

Design Thinking and the Research Application Problem

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Abstract

After 35 years, Weisman's (1983) framing of 'research application problems' is still haunting the architectural research community: Practitioners' common misconception of research as an accumulation of social facts ready to be applied, institutionalized separation of research and application, and the industry's persistence in using the traditional positivist and empiricist mindset for explaining and generalizing complex social phenomena are yet among the key obstacles on the way of answering a half-century question: 'How might we seamlessly integrate environmental design research into the practice of design?' Yet, considering the longevity of this question, perhaps we have not been asking the right one.

Reframing the question's core assumption, this paper suggests exploring a more generative inquiry: How might we offer an alternative to the research-application duality? This new framing recognizes that the "research application" itself is a problematic combination because it assumes that research is an activity accomplished separate from practice; that it needs to be later translated and applied.

In response to the new question, this paper attempts to frame 'design thinking' as a methodological alternative to the research-practice duality. We start by framing pragmatism as the philosophical worldview that presents an alternative to the traditional positivist framework. Then we discuss how this philosophical tradition provides a foundation for action research as an approach for creating local knowledge that is useful to practice. And finally, we advocate for design thinking as a methodology which incorporates the element of design into action research and, therefore, seamlessly integrates researchers' insights, practitioners' expectations, and users' needs in the context of projects. The paper concludes by sharing three design thinking examples to put the conversation in the context of real-world application.

Introduction

In his 1983 publication, *Environmental Programming and Action Research*, Weisman reviews a substantial body of literature depicting the ‘research application problem’ in different areas of social and behavioral sciences and argues that environmental design research has not been immune either. After 35 years, the root causes of the problem seem to be still relevant: (a) Framing research as “an accumulation of social facts that can be drawn on by practitioners when they are ready to apply them (Susman & Evered, 1978)”; (b) institutionalized separation of research and application activities within the behavioral sciences due to the general tendency toward specialization in modern science and scholarship¹; and, (c) adoption of traditional positivist and empiricist approaches to science which is simply not capable of dealing with many of the issues central to the study and understanding of organizations. This problem, as Susman and Evered (1978) argued, reflects not a “crisis of relevancy or usefulness ... [but] really a crisis of epistemology”.

This three-tier problem is an epistemological and methodological roadblock on the way of answering this architectural community’s half-century question: ‘How might we seamlessly integrate environmental design research into the practice of design?’ Yet, considering the longevity of this question, perhaps we have not been asking the right one. Design thinkers tend to reframe problem statements that do not seem to capture the root cause, are too vague or general to effectively tackle, or are not generative of diverse solutions. We used design thinking’s reframing technique to create a more generative problem statement: How might we offer an alternative to the research-application duality? This new framing recognizes that the ‘research application’ itself is a problematic combination because it assumes that research is an activity accomplished separate from practice; that it needs to be later translated and applied. The alternative approach, however, does not recognize this duality on both level of epistemology and methodology.

¹) Sanford (1970) characterizes this as a ‘science-engineering’ model in which discoveries are first made (in the lab as it were) and then ‘applied’.

To address the research application problem on the epistemological level, we advocate for pragmatism as the alternative to positivism. The participatory, action-oriented, and emergent nature of this philosophical tradition provides the license for using action research in response to social problems. Additionally, action research can be considered as the methodological reaction to the “institutionalized separation of research and application activities”. Finally, framing ‘design thinking’ methodology as a type of action research that integrates the element of design into the process, we propose an alternative to the research-practice duality. Figure (1) summarizes this core argument.

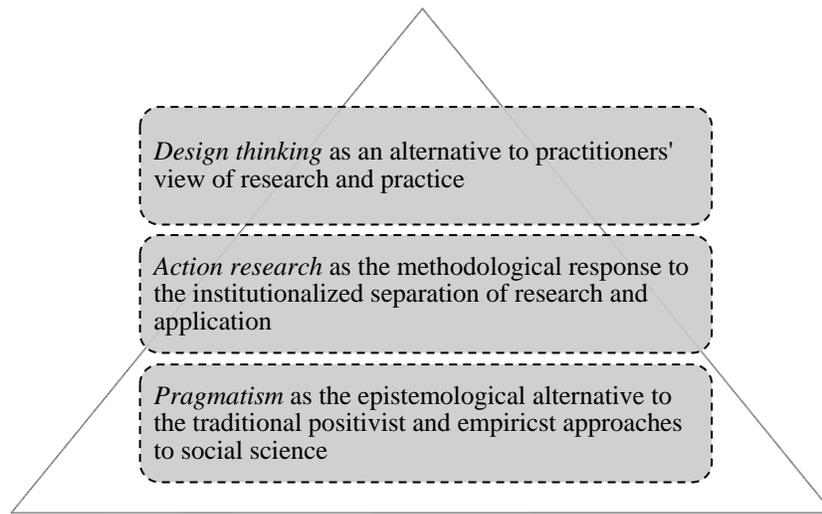


Figure (1) Addressing three tiers of research application problem.

Pragmatism: An epistemological alternative

Pragmatism can be traced back to the work of Peirce, James, Mead, Dewey, and later Rorty, Murphy, Patton, and Cherryholmes. As opposed to positivism where the main concern is uncovering the empirical truth, pragmatists are curious about applications – what works – and solutions to problems (Patton, 1990; Creswell, 2014; Rorty, 1999). In other words, truth is not the goal of the inquiry (Rorty, 1999). In a sense, pragmatism is a departure from ‘what is’ to ‘what will be’, or in Rorty’s (1999) terms,

from certainty to imagination. Although pragmatists believe in an external world independent of the mind as well as that lodged in the mind, they suggest that we need to stop asking questions about reality and the laws of nature (Cherryholmes, 1992). When asked about such topics, pragmatists “would simply like to change the subject ... [because such debates] does not get us anywhere” (Rorty, 1983, p. xiv)². Pragmatism’s key differentiating characteristics in comparison with positivism can be summarized in the following three (Robson, 2011; Fishman, 1999; Johnson & Onwuegbuzie, 2004; Creswell, 2014):

- Recognizing the existence and importance of the natural or physical world as well as the emergent social and psychological world. In other words, viewing human inquiry (i.e. what we do in our day-to-day lives as we interact with our environments) as being analogous to experimental and scientific inquiry.
- Defining truth as what works at the time while taking an explicitly value-oriented approach to research that is derived from cultural values such as democracy, freedom, equality, and progress.
- Endorsing eclecticism and pluralism and drawing liberally from both quantitative and qualitative assumptions based on their usefulness.

From pragmatism to action research

In his comprehensive study of the emancipatory character of action research, Boog (2003, p. 429) writes that “Philosophical pragmatism, especially the works of the philosopher of education Dewey and his close friend the philosopher and social psychologist Mead, was the first grand theory to provide a firm

²) “When they (pragmatists) suggest that we do not ask questions about the nature of Truth and Goodness, they do not invoke a theory about the nature of reality or knowledge or man which says that ‘there is no such thing’ as Truth or Goodness. Nor they have a ‘relativistic’ or ‘subjectivist’ theory of Truth or Goodness. They would simply like to change the subject. They are in a position analogous to that of secularists who urge that research concerning the Nature, or the Will, of God does not get us anywhere. Such secularists are not saying that God does not exist, exactly; they feel unclear about what it would mean to affirm His existence, and thus about the point of denying it.” (Rorty, 1983, p. xiv)

foundation for action research”. In the *Handbook of Action Research*, Peter Reason and Hilary Bradbury (2001) articulate five characteristics of action research: it is an approach to human inquiry concerned with developing *practical knowing* through *participatory, democratic processes* in the pursuit of *worthwhile human purposes*, drawing on *many ways of knowing* in an *emergent, developmental fashion*. Connections with the pragmatic philosophy are evident in all five characteristics of action research:

- Producing ‘practical knowledge’ that is useful to people in the everyday conduct of their lives as a primary purpose of action research (Reason, 2002) is also at the heart of the pragmatic approach.
- Like action researcher’s dedication to ‘participatory and democratic processes’, pragmatist’s desire for objectivity is not the desire to find a higher transcendent truth by escaping the limitations of her community (Rorty, 1986; Fishman, 1999).
- Pragmatist’s framing of ‘usefulness’³ qualifies the concept as a ‘worthwhile human purpose’ proposed in the definition of action research.
- Pragmatism, as the natural philosophical duo for mixed methods designs (Robson, 2011; Maxcy, 2003; Johnson and Onwuegbuzie, 2004; Johnson, Onwuegbuzie, and Turner, 2007; Onwuegbuzie and Leech, 2005; Bryman, 2006; Teddlie and Tashakkori, 2009; Denscombe, 2008; Creswell, 2014) is in alignment with action research’s ‘drawing from many ways of knowing’.
- Finally, the ‘emergent’ condition of action research is also a consequent of its participatory nature – a quality well described by the American neo-pragmatist philosopher Richard Rorty:

³) When the question ‘useful for what?’ is pressed, [pragmatists] have nothing to say except ‘useful to create a better future’. When they are asked ‘Better by what criterion?’ they have no detailed answer... [they] can only say something as vague as: Better in the sense of containing more of what we consider good and less of what we consider bad. When asked ‘And what exactly do you consider good?’, pragmatists can only say, with Whitman, ‘variety and freedom’ or, with Dewey, ‘growth’. They are limited to such fuzzy and unhelpful answers because what they hope is not that the future will conform to a plan, will fulfil an immanent teleology... but rather than the future will astonish and exhilarate. (Rorty, 1999:27-8).

We cannot regard truth as a goal of inquiry. The purpose of inquiry is to achieve agreement among human beings about what to do, to bring consensus on the end to be achieved and the means to be used to achieve those ends. Inquiry that does not achieve co-ordination of behavior is not inquiry but simply wordplay (Rorty, 1999: xxv)⁴.

This final principle is also reflected in Weisman's (1983) piece on action research where he argues that a central aspect of virtually all model of action research is the necessity of client or user-participation. The intent of participation in action research goes beyond capturing diverse voices; it is to make the element of action even bolder by empowering and equipping the user to participate in building and shaping a new reality – be it a new culture, a new design, or both.

It is important to touch on two additional attributes of action research approach. First, as Susman and Evered (1978) suggested, success “occurs because of the researcher’s involvement, not from trying to avoid it”. In other words, and in Weisman’s (1983) terms, “the action researcher has a commitment to the resolution of real problems”. Second, when it comes to decision-making, “ordinary knowledge” (cf. Lindblom & Cohen, 1979) is as important as scientific knowledge. Suggesting to involve more than “scientific data”, Weisman (1983) refers to Lewin’s earliest writings on action research where he emphasized the difficulties inherent in the application of “general” principles to “local” conditions. Figure (2) provides a summary of some key aspects of action research.

⁴) Reason (2003) also believes that many action researchers would agree with this Rorty’s position on the goal of the inquiry.

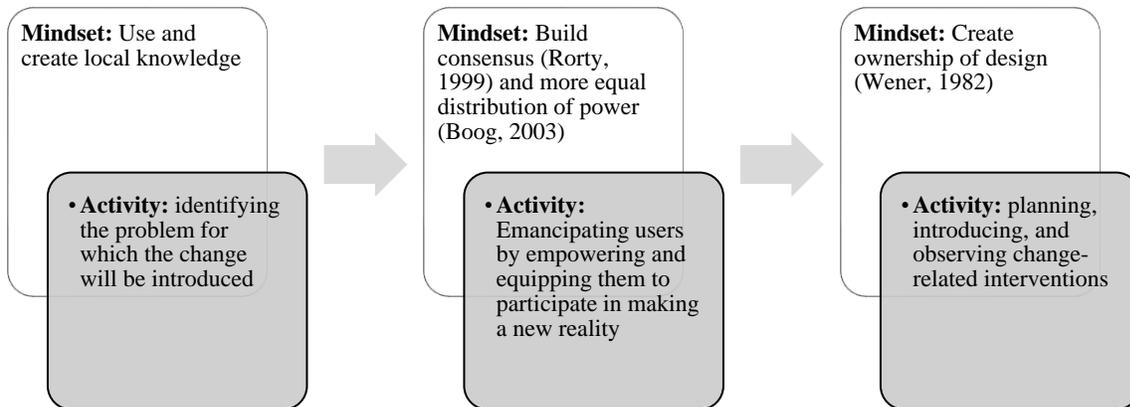


Figure (2) Action research is a change-oriented approach to human inquiry which brings together, participation, empowerment, and action.

From action research to design thinking

Rorty (1999), the American neo-pragmatist philosopher, argues that the quest for certainty should be replaced with the demand for imagination, that one should replace knowledge by hope. He continues by saying that one should stop worrying about whether what one believes is well grounded and start worrying about whether one has been imaginative enough to think up interesting alternatives to one's present beliefs. So, in his view, concern about “building a better future” precedes the obsession about “correspondence to reality”. This is a rather radical view of knowledge. Of course, researchers need to acknowledge and use ‘evidence’. Yet the dilemma is that evidence often tells us about ‘what is’ whereas application, or what is referred to as ‘design’ in the architectural community, is often curious about ‘what if’ and ‘what will be’.

Rooted in the participatory design tradition evolved since the early 1970s (Bjögvinsson et al., 2012; Gobble, 2014) and the ongoing design discourse about the nature of design since the 1960s (Rhinow & Meinel, 2014; Johansson-Sköldberg et al., 2013), design thinking has been largely framed and popularized by IDEO in partnership with several other progressive design companies in the 1990s and Stanford University d.school during the mid-2000s as a way of enabling innovation and dealing with complex problems by making designers’ way of thinking accessible to non-designers (Camacho, 2016; Luchs, 2016; Katoppo & Sudradjat, 2015; Johansson-Sköldberg et al., 2013; Bjögvinsson et al., 2012; Melles et al.,

2012). What has maintained the popularity of design thinking during the past two decades and across different disciplines is the fact that the subject of design, and consequently innovation, within the design thinking framework goes beyond artifacts and products and encompasses processes, systems, organizations⁵, and even life⁶ itself.

At first glance, design thinking is mainly characterized by the same attributes used to describe action research. It is concerned with developing practical knowing, uses participatory processes, is focused on real human and social problems, and employs various ways of knowing. In fact, several studies have recognized the many parallels between the two approaches. For example, Katoppo and Sudradjat (2015) adopted design thinking as a tool to complement participatory action research (PAR) in architectural research method and argued “undoubtedly, the combination of PAR and DT will eventually enrich architectural research with new social and participatory dimensions”. Trullen and Bartunek (2007) also recognized the similarities and wrote that design approaches “follow steps established in action research interventions – data collection, diagnosis, planning, taking action, and evaluating needs which may lead to another cycle of action” (p. 33). Tonkinwise (2010) went one step further by framing design thinking as a form of action research:

[D]esign thinking is foremost defined as the sort of action research that comes from fail-friendly, iterative prototyping in context of immersive social research. (p. 381).

Therefore, design thinking distinguishes itself from action research by the virtue of relying on iteration for the purpose of collapsing the user’s understanding on something that she finds of value. Design thinking’s emphasis on iteration is mainly due to it incorporating the element of design, as a methodology

⁵) This has created an interested especially in the fields of management (Rhinow & Meinel, 2014; Liedtka & Ogilvie, 2011) including organizational change and development (Sato et al., 2010).

⁶) In their 2016 book, *Design Your Life*, Stanford professors Bill Burnett and Dave Evans show how design thinking can be used to ideate and test versions of life that are meaningful and fulfilling.

and mindset for changing existing practices or situations or creating new ones from scratch⁷, into the action research equation. Design thinking argues for a social and situated view about the nature of design; that is, it uses certain tools and techniques to situate and embed the design work in the social setting which lives with the design challenge or opportunity. This includes the process of creating insights through gaining ethnographic knowledge and providing thick description⁸ about the social setting within which the challenge or opportunity is situated – in the design thinking lexicon, this is referred to as empathy. In his editorial note on *Design Studies* special issue, *Articulating Design Thinking*, Rodgers (2013) writes that “[t]here is no universally agreed upon definition of ‘design thinking’, but the strongest common denominator embraces the centrality of the user and empathy to the human condition”.

In addition to its emphasis on iteration and empathy, design thinking augments action research’s ‘plan for change’ into a collective endeavor that focuses on the ‘what if?’ (Liedtka & Ogilvie, 2011). Commonly referred to as ideation, this is when design thinkers create opportunity areas and use abductive reasoning⁹, as opposed to deductive hypothesis-testing¹⁰, for “generating, developing, and testing ideas that may lead to solutions (Brown, 2008)”:

⁷) Romme (2003, 2004) explains that there are three archetypal modes of research. The goal of the science mode is to understand social phenomena on the basis of consensual objectivity by uncovering patterns. The goal of humanities mode is to understand experience of people inside social practice since knowledge arises from what people say about the world. Finally, the goal of the design mode is to produce systems that do not yet exist either by changing existing practices and situations or by creating new ones from scratch. He further explains that the science mode continues to dominate the social science with the humanities mode as its emerging antithesis and critical opponent. This is while the design mode largely remains absent in social sciences.

⁸) In addition to ethnographic and thick data, design thinkers have experimented with incorporating aspects of big data into their work. In studies about using design thinking for changing learning practices in the workplaces, Mojtahedi, et al. (2017) and Mojtahedi (2017) used sensor network technology and space utilization data to complement the ethnographic investigation.

⁹) In this sense, design thinking is less about democracy and more about meritocracy of ideas. Ideation is always concluded by examining the merit of ideas often based on a trinary criteria put forward by IDEO and Stanford d.school: feasibility, desirability, and viability.

¹⁰) Associating design thinking with deducting reasoning, hypothesis-testing, and procedural linearity is expressed in writings and presentations of design thinking critics such as Jen (2018) and Iskander (2018). This seems to be due to most design thinking skeptics tracing the historic roots of the methodology back to 1970s.

We begin to wonder where the future might divert from the familiar flows of the past, how our insights could translate to new possibilities. (Liedtka & Ogilvie, 2011, p.28).

The following diagram shows how design thinking complements and augments action research. While the flow of action research implies a sequence of activities, the design thinking process is concerned with four complementary planes. Therefore, the boundary between research and application becomes indistinguishable. Moreover, each plane can be considered as a standalone activity while carrying qualities of other three. Thus, any of the four planes can be considered as the starting point for examining the design problem or taking action for solving it. Finally, in this model, there is no established sequence of activities or primacy of one over the other – planes and their corresponding tools and techniques are deployed into the field based on their usefulness for users and relevance to design challenges or opportunities. This is contradictory to the sequential nature of the positivist view where the researcher’s task is to establish facts for designer’s consumption.

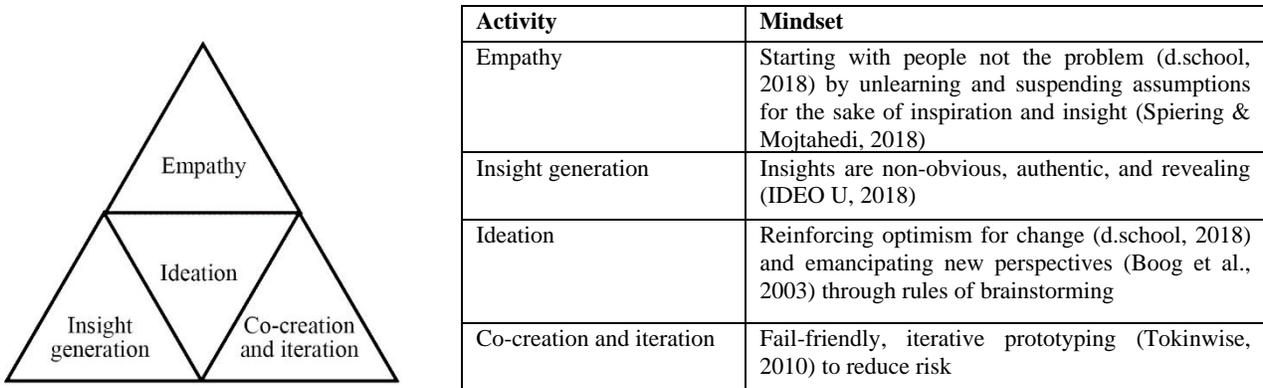


Figure (3) An unfolded triangular pyramid showcasing different planes or facets of design thinking as a methodology and mindset for changing existing practices and situations or creating new ones from scratch.

Example from practice

Examples from three projects at HGA are presented to place this framing of design thinking as a reaction to research-practice duality into the context. Each example is associated with an image that renders the facet of design thinking diagram through which the project is examined.

Example 1: Designing moments that matter for employees

- Context: A manufacturing company asked the design team to strategize for a human-centered workplace for their headquarters. Several design challenges were identified after conducting ethnographic observation and interviews as well as a journey mapping workshop. The following design challenge and solution are one of many other that shaped the workplace strategy.
- The challenge: How might we make employee's morning relaxing and delightful as opposed to rushed and stressful?
- The outcome: Instead of entering into a waiting area or reception counter, employees' very first moment of contact with the building in the morning is shaped by a relaxing and inviting café. Every morning, they walk into the smell of fresh coffee and buzz of people chatting.

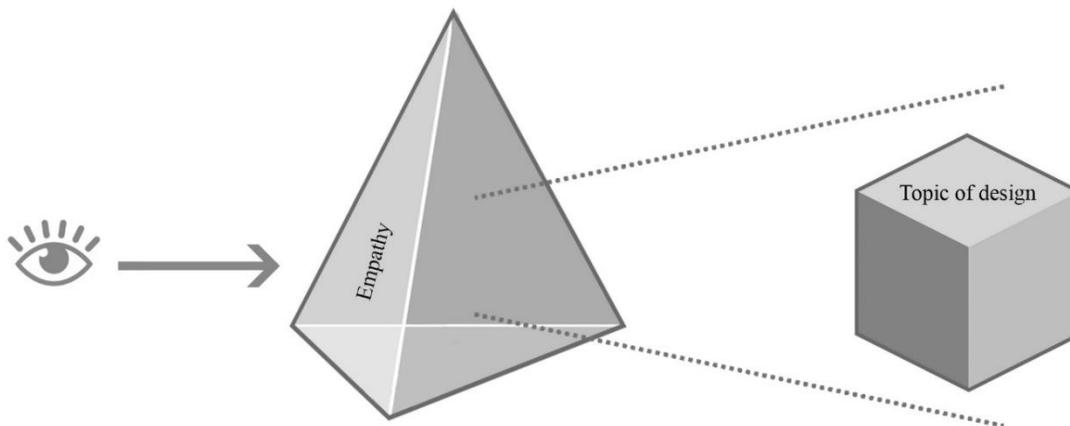


Figure (4) Approaching the design project from the perspective of 'empathy'

Example 2: Designing by flipping orthodoxies

- Context: A healthcare clinic is reviving the idea of the trusted family doctor by opening primary care clinics to improve health and lower costs with a focus on inner cities. The

company believed that conventional clinic spaces were not supportive of their model of health delivery.

- The challenge: How might we rethink all components of a clinic space that provides a way of delivering care different from all other clinics?
- The outcome: The design team collected over 50 top clinical operational and design assumptions (e.g. patients/members wait in the waiting room upon entrance), and then flipped all of those assumptions (e.g. instead of waiting upon arrival, patients go to a genius bar and talk to a tactical nurse). The client team handpicked the top 20 and organized the cards to build a relational diagram based on patient journeys.

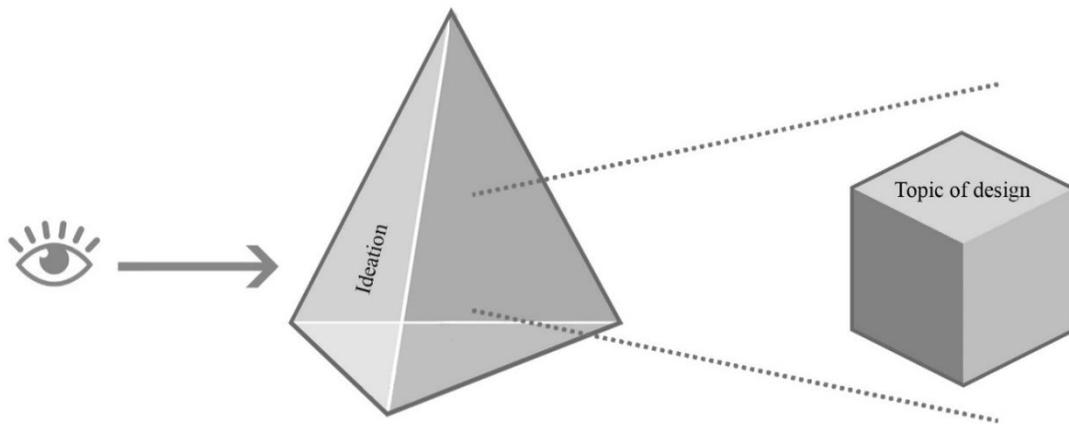


Figure (5) Approaching the design project from the perspective of ‘ideation’

Example 3: Designing an organization by co-creating its physicality

- Context: A growing design company goes through a process of renovating its workplace. Design team uses the changes in the physicality of space as an opportunity to redesign the organization.
- The challenge: How might we increase cross-pollination between different departments in the organization?

- The outcome: The design team curated a workshop where participants created paper models of their future workplace. Then a physical mockup of the future workplace was created in an area as large as 8000 sqf. Social interactions among participants were measured before and after installing the mockup using social sensing technology to track the emergence of cross-pollinators. Finally, the mockup was iterated continually to maximize inter-departmental interactions.

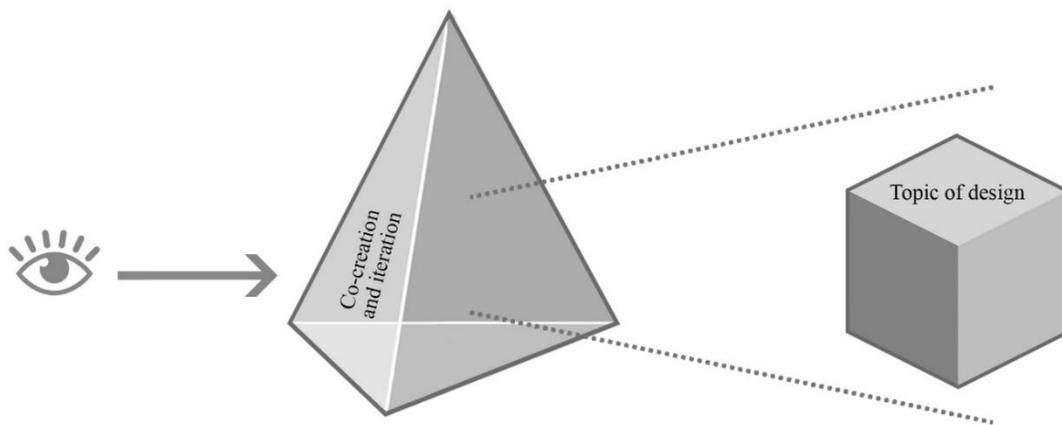


Figure (6) Approaching the design project from the perspective of ‘co-creation and iteration’

Conclusion

Proposing the four complementary planes of empathy, insight generation, ideation, and co-creation and iteration, design thinking challenges the sequential positivist approach towards research and application, and therefore, resolves the research application problem by blurring the boundaries between the two. Design thinking also augments action research by arguing for each plane as a standalone activity that carries qualities of the other three. Consequently, planes and their corresponding tools and techniques are deployed into the field based on their usefulness for users and relevance to design challenges or opportunities. This is contradictory to the sequential nature of the positivist view where the researcher’s task is to establish social and environmental facts for designer’s consumption. There are numerous cases that manifest how the non-linear process responds to the project needs, yet future work needs to study feasibility, viability, and desirability of such cases through post-occupancy evaluation.

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