Design Research Today: Challenges and Opportunities

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Abstract

Today research is fundamental to design practice and different models of design research exist.

The paper begins with a brief historical review of design research and moves on to describe various contemporary research typologies. The author maintains that we live in an Age of Pluralism in which multiple perspectives on the problems that confront us compete for our understanding. The author does not advocate for one particular conception of design research but positions the discussion of different research typologies within a design research culture characterized by intellectual pluralism and disciplinary debates.

Design research embraces more than problem solving through empirical testing of different potential solutions; research can identify genuine human needs and question existing practices and assumptions. Instead of asking which model is the correct one design researchers should ask how could such research typologies be used? Based on his thirty years of experience as an editor of the journal *Design Issues* the author offers practical advice on preparing research for publication and suggests how design researchers can participate in a pluralist conversation about the role of design research today. The author cites Herbert Simon's call for designers *to leave the next generation with a better body of knowledge and a greater capacity for experience*.

The paper concludes with a discussion of the design agenda outlined in *The Montreal Design Declaration* issued in 2017 by the World Design Summit.

Keywords Desig Research, Pluralism, Inquiry, Montreal Design Declaration

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Today research is fundamental to design practice. This simple statement covers a complex and confusing reality; multiple models of design research compete for our attention while new opportunities and unavoidable problems challenge traditional models of disciplinary knowledge and education. It is this complex and confusing reality I wish to discuss. We live in an Age of Pluralism, an age in which multiple perspectives on what problems confront us – as individuals, as nations and as a global community – compete for our understanding. My purpose here is not to advocate for a particular conception of design research but rather to suggest how design researchers can understand and participate in a pluralist conversation about the role of design research today.[1]

Many institutions and researchers work with a notion that research supports practice by providing the knowledge and the evidence practitioners need to practice effectively and speak persuasively about their work. In this view research plays an important role in the creation of new knowledge and the movement of knowledge into the development of empirically grounded propositions for action. Researchers develop and evaluate the evidence that supports proposed actions.

This view of research as an activity that generates empirically grounded evidence for action is being challenged by alternate ways of formulating the brief for research. Research can also be thought of as the thoughtful and rigorous interrogation of practice and a mode of activity that continually challenges rather than supports disciplinary assumptions in an effort to expand practice into new area and push practitioners to develop new forms of practice.[2] This is a form of research that interrupts rather than supports familiar forms of practice.

Although I have been one of the editors of the journal *Design Issues* for more than thirty years I was trained originally as a historian and I still tend to begin most thinking exercises by looking for a historical perspective on the subject under consideration. So I will begin this discussion of contemporary directions in design research with a series of reflections on the history of design research. Think of these reflections as stepping-stones leading from the past to the present.

I offer another simple statement: designers have always conducted research. We know, for example, that William Morris, the English Arts & Crafts master, collected specimens and studied textile history in an effort to recover pre-modern recipes and techniques for dyeing fabrics. And we know that the great calligrapher and type designer Edward Johnston's research into medieval and renaissance manuscripts was essential to his revival of fine lettering in the early 20th century. But this kind of research was personal and the research results flowed directly into their design work. In the second half of the 19th century design advocates faced a challenge: they needed to make the case that designers played an important role in the production process. They needed to demonstrate that what designers did added value to the products they designed. Central to the 19th century Design Reform Movement was an emphasis on design education as a way to assure industry that design professionals were equipped to do precisely this: add value. In his *Principles of Decorative Design* published in 1873 the designer and design theorist Christopher Dresser made the argument for what he called Art-knowledge.

> Art-knowledge is of value to the individual and to the country at large. To the individual it is riches and wealth, and to the nation it saves impoverishment. Take, for example, clay as a natural material: in the hands of one man this material becomes flower pots, worth eighteen pence a "cast" ... in the hands of another it becomes a vase, worth five pounds, or perhaps fifty. It is the art which gives value, and not the material.[3]

Walter Gropius and the Bauhaus will serve as my second "stepping stone." The Bauhaus was founded as a school and one of Gropius's great contributions to modern design was to reformulate the way we think about design education. Gropius described the workshops at the Bauhaus not as classrooms but as *laboratories*, that is, as places of quasi-scientific testing and experimentation.

The Bauhaus workshops are essentially laboratories in which prototypes of products suitable for mass production and typical of our time are carefully developed and constantly improved. In these laboratories the Bauhaus wants to train a new kind of collaborator for industry and the crafts, who has an equal command of both technology and form.[4]

Indeed experimentation replaced emulation as the primary teaching method at the Bauhaus. Instead of learning by studying history and emulating great paradigms from the past, students at the Bauhaus would learn by working directly with materials and new production technologies and systems.

Walter Gropius's vision and the Bauhaus model had an enormous impact on the subsequent development of modern design and modern design education. By the late 1960s and early 70s, however, as we became more aware of the negative environmental and social costs of material progress designers and design critics called on the design community to rethink its role in promoting endless cycles of production and consumption. One voice that spoke with particular force and clarity was Victor Papanek.

> By creating whole new species of permanent garbage to clutter up the landscape, and by choosing materials and processes that pollute the air we breathe, designers have become a dangerous breed ... Design must become an innovative, highly creative, cross-disciplinary tool responsive to the true needs of men. It must be research oriented, and we must stop defiling the earth itself with poorly designed objects and structures.[5]

Note that Papanek did not say designers should stop designing. Instead he called upon designers to be better at their jobs. In order to be better they needed to do a better job of research, they needed to draw up research methods and tools from other disciplines to enrich their thinking and they needed to respond to genuine human needs. For Papanek's research embraced more than problem solving through empirical testing of different possible solutions; research could and should identify genuine human needs and question existing practices and assumptions.

At almost the same time that Victor Papanek was admonishing designers to do a better job Herbert Simon published his influential book *The Sciences of the Artificial*. This is a key text in the evolution of thinking about design and Simon's definition of design as changing

existing situations into preferred one continues to shape design discourse.[6] Simon's definition emphasizes intention over expression and purpose over form. Instead of design as a form of personal expression and the designer as a type of artist Simon suggested that design could be understood as a statement of intention. He argued that design could be studied as a science and as such design was amenable to rational analysis.

Although this is a discussion of design research, there is an ethical dimension to Simon's argument that is worth noting here. Design is the process through which abstract ideals become concrete realities and in that process what is desired is inevitably transformed into what is possible. If, as Simon argues, design is an expression of intention then the design process is also the time for explicitly identifying the goals (economic, political, social, environmental) embedded in a design brief, prioritizing these goals and resolving competing or conflicting values. Establishing priorities and resolving conflicts require ethical reflections on situations.

More important for the argument I am building here are Simon's observations about the results of design actions.

> The final result of our actions is to establish initial conditions for the next stage of action ... How do we want to leave the world for the next generation? What are good initial conditions for them? One desideratum would be a world offering as many alternatives as possible to future decision makers ...A second desideratum is to leave the next generation with a better body of knowledge and a greater capacity for experience.[7]

To leave the next generation with a better body of knowledge: This is a call for designers to create and promote a culture of research.

What does a research culture for design look like? We have different models for answering this question. In the early 1990s Christopher Frayling formulated the often-cited typology for design research as research *into* design, research *for* design and research *through* design. This has always been an awkward model and one that tends to confuse rather than clarify the discussion. Frayling was responding to new priorities and changes in the funding plan for Higher Education in the United Kingdom. From the tone of his presentation it is clear he was also trying to respond to skepticism regarding the very idea that artist and designers did something called research. He obviously saw his triad of *into*, *for* and *through* design as the starting point for a much needed debate.

> *I can only add, that research for art, craft and design needs a great deal of further research. Once we get use to the idea that we don't need to be scared of research – or in some strange way protected from it – the debate can really begin.*[8]

On this last point Frayling was indeed correct and during the decades since the publication of his paper multiple attempts to map the field of design research have been made.

In the United States research activities are often mapped used the Carnegie Foundation model of the Four Scholarships.[9]

Carnegie Foundation for the Advancement of Teaching: the Four Scholarships

The Scholarship of Discovery which equates most closely with conventional research practice, involving a commitment to knowledge for its own sake, freedom of inquiry and following an investigation wherever it may lead in a disciplined fashion.

The Scholarship of Integration which involves making cross-disciplinary connections, contextualizing specialist knowledge for extra-disciplinary audiences and educating non-specialists. Conventional interpretations of research often have problems with research targeted where fields converge in overlapping academic neighborhoods.

The Scholarship of Application which involves a service to communities and social contexts wherein theory and practice are in a process of dynamic interaction, from which new intellectual understandings might arise from the very act of application.

The Scholarship of Teaching which involves making the work of the academic consequential in so far as it is understood by others. Teaching not only transmits knowledge, but in the process transforms and extends it in a fundamental way.

The Carnegie Four Scholarship Model was designed to describe research across the entire spectrum of disciplines and fields that characterize the modern research university. In the early 2000s a group at the University of Brighton in the United Kingdom led by Bruce Brown drafted a White Paper to facilitate discussions of research in the creative arts and design. *Types of Research in the Creative Arts and Design* identified four types of research.[10]

Types of Research in the Creative Arts and Design

Scholarly Research creates and sustains intellectual infrastructure within which pure, developmental and applied research can be conducted. It aims to map the fields in which issues, problems, or questions are located. It documents and compiles knowledge, resources, methods, tools and models.

Pure Research asks fundamental questions in the field and explores hypotheses experimentally. It searches for pure knowledge that may uncover issues, theories, laws or metaphors that may help explain why things operate as they do, why they are as they are, or why they appear to look the ways they do. It generates significant new facts, general theories or reflective models where immediate practical application or long-term ... benefits are not a direct objective.

Developmental Research serves two purposes (a) it identifies the limitations of existing knowledge... (b) it harnesses, tests and reworks existing knowledge so to evolve special methods, tools and resources in preparation for solving specific problems, in specific contexts, through applied research.

Applied Research involves a process of systematic investigation within a specific context in order to solve an identified problem in that context... It is informed by the intellectual infrastructure of scholarly research in the field; it applies and/or transfers enhanced knowledge, methods, tools and resources from pure and developmental research; it also contributes to scholarship in the field through the systematic dissemination of the results.

The last conceptual model I want to present was recently developed and presented by the design strategist John Maeda. What is provocative about Maeda's approach is that he describes different types of designers rather than different types of research.

Design In Tech Report 2018

Classical designers, who create physical objects or products for a specific group of people (think architects as well as industrial, furniture and graphic designers)
Commercial designers who innovate by seeking deep insights into how customers interact with products and services (think teams of researchers huddled around whiteboards and mosaics of brightly colored Post-it notes)
Computational designers, who use programming skills and data to satisfy millions or even billions of users instantaneously (think tech firms like Amazon and Facebook).

Create, innovate, compute: Maeda's triad is an attempt to acknowledge the spectrum of contemporary design practice. It begins with designers who understands design in a very traditional way as form making and understand form as an artifact made out of materials manipulated in beautiful or efficient ways. Maeda's second type of designer focuses less on form and materials and more on understanding how people interact with products and services. His third type works with algorithms and data models. The computational designer thinks and works digitally and the results of this type of design tend to shape user experience rather than the material form of objects.

I could continue to build this list of research typologies but the point of such a list is evident: there is more than one-way to think about design research. Inevitably questions arise: Which model is the best model? Which research path is the correct path? My purpose is not to argue the merits of one model versus another. Instead of asking *which* is the correct one we should ask *how* can such frameworks used? Funding agencies and academic institutions use them in assessment exercises to describe the types of research they support, to define distinctive institutional identities or to set funding priorities. Individual researchers can use them to articulate their own research agendas, position themselves within some larger field of scholarly inquiry or clearly align themselves with institutional priorities

Previously I cited Herbert Simon's call to leave the next generation with a better body of knowledge so that future decision makers could understand the alternatives available to them as they struggle to change exiting situations into preferred one. I believe that means leaving the next generation with rigorous and accessible bodies of knowledge they can draw upon to keep alive the search for truth and understanding to solve the problems and seize the opportunities that lie ahead. This means building a healthy culture of research in design that *adds* new knowledge but also *tests* existing knowledge, *connects* design knowledge – what designers know about the world and understand about the people in it – to bodies of knowledge in other disciplines. There is no consensus on which of the models above is the best one. In an Age of Pluralism clarity replaces consensus as the critical foundation for constructive conversation. You must be clear about what you are doing and how you are doing it. If you are not clear about what you are doing you will not be heard, you will not be part of the important conversations that define problems, set policies and allocate resources. Operating in such an intellectual and academic milieu characterized by multiple modes of scholarship and research is challenging. Is there a place for pure research? Is there a place for applied research? Is there a place for research that tests and evaluates existing tools and techniques or maps existing knowledge in an effort to identify gaps in our understanding? Yes, yes and yes. These models do not provide answers; they provide useful and useable frameworks for institutions and individuals to refine and clarify the nature of their research.

Now for some practical advice from a journal editor about research and research cultures: research must be shared. Sharing is what defines a research community regardless of the discipline involved. When you publish you are sharing. When you publish you are adding to the body of knowledge and doing so in a particular way that makes your work accessible to others working on related problems and issues. Think of publishing as harvesting the fruits of your labor and storing your harvest until others need it and can draw upon it. There is a distinction between the results of research that are channeled directly in the design of products, services and experiences and research results that are shared through publication. Sometimes it is difficult for non-designers to recognize and appreciate the knowledge embedded in designed things.

When you publish you are not just adding to your personal credibility but also the authority of the design community as a whole. Previously I cited Christopher Dresser's remark that what he called art-knowledge (what today we would call design knowledge) added value to the production of ceramics pots. This corresponds to what John Maeda described as classical design, i.e. beautiful form making. Maeda goes on to describe two other types of designers: the design thinker who contributes to innovation in product design and the computational designer who understands algorithms and data models. Their credibility depends not on their artistic sensibility but their command of strategies, tools and data.

In addition to sharing the fruits of your research, publication in peer-reviewed journals adds to the credibility of designers.

Publication also completes your research in a way that is different from completion in the form of a designed artifact or system or service. Publication allows you to reflect upon what you have learned through research. One question I ask as an editor is: n*ow that we know this (whatever this is) what do we know?* I look for authors who can tell me what they have done and why what they have done is important. How does this piece of research contribute to our understanding of a larger area of inquiry? There is an important distinction between research and inquiry. Inquiry as I use the term stands for the assumptions, concerns and purposes that initiate and guide research campaigns. Inquiry is different from the project briefs that define the direction, pace and product of research campaigns. Inquiry involves the reasons we accept particular project briefs, the general concerns that specific research campaigns contribute to advancing. Inquiry in this sense is generative; it comes before and reaches fruition through research and practice. An example: you may be involved in the research and design of specific types of medical devices, but the broader area of inquiry may address health care concerns such as the role of the patient in managing his or her own condition or debates about the relevant merits of technological versus alternative holistic approaches to managing health.

Another question I ask as an editor is: why should anyone interested in design read this manuscript? In *Design Issues* we actually published relatively few articles that that simply identify a test group, describe a testing methodology and report the statistical results generated by the investigation. Until you can tell us why your work is noteworthy, what larger area of inquiry it addresses, it will not get published.

I began this discussion by looking back to some key moments in the evolution of our understanding of design, design research and design education. I want to conclude by looking ahead to future research agendas. In 2017 an international working group composed of representative of professional design associations and design-related disciplines along with representatives from various NGOs convened the World Design Summit in Montreal, Canada. Participants in the Summit issued the *Montreal Design Declaration*. The document opened with a section labeled "The Value of Design" and offered this definition:

> *Design is the application of intent: the process through which we create the material, spatial, visual and experiential environments in a world made ever more malleable by advances in technology and materials and increasingly vulnerable to the effect of unleashed global development.*[12]

There are clear echoes in this definition of Herbert Simon's thinking in this definition of design as intent and process.

The Montreal Design Declaration concludes with a section labeled: "Call to Action". Four bullet points from this section are particularly relevant to this discussion of design research.

Development of Design Metrics: collection of data and establishment of effective measures to better enable the evaluation of the impact of design, thus demonstrating the strategic value of design.

Development of Design Standards: support of professional design communities, the development of design industry infrastructures and the development of standards, codes, covenants, best practices, legal protections and certification programs.

Enhancement of Design Education: support for educational institutions, methods and processes specific to design education, design research and life-long learning and capacity building for designers.

Vigilant Design: in a world increasingly impacted by machine learning and artificial intelligence, designers must help ensure that the impact of algorithms and technology are ethical and inclusive of social, cultural and ethnic diversity.

Metrics, standards and education are familiar topics in any discussion of design research and education. Vigilance, however, signals a new and increasingly pressing concern as machine learning and artificial intelligence grow in importance.

The Montreal Design Declaration lays out an ambitious agenda; it offers a set of questions and targets that are explicitly about design. To the extent that members of the Korean Society for Design Science can demonstrate that designers understand important things about how design shapes human experience and can share this knowledge in constructive ways with others you will part of important conversations and you will make the world a better place. *The Montreal Design Declaration* is also a call to action. Answering this call will meet Herbert Simon's call to leave the next generation with more options and a better body of knowledge. It will also meet Victor Papanek's call to make design responsive to true human needs. This is an ambitious call to action. It is also a noble one and worthy of our best efforts.

References

1. This text is based on my presentation *Design Research Today: Challenges, Opportunities and Conversations* for the Korean Society of Design Research, June 2, 2018. I wish to thank the Korean Society of Design Research for the invitation to speak. I also wish to thank Yonsei University and Research Fun 2018–12–0093 for the generous support of my visit.
2. Dunne, A., & Raby, F. (2013). *Speculative everything: design, fiction, and social dreaming*. MIT press. Also see: Critical Design FAQ. Anthony Dunne & Fiona Raby. http://www.dunneandraby.co.uk/content/bydandr/13/0.
3. Dresser, C. (1873). *Principles of Decorative Design*. London: Cassell, Petter, and Galpin.
4. Gropius, W. (1926). Principles of Bauhaus production. In UlrichConrads, *Programs and Manifestoes on 20th Century Architecture*. MA: MIT Press, Cambridge.
5. Papanek, V. (1971). *Design for the Real World*. New York: Pantheon Books.
6. Sion, H. A. (1969). The Sciences of the Artificial. MIT Press.
7. Simon, H. A. (1969). The Sciences of the Artificial. MIT Press.
8. Frayling, C. (1993). Research in Art and Design. Royal College of Art Research Papers, 1(1), 5.

9. Boyer, E. L. (1990). Chapter Two: Enlarging the Perspective. In Scholarship Reconsidered: Priorities of the Professoriate. (Carnegie Foundation for the Advancement of Teaching, Princeton, NJ: 1990). Available at *https://depts.washington.edu/gs630/Spring/Boyer.pdf.*)
10. Brown, B., Gough, P., & Roddis, J. (2004). Types of Research in the Creative Arts and Design. University of Brighton. Available online at: https://www.scribd.com/document/36936265/Brown-Types-of-Research-2004.
11. Maeda, J. (2017). Tech Report 2017. Abailable at *https://designintech.report/2017/03/11/design-in-tech-report-2017/*.
12. Montreal Design Declaration (2018). *Design Issues, 34*(2), 77-82. Available at: http://montrealdesigndeclaration.org.