

The Theory-Practice Gap as Generative Metaphor

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Jordan Beck & Hamid R. Ekbia

Main Contributions

We interpret the gap as a generative metaphor (Schön, 1979).

We describe the emergence of the gap in HCI discourse and examine its development and possible limitations.

We propose a new metaphor (the continuum) as a way of reframing the theory-practice relationship.

Generative Metaphor 1. The Paintbrush-as-pump Story

... Synthetic bristle development was not going well.

... Comparing synthetic to natural bristles did not yield effective insights.

“You know, a paintbrush is a kind of pump!”

Paintbrush-as-pump. Insights from the Story

... generative metaphors create new perceptions, explanations, and inventions.

... they organize features of reality, describe what's wrong, and set a direction for transformation.

... they develop over time.

Generative Metaphor 2. The Theory-Practice Gap

Connecting Theory and Practice (Butler, 1985)



What's Wrong: Communication

Session: Design Research

CHI 2013: Changing Perspectives, Paris, France

Design Research at CHI and its Applicability to Design Practice

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ABSTRACT

This note summarizes our analysis of 25 papers from CHI 2013 that aim to improve or support interaction design practice. In our analysis, we characterize how these CHI authors conceptualize design practice and the types of contributions they propose. This work is motivated by the recognition that design methods proposed by HCI researchers often do not fit the needs and constraints of professional design practice. As a consequence, we conducted an analysis of the CHI 2013 papers and interviewed 13 practitioners about their attitudes towards learning new methods and approaches. We conclude the note by offering some critical reflections about how HCI research can better support actual design practice.

Author Keywords

Design research; interaction design; design practice.

ACM Classification Keywords

H.5.2 User Interfaces: Theory and methods.

General Terms

Design.

INTRODUCTION

Within HCI, a considerable amount of research is concerned with supporting the practice of interaction design. It is possible to interpret this concern as a desire to produce research results that would have practical value outside of the academic world of "understanding and exploring". This ambition to make a difference in the "real world" is understandable and one way for researchers to legitimize their work. This ambition can take on many forms, among the more common are the development of new approaches, methods, techniques and tools. But there are also other forms of contributions aimed at impacting practice, such as new technological solutions and designs.

However, it has been argued that much of this research

output is never adopted or used by practitioners because it does not fit the needs and constraints of professional design practice [2,7,8]. Given these practical constraints, these authors serve as a useful catalyst for inquiry. For instance, Rogers [8] argues that the reason is in many cases that the results developed by researchers are too abstract, too complex, too difficult to learn and take too much time to use. Stolterman [9] argues similarly that a majority of the research is based on an overly simplistic understanding of practice, and as a result, the proposed methods and tools do not fit the constraints of real design practice.

Based on the assumption that academic research could be better adapted to the needs of professionals, we decided to approach the issue by engaging in two studies.

First we decided to analyze research papers presented at CHI 2011. We focused our analysis on the arguments and reasons the researchers use to make the case that their contribution is important and valuable to professional practice. We reviewed all papers in the proceedings and identified 35 papers in which we detected an intention to improve or support the interaction design practice. We analyzed these papers in terms of the way they conceptualize, operationalize and generalize issues of design practice, and what kind of contribution they propose to practice.

As a complement to the analysis of the CHI papers we also interviewed 13 practitioners about how they learn about new methods and approaches and about how they perceive the CHI conference, especially from the perspective of giving their support for their professional practice.

These two studies will be following with this note will first describe the paper analysis study and the patterns that we observed. We then present the practitioner interview study and its findings. At the end we outline some implications for HCI research.

New approaches, methods, and tools for interaction design are created and developed by many in diverse contexts and for different purposes. There are for instance some larger design consultancies that are constantly engaged in the development of new methods and techniques as part of their

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Session: Design Theory

CHI 2014, One of a CHInd, Toronto, ON, Canada

Between Theory and Practice: Bridging Concepts in HCI Research

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ABSTRACT

We propose the notion of "bridging concepts" as a practice from an intermediary knowledge domain, HCI research, bridging between theory and practice. We argue that bridging concepts address the challenge of facilitating exchange between theory and practice in HCI, and we compare it to other intermediary forms of knowledge in HCI. We also propose that bridging concepts are useful. We argue that bridging concepts are useful for HCI research, for HCI theory and for HCI practice. We propose that bridging concepts have three defining characteristics: a solid theoretical foundation, a set of design artifacts and a range of exemplars that demonstrate the scope and potential of their application. These constituents are accountable to both theory and practice. We present an analysis of the concept of "peopledes" as an example of a bridging concept aimed at spurring user curiosity and engagement.

First we decided to analyze research papers presented at CHI 2011. We focused our analysis on the arguments and reasons the researchers use to make the case that their contribution is important and valuable to professional practice. We reviewed all papers in the proceedings and identified 35 papers in which we detected an intention to improve or support the interaction design practice. We analyzed these papers in terms of the way they conceptualize, operationalize and generalize issues of design practice, and what kind of contribution they propose to practice.

As a complement to the analysis of the CHI papers we also interviewed 13 practitioners about how they learn about new methods and approaches and about how they perceive the CHI conference, especially from the perspective of giving their support for their professional practice.

These two studies will be following with this note will first describe the paper analysis study and the patterns that we observed. We then present the practitioner interview study and its findings. At the end we outline some implications for HCI research.

New approaches, methods, and tools for interaction design are created and developed by many in diverse contexts and for different purposes. There are for instance some larger design consultancies that are constantly engaged in the development of new methods and techniques as part of their

design thinking. Among these, one can draw more or less directly upon existing theoretical positions (e.g., cognitive psychology, "improvisation", etc.). Rogers [9] and Stolterman [10] and developing position and theories within the frame of HCI (e.g. activity theory) [22], or one can develop theoretical constructs from design practice and examples of interactive systems (e.g. design patterns [42]). One of the persistent challenges for interaction design researchers and practitioners is how to relate their efforts to be gap between theory and the specific design instances. Many theories are abstract, since they must account for a variety of instances, and thus they can be difficult to translate and operationalize in relation to the particular design situation. In this article, we propose to explore the gap between theory and practice. Some of the well-known concepts and forms of knowledge in HCI such as patterns and heuristics occupy this space, arguably because they draw upon a wider set of input than the specific design situation, yet are operational and aimed at helping designers address the specific situation.

In this paper, we introduce the notion of "bridging concepts" as an intermediary form of knowledge relating between abstract theory and design practice and we argue that bridging concepts are distinguished by their ability to facilitate exchange between theory and practice. Articulating knowledge in the form of bridging concepts, prompts us to formulate knowledge in a way that specifies the accountability to both theory and practice. While concrete design knowledge is often considered to be more important in academic research, it is arguably even more so for HCI. Within HCI, much theory has been imported from other more established disciplines such as psychology and sociology [39]. For interaction design researchers and practitioners, this presents an opportunity to relate to what extent newly imported theories are useful. To complicate matters, the subject matter of research in HCI—ever-evolving interactive interfaces and reconfigurations of human-computer relations—is under constant development. This necessitates the need for continuous reflection on how new materialist theories and practices challenge our theoretical assumptions and in turn how theories can be applied to understand these new developments. Bridging concepts provide one way of facilitating this exchange by articulating the knowledge construct both in terms of its ties to theory

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Understanding Interaction Design Practices

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ABSTRACT

Interaction design—the specification of digital behaviors in response to human or machine stimuli—is a complex field. Identifying the design practices that combine knowledge of technological possibilities of the participants and systems in play, skilled aesthetic judgment, and empirically informed empathy with potential users [28, 36]. Interaction designers as practitioners work in many arenas of technology development, from universities and research labs to business product groups and small startups. Multiple studies have suggested that many frameworks and theories proposed in HCI research and interaction design practices. Then we propose this disconnection in part emerges from a persistent failure to adequately address the lived complexity of design practices. HCI's research commitment to systematic analysis of how people make use of technologies is well-known. Yet there has been much less attention to the specific ways in which technologies are used in environments in which design takes place. In this instance, we propose results from an assumption that the social worlds and epistemological beliefs of the imagined "users" of HCI theories and frameworks—*in particular, professional interaction designers*—are largely identical to those of the researchers producing them.

Interaction design as a profession, has two distinct groups of practitioners (academics and conference). If we as HCI researchers want to participate in this world, we will need to broaden our current research agenda. We can never assess the existence and nature of any gap without attending more closely to how professional design actually works, and to why they understand what constitutes a "good" design. In turn, academics and professional roles. A broader research agenda could help HCI researchers understand and theorize what interaction design is, and present opportunities for HCI research to contribute to a broader range of practices.

In this paper, we contend there is a need to produce theories of design/lyric practice that are *resonant* with the everyday practices of HCI practitioners.

¹ For example, the Interaction Design Association (IxDA) association and annual conference, the interactive track of the South by Southwest (SXSW) conference, and the American Institute of Graphic Arts (AIGA).

What's Wrong: Practitioner Constraints

Session: Design Research

Design Research at CHI and its Applicability to Design Practice

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ABSTRACT

This note summarizes our analysis of 35 papers from CHI 2011 that aim to improve or support interaction design practice. In our analysis, we characterize how these CHI authors conceptualize design practice and the types of contributions they propose. This work is motivated by the recognition that design methods proposed by HCI researchers often do not fit the needs and constraints of professional design practice. As a result, we conducted a survey of the CHI papers and also interviewed 13 practitioners about their attitudes towards learning new methods and approaches. We conclude the note by offering some critical reflections about how HCI research can better support actual design practice.

Author Keywords

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ACM Classification Keywords

H.5.2 User Interfaces: Theory and methods.

General Terms

Design.

INTRODUCTION

Within HCI, a considerable amount of research is concerned with supporting the practice of interaction design. It is possible to interpret this concern as a desire to produce research results that would have practical value outside of the academic context. The understanding and explanation of this ambition to make a difference in the "real world" is understandable and one way for researchers to legitimate their work. This ambition can take on many forms, among the more common are the development of new approaches, methods, techniques and tools. But there are also other forms of contributions aimed at impacting practice, such as new technological solutions and designs.

However, it has been argued that much of this research

output is never adopted or used by practitioners because it does not fit the needs and constraints of professional design practice [2,7,8]. In this note, we argue that in some cases, these authors' conceptualizations of design practice and the types of contributions they propose are problematic. This work is motivated by the recognition that design methods proposed by HCI researchers often do not fit the needs and constraints of professional design practice. As a result, we conducted a survey of the CHI papers and also interviewed 13 practitioners about their attitudes towards learning new methods and approaches. We conclude the note by offering some critical reflections about how HCI research can better support actual design practice.

First we decided to analyze research papers presented at CHI 2011. We focused our analysis on the arguments and reasons the researchers use to make the case that their contribution is important and valuable to professional practice. We reviewed all papers in the proceedings and identified 35 papers that we deemed most promising to support and support the interaction design process. We analyzed these papers in terms of the way they conceptualize, operationalize and generalize issues of design practice, and what kind of contribution they propose to practice.

As a complement to the analysis of the CHI papers we also interviewed 13 practitioners about how they learn about

new methods and approaches and about how they perceive the CHI conference, especially from the perspective of giving them support for their professional practice.

Then we conducted a paper analysis study and the patterns that we observed. We then present our practitioner interview study and its findings. At the end we outline some implications for HCI research.

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Understanding Interaction Design Practices

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ABSTRACT

There is an undesirable gap between HCI research aimed at informing interaction design practice and the practitioners in question. To close this gap, we advocate a theoretical and methodological focus on the day-to-day, lived experience of designers. To date, this type of theory-generative, experimentally oriented research has focused on the users of technologies, not the designers. In contrast, we propose that HCI research should focus on the theory-generative, experimentally oriented interaction design practice that resonates with practitioners themselves. In part one of this paper, we describe the mismatch between HCI research and interaction design practice. Then we present vignettes from an observational study of commercial design practice to illustrate the issue and, in part two, we propose a research agenda and theoretical challenges in research practice that might support the goal of integrating HCI research with interaction design practice. We then discuss current research methods and theories to identify changes that might enlarge our view on practice. In part three, we elaborate on our theoretically minded agenda and a kind of ideal-type theory.

Author Keywords
Interaction design, practice, theory

ACM Classification Keywords
H.5 [Miscellaneous]: K.4.3 [Organizational Impacts]

General Terms
Human Factors

INTRODUCTION

In many academic disciplines, one major research goal is to influence on practice. The sharing of examples and theories of practice fuels education, research, and innovation in commercial activity. Indeed, human-computer interaction (HCI) researchers often describe HCI as an integration of academic practice and professional practices [3, 18, 32] – in particular, the new profession of interaction design.

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New approaches, methods, and tools for interaction design are created and developed by many in diverse contexts and for different purposes. There are for instance some larger design consultancies that are constantly engaged in the development of new methods and techniques as part of their

interaction design – the specification of digital behaviors in response to human or machine stimuli – is a complex discipline. Ideally, interaction design requires conceptual knowledge of technological possibilities of the platforms and systems in play, skilled aesthetic judgment, and empirically informed empathy with potential users [28, 36]. Interaction designers as practitioners work in many areas of technology development, from universities and research labs to business product groups and small start-ups.

Multiple studies have suggested that many frameworks and theories proposed in HCI research (i.e. [34, 43]) have not fully integrated the needs of interaction design practice. We propose this disconnection in part emerges from a persistent failure to adequately address the lived complexity of design practice. HCI's research commitment to systematic analysis of how people make use of technologies is well-known. Yet there has been much less attention paid to the lived complexity of the variety of environments in which design takes place. This is important, we propose, results from an assumption that the social worlds and epistemological beliefs of the imagined "users" of HCI theories and frameworks — in particular, professional interaction designers — are largely identical to those of the researchers producing them.

Interaction design, as a discipline, has its own distinct professional culture, publications and conferences.¹ If we as HCI researchers want to participate in this world, we will need to broaden our current research agenda. We cannot even assess the existence and nature of any gap without attending more closely to how professional designers actually work, and how they understand what constitutes design practice, and what are the constraints of professional roles. A broader research agenda could help HCI researchers understand and theorize what interaction design is, and present opportunities for HCI research to contribute to a broader range of practices.

In this paper, we contend there is a need to produce theories of design practice that are *resonant* with the everyday

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Session: Design Theory

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Between Theory and Practice: Bridging Concepts in HCI Research

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ABSTRACT

Design thinking is the application of design concepts as a form of intermediary knowledge in HCI research. It is a residing form between theory and practice, and theories within the form of HCI (e.g. activity theory [22]) or one can develop theoretical constructs from design practice and examples of interactive systems (e.g. design patterns [42]). One of the persistent challenges for interaction design researchers and practitioners is that there often seems to be a gap between theory and the specific design context, by the time theories are abstract, since they must account for a variety of instances, and thus they can be difficult to translate and operationalize in relation to the particular design situation. In this article, we will argue that bridging knowledge concepts can exist in the middle ground between theory and practice, as the bridge of the widely known concepts and forms of knowledge in HCI such as patterns and heuristics occupy this space, arguably because they draw upon a wider set of input than the specific design situation, yet are operational and aimed at helping designers address the specific situation.

In this paper, we introduce the notion of bridging concepts, as an intermediate form of knowledge residing between abstract theory and design practice and we argue that bridging concepts are distinguished by their ability to facilitate exchange between theory and practice. Articulating knowledge in the form of bridging concepts, prompts us to formulate knowledge in a way that specifies the accountability to both theory and practice. While the notion of bridging concepts is well-known and has been important in academia in general, it is arguably even more so for HCI. Within HCI, much theory has been imported from other more established disciplines such as psychology and sociology [30]. For interaction design researchers and practitioners, this is an opportunity to reassess the role of and what extent newly imported theories are useful. To complicate matters, the subject matter of research in HCI – ever-evolving interactive interfaces and recognitions of human-computer relations – is under constant development. This accelerates the need for continuous reflection on our methods, interactions, studies and practices, changing our theories, and how these can be applied to understand these new developments. Bridging concepts provide one way of facilitating this exchange by articulating the knowledge construct both in terms of its ties to theory

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What's Wrong: Abstraction

Session: Design Research

Design Research at CHI and its Applicability to Design Practice

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ABSTRACT

This note summarizes our analysis of 35 papers from CHI 2010 that aim to improve or support interaction design practice. In our analysis, we characterize how these CHI authors conceptualize design practice and the types of contributions they propose. This work is motivated by the recognition that design methods proposed by HCI researchers often do not fit the needs and constraints of professional practice. As a result, we conducted a survey among the CHI 2010 papers and also interviewed 13 practitioners about their attitudes towards learning new methods and approaches. We conclude the note by offering some critical reflections about how HCI research can better support actual design practice.

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INTRODUCTION

Within HCI, a considerable amount of research is concerned with supporting the practice of interaction design. It is possible to interpret this concern as a desire to produce research results that would have practical value outside of the academic world – as a desire to understand and explain what this ambition to make a difference in the "real world" is understandable and one way for researchers to legitimize their work. This ambition can take on many forms, among the more common are the development of new approaches, methods, techniques and tools. But there are also other forms of contributions aimed at impacting practice, such as new technological solutions and designs. However, it has been argued that much of this research

is a complement to the analysis of the CHI papers we also interviewed 13 practitioners about how they learn about new methods and approaches and about how they perceive the CHI conference, especially from the perspective of giving them support for their professional practice.

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Session: Design Theory

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Between Theory and Practice: Bridging Concepts in HCI Research

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ABSTRACT

We argue that the notion of "bridging concepts" as a perspective on intermediary knowledges in HCI research, resulting from developing existing positions and theories within the frame of HCI (e.g. activity theory [22]) or one can develop theoretical constructs from design practice and examples of interactive systems (e.g. design patterns [42]). One of the persistent challenges for interaction design researchers and practitioners is how to bridge between theory and practice. We argue that bridging concepts have to be defined as a means to build a theoretical foundation, a set of design articulations and a range of exemplars that demonstrate the scope and potential of their application. These constituents specify how bridging concepts, as a form of knowledge, are accountable to both theory and practice. We present an analysis of the concept of "peopholes" as an example of a bridging concept aimed at stirring user curiosity and engagement.

Author Keywords
Experience-oriented design; Interaction design theory; Engagement; Analytical frameworks.

ACM Classification Keywords
H.5.2 [Information Design and Presentation]: User Interfaces – Theory and Methods; User-Centered Design.

INTRODUCTION

The notion of design thinking – i.e. the modes of design, design theory, and design practice – is a topic that characterizes HCI. It has become a topic of much discussion in the CHI community in recent years. While a number of contributions and discussions have developed our understanding of design thinking, there is also a consensus that there is still a need to clarify and articulate (e.g. [28]) what constitutes design thinking, and indeed to discuss how we may arrive at an articulation (e.g. [40]). These are difficult tasks, in addition to the challenge of Permissions to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

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design thinking. Among these, one can draw more or less directly upon existing theoretical constructs (e.g. cognitive psychology) or import them from the terminology of Rogers [39], or develop existing positions and theories within the frame of HCI (e.g. activity theory [22]) or one can develop theoretical constructs from design practice and examples of interactive systems (e.g. design patterns [42]). One of the persistent challenges for interaction design researchers and practitioners is how to bridge between theory and practice. We argue that bridging concepts, by their very nature, are abstract, since they must account for a variety of instances, and thus they can be difficult to translate and operationalize in relation to the particular design situation. In this article, we argue that bridging concepts are a means to bridge between theory and practice. Some of the widely known concepts and forms of knowledge in HCI such as patterns and heuristics occupy this space, arguably because they draw upon a wider set of input than the specific design situation, yet are operational and aimed at helping designers address the specific situation.

In this paper, we introduce the notion of bridging concepts as a more intricate form of knowledge介在between abstract theory and design practice and we argue that bridging concepts are distinguished by their ability to facilitate exchange between theory and practice. Articulating knowledge in the form of bridging concepts, prompts us to formulate knowledge in a way that specifies the accountability to both theory and practice. While a number of contributions and discussions have developed our understanding of design thinking, there is also a consensus that there is still a need to clarify and articulate (e.g. [28]) what constitutes design thinking, and indeed to discuss how we may arrive at an articulation (e.g. [40]). These are difficult tasks, in addition to the challenge of Permissions to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

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The Theory-Practice Gap. Future Transformations

- >> make findings understandable and applicable to practice
- >> practitioner constraints could be eased
- >> abstraction could be reduced such that the connection to practice is clearer



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Q1: Why do researchers attend to some features of reality and not others?

Q2: Has the gap metaphor
been effective?

Q3: What don't we see?

continuities | lenses



Opportunity

Frame theory and practice in terms of a different generative metaphor...
one that draws attention to connections and synergies.

REVERSAL

(Derrida, 1982)

“Expands our understanding of [a phenomenon] by flipping the center and the margins...”

CONTINUUM

emphasis continuities, agreement, and harmony

AFFORDANCES

How and why have practitioners adopted/used the concept?

Q: How do we leverage existing connections to strengthen theory and practice?

Three Paths Forward

Bridge assessment

Case studies of continuities/synergies

Framing practice as a kind of theorizing

... open a space to explore
different framing metaphors

THANKS SO MUCH!