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Design Research: Making of a Connected Discipline Part 1

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Abstract: Despite the existence of societies, journals, conferences, and doctoral programs that generate increasing numbers of doctorates and research publications design research is not a coherent intellectual field with a clear boundary of its subject matter, nor an academic discipline founded on a consensual understanding of its purpose, methodology and pedagogical curriculum; subsequently, there is hardly any commonality across doctoral programs and the assessment of a doctoral degree is difficult if not impossible, so criticised the late design historian Victor Margolin. He called to unify and bound design research to solve these problems. While agreeing with his critiques and appreciating his good intentions, I will argue that his call is impractical as well as undesirable due to the social circumstances and the nature of design inquiry and the changing academic research practice which tend towards inter/trans-disciplinarity. Efforts should rather be directed to join fragmented design research in an evolving and inclusive manner to establish a dynamically connected discipline.

Keywords: Design Research. Fragmented Adhocracy. Transdisciplinary. Connected Discipline. Design Studies.

1. Introduction

Reservoirs of knowledge shaping regularised behavioural practices, sets of discourses, ways of thinking, procedures, emotional responses and motivations. These provide structured dispositions for disciplinary practitioners who reshape them in different practice clusters into localised repertoires. While alternative recurrent practices may be in competition within a single discipline, there is common background knowledge about key figures, conflicts, and achievements. Disciplines take organizational form, have internal hierarchies, and bestow power differentially, conferring advantage and disadvantage. (Paul Trowler, et al, 2012, p.9)

In his keynote at the 2016 Design Research Society 50th Anniversary Conference in Brighton, the late design historian Victor Margolin mounted constructive criticisms on the state of design research

(Margolin 2016). He charged, despite the existence of societies, journals, conferences, and doctoral programs that generate increasing numbers of doctorates and research publications; design research is not a coherent intellectual field with a clear boundary of its subject matter, nor an academic discipline founded on a consensual understanding of its purpose, methodology and pedagogical curriculum. Subsequently, there is hardly any commonality across doctoral programs and the assessment of a doctoral degree is difficult if not impossible. Concomitantly, much of design research, despite executed using valid methods, has narrowly formulated questions not related to a larger set of common issues pertinent to the advancement of valuable design knowledge. To save design research, Margolin has made several substantial and operational suggestions to unify and bound the discipline. Years have passed since his speech, but little has changed. In his honour, I join his call to critically reflect on the current state of design research and I will build on what Margolin has laid out and yet left open. Although he made clear the problems facing design research, he overlooked some critical issues that must be brought forth to develop effective solutions. It will be argued that the social circumstances and the nature of design inquiry and the changing academic research practice tending to inter/trans-disciplinarity render the situation unavoidable; thus, unifying and bounding design research are impractical and undesirable. To move forward, efforts should rather be directed to join the fragmented design research in an evolving and inclusive manner to establish a dynamically connected discipline. A connected discipline is not stringently defined here, it is rather a concept inviting imagination and directing a discussion toward productive improvement of the state of design research. I will use Robert Whitley's concept fragmented adhocracy to explain why it is a futile attempt to unify and bound design research. Then I will recount the main controversies in the development of design research, particularly research-cum-practice, to conclude that disciplining design research is also undesirable. I will end by proposing to use 'connected discipline' as a conceptual tool to guiding solving the problems of fragmentation.

2. Design Research as Fragmented Adhocracy

The state of Design Research as described by Margolin resembles a fragmented adhocracy, a construct introduced by the sociologist Robert Whitley (1984) to characterize the social and intellectual make-up of a particular type of academic discipline. Being specialized in the social organization of sciences, Whitley refers a scientific field to a 'reputational system of work organization and control' in which intellectual work done must be novel and at the same time useful to other colleagues for its originator to gain reputation and rewards. He argues that the more (inter)dependent among researchers in pursuing new knowledge, the clearer is the boundary and identity of a discipline. Besides, the more certain in technical procedures in producing and evaluating knowledge claims, the easier the assessment and the stronger its ability to fend off amateurs. A fragmented adhocracy is a result of low mutual dependency among researchers combined with a high uncertainty in research techniques.

Whitley's analysis of fragmented adhocracy is applicable to design research. Firstly, a plurality of audiences for knowledge claims and various legitimate sources for funding contribute to low interdependency among design researchers. Design researchers might seek funds and recognition from diverse agencies, including those for scientific research, artistic work, or cultural projects as well as from the industry. Furthermore, not only researchers but also designers are entitled to claim design skills and knowledge and compete for rewards and resources. Commercial designers, for the most part, still do not rely on knowledge gained from design research to attract customers for their services. Saying this does not mean the sole aim of design research is to service existing practice, but that a constructive relationship between research and practice has not been established. Commercial designers have their own independent associations, lobbies, and awards for recognition. To

complicate things, design competences are valued in interdisciplinary research projects such as in health care. Participation from designers or design researchers in these research projects, though often without generating any substantial new knowledge for design, is considered doing research. Arguably there is no single authority which oversees, regulates, and represents design research and its strategic relationship with practice and education; as a result, according to Whitley (1984, p789), individual researchers “do not have to produce specific contributions which fit in to those of others in a clear and relatively unambiguous manner. Rather, they tend to make relatively diffuse contributions to broad and fluid goals which are highly contingent upon local exigencies and environmental pressures ... The political system is therefore pluralistic and fluid with dominant coalitions being formed by temporary and unstable controllers of resources and charismatic reputational leaders”.

Secondly, a plurality of theories and methods borrowed from other disciplines to conduct design research, as important and necessary as it is, makes research results difficult to evaluate and almost impossible to build a unified discipline. A review of recent conference proceedings attests that anyone can claim to be conducting design research. On the one hand, as Klaus Krippendorff (2006) has warned, design discourse is weak and can be easily colonized by other discourses. On the other hand, serious efforts to provide a science for design as made by Krippendorff, among others, has not been widely embraced. To take up or engage with his proposal, one must examine theories on communication, cybernetics and more, and not too many are willing or able to do that. Researchers who have their own intellectual references inevitably ignore it. Since there is no widely accepted overarching theory to guide research, it is hardly possible to compare, consolidate and determine whether a contribution is new knowledge. As a result, in a fragmented adhocracy more pluralism tends towards stagnation rather than progress; and more research publications lead to confusion rather than a robust body of knowledge.

Thirdly, the fragmentation of design research is aggravated by the general academic climate. According to Garcia & Sanz Menéndez (2005), the reputation of a researcher is established by means of either intellectual advances recognized collectively or by public funds acquired successfully. Given intellectual advances are difficult to measure and compare in design research, getting funds is a more effective way to gain reputation. One might assume acquiring funds relies on intellectual merits, but studies show that networking plays a more important role (Ashkan Ebadi, et al,2015). This might not be new insight, but it is worth emphasizing that collective inquiry and discipline building are not necessarily priorities for busy design researchers. Therefore, realistic expectations and effective developmental strategies should be tailored for design research. Margolin’s call to build a unified and bounded discipline is impractical. More importantly, his proposal is also controversial.

3. Design Research as Undisciplined

The fragmentation in design research is a general situation of design education as well as a collateral of experimenting with unconventional research practices. As mentioned earlier, different theories and methods used for conducting design research is a major contribution to fragmentation. It is however a part of a long-standing situation. Design curricula on the Bachelor and Master level are as diverse as that of the Doctoral. Design education has over the years incorporated artistic, technical, business, humanities, and the social-scientific domains and from which individual design school employs a different mix of professionals (Brenner & Rogers 2013). These are the same people who develop doctoral programs and conduct research, no wonder a plurality of theories and methods is used. The situation of fragmentation is nothing new but is exposed so painfully clear due to the institutional demand for research publication. Nor is the problem unknown as one of the reasons for establishing doctoral study and research is precisely to correct this.

Yet the idea to establish a unified and bounded design discipline has remained controversial ever since the international debates began at the Ohio conference on Doctoral Education in Design in 1998 (Buchanan 1999). The major objection is that design is interdisciplinary and creative by nature, any boundary will only stifle its development and destroy its potentials. Furthermore, study has shown that individual discipline is losing some influence on how research is practiced (Manathunga & Brew 2013). Interdisciplinary research and Mode-2 knowledge production¹ are the chief reasons for the change. Mode-2 knowledge production refers to research that is socially distributed, application-oriented, trans-disciplinary and subject to multiple accountabilities. Referring to Mode 2 Science, Wolfgang Jonas and colleagues (2013) have argued for design to be a transdiscipline which collaborates with different academic disciplines and practitioners to solve real-world problems.

By conviction or convenience, many design researchers do not seem to be bothered by Margolin's concerns and continued to breach boundaries. Specifically, mixing research and practice has become a trademark of much design research. The goals and context of research are traditionally different from those of practice. Research is primarily aimed at generating new knowledge and understanding for professionals in research, teaching and practice. Practice is primarily aimed at exercising and materializing new or existing knowledge for practical ends. However, in much design research now the context and recipients of its results are very similar or close to those of design practice. I might call this research-cum-practice which includes Practice-Led Research, Project-Grounded Research and Research-Through-Design, Constructive Research, and their variations. These models have been created under different circumstances to serve diverse needs and to function as methodological, strategic, and paradigmatic tool (Chow 2010). Despite differences, they mostly share some basic beliefs and there is a family of resemblances in epistemological positions, research methods and outcomes (Godin and Zahedi 2014). With different degree of emphasis and various depth of understanding, they all see designing as a way of knowing or holding potential to generate knowledge. The artifactual, "wicked", future-oriented, project-based, and interdisciplinary are key characteristics celebrated and capitalized for design research. Despite its currency and potentials, design research-cum-practice complicates and intensifies the problems of fragmentation. Many design research papers have a similar structure to problem solving in design, see Table 1.

Table 1. Structure of design research paper resembles problem solving.

Structure	Research-cum-practice	Problem Solving in Design
Problem	1. The author has an interest in the issue 'Y'.	1. There is an issue to be addressed.
Research	2. The author thinks that 'X' will address the issue 'Y'. The author synthesizes some thoughtful and useful works often and mostly from other disciplines, to	2. Ideas, resources and know how are brought together to
Results	3. proposes 'X' as a solution for addressing 'Y'	3. propose a solution

¹ 'Mode-2' knowledge production was first coined in Michael Gibbons et al, *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* (London: SAGE, 1994). For a critical appraisal on the validity and coherence of this concept, see Laurens K. Hessels and Harro van Lente, „Re-Thinking New Knowledge Production: A Literature Review and a Research Agenda“. *Research Policy* 37, no. 4 (2008.): 740–60.

Certainly, there is nothing wrong for design researchers to follow the common design process; this is after all the main idea behind research-cum-practice; however, design research becomes problematic when it does not generate significantly new knowledge for other design researchers. Much design research, as valuable as it might be, is strictly speaking individual inquiry and can hardly be considered a piece of collective disciplinary research. Often there is little in-depth and careful evaluation, examination, critique of existing ideas and solutions **generated by other design researchers** although knowledge from other disciplines is referenced, as noted in Table 1. This is a stark contrast to scientific, technical, and scholarly research in which literature review on the state-of-art understanding of the topic from one's own discipline is conducted; and inadequacies and knowledge gap identified. From there new questions are raised, solutions are made. Without taking these steps to build on others works, same mistakes are repeated, the wheel reinvented, synthesis hardly possible and little genuine progress or change made. Disciplinary research is a social and collective activity and new knowledge claims are made relative to what is known within the discipline. Without positioning one's work in existing body of design knowledge and articulates its novelty, one is conducting individual inquiry rather than disciplinary research.

At this point, we unavoidably come upon one of the most contentious questions in the design research debates, namely, the distinction between design practical project (design practice) and design research project. I will draw on Dewey's pragmatism to propound that the difference between them is social-institutional rather than epistemological. This understanding will point to a promising direction to address the fragmentation problem in design research.

3.1 Design research: a matter of social construction

Dewey's pragmatism or logic of inquiry is acknowledged and applied in design research. Donald Schön's theory of reflection-in-action draws on Dewey's epistemology and quite a few refer to Schön to ground their research². Furthermore, Findeli (2003,2004,2010) explicitly names pragmatism as the theoretical basis and so does Dixon (2020), while Melles (2008) suggests it for a methodological framework, Johnson (2011) relies on Dewey to make a case for artistic research, and Chow (2015) uses it to bring design research and artistic research together. By drawing on Dewey, I continue with this line of theorizing, emphasizing an expanded understanding of knowing beyond scientific and scholarly research.

Dewey (1997) uses 'inquiry' to refer to an intelligent thinking and acting process that brings a doubtful situation to its resolution. It is a transformation of a situation in which there is experienced obscurity, doubt, conflict disturbance of some sort, into a situation that is clear, coherent, settled, and harmonious. In sum, inquiry is to transform doubtful situations into resolved ones and knowledge is measured as the quality of intelligence in dealing with problems. By this understanding, science, design, and art are all inquiries, and so is everyday ordinary activity such as finding one's way around in a foreign city. According to Dewey, they all share the same structure or logic of inquiry but differ in the end results or goals. The end of inquiry might be true statements in science, expressive objects in art, useful objects in design, and mundane actions in daily life. Although 'inquiry' and 'research' are synonymous, in the case of the research-cum-practice, 'research' is best understood as an institutionalized inquiry with explicit authorized agreements on its form and norms. From a Deweyan point of view, epistemologically there is little difference between practical design project and research-cum-practice project nor is there any essential difference in their

² For example, John Zimmerman,, Jodi Forlizzi, and Shelley Evenson, "Research Through Design as a Method for Interaction Design Research in HCI." in CHI 2007. San Jose, USA: ACM, and Erik Stolterman, "The Nature of Design Practice and Implications for Interaction Design Research." *International Journal of Design 2*, no.1 (2008): 55–65.

methods and questions. The issue of why and in what manner design inquiry is considered research is more a social-institutional than an epistemological one. The distinction between them hinges on social agreement on their respective functions. In the struggles to develop research-cum-practice, it is overlooked that the key to turn design inquiry to design research is not only clarification of epistemological and methodological questions, but also attention to the institutional terms and norms. The most relevant norm for our discussion is that disciplinary research is collective. A discipline relies on members building on, extending, and correcting one another's works. However, many a design researcher seems to fail to do just this. For example, the debates and efforts to build design research at the turn of the 21st century have resulted in some suggestions which unfortunately have not been systematically and collectively debated and followed through. Wolfgang Jonas (2007a, 2007b), among others, has provided an operational model for research-cum-practice that might be challenged or built on. However, being in a fragmented adhocracy Jonas is mostly ignored. I mention him to reiterate that our main problem is not necessarily intellectual but rather social. The insufficient engagement of existing knowledge generated by design researchers among themselves, is the main source of our troubles and one of the reasons why diversity and pluralism lead to fragmentation rather than creative synergy. If this can be corrected, we will have gone a long way to make progress if not an establishment of a unified research discipline.

4. Renewing Design Research

In conclusion, while Margolin was right in pointing out the deficits in design research and calling for change, his proposed solution is less convincing. The social circumstances and the nature of design inquiry and the changing academic research practice which tend towards inter/ trans-disciplinarity render building a unified and bounded discipline unrealistic and undesirable. To solve the problems of assessment of a doctoral degree and the lack of advancement of valuable design knowledge, it is important to acknowledge fragmented design research is a condition, which must be accounted for when seeking solutions. The reformulated question reads: how might (doctoral) research be assessed and knowledge be advanced in an incoherent field without clear boundary of its subject matter and without consensus on its purpose, methodology and pedagogic curriculum. In other words, how might the fragmented design research be organized to control quality and make progress? Concomitantly how might knowledge generated by design research-cum-practice be evaluated and renewed?

To move forward, an alternative concept of disciplinary research for design must be sought and the image of Wittgenstein's family resemblance is helpful here. There is no defining element to be found in all design research. However, research A might share element x with research B and shares element y with research C; and research B and research C share element z and so on and so forth. I find the phrase connected discipline appropriate and useful to focus our attention and direct our efforts. A connected discipline does not have or require a boundary or a general agreement on goal, subject matter, or methodology; nonetheless, its researchers engage with one another to create new and relevant knowledge by deliberately seeking overlaps, making connections, and facilitating interactions. The concept connected discipline, however, is more of an image than a defined construct, it will require much more elaboration to be robust and useful. To continue exploring this image, some concrete suggestions on how to make a connected discipline will be presented in "Design Research: Making of a Connected Discipline Part 2" in this volume.

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Rosan is Professor of Design Theory. She has been interested in understanding and establishing Design Research since she began her doctoral study at the turn of 21st Century when there were exciting and controversial debates raging on the topic.

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