ADVANCEMENTS IN DESIGN RESEARCH

11 PhD theses on Design as we do in POLIMI

edited by Lucia Rampino and Ilaria Mariani

D.I. DESIGN INTERNATIONAL FRANCOANGELI OPEN ACCESS

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Design as enabling agent. Design culture and non-designers in the changing role of disciplines

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Abstract

The network society and accelerating AI have changed the ways things work. In order to keep up with innovation and 'survive' this change, the academy is forced to dissolve disciplinary boundaries, while traditional professions are forced to rethink their roles. The world is in transition, characterized by the continuous need of re-definition of skills and ways of thinking. It is argued that design-related skill-sets are -inter -anti disciplinary and the most relevant for dealing with complexity and rapid change. Three such 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.** According to different authors, design culture (D-culture) play a significant role in transferring the capital of designers to broad society (non-designers), while experience is recognized as one of the most effective ways in developing abilities and skills.

This research investigates the primary assumption that D-culture experience can influence non-designers in developing FPC's. Qualitative and quantitative research methods are applied in order to find out how D-culture experience influence non-designers in improving FPC's, which FPC's are most influenced, and what relation is present between experience on D-Culture and improvement of FPC's among non-designers. The research findings demonstrate that most FPC's tend to be influenced positively by D-culture experience – some of them demonstrate a highly significant change. The findings can be presented to authorities, universities, and organizations within non-designer environments in order to stimulate the social impact of D-culture on non-designers locally.

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New world - new roles

The Internet and network society has changed the way we work, communicate, perceive an experience time and space (Castells, 2011). Complex and unpredictable issues of life make it impossible for any single discipline to plan and implement solutions (Klein,1990). Therefore, academic disciplines are challenged to cross their discipline boundaries in order to keep up with innovation and the traditional professions have to adapt to the "commoditization of work," influenced by accelerating AI (Susskind and Susskind, 2015). According to the World Economic Forum – WEF (2017), one of the main effects of the fourth industrial revolution is **disruption to jobs and skills.** The roles, tasks, and activities for which human beings will be required in a post-professional society are changing. Different authors name the 'probable roles' for the near future among which only a few are recognizable: **para-professionals, empathizers, knowledge engineers, process analysts, moderators, data scientists, trainers, explainers, sustainers**, among them, also – **designers** (Susskind and Susskind, 2015; Daugherty and Wilson, 2018).

According to the analysis by Nesta[1] - Creative, digital, design and engineering occupations will all experience higher demand for their services by 2030, (Bakhshia, 2018).

New roles require new skills. Frey and Osborne mention Creative intelligence tasks and Social intelligence tasks among likely non-technically substitutable tasks by AI – the "bottlenecks". Authors argue that for people to win the race, it is important to acquire **creative and social skills.** WEF argues that by 2020, more than a third of the currently desired core skill-sets of will be comprised of skills that are not yet considered as most important today but are growing fast: **creativity, complex problem solving, critical thinking, emotional intelligence** (World Economic Forum, 2017). The society is changing as well. The shift to a knowledge-based economy has placed greater emphasis on **knowledge as the main asset** (Drucker, 2012). The post-capitalist and network society, imply new ways of working and doing business (Cohen, 2017). **Collaborative sustainable society nodes are emerging**, but it will have the possibility to flourish only if developed appropriate self-regulation and self-organization – "a sustainable way" (Taylor and Taylor, 2007; Manzini, 2015).

[1] Nesta - National Endowment for Science, Technology and the Arts, and innovation foundation based in the UK. www.nesta.org.uk.

Democratizing knowledge. Anti-disciplinary rules

Knowledge is the main asset in post-industrial knowledge society it also bounds academic disciplines and professions. Susskind and Susskind (2015) highlight that academic disciplines and professions – the 'knowledge gatekeepers,' enjoy working on their own excluding from knowledge non-professionals, so-called 'lay people.'

It happens because **knowledge besides its primary purpose of 'truth-seeking' is also related to power and authority** (Abbott, 1988; Muller and Young, 2014). Philosopher Foucault was one of the first to describe the discipline as a "system of control in the production of discourse" (Foucault, 1979) and "to discipline" as the complex set of strategies aimed to control. This type of control has come to dominate much of our modern life.

Foucault also mentions **anti-disciplinary** rights (democratizing the rights of the governed), in this way emphasizing the anti-democratic and authoritarian roots of the 'discipline'. Many other authors describe disciplines and professions as 'differentiationist', undemocratic, etc. (Gieryn, 1999; Beegan and Atkinson, 2008; Shinn, 2002; Dubois, 2016).

Today other authors discuss the term 'antidisciplinarity'. Joi Ito (2014) describes the approach to research in MIT Media Lab[2] as an antidisciplinary one. The antidisciplinary feature is the main requirement for applicants to MIT Media Lab and the only way to keep up with innovation.

Crouch (2013) notes that the term "is mentioned also in Darwin's theory – although Darwinian theory is primarily biological since biology is the 'antidiscipline' of the social sciences [...] the theory is also profoundly behavioral. Over the past 150 years, Darwinian researchers have been able to develop explanations for the behavior of life on earth, including highly complex social behavior, such as one finds in bee colonies and, of course, in human society" (Crouch, 2013).

Suchman (2013) argues "[a]s a development project within the imaginaries of the knowledge economy, making useful knowledge seems even to imply less interdisciplinarity and more antidisciplinarity" (Suchman, 2013).

[2] "The *MIT Media Lab* is an interdisciplinary research lab that encourages the unconventional mixing and matching of seemingly disparate research areas.[…] The Media Lab's antidisciplinary research community is uniquely equipped to address these concerns, leveraging the best that technology has to offer, and connecting technology back to the social and the human". Source: www.media.mit.edu

The transition

According to Manzini (2015), the world is in a continuous transition, characterized by the continuous need of re-definition of skills. As argued by WEF, "[t]he Fourth Industrial Revolution is about more than just technology-driven change; it is an opportunity to help everyone, including leaders, policy-makers, and people from all income groups and nations, to harness converging technologies in order to create an **inclusive, human-centered future**" (World Economic Forum, 2017). On the other hand, The Fourth Industrial Revolution is about creating inequality. The technological development seems to be favoring first the strongest ones, and the most vulnerable parts of society are threatened to be left out because of the lack of ability to adapt. In this situation it is crucial to develop personal characteristics – '**the ways of knowing**', enabling people within society individually manage the possibilities and threats generated by technological development, i.e., become more self-regulated and self-organized. By doing so, there is a chance **for sustainable ways of living to emerge** (Manzini, 2015).

Future Personal Characteristics – FPC's

Within different bodies of literature, design is described as an interdisciplinary field. Designers can face critical issues that don't fit neatly into one discipline (Ito, 2014). In the past ten years design has developed global recognition as an 'agent of change' thanks to the diffusion of Design Thinking (Brown, 2008; 2009). Design is human-centered (Brown, 2009) and designers are characterized by the skill-set potential for nearest future identified by WEF: creativity, complex problem solving, critical thinking, and emotional and social intelligence. **The design-thinkers personality profile** described by different authors (Brown, 2008; Curedale, 2013) combines an extensive list of skills and personal characteristics. Among the most frequently mentioned: *Empathy, Integrative thinking, Optimism, Experimentalism, Collaboration, Curiosity, Prototyping, Team oriented, T-shaped, Convergent & Divergent thinking, Ability to implement, Ability to visualize, Ability to learn from failure.* Other authors introduce new ways of thinking that encompass skill-sets, personal qualities and ways of thinking that enable people to think and act differently than it is set in the current mindsets. Among them are: (i) **Future thinking principles** described by Ito and Howe (2016) – ten core principles that "[…] offer a blueprint for how to shape the new world, and to thrive" (Ito and Howe, 2016): (1) *Emergence over Authority*; (2) *Pull*

over Push; (3) *Compasses over Maps*; (4) *Risk over Safety;* 5) *Disobedience over Compliance*; (6) *Practice over Theory*; (7) *Diversity over Ability*; (8) *Resilience over Strength*; (9) *Systems over Objects*; (10) *Learning over Education;* (ii) **Think Wrong** introduced by Galle *et al.* (2016), a "[…] radical problem-solving-system that reliably produces surprising, ingenious answers to your most wicked questions" (Galle *et al.*, 2016). Authors discuss the 'status quo' as the biggest our challenge for moving forward with the solutions and 'work that matters'. There are six Think Wrong practices, each composed of three personal qualities: *(1) Be Bold – courageous, idealistic, challenging; (2) Get Out – adventurous, attentive, receptive; (3) Let Go – uncensored, crazy, prolific; (4) Make Stuff – Collaborative, Ingenious, Simple; (5) Bet Small – curious, experimental, thrifty; (6) Move Fast – open, confident, united.* It is noticeable that the mentioned skill-sets encompass the nature of design. Moreover, all of the mentioned: Design Thinking, Think Wrong and Future Thinking Principles aligns with the interdisciplinary profile described by Klein (1990). Later on, this study all the mentioned thinking principles skills and personal qualities are called **Future Personal Characteristics – FPC's**. The question remains, which are the best ways to transfer these FPC's at a large scale. Bruce Mau in his book *Massive Change* (2004), discuss the sense of design culture (D-culture) towards future global change – "[…] objects and techniques that are transforming our lives" (Mau and Leonard, 2004). D-culture is defined as 'agency' that may be appropriated into attempts to reform the aims, practices, and effects of design towards "greater and more direct social and environmental benefit" (Julier, 2014). Manzini and Bertola (2004) argue that projects on D-culture can play a significant role in transferring the enduring capital of designers to the broad society (i.e., non-designers). According to Bruner and Olson (1973), the experience is one of the most effective ways in gaining the abilities and skills among human-beings. Authors also state that "[...] culture and experience were both ignored as possible candidates to account for their development, [...] making [education] a poor instrument for the attainment of those important effects" (Bruner and Olson,1973, p. 21).

Research question, aims & contribution

Referring to the described above, the research aims to investigate how and to what extent D-Culture experience works in developing non-designer FPC's. More in detail the goals are to understand (1) which D-culture features might generate influential experience for developing non-designer's

FPC's; (2) which FPC's are most influenced; and (3) what relation is present between non-designers experience on D-Culture and the development of their FPC's. Specifically, the research aims to: (1) implement a project on D-culture within the chosen non-design environment, involving non-designers within the D-culture experience. (2) Evaluate D-culture experience effects on non-designers FPC's. The research contributes to existing knowledge by providing evidence on the D-culture effects on non-designers. Results can contribute to legitimizing D-culture impact on social innovation within non-designer environments.

Research methodology

The research methods adopted in this study are mixed – qualitative and quantitative with the exploratory objective. Two research methods are adopted: (1) Case Study and (2) Action Research method. *A case study* is an ideal methodology when a holistic, in-depth investigation is needed (Feagin *et al.*, 1991; Gummesson, 1991). The primary motivation for action research is the practitioner researcher's '[...] felt need to initiate change' (Elliott, 1991, p. 53). The action research intervention is performed within a real-life situation for a period during which the observations are collected; it is an iterative process, the findings are brought back directly into practice with the aim to make a change (Elden and Chisholm, 1993).

Case study

In this research, a case study research method served to understand how a project on D-culture works in this way providing data for action research intervention. The selection of the case was determined according to the following criteria: (1) the case should represent the cultural organization or project with a strong historical background in design, (2) the organization/project should be focused on D-culture, and its diffusion to broad society as a core value. Eight study visits to creative, cultural organizations and projects were made in order to find the best suitable case. Comparing the organizations visited, the DesignLibrary[3], a cultural community-based project on

[3] DesignLibrary is the first library entirely dedicated to design that was established in Milan in April 2006 in occasion of Milan Design Week, in collaboration with Electrolux and patronage of ADI (Industrial Design Association). Other two branches later opened in Shanghai (2007) and Istanbul (2009). Source: DesignLibrary official documentation.

D-culture based in Milan, Italy, met best the requirement criteria mentioned above: (1) DesignLibrary hosts one of the most significant archive dedicated to design in Italy, i.e., has a strong historical background in design; (2) it is a community-based project on D-culture, which deliver an exceptional D-culture experience; the mission of the project is to diffuse D-culture to a broad international community. (3) DesignLibrary demonstrates a significantly higher focus on D-culture, comparing to other organizations visited. The collection and analysis of the data for the case study started in 2014 and ended in 2016. The data include Interviews with project representatives, official project documentation, researcher's gathered data from direct observation (notes, photographs), project website. The narrative framework is used around which the case study is organized. The data analysis follows four logical categories: *Development; Structural arrangements; Cultural process – activities; Benefits & challenges.*

Organized in such manner the case study provides an intricate understanding and describes the DL model to be implemented as the action research project within a chosen non-design environment.

Action research

The project DesignLibrary Kaunas (DLK)[4] was developed as an action research intervention in a non-designer environment, during which non-designers are exposed to D-Culture experience for some time. DLK project is implemented starting from 2015, by replicating the model of DesignLibrary (DL) defined in the case study. The intervention location is provided by Kaunas University of Technology (KTU), the project is located in KTU research & business center 'Santaka' Valley[5]. The DL model is based on the membership model. Therefore, people willing to participate in DLK cultural activities have to purchase a yearly DLK membership. The membership fee is low but always applied. The members choose to participate or not in the program by their own choice, the project is communicated by randomly distributed campaigns. According to DLK data of June 2018, there are **312 individual mem-**

[4] DesignLibrary Kaunas is the fourth branch of DesignLibrary network opened in Kaunas, Lithuania in 2016.

[5] Science and business valley 'Santaka' is located in Kaunas, Lithuania and managed by Kaunas University of Technology. The valley aims to carry out interdisciplinary scientific and applied research. Source: www.santakosslenis.lt/en/

bers associated with DLK project. The bigger part of members are women (66%) and 34% are men. Members fall into 5 different disciplinary categories: Design & Architecture – 24%, Culture & Arts – 9%, Engineering & Technology – 17%, Business & Management – 24%, Other – 26%. The later section combines different fields that were not significant enough by number to form a representative group of one discipline. Among them are healthcare, food, sports and other. DLK project is held in Kaunas – the second bigger city in Lithuania (after Vilnius, the capital of Lithuania). The bigger part of the members are from Kaunas 63%, then 10% from Vilnius and 27% from other smaller cities of Lithuania. Events **'Design Thursdays'** (DT) are the main activities that generate D-Culture experience in DLK project. The DT events are organized by involving design experts and trained moderators and people from other disciplines as speakers sharing a stage with designers. The DT topics are selected by relating design with other disciplines in order to gain interest from non-designers. 22 DT events were organized in the period of 33 months (October 2015 – June 2018). The data about non-designers D-Culture experience and its effects on the development of their FPC's were collected during the DLK project intervention performing **DLK enquiry divided into two parts: (1) interviews** – qualitative; **(2) survey** – quantitative. **Interviews** were conducted in June 2018 at DLK, Barsausko str. 59, Kaunas, Lithuania, 15 participants, DLK members were reached. Respondents are interviewed individually in the English language. The design of the used semi-structured Interview consists of 4 thematic topics: 1) personal information & relationship with DLK; 2) design knowledge; 3) experience on D-culture; 4) future thinking. The strategy of thematic coding is employed accordingly in order to analyze these four thematic sections. **The survey** is conducted in July 2018. The online questionnaire is chosen as a tool to collect data for the survey. The non-random convenience sample is selected. The questionnaire was sent by email and DLK project newsletter to 312 DLK members and additional 1192 contacts subscribed to the DLK newsletter. The answers were gathered following four sections of the questionnaire: 1) Personal information & knowledge on design; 2) Professional field (discipline) and personal performance work-wise; 3) Involvement in DLK activities; 4) Personal skills, qualities and ways of thinking (FPC's). 127 designers and non-designers filled the Internet questionnaire. In this research, only non-designer responses were used (93,7%), so the data related to designers (6,3%) were dropped-out initially leaving a sample of N = 119 respondents as scope. The descriptive statistics showed the majority of respondents were females (63%). Concerning age groups, the respondents within a range of 30-45 years were a dominant group (42,9%). The distribution by age, in fact, is consistent as there are at least

20% of the sample in each group meaning the survey covers various contingent. The distribution by professional field participants is inclined towards Engineers & Technology specialists (29,4%) and Business & Management specialists (26%). Interesting to note that more than 20% of respondents are from other fields which are not specified in this research.

In contrast, the minority of respondents works in Culture & Arts and Engineering & Technology field. Combined these respondents cover about 20% of the research sample. Survey participants are clustered into two clusters by the involvement level in DLK as the research objective is to compare the effect of D-culture experience between different groups by involvement in DLK. Therefore K-means cluster analysis was conducted to extract two clusters. Cluster analysis results suggest the division of respondents in two clusters. The first cluster consists of 65 (54,6%) respondents (High involvement in DLK) and the second – 54 (45,4%) respondents (Low involvement in DLK). The statistical analysis methods Descriptive statistics, Cronbach's Alpha, Kolmogorov – Smirnov test for normality, Independent samples (2 samples), Mann – Whitney test are applied for survey data analysis. The results of qualitative and quantitative DLK enquiry results are triangulated and summarized providing final research conclusions.

Findings and Conclusion

The research findings on (i) D-culture experience features and (ii) non-designers FPC's affected by D-culture are organized within three levels according to the level of influence: **(1) Very high; (2) High; (3) Moderate.**

Very high D-Culture influence.

The research results show that: D-culture experience let non-designers significantly develop the following FPC's: *Confidence, Collaboration, Team orientation, Integrative thinking.* The following let non-designers to adopt three future thinking principles: *Emergence over Authority, Practice over Theory, Learning over Education.* Most important D-culture features influence the development of all mentioned FPC's: *Listening to Designer's stories and Discussing on design practices.*

High D-Culture influence.

D-culture experience demonstrates to be influential also on developing *Convergent and divergent thinking,* enable non-designers in *Prototyping and Experimentation*, let them become more *Ingenious and Challenging.* The fol-

lowing let non-designers to adopt three future thinking principles: *Risk over Safety and Pull over Push* future thinking principles. The D-culture effects on these FPC's are less evident but anyway remains quite strong. The listed FPC's are influenced by *Analyzing design artifacts & prototypes, Staying in design-intensive environments, Reading books and Interacting with designers.*

Moderate D-Culture influence.

FPC's: *Empathy, Optimism, Curiosity, T-shaped, Ability to visualize, Ability to implement and being Attentive, Simple, Receptive, Prolific, Adventurous, Courageous, United, Uncensored* as well as the understanding of *Disobedience over Compliance, Systems over Objects, Resilience over Strength* future thinking principles are moderate and could be developed through Co-creating activities and Online activities over more extended period of time.

Generally, D-culture experience also let non-designers develop *a general understanding of D-Culture*, and *influences to think and act differently***,** while the development of design knowledge is moderate and can be developed over a more extended period. Finally, the research findings let to conclude that *D-culture experience influence significantly non-designer's satisfaction with their work,* while the ability to manage the changes workwise is influenced strongly among women, men do not show significant results. D-culture experience to be significantly influential also on men ability to deal with challenging work environments the experience itself should encompass additional specifically tailored D-culture features. The following research results can be presented to non-designer environment stakeholders (universities, associations, and governments) in order to encourage policies towards legitimizing D-culture as an essential factor for social innovation in non-designer environments.

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