

Doctoral Education in Design: Problems and Prospects

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This article appeared in a slightly different version in *Elisava TdD 26* (November 2009).

The Nature of Design Research

In October 1998, the first conference on doctoral education in design was held at Ohio State University. Sponsored by *Design Issues*, The School of Design at Carnegie Mellon University, and the Department of Industrial, Interior, and Visual Communication Design at Ohio State University, it brought together participants from a number of countries and resulted in a published set of papers.¹ In his keynote address to the conference, Richard Buchanan, then Director of The School of Design at Carnegie Mellon University and a co-editor of *Design Issues* made a distinction between paleoteric thinking, which he said was “based on the identification of *discrete subject matters* such as we find throughout the university today,” and neoteric thinking, which was “based on *new problems* encountered in practical life and in serious theoretical reflection.” The goal of paleoteric education, he continued, was to “expand the knowledge of a particular subject matter, often in greater and greater detail,” while the goal 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.”² Buchanan envisioned doctoral education in design as a neoteric enterprise that could become “a model of what the new learning may be in our universities and in our culture as a whole.”³

Since that conference and several others that followed in La Clusaz, France (2000), Tsukuba, Japan (2003), and Tempe, Arizona (2005), interest in doctoral education in design has increased considerably, and a large number of new programs have been established.⁴ Today they exist in many countries and more are on the way, despite the fact that the fundamental questions about what constitutes doctoral education and what it is for remain unresolved. Most new programs appear to be devised locally without reference to others elsewhere.

What then are we to make of this cacophony of doctorates, each claiming that its recipients possess a body of knowledge that both signifies a mastery of the design field and qualifies them to contribute to it by producing research of their own? To raise questions about the state and status of doctoral education, we also need to consider the state of design research, a field that itself remains equally cacophonous and without a set of shared problematics. Of most concern, at least to this writer, is a lack of

- 1 See Richard Buchanan, Dennis Doordan, Lorraine Justice, and Victor Margolin, eds. *Doctoral Education in Design 1998: Proceedings of the Ohio Conference, October 8–11, 1998* (Pittsburgh: The School of Design, Carnegie Mellon University, 1999).
- 2 Richard Buchanan, “The Study of Design: Doctoral Education and Research in a New Field of Inquiry,” in *Doctoral Education in Design 1998: Proceedings of the Ohio Conference, October 8–11, 1998*, 6–7.
- 3 *Ibid.*, 7.
- 4 See David Durling and Ken Friedman, eds. *Doctoral Education in Design: Foundations for the Future. Proceedings of the Conference held at La Clusaz, France, 8–12 July 2000* (Staffordshire: Staffordshire University Press, 2000) and David Durling and Kazuo Sugiyama, eds. *Proceedings of the 3rd Doctoral Education in Design Conference, Tsukuba International Congress Center, Tsukuba, Japan. 14–17 October 2003.*

consensus as to how we identify the subject matter of design and, of equal importance, what design research is for and how different communities of researchers contribute to its purpose.

The first question may be easier to answer than the second. Richard Buchanan was correct when he stated in his Ohio State address “design does not have a subject matter in the traditional sense of other disciplines and fields of learning.”⁵ Elsewhere he broadly characterized the subject matter of design thus: “Design is the human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes.”⁶ Buchanan’s broad definition is one that I share. A related definition had been put forth twenty years earlier by Bruce Archer, director of the Design Research Department at the Royal College of Art in London. In a seminal conference paper on design research, Archer stated that design was “the combined embodiment of configuration, composition, structure, purpose, value, and meaning in man-made things and systems.”⁷ What the definitions of Buchanan and Archer have in common is that they conceive design broadly and do not limit it to a set of given taxonomic categories. As Buchanan 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 products.

Given the fact that design is not fixed but is continually developing, we need to distinguish between how it is constituted as a subject for design researchers and those who educate them and how subject matter is constituted for scientists and scholars in the humanities. When we study design, we study a form of human action that arises from a social situation. Design is thus part of the study of society rather than nature. According to the social constructivists, society itself is a contingent phenomenon whose structure and organization, like design products, is human made rather than decreed by nature. Like design research, social research may be concerned with what has been done, what currently is, and what might be.

However, I do not wish to draw too close a comparison between the social world as a constructed entity and the world of products, which is only one part of it.⁸ The social world is far more complex and requires many more disciplines to study its diverse aspects. Nonetheless, the realm of design does partake of this complexity in that the production, distribution, and use of products are part of a larger social process.

I now want to distinguish the study of design from two other subjects that are rooted in the natural, rather than the social, world. I am not going to draw a reductive comparison between the two worlds, claiming that the natural world is completely a product of nature and the social world is completely a product of human construction. In fact, humans have intervened in nature throughout history and what appears to us as the natural world

5 Buchanan, *The Study of Design*, 7.

6 Richard Buchanan, “Design Research and the New Learning,” *Design Issues* 17:4 (Autumn 2001): 9.

7 Bruce Archer, “A View of the Nature of Design Research,” in Robin Jacques and James A. Powell, eds. *Design, Science, Method* (Guilford, UK: Westbury House/IPC Science and Technology Press, 1981), 30.

8 See my essay, “The Product Milieu” in Richard Buchanan and Victor Margolin, eds. *Discovering Design: Explorations in Design Studies* (Chicago and London: The University of Chicago Press, 1995).

today is a world that has absorbed these interventions. Nonetheless, what differentiates today's natural world from the social world is the degree of cause and effect that arises as a result of human intervention. To clarify this difference, let us look at the history of research on the human body that has led to our current understanding of health and its absence.

For centuries, researchers have mapped the human body, identifying its anatomy, its organs, and more recently its genetic code. On the basis of this mapping, theories of medicine arose that today are the basis for maintaining a given level of health. As a result of medical knowledge, a host of interventions that range from medical procedures and drugs to artificial limbs and organs has evolved. There is much that we still do not understand about the human body and the factors that cause its illness, but many problems have been identified and researchers continue to work on them.

The reason for mentioning the human body here is to present a research paradigm that I will then compare with a related paradigm for design research. To make my point, I will not make reference to the research on the human mind, which is considerably less developed than that on the body in that we can explain less about how and why humans behave as they do than we can about how the body functions. The paradigm of research on the body is based on the following premises:

- There is a discrete phenomenon—the human body—to be investigated. That phenomenon is essentially stable.
- Research on the human body is cumulative. What researchers in the past have discovered contributes to our current knowledge.
- There is a consensus on the criteria that the different methods for studying the human body must meet to be accepted as valuable.
- Applications of the accumulated knowledge about the body result in productive interventions.
- There is a broad consensus on what constitutes a healthy body and agreement on what impedes health.
- Accumulated knowledge of the body has led to the identification of research problems that will advance that knowledge.

In sum, the history of research on the body has resulted in a community of medical investigators who work within a relatively well-defined set of problems. Their investigation is supported by a system of pedagogy, journals, conferences, and funding from government and private sources. The funds allocated by the Bill and Melinda Gates Foundation or the World Health Organization, for example, are based on the confidence that money well spent will help to eliminate certain diseases.

We can also consider another research paradigm based on the study of the earth and the natural forces that affect it. Over centuries geographers and other scientists have mapped the physical structure of the earth and learned to understand the delicate balance of its surrounding environment and its ecosystems that also include living beings from insects to humans. As with the human body, we have seen that absent the conditions for healthy living, the earth becomes unhealthy. This, in turn affects the quality of human life.

Given the vast complexity of the earth compared to the human body, it is easier for skeptics to doubt the claims that the earth's health depends on particular conditions that are partly created by human behavior. Too much carbon dioxide in the atmosphere, many scientists argue, contributes to global warming. Evidence is to be seen in the melting of the polar ice cap and in severe climate change. Many types of researchers—biologists, geophysicists, botanists, chemists, and lots of others—study the earth. Although they work in different fields, their research methods are compatible and the findings of researchers in one field can be related to those in another. As with the study of the human body, there is a general consensus on research methods and on how to assess the validity of research results.

By contrast with the natural world, the constitution of the social world as a field of study entails a far higher degree of constructivism than the study of the human body or the earth; that is to say, there is no point of origin where the social world was given to humans as a prior phenomenon. It was and continues to be created by us. Over the years, many social scientists have sought to explain social processes in terms of laws, but these explanations have always been tentative and only a few have resulted in satisfactory predictions of social behavior that can be counted on.

The fact that design is a contingent practice makes its study significantly different from the study of a given phenomenon like the human body or the earth. On the one hand design is evident in what has already been done—the products that have been created in the past along with the conditions of their production and use. On the other hand, design is an activity that produces new products; hence, its study needs to focus in part on how that is done, what new products might be produced, and how.

The history of design education is rather short. Design for industry and mass communication arose from craft practices and techniques. Although the Industrial Revolution began in the eighteenth century, the practices that we today call product design and graphic design had their roots in the 1920s and 1930s, and educational programs to train designers began in those years. Master's degrees in design that qualified designers to teach others are a post-World War II phenomenon. Bruce Archer writes that the Design Research Department at the Royal College of Art was

9 Archer, "A View of the Nature of Design Research," 32. Archer does not indicate in his article, however, when the first PhD in design was awarded at the RCA.

converted in 1976 to a postgraduate teaching department where Master's and PhD degrees were awarded.⁹

Although it is clear that the principal purpose of the Master's degree was to prepare teachers of design by offering more advanced design courses and the opportunity to engage in a modest research project, the purpose of a general doctorate in design has never been well articulated. In several countries, the doctorate has become a symbol for research and has been made a requirement for teachers of design. Thus, the degree is more symbolic than pragmatic and the need to do research is not driven by a shared research problem or set of problems but instead by the need to maintain the status of the degree.

Problems with Design Doctorates

We can cite a number of reasons why the purpose of design doctorates remains unclear or questionable. First is the dissociation of design research from the design professions. Even though design within the broad definitions of Buchanan, Archer, and others can embrace engineering, architecture, and computer science, as well as product design, interior design, and communication design, these communities of practitioners are sharply divided, and the fields of engineering, architecture, and computer science have their own doctorates. The communities of product and communication designers have not been engaged in discussions about doctoral education in design, and consequently the international design associations, such as ICOGRADA (International Council of Graphic Design Associations), ICSID (International Council of Societies of Industrial Design), and IFI (International Federation of Interior Designers / Architects) have little or no connection to the world of design research as it is represented by IASDR (International Association of Societies of Design Research).¹⁰ Consequently the general field of practice is not calling for a higher degree to meet a specific purpose. The result of this is that the general field of practice is not calling for a higher degree to meet a specific purpose. The consequence is that there is no formal relation between the design research community and those who design.

A second reason is that a great deal of interesting work that might well be called design research is being carried out by experts who were not trained in the field. Large corporations like Google, Microsoft, IBM, Hewlett-Packard, Intel, and many others hire PhDs for their research teams in fields ranging from electrical and software engineering to anthropology and psychology. Deutsche Telekom, for example, has a large research center, Deutsche Telekom Laboratories, that does research on future products and services. Intel also hires academics to conduct fieldwork on how consumers use mobile phones and other products. One can assume that extensive research on new products continues in all large corporations that produce consumer goods. These range from Samsung in Korea to Nokia in

¹⁰ Members of the IASDR are the China Institute of Design, the Design Research Society, the Design Society, the Japanese Society for the Science of Design, and the Korean Society for Design Science.

Finland. In general, there is no clear connection between the needs of these companies for experts in the design of complex objects and systems and the universities that should be producing such experts. One explanation for this lack of connection is the Media Lab at MIT, where doctorates are awarded to students who work on a range of projects that involve design, although such projects are not necessarily called by the name. Graduates of the Media Lab are well prepared to undertake design-related tasks of an advanced nature, and some find their way to positions in large corporations. The newly-formed Aalto University in Helsinki, which resulted from a merger between the University of Art and Design, the Helsinki School of Economics, and the Helsinki University of Technology, also plans to offer advanced studies in design-related fields to meet the government's call for more innovation. Unfortunately, the research done by industry is proprietary and does not form part of the achievements with which the international design research community is publicly identified.¹¹ Consequently, a survey of research topics as indicated by various conference proceedings does not yield a strong sense of consensual problems for which researchers are finding solutions.

An additional reason why the purpose of design doctorates remains unclear or questionable is the lack of communication between the different design research communities that exist in fields like engineering, interaction design, software design, and so forth. Although much research in these communities is technical and therefore not easily accessible to those outside the immediate circle of researchers, there is little discussion in the general design literature about how relations between these research fields might be improved.

One conclusion to draw from this analysis is that doctorates in design need to have some focus, just as they do in the related field of engineering. There is no single doctorate in engineering nor is there a single engineering research community. Generally, a university has a College of Engineering with separate departments for electrical engineering, mechanical engineering, civil engineering, bioengineering, aeronautical engineering, and other specialties, all of which were created to address specific sets of practical problems. In the future, we may see something similar in design as doctorates are offered in interaction design, transportation design, organization design, social network design, service design, sustainable design, and many other potential fields.¹² Such doctorates ought to arise as problem areas are identified, thus lending assurance to students in those programs that they will be entering a job market that has a need for their expertise.

To complement these doctorates in design, there is a need for advanced degrees in design history and design studies. Design history is already a distinct field with various opportunities for doctoral study. As a research field it is well developed with several

11 There are occasional exceptions to this situation of proprietary research. See the article by Genevieve Bell, a staff anthropologist at Intel, "Satu Keluarga, Satu Komputer (One Home, One Computer), Cultural Accounts of ICTs in South and Southeast Asia," *Design Issues* 22:2 (Spring 2006): 35–55.

12 See, for example, the special number of *Design Issues* dedicated to Design and Organizational Change, *Design Issues* 24: 1 (Winter 2008).

academic journals, regular conferences, and a stream of high-quality research that comes not only from trained design historians but also from historians in diverse fields who find design compelling as a subject of research. The one problem in the field is that it is defined too narrowly. Most design historians tend to concentrate on the paleoteric taxonomies of objects rather than embracing the neoteric manifestations of design practice.¹³

Design studies is also an aspect of design research whose territory has yet to be clarified. I would argue, as I have done in the past, that design history can be seen as one strand of a broader field of design studies.¹⁴ Together they investigate design as it was and currently is, concentrating on the production and use of products. Design history, however, focuses on design in the past, while design studies embraces the present as well. There are good reasons to create doctoral programs in design studies, since the graduates of such programs would not be expected to be designers as well unless they had prior training as practitioners. By contrast, the expectation for someone with a PhD in design should be that he or she is capable of designing something. Therefore, specialization is required to gain knowledge that will prepare graduates for specific tasks.

Moving Forward

To sort out the confusion that exists in the fields of design research and doctoral design education, the following issues need to be addressed:

- The difference between research in design and design studies needs to be made clearer so that doctoral degrees in one or the other can more accurately indicate what expertise the degree holder has. Design studies researchers can engage a broad range of topics that may lead to a better understanding of design as a phenomenon rather than to a transformation or amelioration of practice, although that is not precluded. Design researchers, on the other hand, should be contributing to a transformation of practice, either by critiquing something current that seems deficient or proposing something new.
- Distinctions need to be made between the different kinds of design practice so that degree programs geared to one or another practice can be developed.
- Some discussion is called for on core curricula for all doctoral programs in design. As the situation exists, there is no guarantee that two doctors of design will have read any of the same literature or have been exposed to any of the same research methodologies
- More attention needs to be paid to design's relation to other practices and disciplines that might be drawn upon in doctoral education.

13 I address this issue in my essay "Design in History," *Design Issues* 24:2 (Spring 2009): 94–105.

14 See my essay, "Design History and Design Studies," in Victor Margolin, *The Politics of the Artificial: Essays on Design and Design Studies* (Chicago and London: The University of Chicago Press, 2002).

To envision how the field of design research might develop further, we can return to the distinction that Bruce Archer makes between the way a lexicographer and a mathematician think about language. "The lexicographer," says Archer, "attempts to discover the meaning of words and phrases on the basis of the ways in which the words and phrases are actually used and meant by the community concerned. The mathematician, by contrast, is careful to define his terms, either for the occasion or in reference to some previous worker's definition."¹⁵ Archer's preference is for the lexicographer's approach, which he admires for its flexibility. His distinction between deriving meaning from usage or prior definitions can also hold for design researchers. Rather than define research objectives too strictly, it is more productive, as Archer suggests, to build on what other researchers are actually doing. Research nodes, which represent accumulations of related research activities, need to attract interest through their potential for significance and value. When the researchers in a field are clear about what they do, such nodes appear readily. When the research agenda is murky, they do not appear at all.

Conclusion

Despite the fact that the subject matter of design research is not as clearly defined as the human body or the earth, much valuable work has been done. Design research is international, although the communication of results between researchers in different countries is hampered by the lack of a common language. Although English is the most prevalent language among researchers, there are many scholars in Brazil, Japan, Korea, China, and other countries whose work is not known outside their own language group.¹⁶ This is particularly evident in design history, where much research has been published in non-Anglophone languages and is unknown to most English-language design historians. Consequently, a lot of what is already known is absent from the design history surveys, which leave out design in large parts of the world.

There is a need to review the history of design research and identify a group of texts that are still seminal to researchers, whether they are historical documents or more recent books and articles. Such texts should form a pool of possibilities for core curricula whose contents can be shared by researchers in different doctoral programs.¹⁷ The purpose of such texts within a research community is to constitute a common heritage to reinforce the idea that design researchers are engaged in a shared enterprise, no matter how diverse their interests. I am not advocating a single core curriculum but rather consideration of a large pool of texts from which individual core curricula can be drawn. This pool would certainly include the hundreds of articles that have been published in the major academic design journals since the 1970s. It would include as well the writings

15 Bruce Archer, "A View of the Nature of Design Research," 30.

16 There are regular design and design studies research congresses that are held in Japan, Korea, Brazil, and elsewhere in languages other than English. The proceedings of these congresses, if not bilingual as they rarely are, remain unknown to researchers in Europe and the United States, who occupy a major position in the international design and design studies research fields.

17 See my bibliographic essay, "Postwar Design Literature: A Preliminary Mapping," in Victor Margolin, ed. *Design Discourse: History, Theory, Criticism* (Chicago and London: The University of Chicago Press, 1989), 265–288.

of scholars and theorists ranging from the nineteenth century to the present. Texts by John Ruskin, William Morris, Thomas Carlyle, Adolf Loos, Walter Gropius, László Moholy-Nagy, George Nelson, Tomás Maldonado, Gui Bonsiepe, Gert Selle, Donald Schön, Lucy Suchman, Albert Borgmann, Langdon Winner, Ivan Illich, Victor Papanek, Richard Buchanan, Victor Margolin, Dennis Doordan, Erik Stolterman, Gillo Dorfles, Ken Friedman, Terry Love, Clive Dilnot, Herbert Simon, Alain Findeli, and many others provide rich material for courses in doctoral programs. There should also be more reference to such texts in what we might call the meta-literature of the field—the body of research that reinterprets and reevaluates key documents—just as is done by scholars in sociology, anthropology, literature, and art history.

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.