

Rigor and Relevance: Knowledge Production in Interaction Design

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Abstract

Interaction design calls for rigor and relevance in its knowledge production. Given the diversity of theories, processes and design contexts within the field, there is a need for further development of appropriate theories, frameworks and concepts that aid better integration of design and research. I believe that multiple options are needed, depending on the main orientation (research or design), intentions and desired outcomes. Intermediary forms of knowledge such as bridging concepts, strong concepts or generic design, as well as pluralistic approaches related to arbitrage and bricolage, could all offer a good start in building a more comprehensive conceptual toolbox for this purpose and increasing rigor and relevance in knowledge production.

Author Keywords

Contribution; knowledge production; prototyping; design classes.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Educated as a mathematician, with art and design programs taken alongside graduate studies (and later work), I have long wondered what am I - a scientist doing design for pleasure, or a designer making a living by doing science. Interaction design offered a possibility to integrate research and design, although no longer at a personal level only.

In [1], Owen proposes a model for knowledge production and use depicted in Figure 1.

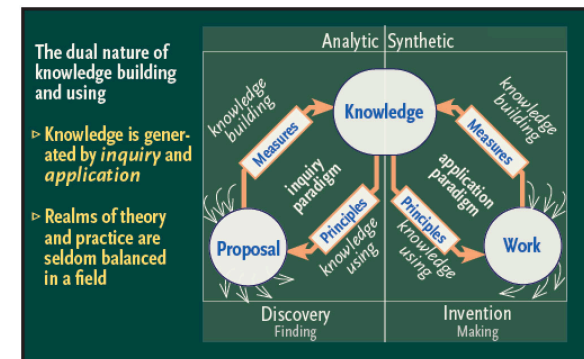


Figure 1. The dual nature of knowledge building, Owen [1].

Within interaction design, the research (finding, discovery) and design (prototyping, making) are often intertwined, involving knowledge of *techne* (programming, digital crafting), *episteme* (theoretical grounding) and *phronesis* (practical design knowledge). Production of new knowledge within these three (or any similar distinctions between knowledge forms) is also expected. Situation is further complicated by multiple roles interaction designer often assumes (researcher, designer, programmer, crafter). However, he/she may have a personal biases towards, or different levels of expertise in, either finding or making [2].

Figure 1 makes another important point: realms of theory and practice are seldom balanced in a field. I remember with fondness Papadimitriou's paper [3], where he discusses the relation between theory and practice in the field of data bases, summarizing what a good theory is, how applied science looks like during the 'normal' phase (ref. Khun [4]), and what is the equivalent of 'crises' in a non-natural, applied science field of data bases. The 'crises' was identified as the lack of connections between theory and practice, and represented by a directed graph with very few paths between theory and practice, while many paths existed within both theoretical and practical domains.

Similar arguments are true for interaction design. If the knowledge circle, Figure 1, were further divided into diverse knowledge forms, it would become even more transparent that there are too few connections between discovery and invention. A demand that the knowledge be relevant and rigorous exists within both discovery and invention. However, different criteria of relevance and rigor apply to different knowledge forms whose purposes, processes, and contexts are also different

[5], [6]. Navigating this landscape is particularly difficult for a novice interaction designer such as, for example, a PhD student in design-oriented research [7], [8], who needs to address the knowledge production related to all these diverse knowledge forms, and establish both relevance and rigor in their work. A recent debate within our research group (design of information systems), provoked by Wiberg and Stolterman's paper [9] and summarized as shown in Table 1, clearly indicates differences between predominantly finders and makers within the group. During the discussion among faculty members and PhD students, it became apparent that also definitions of what constitutes new knowledge or what its relevance is were different. The differences, though, as suggested later in this proposal, can be considered as assets towards creating better integrated views.

What are the properties of a good contribution in this field?	Group members, background in PD and DIS	HCIDesign perspective
Novelty	No	Yes
Scientific rigor	Yes	Not required
New knowledge	Not required	Yes
Relevance	Yes	Yes
Ethics	Yes	Yes

Table 1. Summary of the discussion on what constitutes a good contribution to the HCIDesign field, in particular related to prototyping, held in December 2014 at the research group.

Direct bridging of practice and research may have some success [10], and may facilitate application of theory in practice and integration of results from practice with

theory within a specific domain. It is an interesting direction to explore in interaction design, when design-oriented research is used [7], [8]. I could make a similar statement about other forms of intermediate knowledge [9], [11], [12]. Yet, there are other possibilities as well.

I would suggest, in addition and complementary to intermediate knowledge forms, arbitrage and bricolage as pluralistic approaches to bridging the theory-practice gap.

Arbitrage is a concept used in economy and has to do with price negotiations where one capitalizes on striking deals that profit most from imbalance between prices on similar items at different markets. Translated to interaction design and proposal to introduce intermediate knowledge forms, one might want to strike the optimal balance for similar work in terms of capitalization on differences in knowledge among practitioners and researchers, working closely together. Over time, this strategy could increase links between research and practice in interaction design.

Bricolage and *assemblages* are terms used by Levi-Strauss [13], and others. I have experimented with concepts within interaction design, where these terms appeared to be very useful for teaching science students (HCI students) to be more inventive and better understand design practice [14], [15], [16] while also improving their analytic skills. Essentially, using assemblages of diverse knowledge and skills within a team, through a process of arbitrage, optimal approaches to solving real life problems in interaction design are negotiated.

In conclusion, my contribution to the discussion would be a proposal to use, in addition to intermediate knowledge forms, also arbitrage and assemblages of skills, in other words, good team work towards creating knowledge forms that support both research and design.

References

- [1] C. Owen, "Design thinking: Notes on its nature and use," *Design Research Quarterly*, vol. 2, no. 1, pp. 16–27, 2007.
- [2] A. L. Culén, S. Joshi, and A. Atif, "HCID: Who is an interaction designer?" DRS 2013, Oslo, pp. 1924–1937.
- [3] C. H. Papadimitriou, "Database Metatheory: Asking the Big Queries," *SIGACT News*, v 26, pp. 13–30, 1995.
- [4] T. S. Kuhn, *The Structure of Scientific Revolutions, 3rd Edition*, The University of Chicago Press, 1996.
- [5] D. A. Schön, *The reflective practitioner: How professionals think in action*, v5126. Basic books, 1983.
- [6] J. Dewey, *Logic - The Theory of Inquiry*. S.l.: Saerchinger Press, 2007.
- [7] D. Fallman, "Why research-oriented design isn't design-oriented research: On the tensions between design and research in an implicit design discipline," *Knowledge, Technology & Policy*, vol. 20, no. 3, pp. 193–200, 2007.
- [8] J. Zimmerman and J. Forlizzi, "Research Through Design in HCI," in *Ways of Knowing in HCI*, J. S. Olson and W. A. Kellogg, Eds. Springer New York, 2014, pp. 167–189.
- [9] M. Wiberg and E. Stolterman, "What Makes a Prototype Novel?: A Knowledge Contribution Concern for Interaction Design Research," iNordiCHI 2014, pp. 531–540.
- [10] P. Dalsgaard and C. Dindler, "Between Theory and Practice: Bridging Concepts in HCI Research," in *Proceedings of the SIGCHI Conference on Human*

Factors in Computing Systems, New York, NY, USA, 2014, pp. 1635–1644.

[11]K. Höök and J. Löwgren, "Strong Concepts: Intermediate-level Knowledge in Interaction Design Research," *ACM Trans. Comput.-Hum. Interact.*, vol. 19, no. 3, pp. 23:1–23:18, Oct. 2012.

[12]T. Binder and J. Redström, "Exemplary design research," 2006.

[13]C. Lévi-Strauss, *The Savage Mind*. University of Chicago Press, 1966.

[14]S. Finken, A. L. Culén, and A. A. Gasparini, "Nurturing Creativity: Assemblages in HCI Design Practices," in *Proceedings of DRS 2014*, Umeå, 2014, pp. 1204–1217.

[15]A. L. Culén, H. N. Mainsah, and S. Finken, "Design, Creativity and Human Computer Interaction Design Education," *Journal On Advances in Life Sciences*, v 6 n 3&4 2014, vol. 6, no. 3&4, 2014.

[16]A. L. Culén and A. Følstad, "Innovation in HCI: What Can We Learn from Design Thinking?," *NordiCHI 2014*, Workshop 20, pp. 849–852.