants). The social dimension of the event is emphasized by its being shaped as a “Festival”, that is to say a space and time where to celebrate and share knowledge, promoting conversations on design and design research. At the core of the Festival lies the intent to address a persistent and long standing weakness of the design discipline (Buchanan, 1992), namely the difficulty in activating constructive discussions and effective knowledge exchange between practitioners and researchers from one side, and among different design academic communities on the other. The aim of the PhD Festival, which explores design research both during the “formal” defence of the doctoral theses and the “informal” talks given by the members of the panels of discussants (the so called “design pills”), is to leverage diversity and interconnections and to reflect on the broad nature of design and its relationship with other disciplines.

More in specific, this book presents the outcomes of the doctoral research carried out by eleven PhD candidates who completed their three-year commitment and are discussing their thesis early in 2019, on the occasion of the 9th edition of the PhD Design Festival. What emerges is a complex picture wherein several fields are investigated, covering multiple aspects of design

research: education in spatial and fashion design, soft skills and collaborative processes, cultural and creative industries, data visualization, DIY-Materials, the revitalization of urban spaces. Eluding reduction, design research persists in exploring meanings, implications and hybridisations that feed itself. Indeed, as Buchanan (2001) noted, designers are continually inventing new subject matter; thus, it is not possible to limit the investigation of design to a fixed set of material or immaterial artefacts.

Such diversity is also nurtured by the wide spectrum of disciplines covered by the backgrounds of both Polimi research supervisors and PhD candidates, ranging from architecture to design, from art history to mechanical and chemical engineering. Since design facilitates encounters and networking, dialogues and conversations (Guerrini and Volonté, 2018), the Doctoral Programme in Design at Polimi looks at disciplinary overlapping as an added value and a source of benefit.

In the variety of researched topics, a common trait can be found in the continuous need of updated ways of addressing complex problems, as already mentioned above. It is such need that drives the evolving boundaries of design research forward, not just within our Doctoral Programme, but within all the national and international Doctoral Programmes in Design we are acquainted with.

Eleven theses, two categories, four fields of investigation

The presented eleven doctoral theses reach out to different design fields and research categories, exploring current and potential relationships among design, art and engineering. In this respect, it has to be said that even if the book does not cover the whole range of topics currently investigated within the Polimi Doctoral Programme in Design, it provides a distinctly established overview of some of our areas of interest as well as a viewpoint on our way of conducting research. Each essay is the result of a three-years doctoral work that stemmed from specific research assumptions and then framed its own design questions and objectives.

Analysing the outcome of each dissertation, it is possible to subdivide the eleven theses into the following two categories (Bertola and Maffei, 2008):

- **theoretical research**, i.e. dissertations with a prevalently theoretical slant, the outcome of which implicates the construction of new conceptual tools. In this first category we can find the large majority

of this year dissertations, eight out of eleven. We are referring to the dissertations by the following PhD candidates: De Rosa, Lin, Valušytė, De Vecchi, Tiburcio, Braga, Colombo and Ayala-Garcia.

- **instrumental research**, where research is mainly into design related methods and approaches. In this category, we include the remaining three dissertations. The outcome of the first one, by Motta, is a teaching tool for fashion design. The second one, by Testa, proposes a set of design tools for multidisciplinary teams. In the last one, Briones developed a research tool, i.e. a taxonomy for exploring the visual representation of data-driven narratives.

Focusing instead on the topics covered by the PhD candidates, the volume is structured into four sections gathering the eleven essays around the following fields of investigation: Design Education; Collaborative Processes; Cultural and Creative Companies; Technology for Social Change.

In general, it should be noted that three out of eleven theses deal with Fashion Design. This should not come as a surprise, being the Fashion Industry a pillar of the Made in Italy and of Milan, one of the Fashion capital at an international level.

Under the topic **Design Education**, three dissertations are gathered: the first one investigates the possibility to match spatial and service design in a novel framework useful to educate a new breed of designers. The second one deals with the urgent need of internationalization of the fashion design curriculum. The third one deals as well with fashion design education, with a specific focus on knitwear design.

When it comes to **Collaborative Processes**, three dissertations open up quite different yet related points of view. In a nutshell, all of them explore how design relates to and nurtures soft skills, each dissertation with a specific aim: the first one aims to educating non-designers; the second one to facilitating the setup of empathic experiences; the last one to giving rise to participative processes for urban renewal.

The third field deals with use of design-driven innovation as it is nowadays a recognized competitive lever for **Cultural and Creative Companies**. Two dissertations cover this topic, one focusing on the Brazilian manufacturing system, the other on the Italian Fashion Industry.

The fourth field of investigation is concerned with the impact of **Digital Technologies**. Under this topic, the last three dissertations are gathered, all of them analysing this phenomenon from a social perspective that complies well with the design discipline.

The first dissertation enquires how data and their visualization can contribute to our knowledge as well as to collective activism. The second one envisions experiences, strategies and possibilities in urban spaces and smart cities. The last one analyzes the emerging phenomenon of DIY-Materials.

Hereafter, a brief summary of each essay is presented.

Perspectives in Design Education

In *Dialogues on the relationship between Spatial and Service Design*, Annalinda De Rosa explores the relationship between Spatial Design and Service Design. Her aim is to carry out a first step towards an approach defined as Service+Spatial (S+S) Design: the thesis is a foundational act in this direction. The study looks at the topic employing and intertwining a twofold viewpoint: a design perspective and a design culture background. The aim is to move towards transdisciplinarity contributing to expand the knowledge on Spatial Design, an research field still little explored when it comes to Service Design.

In *Internationalizing the Fashion Design Curriculum: Nurturing Internationalized Talents*, Xiaozhu Lin explores the practice of curriculum internationalization within and across the discipline of fashion design. In parallel to this critical analysis, the author identifies strategies to internationalize the fashion design curriculum, as well as possible improvements and potential adjustments to be implemented in order to improve the programme. As such, the practical results are intended to offer a valuable reference to other design educators to explore the theory and practice of curriculum internationalization.

In *Designing Knit Designers. Teaching tools and methods to train professionals for the knitwear industry*, Martina Motta focuses on Italian knitwear both as an industrial excellence and as a design discipline taught inside design universities. Her aim is to experiment new ways to support Small and Medium Enterprises to answer their concrete needs in terms of young professionals. The research acts with experimental activities towards the definition of tools and methods to train professionals able to respond to the needs of the industrial context, with the proper technical and cultural knowledge and the project-oriented mind-set typical of industrial design disciplines.

Collaborative Processes Enabled by Design

In *Design as enabling agent. Design culture and non-designers in the changing role of disciplines*, Rūta Valušytė argues that design-related skill-sets are the most relevant for dealing with complexity and rapid change. Three skill-sets are associated to design: (1) Design Thinking skills; (2) Thinking Wrong personal qualities; (3) Future Thinking Principles, all together in this research labeled as Future Personal Characteristics – FPC’s. Valušytė’s research investigates the primary assumption that D-culture experience can influence non-designers in developing FPC’s.

In *Designing the empathic experience. Suggestions from art practices*, Alice Devecchi builds a theoretical framework from a phenomenological account of empathy, focused on empathy’s nature of interpersonal experience introducing the other into one’s own personal horizon and enabling the acknowledgment of otherness. Her cross-disciplinary work waves philosophy and art into the current design discourse, trying to translate theoretical reflections about empathy and our modes of experiencing the other into guidelines for facilitating collaborative processes and managing the relational dynamics at stake therein.

In *Intermediate urban space. Design and light art as catalysts for change: participation beyond fruition*, Isa Helena Tibúrcio aims to inspire the production of interventions in the urban space, which can, simultaneously, be closer to people’s needs and offer aesthetic experiences. The main contribution of her research is to move the focus of ordinary people from fruition to participation into the conception phase of the design process. A second contribution is to discuss the concept of “intermediate urban space”, matching the physical and symbolic aspects into one concept related to the space of the urban experience.

Design for Cultural and Creative Companies

In *Handling the Complexity of Design Support Programmes*, Mariana Fonseca Braga and her supervisor, Francesco Zurlo, analyse design support programmes that aim at introducing design innovation into Micro, Small and Medium-sized Enterprises with little or no design experience in Brazilian traditional industries. The analysis showed that barriers and drivers differ according to: (1) the context in which each project is embedded, including the

economic and political priorities and orientation, as well as cultural aspects; (2) the way programmes and their projects are crafted, managed, implemented, and evaluated; (3) the background and mindset of key stakeholders who take part in these projects.

In *FashionTech: Interaction Across Boundaries. Integration practices for design-enhanced user experiences*, Susanna Testa identifies the tools that are necessary to streamline the design process of fashion products with embedded technology. The outcome is a methodological proposal and a tool for integration-based design. This approach permits to highlight the need to train professionals who may play a cross-cutting role in the integration process between the disciplines and the actors involved.

Design and Technology for Social Change

In *A taxonomy of data visualization projects for alternative narratives*, Maria De Los Angeles Briones states that data visualization for data activism must disclose its design process in order to communicate not only visual evidence but also the construction of such evidence. Therefore, she designed a taxonomy aimed to organize the exploration of cases. Her taxonomy is not intended to impose a single classification, but to be a starting point for exploring the visual representation of data-driven alternative narratives.

In *Studying digital images in groups: the folder of images* Gabriele Colombo proposes the use of digital images available online as a source for the study of collective phenomena. He discusses four features of digital images to make the case for the shift from the individual image to the group of images (i.e. the folder of images) as main unit of analysis. The four features are: volume, images as data, networked nature, blurriness. As a conclusion, he argues for the design of tailored interfaces for the study of images in groups.

In *The Materials Generation*, Camilo Ayala-Garcia and his supervisor, Valentina Rognoli, present a research conducted to understand the DIY-Materials phenomenon as one of the emerging materials experiences in the field of design. The essays shows the formulation of research questions and hypotheses, the qualitative methods and strategies applied to conduct a number of tests, and the way in which the gathered evidences are drawn together in an attempt to clearly define this phenomenon.

As a conclusion, we want to recall the following statement by Victor Margolin:

As the artificial world continues to expand in its relation to nature, design is too important a subject to be ignored. We humans are the stewards of this artificial world just as we are responsible for the natural one. Only by preparing ourselves to manage an increasingly complex natural and social environment in which design plays an ever more important role will we be able to fulfill our duty as good stewards. Well-conceived and highly focused doctoral programs in design are central to this task.

(Margolin, 2010, p.78).

Such claim, written by one of the leading scholar in Design Research, appears to be particularly appropriate to finish our reasoning aimed at introducing the eleven essays collected in the present book.

References

- Archer, B. (1981). A view of the nature of design research. *Design: Science: Method*, 1, 30-47.
- Bertola, P., and Maffei, S. (Eds.) (2008). *Design Research Maps. Prospettiva della ricerca universitaria in design in Italia, 2003-2007*. Milano, Italy: POLI.design.
- Biamonti, A., and Guerrini, L. (Eds.) (2017), *Polimi Design PhD_017: 10 PhD thesis on Design as we do in POLIMI*. Milano, Italy: FrancoAngeli.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5-21.
- Buchanan, R. (1999). *The Study of Design: Doctoral Education and Research in a New Field of Inquiry*, in Buchanan, R., Doordan, D., Justice, L., and Margolin, V. (Eds.). *Doctoral Education in Design 1998: Proceedings of the Ohio Conference, October 8-11, 1998*, The School of Design, Carnegie Mellon University, Pittsburgh.
- Buchanan, R. (2001). Design Research and the New Learning. *Design Issues*, 17 (4), 3-23.
- Cross, N. (1999). Design Research: a Disciplined Conversation. *Design Issues*, 15(2), 5-10.
- Findeli, A. (1998). A quest for credibility: Doctoral education and research in design at the University of Montreal. In *Doctoral education in design: proceedings of the Ohio Conference*, October 8-11, 1998. School of Design, Carnegie Mellon University.
- Frayling, C. (1993). Research in Art and Design. *Royal College of Art Research Papers*, 1(1), 1-5.
- Friedman, K. (2003). Theory construction in design research: criteria: approaches, and methods. *Design Studies*, 24(6), 507-522.
- Margolin, V. (2010). Doctoral Education in Design: Problems and Prospects. *Design Issues*, 26(3), 70-78.

- Rampino, L. (2018). *Evolving Perspectives in Product Design: From Mass Production to Social Awareness*. Milano, Italy: FrancoAngeli.
- Rampino, L., and Colombo, S. (2010). Toward a Taxonomy of Design-research Methods. In Rampino, L. (Ed.), *Design Research: Between Scientific Method and Project Praxis*. Milano, Italy: FrancoAngeli.
- Rittel, H. W., and Webber, M.M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, 4(2), 155-169.

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Lucia Rampino is an Associate Professor at Politecnico di Milano, Department of Design. In her research activity, she explores theories of design and the nature of design processes, in particular as they pertain to knowledge creation and product innovation. She has taken part in various research projects and serves as reviewer for both Design Journals and Conferences. Since 2009, she is on the Design PhD Faculty of Politecnico di Milano.

Ilaria Mariani, PhD in Design, is Contract Professor at the School of Design, and post-doc Research Fellow at the Department of Design, Politecnico di Milano. She designs and researches games (physical, digital and hybrid) and interactive narratives as complex systems for communication, learning and social innovation, focusing on assessing their impact on users. On such topics, she has been taking part in national and international research projects, and she has been often involved in organizing conferences, reviewing journal and conference articles.